DWR PERRIS DAM
EMERGENCY RELEASE FACILITY

Addendum No. 1
SCH No. 2013091027

Prepared for
Department of Water Resources

September 2020

ESA

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DWR PERRIS DAM EMERGENCY RELEASE FACILITY

Addendum No. 1

1.0 Introduction

1.1 Purpose of the Addendum

The purpose of this Addendum is to evaluate the potential environmental effects associated with the proposed modifications to the Perris Dam Emergency Release Facility (ERF) Project (project). The Final Environmental Impact Report (EIR) for the project was certified and approved by the California Department of Water Resources (DWR) in May 2018. Since the certification of the Final EIR, modifications to the project have been identified. The proposed modifications include minor project footprint changes, a modified access road, a description of impacts to the Perris Valley Channel, and connection from an existing drainage ditch to the project channel. Other project components as described in the certified EIR would remain the same and would still be implemented as part of the proposed project.

1.2 Regulatory Background

Section 15164(a) of the CEQA Guidelines provides that an addendum to a previously certified EIR for a project is permissible if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred. A subsequent EIR must be prepared if:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

    a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

DWR has evaluated the environmental impacts of the proposed modifications and, as lead agency, has determined that none of these conditions apply. Therefore, an Addendum to the certified EIR is the appropriate environmental document to analyze the proposed modifications. The justification for this determination is provided below in Sections 2 through 6.

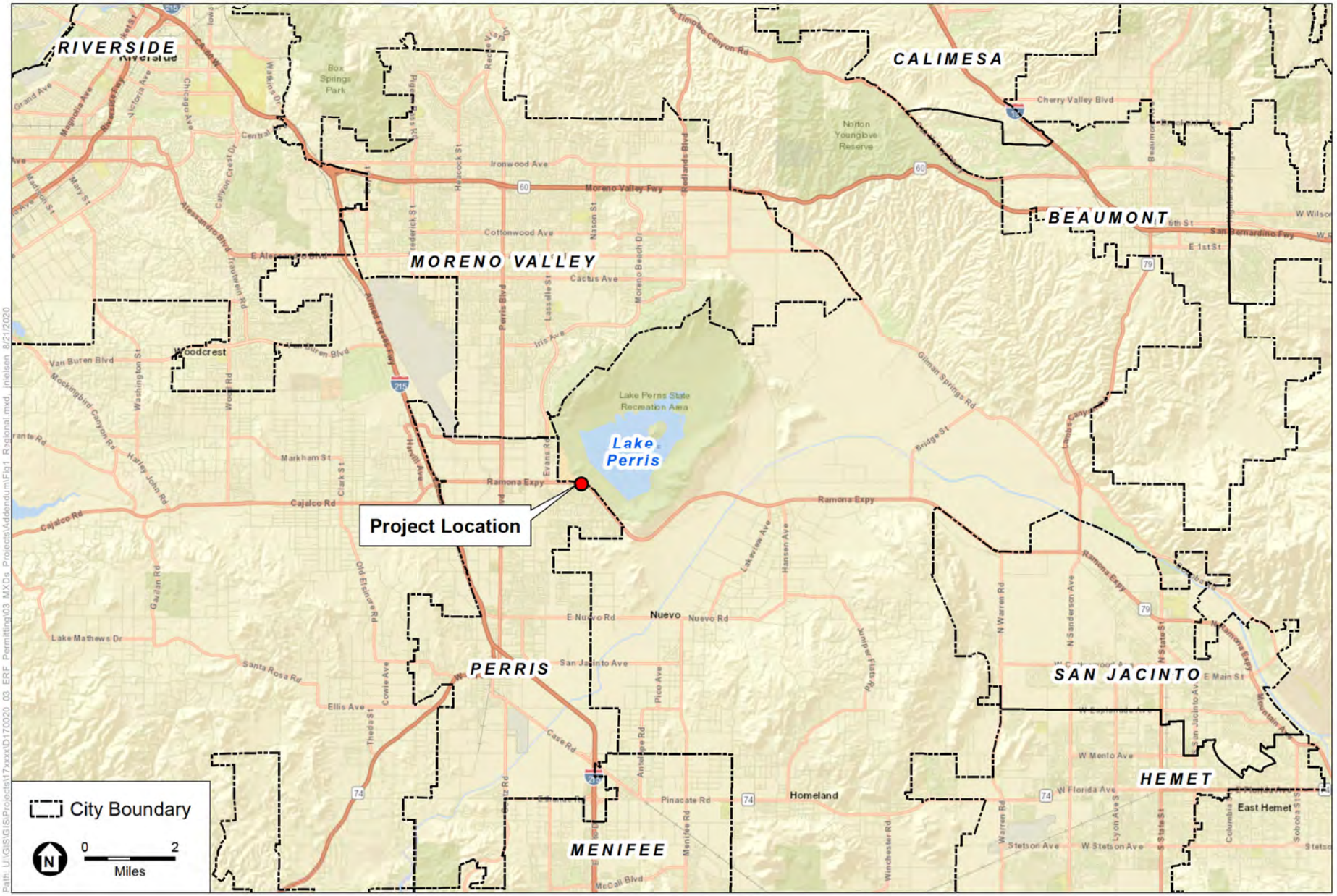
2.0 Certified Project Overview

2.1 Project Description

DWR has approved implementation of the Perris Dam Emergency Release Facility Project, located in an unincorporated portion of western Riverside County approximately 15 miles south of the City of Riverside and partially within the City of Perris (**Figure 1**). The proposed project would be constructed partially within the Lake Perris State Recreation Area (SRA), the Lake Perris Fairgrounds, and DWR property north of Ramona Expressway and would connect to the Perris Valley Channel.

The proposed project as described in the certified EIR would modify the existing emergency release structure and construct a water conveyance facility that would release and convey emergency flows from the Perris Reservoir in the event of an emergency drawdown. The existing bulkhead of the emergency release structure would be removed and replaced with an automated valve(s), which adds flexibility and redundancy to the system and makes the emergency release facility safer to operate. As described in the EIR, the emergency release structure would maintain a maximum design capacity of 3,800 cubic feet per second (cfs), but would be operated in accordance to DWR's Perris Dam Emergency Release Facility Operations Plan to not exceed the capacity of the downstream Perris Valley Channel when operationally possible.

The Emergency Release Facility will be constructed in three distinct sections: SRA Segment, Fairgrounds Segment, and Western Segment. During an emergency release, water would be directed from the emergency release structure to the Perris Valley Channel by a levee system across the open SRA land between the dam and Ramona Expressway (SRA Segment), a channel across the southern end of the Lake Perris Fairgrounds (Fairgrounds Segment), and finally a channel north of Ramona Expressway to the Perris Valley Channel (Western Segment). Upgrades will also be made to the release structure. **Figure 2** illustrates the three distinct facility segments and the release structure upgrades.



SOURCE: ESRI

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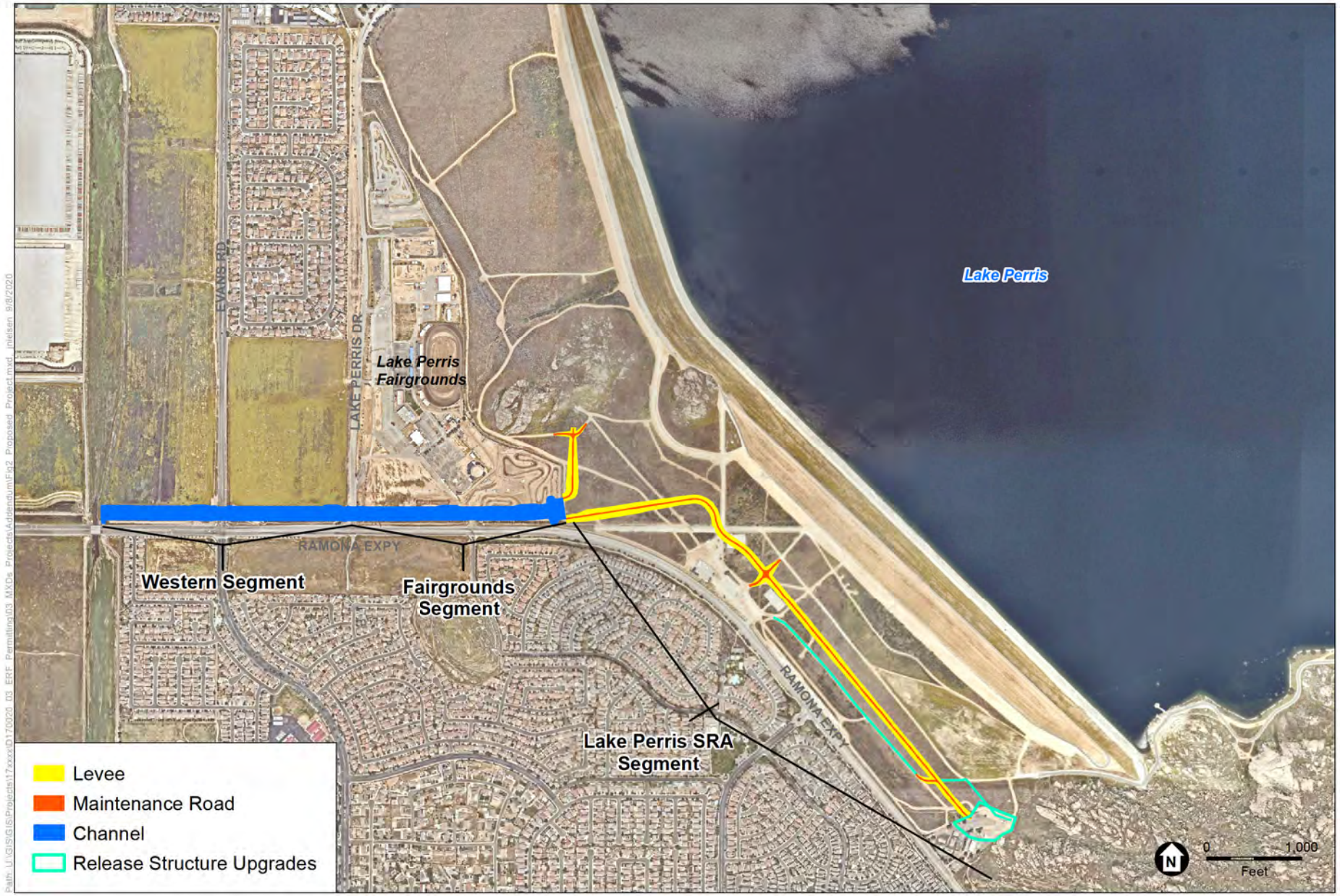
Figure 1
Regional Location

ESA



SOURCE: Nearmap Imagery 5/7/2020; DWR, ESA.

Perris Dam Emergency Release Facility, Addendum No. 1

Figure 2
Proposed Modification

ESA

SRA Segment

Two levees, the Main Levee and North Training Levee, would be constructed as part of the emergency release conveyance facility within the SRA. The Main Levee would be approximately 6,000 feet long, up to 10 feet high, and up to 87 feet wide at the bottom with 3:1 slopes. The North Training Levee would be approximately 685 feet long, up to 8 feet high and up to 60 feet wide at the bottom with 3:1 slopes.

All levees within the SRA would be constructed from native soil. A layer of rock would be placed on the levees to protect the embankment from erosion during an emergency release. The rock would be overlain by a minimum of two feet of native soil, to provide habitat for the small mammals including the Stephens' kangaroo rat (SKR) and Los Angeles pocket mouse. This form of levee construction is atypical and has been designed in coordination with a small mammal biologist to serve both its primary function as a water conveyance system and secondarily to provide suitable burrowing habitat for small mammals. The levees would be revegetated with native grasses and shrubs to replace habitat that was temporarily disturbed during construction. A 20-foot-wide dirt access road would be constructed on top of each levee for periodic maintenance checks of the levee system.

Fairgrounds Segment

The Fairgrounds Segment would receive water from the drainage basin in the SRA Segment and deliver it to the Western Segment. Water would be conveyed from this segment through an unlined trapezoidal channel approximately 140 feet wide at the top and 100 feet at the bottom with 2:1 side slopes. The channel would be 25 feet deep on the east end and 11 feet deep on the west end.

Within the Fairgrounds Segment, the conveyance channel would cross under two roads: one at the Lake Perris Fairgrounds' eastern entrance at Avalon Parkway (Fair Way) and the other at Lake Perris Drive. Partial or full road closures may be necessary during the construction of both under-crossings. Access to the Lake Perris SRA and the Lake Perris Fairgrounds would be maintained during any such closures via either the Avalon Parkway (Fair Way) entrance or the Lake Perris Drive entrance.

Western Segment

The Western Segment would be developed as an unlined, earthen, trapezoidal channel. The side slopes would be stabilized with rock for slope protection. The channel would be approximately 2,500 feet long, with a 120-foot top width and 80-foot bottom, and nine feet deep with 2:1 side slopes. A permanent 15-foot access road would be required on both sides of the channel.

The earthen channel would connect the Fairgrounds Segment to the Perris Valley Channel parallel to Ramona Expressway within DWR's existing right-of-way (ROW). Similar to the other two road crossings in the Fairgrounds Segment, this segment would cross under Evans Road through a bridge to be constructed as part of the project. A control structure at the connection to the Perris Valley Channel would be constructed to control the flow depth within the channel. Either a concrete weir or a series of box culverts and an embankment across the channel would be

constructed. Scour protection would be provided at the junction to protect the Perris Valley Channel from erosion damage.

2.2 Public Participation and Proposed Project Approval

The Notice of Preparation and the Notice of Availability of a Draft EIR were posted with the County Clerk in Riverside County, the State Clearinghouse, and two local newspapers (The Press-Enterprise and The Perris Progress/The Perris City News). The documents were also distributed to affected public agencies, community groups, and other interested parties. In addition, one public scoping meeting was held on September 19, 2013 at the Lake Perris Fairgrounds, Harrison Hall, 18700 Lake Perris Drive in Perris, California.

The Draft EIR was circulated for public review from September 9, 2016 through October 24, 2016. During this period, DWR held a public meeting to provide interested persons with an opportunity to comment verbally or in writing on the Draft EIR and the project. The public meeting was held on September 27, 2016 at the Lake Perris State Recreation Area, Lakeview Pavilion, 17801 Lake Perris Drive in Perris, California.

DWR chose to revise and recirculate some sections of the Draft EIR pursuant to CEQA Guidelines Section 15088.5(c). These recirculated sections replaced the corresponding sections of the 2016 Draft EIR. All other sections remained unchanged. A Notice of Availability of a Recirculated Draft EIR was posted with the County Clerk in Riverside County, the State Clearinghouse, and two local newspapers (The Press-Enterprise and The Perris Progress/The Perris City News). The documents were also distributed to the same affected public agencies, community groups, and other interested parties as the original Draft EIR. The Recirculated Draft EIR was circulated for public review from September 29, 2017 to November 13, 2017. DWR certified and approved the Final EIR and a Notice of Determination (NOD) for the project was filed on May 3, 2018.

3.0 Objectives of the Proposed Project

The proposed modifications maintain the same objectives as listed within the certified EIR for the project, and are provided below:

- Construct improvements to reduce the risk to public safety and property resulting from the execution of an emergency operation to drawdown Lake Perris;
- Reduce the risk to DWR Operations and Maintenance staff from operating the emergency release structure; and
- Improve the emergency release structure such that it can be reliably operated to drawdown Lake Perris to meet Division of Safety of Dams (DSOD) emergency drawdown requirements.

4.0 Description of Proposed Modifications

The proposed modifications to the project evaluated in this Addendum include minor footprint changes within or near previously proposed construction areas and minor changes to previously proposed components.

4.1 Minor Footprint Changes

Minor Staging/Construction Area Footprint Changes: The overall project construction impact area has been expanded to accommodate more staging areas and construction equipment usage within the project impact area as shown in **Figure 3**. In addition, one of the staging areas directly below the dam is being relocated to dam's southeast corner, in order to be closer to the release structure upgrade work. The newly affected areas would be located in areas such as along Ramona Expressway where construction trailers are present, along the dam base where the area is graded and maintained, and within the Fairgrounds where overflow parking areas are currently graded, which do not provide sensitive habitat (Figure 3). Other areas were expanded to accommodate the revised levee configuration, additional levee ramps, and a revised haul route (see descriptions of these modifications below). As described in the certified EIR, all temporary impacts to vegetated areas during construction would be restored to pre-project conditions.

Relocation of Utilities: Utility relocations would be required within the Fairgrounds and Western Segments. This would include relocation of overhead power lines, sewer, communications and water lines as needed for project implementation. The utility relocations would occur within the construction impact area and south of Ramona Expressway along Evans Road.

Release Structure Modification: The modifications to the release structure would be conducted as described in the certified EIR. However, to properly update the release structure, a new drain line (buried pipeline) connecting the de-watering sump of the release structure to an existing collection pipe would be required. This de-watering sump would collect any nuisance water that may collect in the outlet structure. The new drain line would require an approximately 3,440-foot, 6-inch PVC pipe be placed mainly within existing dirt roads as shown on Figure 2. The width and depth of the trench needed to bury the drain line would vary based on the terrain and the grade of the line. The majority of the drain line work and associated equipment would stay within the boundaries of existing dirt roads below the dam, and would stay within the proposed modification's overall construction impact area (Figure 3).

4.2 Minor Changes to Existing Project Components

Levee Configuration Modification: The levee configuration included in the certified EIR was created during preliminary design. Through coordination with Metropolitan, the levee configuration has been modified as shown in Figure 2 due to engineering considerations. DWR has modified the levee path so that it crosses over the inland feeder closer to a right angle, as required, and also avoids any direct impacts to riparian vegetation. In addition, minor changes to the width and height of the levees have been made. The Main Levee would be up to 15 feet high, and up to 115 feet wide at the bottom. The North Training Levee would be up to 18 feet high and up to 135 feet wide at the bottom. The North Training Levee would also be slightly longer at 700 feet long. Both levee slopes would remain at 3:1. The access road along the top crest of the levee would be a graveled road. New levee ramps at three locations along the levee would be required to accommodate larger vehicles that need to access areas adjacent to the dam. These new ramp locations are shown on Figure 2. One ramp would flank both the east and west sides of the north training levee. The two other ramps would be constructed along the main levee, one with ramps on the north and south side of the levee, and the second, southernmost ramp would only be required along the southern side of the levee. An access road would be constructed along the top of the ramps.

SOURCE: Nearmap Imagery, 5/7/2020, DWR, ESA.

Perris Dam Emergency Release Facility, Addendum No. 1

Figure 3
Proposed Modification Footprint Comparison

ESA

Perris Valley Channel Updates: In order to accommodate the design flow, prevent scour, and stabilize the banks of the Perris Valley Channel, approximately 5,000 cubic yards of 18-inch or smaller crushed rock would be permanently placed on approximately 229-linear feet along the bottom and slopes of the Perris Valley Channel. This design feature was described in the certified EIR as scour protection, but was not identified in the figures. It is included here for clarity.

Connection to Existing Drainage: The existing drainage along Ramona Expressway collects runoff from Ramona Expressway and conveys it to the Perris Valley Channel. Once the proposed project is constructed, the existing drainage would be re-graded as a swale and would continue to collect runoff. In order to properly drain runoff, the existing drainage channel along the Fairgrounds and Western Segments would be re-graded and eight new drop inlets would be installed in the existing channel to convey runoff water from the existing channel along Ramona Expressway to the new adjacent ERF channel. In addition, there would be eight drop inlets on the north side of the new channel to convey local runoff into the ERF channel. Each drop inlet would consist of a concrete apron structure approximately five feet by five feet with a metal grating over the opening to an 18-inch pipe. Pipes would be buried and convey runoff water directly into the new ERF channel. These features improve stormwater conveyance but were not identified in the certified EIR.

Haul Route Change: Changes to the haul route have been made to avoid usage of Ramona Expressway and reduce traffic impacts. As shown on **Figure 4,** the new haul route would travel east-west along the north side of the channel in the Fairgrounds segment, reducing the distance traveled by the north-south piece of the haul route on Lake Perris Drive. In order to cross Evans Road, haul traffic would travel north-south on project right-of-way on either side of Evans Road, crossing over at a safe distance from the intersection with Ramona Expressway. In addition, construction vehicles may have the option to travel through the Fairgrounds, connecting the haul route from Lake Perris Drive to the SRA portion of the project area. A small portion of the haul route has been extended to connect to the new proposed staging area below the dam's left reach.

5.0 Environmental Setting and Analysis

5.1 Air Quality/Greenhouse Gas Emissions

The certified EIR evaluated impacts to air quality from construction and operation and concluded that impacts associated with air quality would be less than significant. This section provides analysis of the potential air quality impacts associated with the proposed modifications.

Impact Discussion

The proposed footprint and design component modifications would not increase the duration of the construction activities. None of the footprint changes would result in modifications to air emissions. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce project impacts to less than significant levels. These measures assign a maximum amount of truck trips per day and require appropriate EPA Tier 4 engines or their equivalent. The overall construction period for the proposed project would remain the same with the proposed modifications, which, as stated in the certified EIR, is anticipated to occur over a 3-year period. Once constructed, the proposed modification would not change operational activities as described in the certified EIR.

SOURCE: Nearmap Imagery, 5/7/2020; DWR; ESRI

Perris Dam Emergency Release Facility, Addendum No. 1

Figure 4
Proposed Modification Haul Route Comparison

ESA

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.2 Biological Resources

The certified EIR evaluated impacts to biological resources and concluded that impacts to special status plant and wildlife species, and associated habitat conservation plans, would be considered less than significant with mitigation. This section provides analysis of potential biological resources impacts associated with the proposed modifications. The biological assessment report has been updated as a result (Appendix A-1). Several technical surveys have been conducted within areas potentially affected by the proposed footprint modification that include breeding-season burrowing owl surveys (Appendix A-2), rare plant surveys (Appendix A-3), and a focused habitat assessment and survey results for SKR (Appendix A-4). The following discussion summarizes the potential effects associated with the proposed footprint and project component modifications.

Impact Discussion

Minor Footprint Changes

Each of the proposed footprint modifications are located within areas that were either previously surveyed in the certified EIR and/or within areas that have been previously disturbed and have little to no habitat value for special status species. As such, the minor footprint changes would not present any new impacts to sensitive biological resources. The amount of habitat temporarily affected is increased slightly, but the mitigation measures requiring no net loss of habitat would ensure that impacts are not substantially greater than those identified in the certified EIR. The biological assessment report included as Appendix A-1 encompasses the project area including the new proposed modifications. Further, the minor footprint changes would not conflict with the provisions of a habitat conservation plan, such as the Western Riverside County Multiple Species Habitat Conservation Plan or the SKR Habitat Conservation Plan, for the same reason as the proposed project. Impacted areas would be restored, and no listed species would be affected requiring an incidental take permit from either the California Department of Fish and Wildlife or the US Fish and Wildlife Service. Potential impacts associated with the proposed modifications would be mitigated to less than significant levels with the implementation of Mitigation Measures BIO-1 through BIO-7. As such, potential impacts associated with the minor footprint changes of the proposed modifications would remain less than significant with mitigation. Additional surveys conducted of the project impact areas in 2019 are summarized below.

Burrowing Owls

Breeding season burrowing owl surveys were conducted by Environmental Science Associates (ESA) in 2019 pursuant to the guidelines outlined in the California Department of Fish and Wildlife (CDFW) *Staff Report on Burrowing Owl Mitigation* (CDFW staff report) (CDFG 2012). The survey began with an initial habitat assessment that was completed throughout the majority

of the project modification area, including required survey buffers, to identify areas containing suitable burrowing owl habitat. The private property just north of the Western Segment was assessed visually from DWR's ROW and the property boundaries, as access was not feasible at the time of the surveys. Subsequent focused visual surveys were completed to determine presence or absence of owls within the survey area. Survey dates and times are listed in Table 1.

No burrowing owls or sign of owl presence (e.g., feathers, pellets or whitewash) were observed during the breeding season surveys; however, on January 18, 2019, an ESA biologist incidentally observed a burrowing owl perched at the entrance of a burrow on the private parcel located immediately to the west of Evans Road. Burrowing owls have not been observed subsequently, including at any time during the 2019 focused surveys. A burrowing owl survey memorandum was prepared by ESA and is attached in Appendix A-2.

TABLE 1
BREEDING SEASON SURVEYS

Survey	Date	Time
Survey 1	3/04/2019	0619-1102
	3/04/2019	1535-1755
	3/05/2019	0606-1035
	3/05/2019	1523-1729
	3/06/2019	0715-0932
	3/06/2019	1530-1752
	3/07/2019	0603-1121
Survey 2	4/16/2019	0618-1030
Survey 3	5/15/2019	1603-1941
Survey 4	6/19/2019	1600-1715
	6/20/2019	0904-1011

Rare Plants

Four rounds of focused rare plant surveys were conducted on March 4-7, April 16, May 15, and June 19-20 of 2019. The surveys were conducted pursuant to the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). The 2019 focused plant surveys confirmed that there are no special-status plant species on or within the project modification areas. A rare plant survey report is provided in Appendix A-3.

Stephen's Kangaroo Rat

A field assessment for SKR was conducted by a permitted biologist on November 10, 11, 19, and 20, 2018, and live-trapping nighttime surveys were conducted within and adjacent to the project modification areas on March 16 to 21, 2019. A technical report was prepared (See Appendix A-4) that concluded that the proposed modifications would not impact SKR individuals or SKR occupied habitat. No SKR were observed within the modification areas; however, four SKR were captured in adjacent areas outside of the project's limits and adjacent to the certified and

proposed haul route. Haul routes will be flagged and construction equipment traveling throughout the project site would be required to stay within the existing dirt roads/delineated areas. This would ensure that SKR habitat is not disturbed during construction.

Minor Changes to Existing Project Components

The proposed changes to project components would not increase impacts to biological resources. The Perris Valley Channel Updates and the Connections to Existing Drainage components of the proposed modifications would occur within areas that are maintained by Riverside County Flood Control and Water Conservation District as part of the local drainage system. The burrowing owl surveys, Stephen's kangaroo rat surveys, and rare plant surveys that were conducted in 2019 determined that there are no special-status species within these areas. As such, no impacts to special status species would occur due to the proposed minor changes to existing project components; therefore, impacts would remain less than significant with the mitigation included in the certified FEIR.

Through DWR's coordination with Metropolitan Water District of Southern California, it was determined that the proposed levee would need to be constructed at a 60-degree angle over the existing, underground Metropolitan Inland Feeder due to engineering considerations. The revised levee path means that construction work would occur closer to occupied least Bell's vireo habitat than the alignment considered in the certified EIR. Potential impacts to nesting birds would be reduced to less than significant levels in accordance with certified EIR Mitigation Measures BIO-3, BIO-5, and BIO-6, which include pre-construction surveys, avoidance, and establishment of non-disturbance buffers.

The new levee ramps would be mainly constructed within existing access roads below the dam, with small portions outside of the existing access roads in order to accommodate the flared shape of the ramps. Impacts to vegetation below the dam for all three proposed ramps would total approximately 0.55 acre of temporary impacts to grassland habitat. The 0.55 acre impact would be restored onsite, along the slopes of the ramps and would be accounted for in the project's Restoration Plan per Mitigation Measure BIO-2c. Since the new ramps would be installed at existing road crossings, no additional permanent impacts to grassland habitat would occur due to the proposed modifications.

As previously indicated, protocol burrowing owl surveys conducted in 2019 revealed that there are no burrowing owls within any of the proposed project/proposed modifications impact areas. Burrowing owl were observed by ESA in 2019 immediately to the west of Evans Road along the proposed modification's Haul Route Change location. This area would accommodate a haul route to allow for construction vehicles to safely cross Evans Road and to avoid Ramona Expressway for the duration of construction activities located west of Evans Road. The haul route would be placed as far west as possible within DWR's construction easement from existing owl burrows. As such, the burrow would not be impacted and would be located at least 50 feet away from the haul route.

As stated in the certified EIR, should owl burrows become inhabited, implementation of Mitigation Measures BIO-3 through BIO-6, which includes pre-construction surveys, burrowing

owl protocol surveys, preparation of a relocation plan, nest avoidance, and non-disturbance buffer zone establishment, would reduce any potential impacts to burrowing owls to a less-than-significant level. Impacts to biological resources would remain less than significant with mitigation incorporated for the proposed modifications.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.3 Cultural Resources

The certified EIR evaluated impacts to cultural resources and concluded that impacts would be considered less than significant with mitigation. This section provides analysis of potential cultural resources impacts associated with the proposed modifications based on an updated archaeological resources survey (Appendix B-1) and a Historic Resources Evaluation Report (HRER) (Appendix B-2).

Impact Discussion

The proposed footprint and project component modifications would mainly be conducted within areas previously surveyed as part of the analysis in the certified EIR. However, for those areas not originally surveyed as part of the certified EIR, a Cultural Resources Survey update memorandum was prepared, and is included as Appendix B-1 No archaeological resources were identified within the proposed project modification areas (Appendix B-1). Although, no archaeological resources were identified, as noted in the certified EIR, activities involving ground disturbance could result in the discovery of previously unknown subsurface archaeological deposits that could qualify as historical resources or unique archaeological resources pursuant to CEQA, as well as human remains interred outside of formal cemeteries. Implementation of the certified EIR's Mitigation Measures CUL-1, CUL-2, CUL-3 and CUL- 5 would reduce potential impacts to archaeological resources and human remains to a less than significant level.

To assess potential cultural resources within the Perris Valley Channel, an HRER was prepared covering the Perris Valley Channel, which is the only feature within the overall proposed project impact area with the potential to be a historic resource. Per the HRER the Perris Valley Channel was evaluated for listing in the National Registers of Historic Places (NRHP) and the California Register of Historic Resources (CRHR) under Criteria A/1-D/4 as a historic-period water conveyance feature constructed and maintained by the Riverside County Flood Control and Water Conservation District. As a result of the investigation, the Perris Valley Channel is recommended ineligible for listing in the CRHR and the NRHP under all applicable criteria. As such, the Perris Valley Channel does not qualify as a historic property under Section 106 of the NHPA or as a historical resource under CEQA.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.4 Noise

The certified EIR evaluated impacts to noise and vibration and concluded that impacts to nearby sensitive receptors and open space recreational areas would be considered significant and unavoidable during construction. This section provides analysis of potential noise impacts associated with the proposed modifications.

Impact Discussion

The construction of the proposed modifications would not change the duration of the proposed construction activities that use heavy equipment during the site preparation, grading, excavation, and building activities. As shown on Figure 3, the proposed project modification's impact areas would occur in generally the same location as described in the certified EIR. The distance to nearby sensitive receptors would remain generally the same; therefore, similar to the certified EIR, impacts would be considered significant and unavoidable during construction even with implementation of the certified EIR Mitigation Measures NOISE 1 through NOISE 4.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.5 Recreation

The certified EIR evaluated impacts to recreation and concluded that potential impacts to recreational facilities would be considered less than significant. This section provides analysis of potential recreation impacts associated with the proposed modifications.

Impact Discussion

The proposed minor footprint changes and minor changes to existing components would not create additional impacts beyond those described in the certified EIR. The proposed modification would include changes to the construction footprint and project impact areas, but would not increase the construction duration or include impacts to additional recreational facilities beyond those discussed in the certified EIR, and would not change the duration of project construction. Once constructed, the proposed modifications would not include additional recreational impacts or result in new recreational facilities.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.6 Transportation and Traffic

The certified EIR evaluated impacts to traffic and circulation, and concluded that potential impacts would be considered significant and unavoidable even with mitigation. This section provides analysis of potential traffic and circulation impacts associated with the proposed modifications.

Impact Discussion

To reduce impacts to traffic and circulation, a haul route change has been made to avoid usage of Ramona Expressway. The new haul route would travel east-west along the north side of the channel in the Fairgrounds segment, reducing the distance traveled by the north-south piece of the haul route on Lake Perris Drive. In order to cross Evans Road, haul traffic will travel north-south on project right-of-way on either side of Evans Road, crossing over at a safe distance from the intersection with Ramona Expressway. In addition, construction vehicles will have the option to travel through the Fairgrounds, connecting Lake Perris Drive to the SRA portion of the project area. These proposed changes shown on Figure 4 would reduce impacts to Ramona Expressway. Work on overhead power lines would occur north and south of Ramona Expressway. This work would not require additional road closures and implementation of a Traffic Management Plan and Mitigation Measure TRANS-1 would still be required.

Other proposed modification changes to the project footprint and existing project components would not increase traffic impacts. Impacts to the project area would still be significant and unavoidable during construction and Mitigation Measures TRANS-1 would still be required. The proposed haul route changes would allow for the haul route to be used for emergency access, on an as needed basis as required by Mitigation Measure UTIL-1. No additional impacts to traffic or circulation would occur as a result of the project modifications.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

5.7 Utilities

The certified EIR evaluated impacts to utilities and service systems, and concluded that potential impacts would be considered less than significant with mitigation. This section provides analysis of potential utilities and service systems impacts associated with the proposed modifications.

Impact Discussion

The proposed project included relocation of utilities and the proposed modifications clarify those relocations including changes to the project footprint. The proposed modifications include the relocation of overhead power lines along Evans Road at Ramona Expressway. The proposed modifications impact footprint has been expanded to include these changes. All other utility relocations would occur within the Western and Fairgrounds Segments. Mitigation Measure UTIL-2 would require an underground utility search prior to construction activities. In addition, as described in the certified EIR, DWR would identify utility providers and contact utility owners to include information in detailed project designs and would continue coordination with utility providers to ensure services are protected and any potential interference with utility services during construction is minimal, and impacts to service would be short-term and restored as soon as possible. Impacts to utilities would be considered less than significant with mitigation.

Conclusion

The proposed modifications would not create additional impacts beyond those described within the certified EIR, and would not substantially increase the severity of impacts previously analyzed in the certified EIR. No new mitigation is required beyond the existing commitments contained within the MMRP.

6.0 Summary of Effects

The proposed modifications would not change the impact conclusions of the certified EIR. The proposed modifications would still meet the same project objectives identified in the certified EIR. No new potentially significant impacts would occur, and the proposed modifications would not increase the severity of previously-identified impacts analyzed in the certified EIR. The proposed modifications to the previously-approved project do not meet any of the conditions that would require the preparation of a subsequent EIR or negative declaration pursuant to section 15162 of the CEQA Guidelines or any of the conditions set forth in section 15163 of the CEQA Guidelines.

DWR has evaluated the environmental impacts of the proposed modifications and, as lead agency, has determined that none of the conditions requiring a Subsequent EIR apply. Therefore, an Addendum to the certified EIR is the appropriate environmental document to address the proposed modifications and approve their implementation.

Appendix A
Biological Resources

ESA

A-1 Biological Assessment

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July 31, 2019

Gina Radieve
Senior Environmental Scientist
Department of Water Resources
1416 Ninth Street, Room 452-1
Sacramento, CA 95814

Subject: Perris Dam Emergency Release Facility Project – Biological Resources Assessment Update

Dear Ms. Radieve:

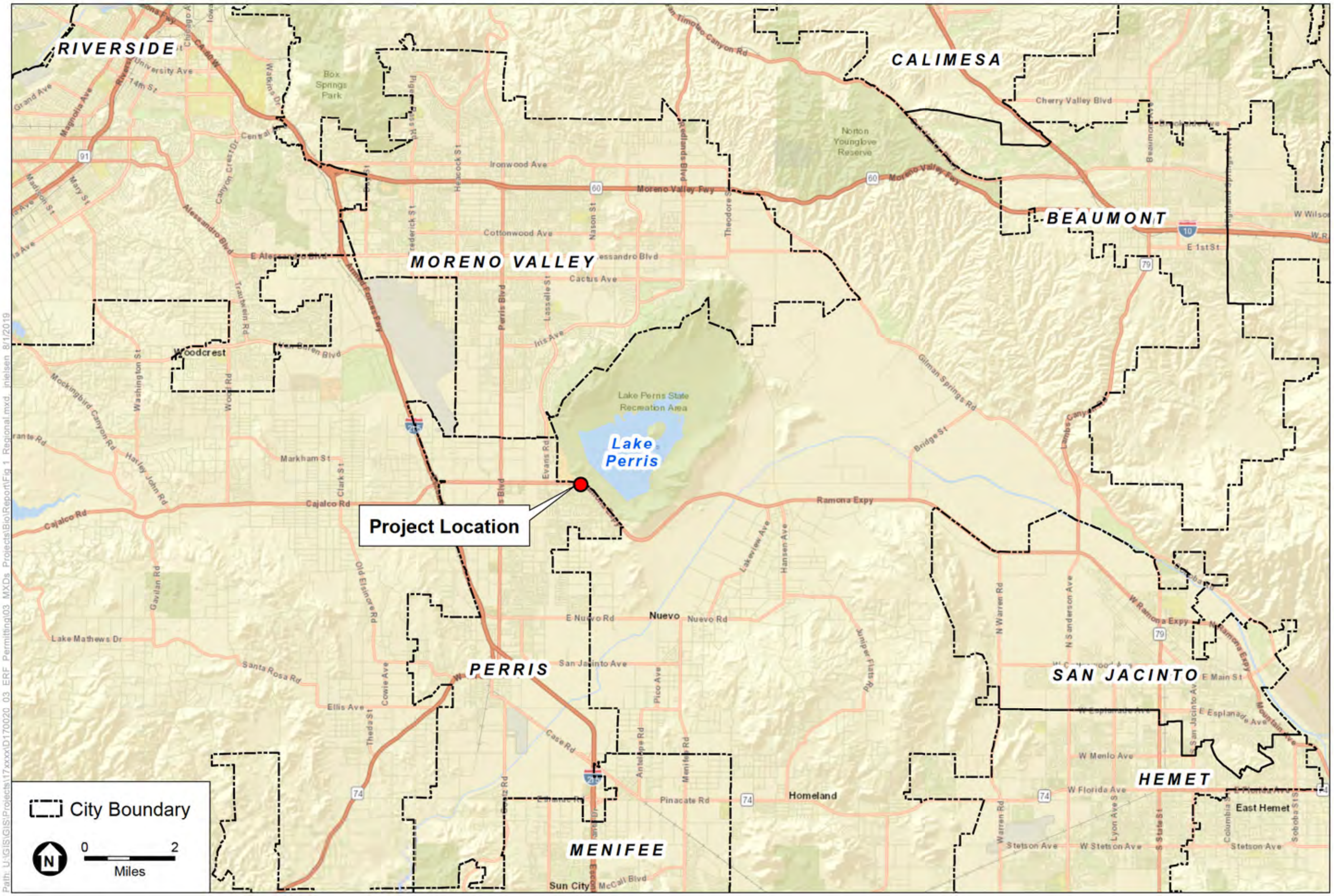
This letter report provides the results of a biological resources assessment conducted to update to the biological resources evaluation (Psomas 2009) previously prepared for the Perris Dam Remediation Program, which included the Perris Dam Emergency Release Facility Project (Project) in 2009. This letter report also includes a brief overview of the Mitigation Monitoring and Reporting Program (MMRP) developed in support of the Environmental Impact Report (EIR) (SCH #201391027) certified for the Project, and includes a discussion of how compliance with the biological resources mitigation measures identified in the MMRP will be achieved prior to and during proposed construction activities.

Background

Since certification of the Project EIR, minor changes have been made to the Project footprint (i.e. haul route) and the baseline conditions included in the initial biological resources evaluation of the Lake Perris Dam Remediation Project (Psomas 2009) may have changed. The purpose of this biological resources assessment is to provide an updated database and literature review, update to the baseline conditions of the 2009 biological report, and identify any new special-status species that have the potential to occur in the Project area.

Project Location

The Project is located in an unincorporated portion of western Riverside County approximately 15 miles south of the city of Riverside and partially within the city of Perris (**Figure 1 – Regional Location**). The Project would be constructed partially within the Lake Perris State Recreation Area (SRA), the Lake Perris Fairgrounds, and a California Department of Water Resources (DWR) property north of Ramona Expressway (**Figure 2 – Project Location**).

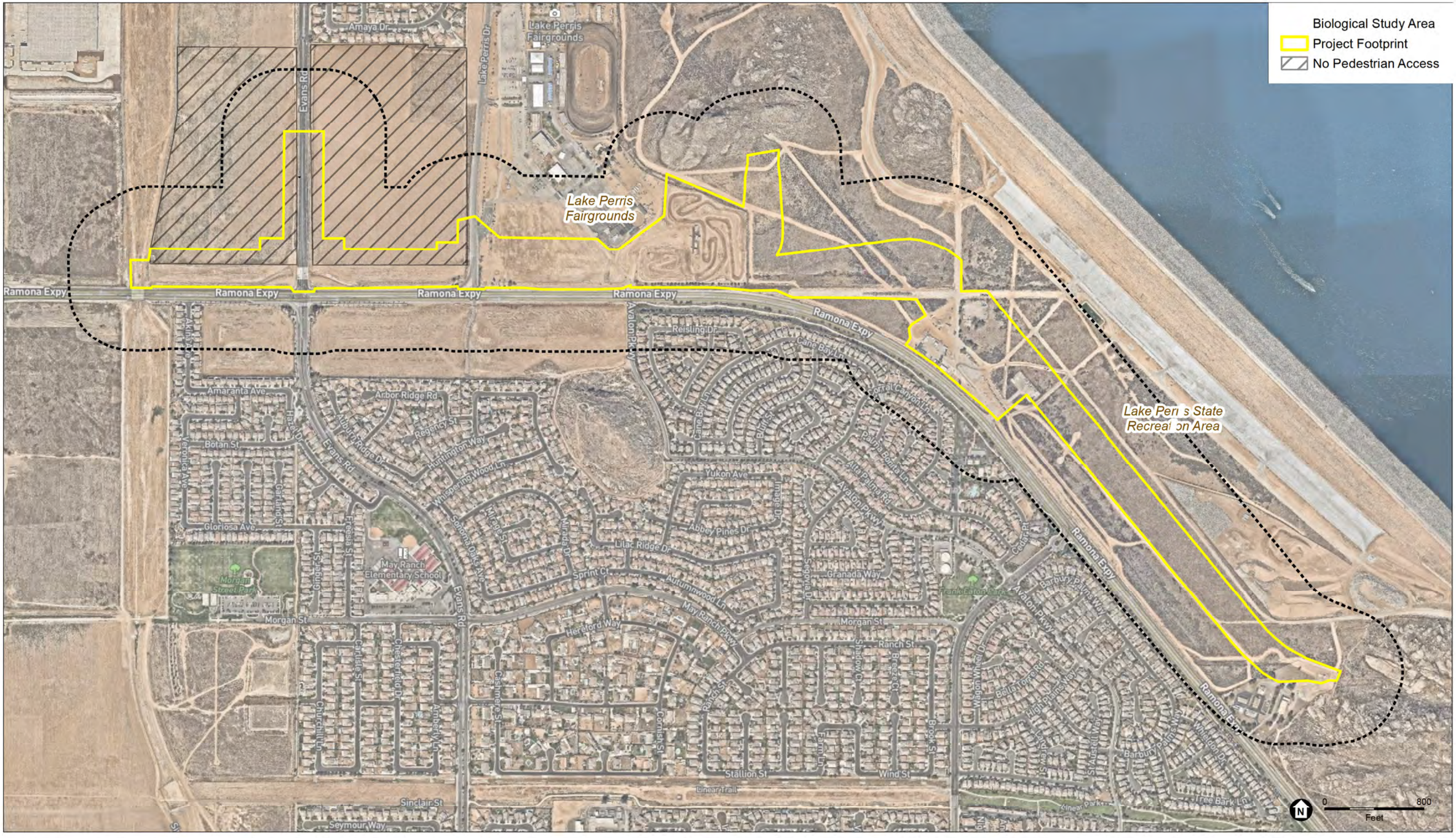


SOURCE: ESRI

Perris Dam Emergency Release Facility Project

Figure 1
Regional Location

ESA



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 2
Project Location

ESA

Methods

Literature Review

Prior to conducting the biological resources assessment, ESA conducted an updated query of available biological resource databases and reports prepared for the Project and other DWR projects at Lake Perris. This information was used to review sensitive biological resources that have been previously detected in the vicinity of the Project site and to assist in the determination of whether existing conditions within the study area have changed significantly and to what degree. The results of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Data Base (CNDDB) and California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California are provided in **Appendix A – CNDDB and CNPS Results**.

- California Department of Fish and Wildlife (CDFW). 2018a. California Natural Diversity Data Base (CNDDB). Database was queried for special status species records in the Perris USGS 7.5-minute quadrangle and eight surrounding quadrangles including El Casco, Elsinore, Lakeview, Riverside, Romoland, Steele Peak, Sunnymead and Winchester. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data: Accessed November 14, 2018.
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Field Studies

For more than 12 years, ESA has conducted numerous biological field surveys throughout the Lake Perris area, including the SRA, in support of various DWR projects, including the Lake Perris Dam Remediation Project, the Emergency Release Facility Project, and the Lake Perris Seepage Recovery Project. Field surveys throughout the SRA and immediately surrounding areas began as early as 2007 and continued through 2019 and included focused burrowing owl and coastal California gnatcatcher surveys, nesting bird surveys, small mammal trapping, etc. Information derived from the available literature and the database query results (listed under Literature

Review) was analyzed in combination with the results of previous field studies (i.e. 2009 biological report), listed below, to assist in determining whether any new special-status species have the potential to occur within the Project area:

- *Biological Resources Evaluation of the Lake Perris Dam Remediation Project* (Psomas 2009).
- *Results of 2012 Least Bell's Vireo Surveys at Lake Perris, Riverside County, California* (ESA 2012)
- *Results of a Survey for Stephens' kangaroo rat and Los Angeles pocket mouse for the Lake Perris Dam Remediation Project, Riverside County, California*. (SJM Biological Consultants 2012).
- *Year 2012 Coastal California gnatcatcher Survey Report for Perris Dam Remediation Project on behalf of Environmental Science Associates*. (Owens Wildlife Biology 2012)
- *Burrowing Owl Protocol Survey Results for the Perris Dam Emergency Release Facility Project.* (ESA 2013)
- *Perris Dam Emergency Release Facility Project – Nesting Bird Data* (ESA 2017).
- *Results of a habitat assessment for the federally endangered Stephens' kangaroo rat (Dipodomys stephensi) (SKR) at the L. Perris Emergency Release Project (ERF) alignment.* (SJM Biological Consultants 2018)

Biological Resources Assessment

A biological resources assessment was conducted by ESA biologists Robert Sweet and Dale Hameister on October 16, 2018. The survey consisted of walking and driving throughout the Project site and surrounding 500 feet (study area) to characterize and map any apparent changes in the vegetation, assess the overall habitat quality onsite and determine the potential for special-status plants and wildlife to occur within the study area, if different than what was outlined in the 2009 biological report.

All incidental, visual observations of flora and fauna, including sign (e.g., presence of scat) as well as any audible detections of wildlife, if different than that noted in the 2009 biological report (Psomas 2009), were noted during the assessment. Native and non-native plant communities and land uses were characterized and delineated on aerial photographs during the field survey, and then digitized on aerial maps using a geographic information system software (ArcGIS). Most descriptions of community and land use types were characterized in the field in accordance with *A Manual of California Vegetation-Second Edition* (Manual) (Sawyer et al. 2009); however, some were characterized based on species dominance or other visual characteristics if a suitable alliance was not appropriate. A detailed description of each plant community and land use is discussed in detail below.

Results

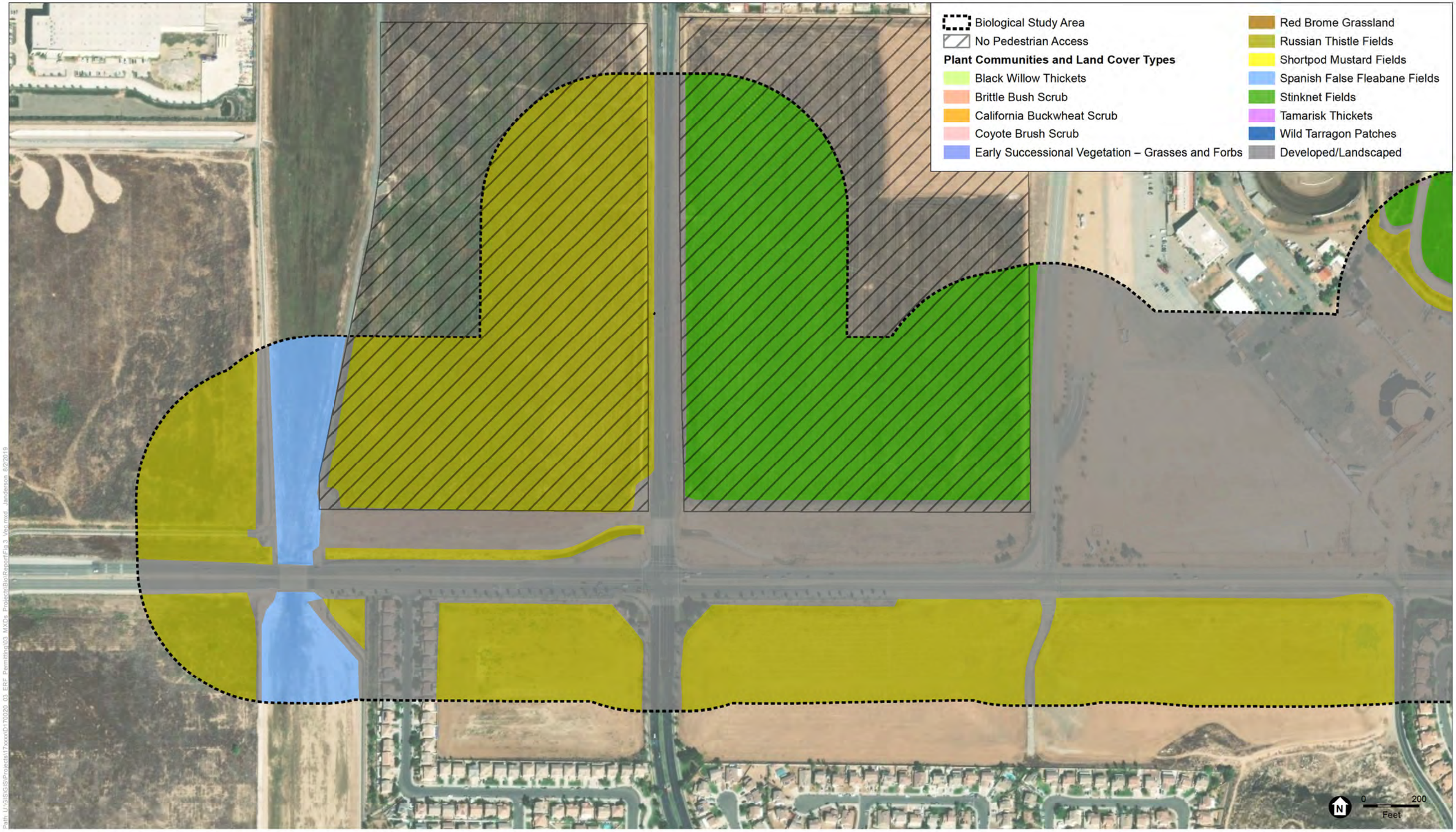
Based on review of the existing reports identified above, coastal California gnatcatcher (*Polioptila californica californica*) have not been reported in the study area. However, the burrowing owl (*Athene Cunicularia*) (ESA 2019), Los Angeles pocket mouse (*Perognathus longimembris* ssp. *brevinasus*), northwestern San Diego pocket mouse (*Chaetodipus fallax* ssp. *fallax*), and Bryant's (San Diego) desert woodrat (*Neotoma bryanti* ssp. *intermedia*) have been documented on the project site (SJM Biological Consultants 2012). Suitable habitat for Stephens' kangaroo rat is present throughout the project site (SJM Biological Consultants 2018). This species has been documented outside of the study area in the southern end of the dam (SJM Biological Consultants 2012, 2019) Least Bell's vireo was last detected below the dam during protocol surveys in 2012 (ESA 2012) and incidentally, outside of direct project impact areas in 2019.

All findings made during the biological resources assessment conducted on October 16, 2018 are consistent with the findings made in the 2009 biological report. However, based on the updated vegetation mapping performed during the biological resources assessment, the descriptions of the plant communities and land uses have been updated and reflected in **Figure 3a** through **Figure 3c**. All other biological resources evaluated in the 2009 biological report (e.g. species potential-to-occur, soils, etc.) remain unchanged and are not analyzed further in this report.

Plant Communities and Land Use

Much of the study area is dominated by developed/landscaped land cover consisting of paved and un-paved roadways (e.g. Ramona Expressway), the Lake Perris Fairgrounds, the Metropolitan Water District property below the dam, etc. Other areas, particularly the large patches of vegetation below the dam, support heavily disturbed herbaceous vegetation communities such as red brome grassland and stinknet fields, with a few native plant communities such as California buckwheat scrub, brittle bush scrub, and black willow thickets. Plant communities and land use are mapped in Figure 3a through Figure 3c.

Acreages are summarized in **Table 1**, and are listed according to *A Manual of California Vegetation* (Manual) (Sawyer et al. 2009). In instances where the community could not be accurately described using the Manual, it was described based on species dominance or other defining characteristics. Vegetation communities considered sensitive natural communities by California Department of Fish and Wildlife (CDFW) as listed in the California Natural Community List (CDFW 2018) are identified with an asterisk. A complete list of plant species observed during the supplemental biological assessment is provided in **Appendix B – Floral and Faunal Compendia**; these compendia are intended to serve as an addendum to those included in the 2009 biological report. Photographs were taken during the site visit depicting the communities and land use within the study area and are provided in **Appendix C – Photographic Log**.



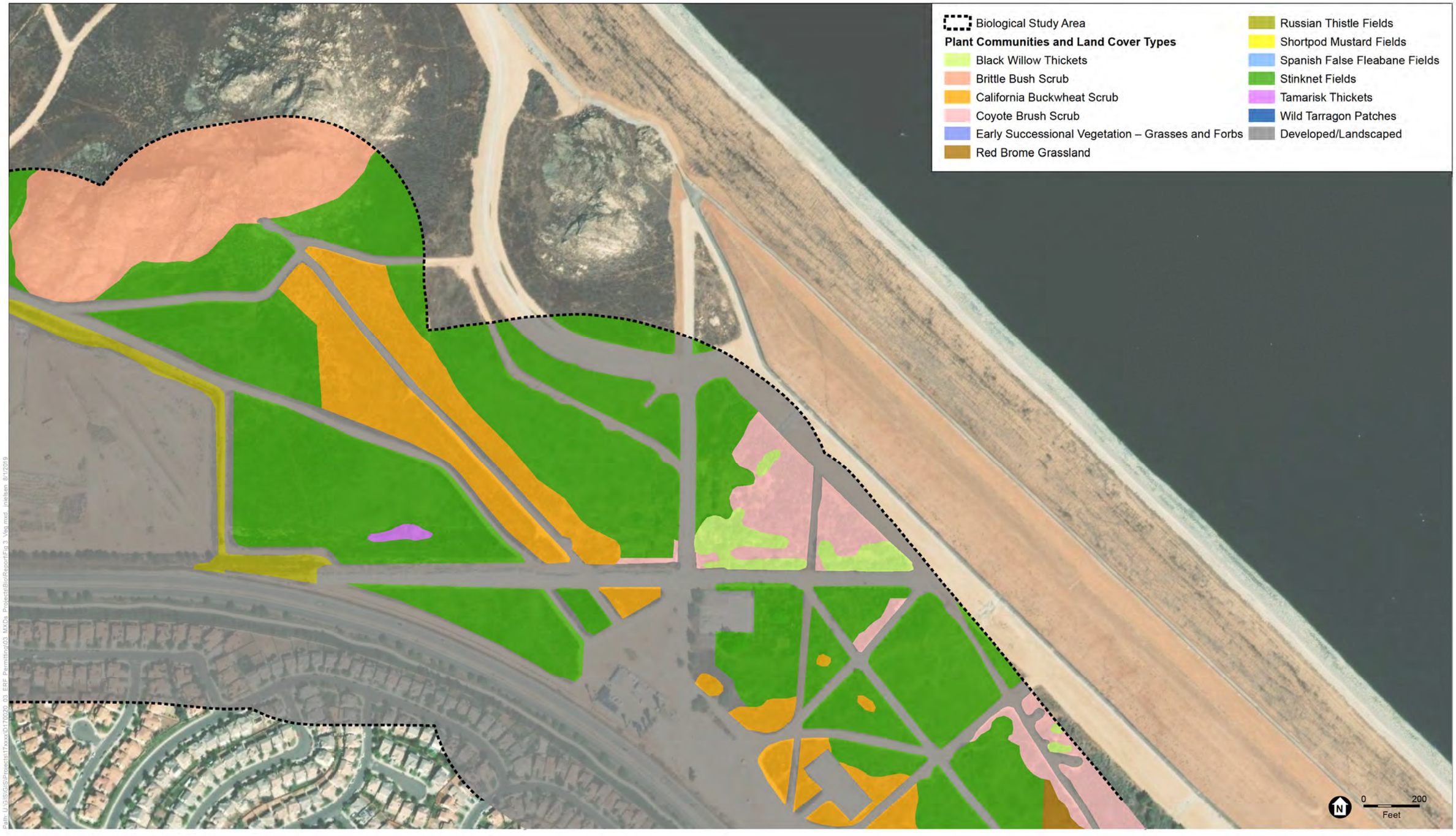
Path: U:\GIS\GIS\Projects\17xxxx\D170020_03_ERF_Permitting\03_MXDs_Projects\Bio\Report\Fig 3_Veg.mxd_Janderson_8/2/2019

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 3a
Plant Communities and Land Use

ESA



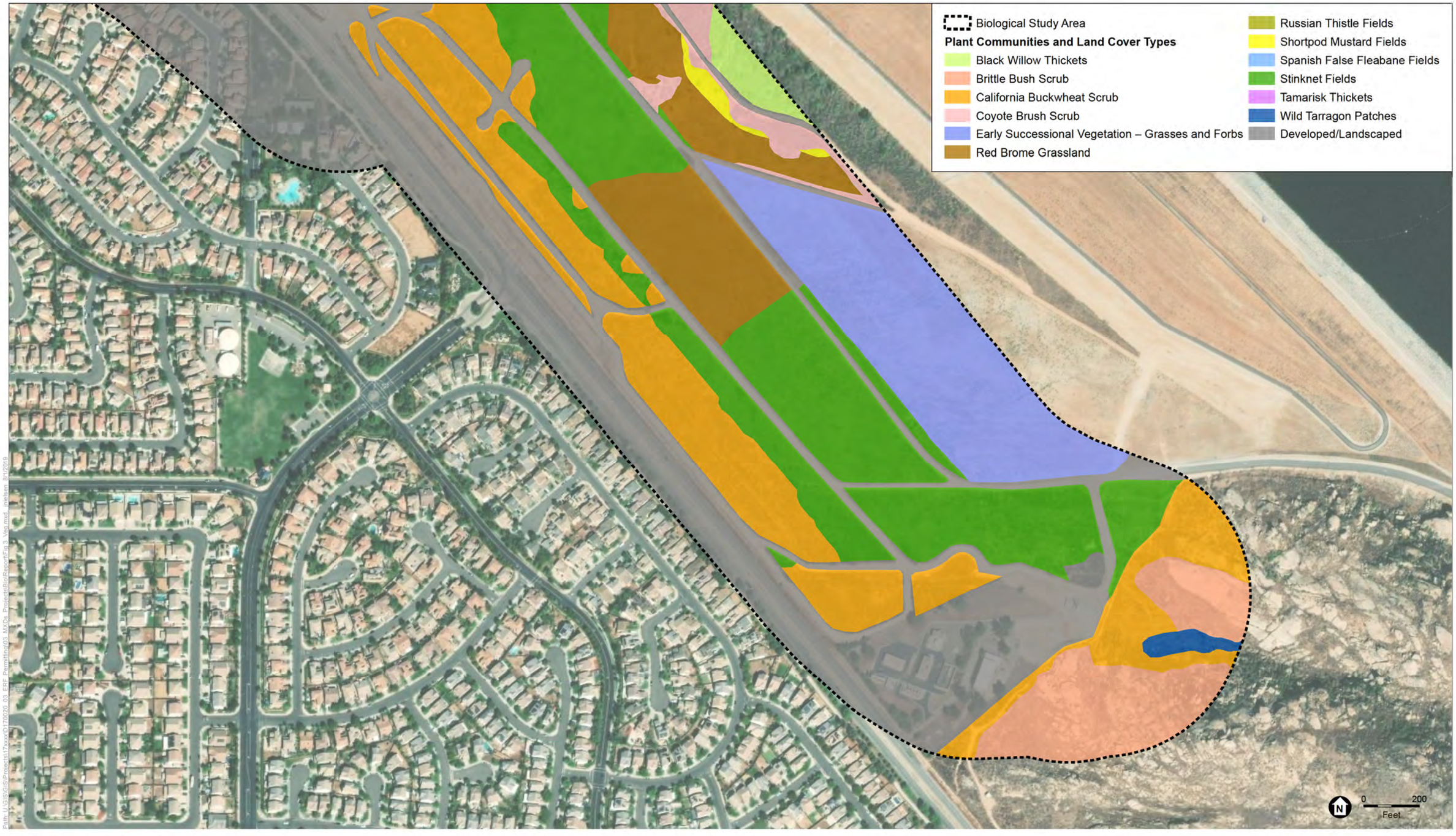
Path: U:\StSG\GIS\Projects\17xxxx\D170020_03_ERF_Permitting\03_MXDs_Projects\Bio\Report\Fig 3_Veg.mxd, jnielsen, 8/1/2019

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 3b
Plant Communities and Land Use

ESA



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 3c
Plant Communities and Land Use

ESA

TABLE 1
PLANT COMMUNITIES AND LAND USE

Plant Community	Acres	State Rank[1]
Black Willow Thickets	3.01	S3*
Brittle Bush Scrub	18.43	S4
California Buckwheat Scrub	28.84	S5
Coyote Brush Scrub	7.09	S5
Early Successional Vegetation – Grasses and Forbs	12.56	--
Red Brome Grassland	8.73	--
Russian Thistle Fields	68.11	--
Shortpod Mustard Fields	0.45	--
Spanish False Fleabane Fields	6.15	--
Stinknet Fields	98.35	--
Tamarisk Thickets	0.21	--
Wild Tarragon Patches	0.52	--
Developed/Landscaped	177.75	--
Grand Total	**430.19**	**--**

*Asterisk indicates that an alliance/association is considered special-status by CDFW.
[1]CDFW state rank denotes the rarity of a vegetation type within the state as follows:
S1 = Critically Imperiled – At very high risk of extirpation due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
S2 = Imperiled – At high risk of extirpation due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3 = Vulnerable – At moderate risk of extirpation due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S4 = Apparently Secure – At a fairly low risk of extirpation due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S5 = Secure - At very low or no risk of extirpation due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

Black Willow Thickets. Black willow thickets are characterized by a tree canopy dominated by Goodding's black willow (*Salix gooddingii*), interspersed with various other native and non-native tree species such as narrowleaf willow (*S. exigua*), red willow (*S. laevigata*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), and tamarisk (*Tamarix ramosissima*). The understory of this community consists of a mixture of dense shrub cover dominated by coyote brush (*Baccharis pilularis*), intermixed by dense patches of herbs and forbs, including such species as red brome (*Bromus madritensis* ssp. *rubens*), bull thistle (*Cirsium vulgare*), annual sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*), and Russian thistle (*Salsola tragus*). Black willow thickets are considered a sensitive natural community by the CDFW.

This community is located within the east-central portion of the study area, below Perris Dam and within the SRA.

Brittle Brush Scrub. Brittle brush scrub is characterized by a sparse shrub layer dominated by brittle bush (*Encelia farinosa*), interspersed with various other shrub species such as California buckwheat (*Eriogonum fasciculatum*). This community supports a sparse herbaceous cover of such species as wild oats (*Avena* sp.), jimson weed (*Datura wrightii*), red brome, and Russian thistle.

Brittle brush scrub is located within the northern and southeastern portion of the study area, within the SRA.

California Buckwheat Scrub. California buckwheat scrub is characterized by a shrub layer varying in density, with a dominance of California buckwheat, interspersed with various other shrub and sub-shrub species, such as tarragon (*Artemisia dranunculus*), California brickellia (*Brickellia californica*), sticky monkeyflower (*Diplacus aurantiacus*), broad scaled Palmer's goldenbush (*Ericameria palmeri* var. *pachylepis*), and skunk flower (*Rhus trilobata*). The herbaceous layer is well developed in areas with less shrub cover and includes various grasses and forbs such as tocalote (*Centaurea melitensis*), turkey-mullein (*Croton setiger*), red brome, stinknet (*Oncosiphon piluliferum*), Russian thistle, Mediterranean grass (*Schismus* sp.), and wild oats.

This community is located along a strip of fragmented patches throughout the southern portion of the study area, between Perris Dam and Ramona Expressway, within the SRA.

Coyote Brush Scrub. Coyote brush scrub is characterized by a dense shrub layer dominated by coyote brush and interspersed with various other shrub or small tree species, such as blue elderberry, chaparral bush mallow (*Malacothamnus fasciculatus*), California brickellia, and tarragon. The herbaceous layer in this community is sparse due to the dense shrub layer; however, grass and forb species are located along the margins of this community, such as annual burrweed (*Ambrosia acanthicarpa*), common sandaster (*Corethrogyne filaginifolia*), Chinese parsley (*Heliotropum curassavicum*), white horehound (*Marrubium vulgare*), and stinknet.

This community is located throughout the east-central portion of the study area, below Perris Dam and within the SRA.

Early Successional Vegetation – Grasses and Forbs. This area is largely devoid of vegetation; however, it is displaying limited successional growth. A native hydroseed mix was applied in 2018 and weed treatment was implemented in early 2019 to limit the establishment of non-native cover. Currently, both native and non-native grasses and forbs are present, including fiddleneck (*Amsinckia intermedia*), shortpod mustard (*Hirschfeldia incana*), smooth barley (*Hordeum murinum*), stinknet, turkey mullein and Russian thistle.

This community is located below Perris Dam, in the southeast portion of the study area.

Red Brome Grassland. Red brome grassland is characterized by a dense herbaceous layer dominated by red brome and sub-dominance of stinknet, interspersed by various other weedy grasses and forbs, including Chinese parsley, fiddleneck, Mediterranean grass, Russian thistle, shortpod mustard, tocalote, and white horehound. A few shrub species were observed speckled throughout this community, including fourwing saltbush (*Atriplex*

canescens) and California buckwheat. Note: in some areas, this community supports a seasonal prominence of fiddleneck.

This community is located in the south-central portion of the study area, between Perris Dam and Ramona Expressway, within the SRA.

Russian Thistle Fields. Russian thistle fields support a dense herbaceous layer dominated by Russian thistle, interspersed with various "weedy" herbaceous species such as fiddleneck, red brome, shortpod mustard, small wire lettuce (*Stephanomeria exigua*) and turkey-mullein. Areas that were hydroseeded following the remediation of the dam, to the southwest of the dam face, support a slightly higher concentration of native species (e.g., small wire lettuce and turkey-mullein) compared to other areas where this community persists. The Russian thistle fields observed to the south of the Ramona Expressway appeared recently tilled and were largely devoid of vegetation. In some areas, this community supports a seasonal prominence of fiddleneck.

This community occurs between the dam and Ramona Expressway and along ephemeral drainages located within the SRA, as well as within active and fallow agricultural fields located to the north and south of the Ramona Expressway. **Shortpod Mustard Fields.** Shortpod mustard fields are characterized as having a dense herbaceous layer dominated by shortpod mustard, interspersed with various weedy, herbaceous species such as fiddleneck, Mediterranean grass, red brome, Russian thistle, small wire lettuce, turkey-mullein and wild oats. Few shrub species were observed within this community, including California buckwheat and brittle bush.

This community occurs within the study area in one location, just southwest of the Perris Dam.

Stinknet Fields. Stinknet fields are present within the study area in fragmented patches between the Perris Dam and Ramona Expressway. This community consists of a dense herbaceous layer dominated by stinknet, interspersed with various weedy herbaceous species such as Mediterranean grass, red brome, Russian thistle, tocalote, turkey-mullein, and wild oats. A significant portion of the stinknet fields were observed adjacent to, and intergrading with, California buckwheat scrub. In some areas, this community supports a prominence of fiddleneck.

This community is located throughout much of the study area within the SRA, as well as, within the Western Segment.

Tamarisk Thickets. Tamarisk thickets were mapped within the survey area in one location, just west of the Lake Perris Fairgrounds and north of Ramona Expressway. This community is characterized by a dense tamarisk canopy and very sparse understory consisting of grasses and forbs such as Chinese parsley, fiddleneck, stinknet, and white horehound.

This community occurs in one location, immediately east of the Lake Perris Fairgrounds and north of Ramona Expressway.

Wild Tarragon Patches. A stand of wild tarragon patches exists within the southeast portion of the study area, between the Lake Perris Dam and Ramona Expressway. This community is comprised of a developed shrub/herbaceous layer dominated by tarragon and a sub-dominance of California sagebrush (*A. californicus*), interspersed with various other species such as California brickellia, jimson weed, Mediterranean grass, red brome, turkey-mullein, and wild oats.

This community is located within the southernmost tip of the study area.

Developed/Landscaped. Disturbed areas are present within the study area that include paved/unpaved roadways, such as Ramona Expressway, and development, such as the Lake Perris Fairgrounds and the residential neighborhoods to the southwest of the SRA, as well as areas that are dominated by ornamental plants. Collectively, these disturbed areas are characterized as "developed/landscaped" and are generally heavily disturbed and/or developed and in some locations devoid of any native vegetation. Ornamental vegetation observed within these areas include river red gum (*Eucalyptus camaldulensis*), Shamel ash (*Fraxinus uhdei*), crape myrtle (*Lagerstroemia* indica), Japanese honeysuckle (*Lonicera japonica*), Canary Island date palm (*Phoenix canariensis*), firethorn (*Pyracantha* sp.), and Peruvian pepper tree (*Schinus molle*).

Mitigation Monitoring and Reporting Program

As identified in the adopted MMRP, specific mitigation measures have been adopted to avoid and minimize impacts to biological resources prior to and during the implementation of the Project. The biological resources mitigation measures from the MMRP are identified below, and a brief summary of the status of the Project's compliance with each measure is provided.

> **BIO-1:** DWR shall conduct preconstruction rare plant surveys during the blooming period of the plants with potential to occur onsite. If rare plants are found to be present within or near the Project impact area, the construction zone limits shall be staked, flagged, fenced, or otherwise clearly delineated by a qualified biologist to ensure that the construction zone is limited to minimize impacts on special-status plant species. These limits shall be identified in the construction drawings. No earth-moving equipment shall be allowed outside demarcated construction zones unless preapproval is obtained from a qualified biologist and in coordination with the USFWS and CDFW.

Focused rare plant surveys were conducted in the spring of 2019 with negative findings. A standalone report of the findings will be prepared and submitted to the appropriate regulatory agencies.

> **BIO-2a:** DWR shall implement the following measures:
>
> - DWR shall have a qualified biologist with a Stephens' kangaroo rat handling permit conduct preconstruction surveys for the Stephens' kangaroo rat within the grassland habitat (suitable habitat) to determine and map the location and extent of Stephens' kangaroo rat occurrence(s) within the Project impact area. Confirmed Stephens' kangaroo rat precincts shall be avoided with the establishment of a non-disturbance buffer zone approved by USFWS and CDFW.

- Where avoidance of confirmed Stephens' kangaroo rat precincts is infeasible, DWR shall purchase credits at an approved Stephens' kangaroo rat mitigation bank or replace occupied-habitat at a 1:1 ratio, or as approved by USFWS, CDFW, and the RCHCA.
- If an emergency drawdown inundates grasslands within the SRA, DWR shall coordinate with USFWS, CDFW, and the RCHCA to determine the appropriate compensation or remediation if necessary. The consultation shall consider known and potential Stephens' kangaroo rat occurrences at the time of the drawdown event.

A habitat assessment for Stephens' kangaroo rat was completed in November of 2018 (SJM 2018) and suitable habitat was observed within the Project impact area. In March 2019, five nights of trapping were conducted within the proposed impact area and surrounding areas. The small mammal survey yielded four Stephens' kangaroo rat captures. All four captures occurred outside of the Project impact area. Implementation of a non-disturbance buffer with approval from USFWS and CDFW will be implemented.

> **BIO-2b:** Prior to initiation of construction, DWR shall place exclusionary fencing around the proposed work area within the SRA where small mammal habitat exists. Once fencing has been installed, a qualified biologist will trap and move small mammals, as well as other incidental wildlife, within the work zone to an appropriate location outside of the impact area. Trapping will occur no more than one week prior to the start of construction activities. Once construction has been completed, DWR shall remove the exclusionary fence.

This mitigation measure will be implemented prior to construction.

> **BIO-2c:** DWR shall prepare a Restoration Plan in coordination with USFWS and CDFW that identifies an appropriate seed mix for revegetation, hydroseeding methods, monitoring frequency requirements, and habitat performance criteria that will identify the minimum percent cover of restored vegetation along the affected areas. Monitoring shall be conducted to determine the presence of small mammal use of the restored levee slopes. Once presence of small mammals has been established along segments of the levee, no further surveys will be required in those segments. If no small mammal species are found utilizing the revegetated slopes within five years of the restoration, DWR will coordinate with USFWS and CDFW to determine an appropriate grassland habitat compensation property to be conserved in perpetuity.

The Restoration Plan will be prepared in 2019, and subsequent restoration will be implemented upon completion of Project activities.

> **BIO-3:** DWR shall have a qualified biologist conduct a preconstruction reconnaissance survey for nesting migratory bird species, burrowing owls, and other nesting birds within 300 feet of the construction limits of each Project element to determine and map the location and extent of special-status species occurrences(s) that could be affected by the Project.

This mitigation measure will be implemented prior to construction.

> **BIO-4:** If potential burrowing owl habitat or signs of owls are found to be present, appropriate protocol surveys must be conducted no more than one year prior to Project implementation between February 1

> and August 31 in accordance with 2012 CDFW Staff Report on Burrowing Owl Mitigation. Avoidance of burrowing owls during the nesting season shall be required, and if burrowing owls are found outside of the nesting season, either passive or active relocation shall be required in consultation with CDFW. If CDFW determines that burrowing owl relocation is required, a qualified biologist shall prepare a burrowing owl relocation plan for approval by CDFW, and a qualified biologist with the appropriate handling permit shall implement the relocation activities and procedures described in the relocation plan.

Based on the presence of suitable burrowing owl habitat documented in the 2009 biological report and during the 2018 biological resources assessment, protocol burrowing owl surveys in accordance with the 2012 CDFW Staff Report on Burrowing Owl Mitigation were conducted in the spring of 2019. No burrowing owls or sign of owl presence (e.g., feathers, pellets or whitewash) were observed during the protocol surveys. However, one owl was incidentally observed by ESA during a 2018 biological survey at the entrance of a burrow, within the private property west of Evans Road. Therefore, avoidance and exclusion measures will be implemented in consultation with CDFW as described in BIO-4.

> **BIO-5:** DWR shall avoid direct impacts on any nesting birds located within the limits of construction by removing plant material outside of the typical breeding season (which is February 1 through August 31).

This mitigation measure will be implemented prior to construction.

> **BIO-6:** If construction and vegetation removal is proposed during the bird nesting period (February 1 through August 31) or nests are observed during the preconstruction surveys, then active nest sites located during the preconstruction surveys shall be avoided and a non-disturbance buffer zone established dependent on the species. The type and intensity of buffer will be determined in the field by the qualified biologist. Nest sites shall be avoided with non-disturbance buffer zones until the adults and young are no longer reliant on the nest site for survival, as determined by a qualified biologist.

This mitigation measure will be implemented prior to construction.

Conclusions

The findings included in the initial 2009 biological report remain primarily unchanged; however, adjustments were made to the plant communities and land use based on the site conditions observed during the October 16, 2018 biological resources assessment. DWR plans to implement measures outlined in the MMRP prior to and during proposed construction activities; therefore, the analyses and determinations outlined in the EIR are expected to remain unchanged.

References

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On behalf of ESA, it has been a pleasure preparing this information for you. Please do not hesitate to contact May Lau at (213) 599-4300 if you have any questions or comments regarding this report.

Sincerely,

Robbie Sweet
Senior Biologist

May Lau
Senior Managing Associate

Attachments: Appendix A – CNDDB and CNPS Database Search Results
Appendix B – Floral and Faunal Compendia
Appendix C– Photographic Log

Appendix A

CNDDB and CNPS Database Search Results

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind

Query Summary:
Quad IS (Perris (3311772) OR El Casco (3311781) OR Lake Elsinore (3311763) OR Lakeview (3311771) OR Riverside East (3311783) OR Romoland (3311762) OR Steele Peak (3311773) OR Sunnymead (3311782) OR Winchester (3311761))

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CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Abronia villosa var. aurita	chaparral sand-verbena	Dicots	PDNYC010P1	98	4	None	None	G5T2?	S2	1B.1	BLM_S-Sensitive, USFS_S-Sensitive	Chaparral, Coastal scrub, Desert dunes
Accipiter cooperii	Cooper's hawk	Birds	ABNKC12040	115	5	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	951	16	None	Candidate Endangered	G2G3	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	Birds	ABPBX91091	226	32	None	None	G5T3	S3	null	CDFW_WL-Watch List	Chaparral, Coastal scrub
Allium munzii	Munz's onion	Monocots	PMLIL022Z0	20	11	Endangered	Threatened	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Pinon & juniper woodlands, Valley & foothill grassland
Ambrosia pumila	San Diego ambrosia	Dicots	PDAST0C0M0	59	3	Endangered	None	G1	S1	1B.1	null	Chaparral, Coastal scrub, Valley & foothill grassland
Aquila chrysaetos	golden eagle	Birds	ABNKC22010	321	2	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Cismontane woodland, Coastal prairie, Great Basin grassland, Great Basin scrub, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous forest, Valley & foothill grassland
Arenaria paludicola	marsh sandwort	Dicots	PDCAR040L0	16	1	Endangered	Endangered	G1	S1	1B.1	SB_SBBG-Santa Barbara Botanic Garden	Freshwater marsh, Marsh & swamp, Wetland
Arizona elegans occidentalis	California glossy snake	Reptiles	ARADB01017	260	12	None	None	G5T2	S2	null	CDFW_SSC-Species of Special Concern	null
Artemisiospiza belli belli	Bell's sage sparrow	Birds	ABPBX97021	61	13	None	None	G5T2T3	S3	null	CDFW_WL-Watch List, USFWS_BCC-Birds of Conservation Concern	Chaparral, Coastal scrub

Asio otus	long-eared owl	Birds	ABNSB13010	46	2	None	None	G5	S3?	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Cismontane woodland, Great Basin scrub, Riparian forest, Riparian woodland, Upper montane coniferous forest
Aspidoscelis hyperythra	orange-throated whiptail	Reptiles	ARACJ02060	362	60	None	None	G5	S2S3	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub
Aspidoscelis tigris stejnegeri	coastal whiptail	Reptiles	ARACJ02143	136	10	None	None	G5T5	S3	null	CDFW_SSC-Species of Special Concern	null
Astragalus pachypus var. jaegeri	Jaeger's milk-vetch	Dicots	PDFAB0F6G1	18	1	None	None	G4T2	S2	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	1974	98	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Dicots	PDCHE040C2	16	16	Endangered	None	G4T1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Alkali playa, Valley & foothill grassland, Vernal pool, Wetland
Atriplex parishii	Parish's brittlescale	Dicots	PDCHE041D0	16	5	None	None	G1G2	S1	1B.1	USFS_S-Sensitive	Alkali playa, Chenopod scrub, Meadow & seep, Vernal pool, Wetland
Atriplex serenana var. davidsonii	Davidson's saltscale	Dicots	PDCHE041T1	27	10	None	None	G5T1	S1	1B.2	null	Coastal bluff scrub, Coastal scrub
Berberis nevinii	Nevin's barberry	Dicots	PDBER060A0	31	1	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	234	11	None	None	G3G4	S1S2	null	null	null
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	766	1	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Brodiaea filifolia	thread-leaved brodiaea	Monocots	PMLIL0C050	134	9	Threatened	Endangered	G2	S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Buteo regalis	ferruginous hawk	Birds	ABNKC19120	107	7	None	None	G4	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Great Basin scrub, Pinon & juniper woodlands, Valley & foothill grassland
Calochortus plummerae	Plummer's mariposa-lily	Monocots	PMLIL0D150	230	9	None	None	G4	S4	4.2	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley & foothill grassland
Calochortus weedii var. intermedius	intermediate mariposa-lily	Monocots	PMLIL0D1J1	140	2	None	None	G3G4T2	S2	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Coastal scrub, Valley & foothill grassland
		Birds	ABPBG02095	154	1	None	None	G5T3Q	S3	null		Coastal scrub

Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren										CDFW_SSC-Species of Special Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	
Caulanthus simulans	Payson's jewelflower	Dicots	PDBRA0M0H0	31	7	None	None	G4	S4	4.2	USFS_S-Sensitive	Chaparral, Coastal scrub
Centromadia pungens ssp. laevis	smooth tarplant	Dicots	PDAST4R0R4	115	71	None	None	G3G4T2	S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Riparian woodland, Valley & foothill grassland, Wetland
Ceratochrysis longimala	Desert cuckoo wasp	Insects	IIHYM71040	2	1	None	None	G1	S1	null	null	null
Chaetodipus californicus femoralis	Dulzura pocket mouse	Mammals	AMAFD05021	54	1	None	None	G5T3	S3	null	CDFW_SSC-Species of Special Concern	Chaparral, Coastal scrub, Valley & foothill grassland
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	Mammals	AMAFD05031	99	21	None	None	G5T3T4	S3S4	null	CDFW_SSC-Species of Special Concern	Chaparral, Coastal scrub
Charadrius alexandrinus nivosus	western snowy plover	Birds	ABNNB03031	138	1	Threatened	None	G3T3	S2S3	null	CDFW_SSC-Species of Special Concern, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters, Sand shore, Wetland
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Dicots	PDSCR0J0C2	30	1	Endangered	Endangered	G4?T1	S1	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Coastal dunes, Marsh & swamp, Salt marsh, Wetland
Chorizanthe parryi var. parryi	Parry's spineflower	Dicots	PDPGN040J2	127	41	None	None	G3T2	S2	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Chorizanthe polygonoides var. longispina	long-spined spineflower	Dicots	PDPGN040K1	166	23	None	None	G5T3	S3	1B.2	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Coastal scrub, Meadow & seep, Ultramafic, Valley & foothill grassland, Vernal pool
Cicindela senilis frosti	senile tiger beetle	Insects	IICOL02121	9	1	None	None	G2G3T1T3	S1	null	null	Mud shore/flats, Wetland
Circus hudsonius	northern harrier	Birds	ABNKC11011	53	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Coastal scrub, Great Basin grassland, Marsh & swamp, Riparian scrub, Valley & foothill grassland, Wetland
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	ABNRB02022	155	2	Threatened	Endangered	G5T2T3	S1	null	BLM_S-Sensitive, NABCI_RWL-Red Watch List, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Riparian forest
Coleonyx variegatus abbotti	San Diego banded gecko	Reptiles	ARACD01031	8	2	None	None	G5T3T4	S1S2	null	CDFW_SSC-Species of Special Concern	Chaparral, Coastal scrub
Crotalus ruber	red-diamond rattlesnake	Reptiles	ARADE02090	189	35	None	None	G4	S3	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Chaparral, Mojavean desert scrub, Sonoran desert scrub
Diadophis punctatus modestus	San Bernardino ringneck snake	Reptiles	ARADB10015	13	1	None	None	G5T2T3	S2?	null	USFS_S-Sensitive	null
		Mammals	AMAFD03143	82	9	Endangered	None	G5T1	S1	null		Coastal scrub

Dipodomys merriami parvus	San Bernardino kangaroo rat										CDFW_SSC-Species of Special Concern	
Dipodomys stephensi	Stephens' kangaroo rat	Mammals	AMAFD03100	220	113	Endangered	Threatened	G2	S2	null	IUCN_EN-Endangered	Coastal scrub, Valley & foothill grassland
Dodecahema leptoceras	slender-horned spineflower	Dicots	PDPGN0V010	38	1	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub
Dudleya multicaulis	many-stemmed dudleya	Dicots	PDCRA040H0	154	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Coastal scrub, Valley & foothill grassland
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	178	6	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
Empidonax traillii extimus	southwestern willow flycatcher	Birds	ABPAE33043	70	2	Endangered	Endangered	G5T2	S1	null	NABCI_RWL-Red Watch List	Riparian woodland
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1350	2	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Eremophila alpestris actia	California horned lark	Birds	ABPAT02011	94	12	None	None	G5T4Q	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marine intertidal & splash zone communities, Meadow & seep
Eumops perotis californicus	western mastiff bat	Mammals	AMACD02011	296	5	None	None	G5T4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, WBWG_H-High Priority	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Euphydryas editha quino	quino checkerspot butterfly	Insects	IILEPK405L	100	4	Endangered	None	G5T1T2	S1S2	null	XERCES_CI-Critically Imperiled	Chaparral, Coastal scrub
Haliaeetus leucocephalus	bald eagle	Birds	ABNKC10010	327	1	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Lower montane coniferous forest, Oldgrowth
Harpagonella palmeri	Palmer's grapplinghook	Dicots	PDBOR0H010	57	4	None	None	G4	S3	4.2	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Coastal scrub, Valley & foothill grassland
Icteria virens	yellow-breasted chat	Birds	ABPBX24010	97	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Riparian forest, Riparian scrub, Riparian woodland
Lanius ludovicianus	loggerhead shrike	Birds	ABPBR01030	109	10	None	None	G4	S4	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of	Broadleaved upland forest, Desert wash, Joshua tree woodland, Mojavean desert scrub, Pinon &

											Conservation Concern	juniper woodlands, Riparian woodland, Sonoran desert scrub
Lasiurus xanthinus	western yellow bat	Mammals	AMACC05070	58	4	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_H-High Priority	Desert wash
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Dicots	PDAST5L0A1	97	23	None	None	G4T2	S2	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden	Alkali playa, Marsh & swamp, Salt marsh, Vernal pool, Wetland
Laterallus jamaicensis coturniculus	California black rail	Birds	ABNME03041	303	1	None	Threatened	G3G4T1	S1	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_NT-Near Threatened, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Dicots	PDBRA1M114	142	14	None	None	G5T3	S3	4.3	null	Chaparral, Coastal scrub
Lepus californicus bennettii	San Diego black-tailed jackrabbit	Mammals	AMAEB03051	103	28	None	None	G5T3T4	S3S4	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Myosurus minimus ssp. apus	little mousetail	Dicots	PDRAN0H031	24	4	None	None	G5T2Q	S2	3.1	null	Valley & foothill grassland, Vernal pool, Wetland
Nama stenocarpa	mud nama	Dicots	PDHYD0A0H0	22	1	None	None	G4G5	S1S2	2B.2	null	Marsh & swamp, Wetland
Navarretia fossalis	spreading navarretia	Dicots	PDPLM0C080	78	19	Threatened	None	G2	S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Marsh & swamp, Vernal pool, Wetland
Neotoma lepida intermedia	San Diego desert woodrat	Mammals	AMAFF08041	118	2	None	None	G5T3T4	S3S4	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Nyctinomops femorosaccus	pocketed free-tailed bat	Mammals	AMACD04010	90	1	None	None	G4	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_M-Medium Priority	Joshua tree woodland, Pinon & juniper woodlands, Riparian scrub, Sonoran desert scrub
Onychomys torridus ramona	southern grasshopper mouse	Mammals	AMAFF06022	28	4	None	None	G5T3	S3	null	CDFW_SSC-Species of Special Concern	Chenopod scrub
Orcuttia californica	California Orcutt grass	Monocots	PMPOA4G010	37	5	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Vernal pool, Wetland
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Mammals	AMAFD01041	56	12	None	None	G5T1T2	S1S2	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Phrynosoma blainvillii	coast horned lizard	Reptiles	ARACF12100	774	40	None	None	G3G4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Chaparral, Cismontane woodland, Coastal bluff scrub, Coastal scrub, Desert wash, Pinon & juniper woodlands, Riparian scrub, Riparian woodland, Valley & foothill grassland
Plegadis chihi	white-faced ibis	Birds	ABNGE02020	20	3	None	None	G5	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marsh & swamp, Wetland
Polioptila californica californica	coastal California gnatcatcher	Birds	ABPBJ08081	830	72	Threatened	None	G4G5T2Q	S2	null	CDFW_SSC-Species of Special Concern,	Coastal bluff scrub, Coastal scrub

											NABCI_YWL-Yellow Watch List	
Salvadora hexalepis virgultea	coast patch-nosed snake	Reptiles	ARADB30033	34	2	None	None	G5T4	S2S3	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Senecio aphanactis	chaparral ragwort	Dicots	PDAST8H060	82	1	None	None	G3	S2	2B.2	null	Chaparral, Cismontane woodland, Coastal scrub
Setophaga petechia	yellow warbler	Birds	ABPBX03010	70	2	None	None	G5	S3S4	null	CDFW_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern	Riparian forest, Riparian scrub, Riparian woodland
Sidalcea neomexicana	salt spring checkerbloom	Dicots	PDMAL110J0	30	1	None	None	G4	S2	2B.2	USFS_S-Sensitive	Alkali playa, Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Wetland
Socalchemmis icenoglei	Icenogle's socalchemmis spider	Arachnids	ILARAU7020	2	2	None	None	G1	S1	null	null	Coastal scrub
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Riparian	CTT61310CA	246	8	None	None	G4	S4	null	null	Riparian forest
Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	Riparian	CTT61330CA	111	12	None	None	G3	S3.2	null	null	Riparian forest
Southern Riparian Scrub	Southern Riparian Scrub	Riparian	CTT63300CA	56	1	None	None	G3	S3.2	null	null	Riparian scrub
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	Riparian	CTT62400CA	230	15	None	None	G4	S4	null	null	Riparian woodland
Spea hammondii	western spadefoot	Amphibians	AAABF02020	464	21	None	None	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Spinus lawrencei	Lawrence's goldfinch	Birds	ABPBY06100	4	1	None	None	G3G4	S3S4	null	IUCN_LC-Least Concern, NABCI_YWL-Yellow Watch List, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Chaparral, Pinon & juniper woodlands, Riparian woodland
Streptocephalus woottoni	Riverside fairy shrimp	Crustaceans	ICBRA07010	82	7	Endangered	None	G1G2	S1S2	null	IUCN_EN-Endangered	Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Symphyotrichum defoliatum	San Bernardino aster	Dicots	PDASTE80C0	102	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Valley & foothill grassland
Taxidea taxus	American badger	Mammals	AMAJF04010	559	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane

												woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Texosporium sancti-jacobi	woven-spored lichen	Lichens	NLTEST7980	19	1	None	None	G3	S1	3	null	Chaparral
Tortula californica	California screw moss	Bryophytes	NBMUS7L090	15	2	None	None	G2G3	S2S3	1B.2	BLM_S-Sensitive	Chenopod scrub, Valley & foothill grassland
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Dicots	PDAST9F031	9	4	None	None	G4T3	S1	2B.1	null	Marsh & swamp, Meadow & seep, Riparian forest, Vernal pool, Wetland
Vireo bellii pusillus	least Bell's vireo	Birds	ABPBW01114	486	37	Endangered	Endangered	G5T2	S2	null	IUCN_NT-Near Threatened, NABCI_YWL-Yellow Watch List	Riparian forest, Riparian scrub, Riparian woodland
Xanthocephalus xanthocephalus	yellow-headed blackbird	Birds	ABPBXB3010	13	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Marsh & swamp, Wetland

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

Plant List

41 matches found. *Click on scientific name for details*

Search Criteria

California Rare Plant Rank is one of [1A, 1B, 2A, 2B, 3, 4], FESA is one of [Endangered, Threatened, Candidate, Not Listed], CESA is one of [Endangered, Threatened, Rare, Not Listed], Found in Quads 3311783, 3311782, 3311781, 3311773, 3311772, 3311771, 3311763, 3311762 and 3311761;
Lifeform is one of [Tree, Shrub, Leaf succulent, Herb, Vine, Stem succulent, Lichen, Moss, Liverwort],
Duration is one of [ann, per, ephem],
Bloom Time is one of [January, February, March, April, May, June, July, August, September, October, November, December]

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Abronia villosa var. aurita	chaparral sand-verbena	Nyctaginaceae	annual herb	(Jan)Mar-Sep	1B.1	S2	G5T2?
Allium marvinii	Yucaipa onion	Alliaceae	perennial bulbiferous herb	Apr-May	1B.2	S1	G1
Allium munzii	Munz's onion	Alliaceae	perennial bulbiferous herb	Mar-May	1B.1	S1	G1
Ambrosia pumila	San Diego ambrosia	Asteraceae	perennial rhizomatous herb	Apr-Oct	1B.1	S1	G1
Artemisia palmeri	San Diego sagewort	Asteraceae	perennial deciduous shrub	(Feb)May-Sep	4.2	S3?	G3?
Astragalus pachypus var. jaegeri	Jaeger's bush milk-vetch	Fabaceae	perennial shrub	Dec-Jun	1B.1	S2	G4T2
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Chenopodiaceae	annual herb	Apr-Aug	1B.1	S1	G4T1
Atriplex pacifica	South Coast saltscale	Chenopodiaceae	annual herb	Mar-Oct	1B.2	S2	G4
Atriplex parishii	Parish's brittlescale	Chenopodiaceae	annual herb	Jun-Oct	1B.1	S1	G1G2
Atriplex serenana var. davidsonii	Davidson's saltscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S1	G5T1
Berberis nevinii	Nevin's barberry	Berberidaceae	perennial evergreen shrub	(Feb)Mar-Jun	1B.1	S1	G1
Brodiaea filifolia	thread-leaved brodiaea	Themidaceae	perennial bulbiferous herb	Mar-Jun	1B.1	S2	G2
Calochortus plummerae	Plummer's mariposa lily	Liliaceae	perennial bulbiferous herb	May-Jul	4.2	S4	G4
Calochortus weedii var. intermedius	intermediate mariposa lily	Liliaceae	perennial bulbiferous herb	May-Jul	1B.2	S2	G3G4T2
Carex buxbaumii	Buxbaum's sedge	Cyperaceae	perennial rhizomatous herb	Mar-Aug	4.2	S3	G5
Caulanthus simulans	Payson's jewelflower	Brassicaceae	annual herb	(Feb)Mar-May(Jun)	4.2	S4	G4
Centromadia pungens ssp. laevis	smooth tarplant	Asteraceae	annual herb	Apr-Sep	1B.1	S2	G3G4T2
Chorizanthe leptotheca	Peninsular spineflower	Polygonaceae	annual herb	May-Aug	4.2	S3	G3
Chorizanthe parryi var. parryi	Parry's spineflower	Polygonaceae	annual herb	Apr-Jun	1B.1	S2	G3T2
Chorizanthe polygonoides var. longispina	long-spined spineflower	Polygonaceae	annual herb	Apr-Jul	1B.2	S3	G5T3

Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	4.2	S4	G4
Cylindropuntia californica var. californica	snake cholla	Cactaceae	perennial stem succulent	Apr-May	1B.1	S1	G3T2
Deinandra paniculata	paniculate tarplant	Asteraceae	annual herb	(Mar)Apr-Nov (Dec)	4.2	S4	G4
Dodecahema leptoceras	slender-horned spineflower	Polygonaceae	annual herb	Apr-Jun	1B.1	S1	G1
Dudleya multicaulis	many-stemmed dudleya	Crassulaceae	perennial herb	Apr-Jul	1B.2	S2	G2
Harpagonella palmeri	Palmer's grapplinghook	Boraginaceae	annual herb	Mar-May	4.2	S3	G4
Hordeum intercedens	vernal barley	Poaceae	annual herb	Mar-Jun	3.2	S3S4	G3G4
Juglans californica	Southern California black walnut	Juglandaceae	perennial deciduous tree	Mar-Aug	4.2	S3	G3
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	1B.1	S2	G4T2
Lepechinia cardiophylla	heart-leaved pitcher sage	Lamiaceae	perennial shrub	Apr-Jul	1B.2	S2S3	G3
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Brassicaceae	annual herb	Jan-Jul	4.3	S3	G5T3
Microseris douglasii ssp. platycarpha	small-flowered microseris	Asteraceae	annual herb	Mar-May	4.2	S4	G4T4
Myosurus minimus ssp. apus	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
Nama stenocarpa	mud nama	Namaceae	annual / perennial herb	Jan-Jul	2B.2	S1S2	G4G5
Navarretia fossalis	spreading navarretia	Polemoniaceae	annual herb	Apr-Jun	1B.1	S2	G2
Orcuttia californica	California Orcutt grass	Poaceae	annual herb	Apr-Aug	1B.1	S1	G1
Romneya coulteri	Coulter's matilija poppy	Papaveraceae	perennial rhizomatous herb	Mar-Jul(Aug)	4.2	S4	G4
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	2B.2	S2	G3
Sidalcea neomexicana	salt spring checkerbloom	Malvaceae	perennial herb	Mar-Jun	2B.2	S2	G4
Symphyotrichum defoliatum	San Bernardino aster	Asteraceae	perennial rhizomatous herb	Jul-Nov(Dec)	1B.2	S2	G2
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3

Suggested Citation

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The Consortium of California Herbaria
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Questions and Comments
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Appendix B
Floral and Faunal Compendia

FLORA

EUDICOTS

Scientific Name	Common Name	Comment
Adoxaceae	Elderberry Family	
Sambucus nigra ssp. *caerulea*	Blue elderberry	
Apocynaceae	Dogbane Family	
Nerium oleander[*1]	Oleander	
Anacardiaceae	Sumac Family	
Rhus aromatica	Skunkbush	
*Schinus molle**	Peruvian pepper	
Asteraceae	Aster Family	
Ambrosia acanthicarpa	Annual burrweed	
Artemisia californica	California sagebrush	
Artemisia dranunculus	Tarragon	
Baccharis pilularis	Coyote brush	
Baccharis salicifolia	Mulefat	
Brickellia californica	Californica brickellia	
*Centaurea melitensis**	Tocalote	
*Cirsium vulgare**	Bull thistle	
Corethrogyne filaginifolia	Common sandaster	
Deinandra fasciculata	Clustered tarweed	
Encelia farinosa	Brittle bush	
Ericameria palmeri var. *pachylepis*	Broad scaled Palmer's goldenbush	
*Erigeron bonariensis**	Flax-leaved horseweed	
Erigeron canadensis	Canada horseweed	
Helianthus annuus	Annual sunflower	
Heterotheca grandiflora	Telegraph weed	
*Lactuca serriola**	Prickly lettuce	
*Oncosiphon piluliferum**	Stinknet	
Stephanomeria exigua	Small wire lettuce	
Boraginaceae	Forget-me-not Family	
Amsinckia intermedia	Fiddleneck	
Heliotropium curassavicum	Chinese parsley	
Brassicaceae	Mustard Family	

*Hirschfeldia incana**	Short podded mustard
Sisymbrium irio	Tumble mustard
Chenopodiaceae	Goosefoot Family
Amaranthus sp.*	Tumbleweed
Atriplex canescens	Fourwing saltbush
*Salsola tragus**	Russian thistle
Crassulaceae	Stonecrop Family
Crassula connata	Pigmy weed
Euphorbiaceae	Spurge Family
Croton setiger	Turkey-mullein
Stillingia linearifolia	Narrow leaved stillingia
Geraniaceae	Storksbill Family
Erodium botrys	Big heron bill
Erodium cicutarium	Redstem filaree
Erodium mochatum	Whitestem filaree
Lamiaceae	Mint Family
*Marrubium vulgare**	White horehound
Lythraceae	Loosestrife Family
*Lagerstroemia indica**	Crapemyrtle
Malvaceae	Mallow Family
Malacothamnus fasciculatus	Chaparral mallow
Oleaceae	Olive Family
*Fraxinus uhdei**	Shamel ash
Onagraceae	Evening Primrose Family
Camissoniopsis bistorta	California sun cup
Phrymaceae	Lopseed Family
Diplacus aurantiacus	Sticky monkeyflower
Polygonaceae	Buckwheat Family
Eriogonum fasciculatum	California buckwheat
Portulacaceae	Purslane Family
*Portulaca oleracea**	Purslane
Salicaceae	Willow Family
Salix exigua	Sandbar willow
Salix gooddingii	Gooding's willow

[1] Non-native

	Salix lasiolepis	Arroyo willow
	Salix laevigata	Red willow
Solanaceae		Tomato Family
	Datura wrightii	Jimsonweed
	*Nicotiana glauca**	Tree tobacco
Tamaricaceae		Tamarix Family
	*Tamarix ramosissima**	Saltcedar
Zygophyllaceae		Caltrop Family
	*Tribulus terrestris**	Puncture vine

MONOCOTS

Scientific Name	Common Name	Comment
Poaceae	Grass Family	
*Avena fatua**	wild oats	
Bromus madritensis ssp. *rubens**	red brome	
*Cynodon dactylon**	Bermuda grass	
Hordeum murinum	Wild barley	
Schismus sp.*	Mediterranean grass	
Mytaceae	Myrtle Family	
*Eucalyptus camaldulensis**	River red gum	

FAUNA

REPTILES

Scientific Name	Common Name	Comment
Colubridae	Egg-Laying Snakes	
E[2] *Pituophis catenifer* ssp. *annectens*	San Diego gopher snake	
Anguidae	Alligator Lizards	
E *Elgaria multicarinatus* ssp. *webbii*	San Diego alligator lizard	
Phrynosomatidae	Zebra-tailed, Side-blotched and Horned Lizards	
Sceloporus occidentalis ssp. *longipes*	Great Basin fence lizard	
Uta stansburiana ssp. *elegans*	Western side-blotched lizard	

BIRDS

[2] Expected

	Scientific Name	Common Name	Comment
	Odontophoridae	Quails	
E	*Callipepla californica*	California quail	
	Accipitridae	Hawks	
	Accipiter cooperii	Cooper's hawk	
	Buteo jamaicensis	Red-tailed hawk	foraging
E	*Buteo lineatus*	Red-shouldered hawk	foraging
	Falconidae	Falcons	
	Falco sparverius	American kestrel	
	Pandionidae	Osprey	
	Pandion haliaetus	Osprey	fly-over
	Pelicanidae	Pelicans	
	Pelecanus occidentalis	Brown pelican	
	Columbidae	Pigeons and Doves	
E	*Columba livia**	rock pigeon	
	Zenaida macroura	mourning dove	
	Trochilidae	Hummingbirds	
	Calypte anna	Anna's hummingbird	
	Selasphorus sasin	Allen's hummingbird	
	Cathartidae	New World Vultures	
	Cathartes aura	Turkey vulture	
	Corvidae	Jays and Crows	
E	*Aphelocoma californica*	California scrub jay	
	Corvus brachyrhynchos	American crow	
	Corvus corax	Common raven	
	Aegithalidae	Bushtits	
E	*Psaltriparus minimus*	American bushtit	
	Troglodytidae	Wrens	
	Salpinctes obsoletus	Rock wren	
	Thryomanes bewickii	Bewick's wren	
	Turdidae	Thrushes	
E	*Catharus guttatus*	Hermit thrush	
	Parullidae	New World Warblers	
	Setophaga coronata	Yellow-rumped warbler	

Sylviidae		Old World Warblers
E	*Chamaea fasciata*	wrentit
Polioptilidae		Gnatcatchers
	Polioptila caerulea	Blue-gray gnatcatcher
Cuculidae		Cuckoos
	Geococcyx californianus	Greater roadrunner
Mimidae		Mockingbirds and Thrashers
	Mimus polyglottos	Northern mockingbird
E	*Toxostoma redivivum*	California thrasher
Passerellidae		Sparrows
	Passerculus sandwichensis	Savannah sparrow
	*Passer domesticus**	House sparrow
	Zonotrichia leucophrys	White-crowned sparrow
Picidae		Woodpeckers
	Colaptes auratus	Northern flicker
	Dryobates nuttallii	Nuttall's Woodpecker
Sturnidae		Starlings
	Sturnus vulgaris	European starling
Emberizidae		Emberizine Sparrows and Allies
	Melozone crissalis	California towhee
E	*Pipilo maculatus*	Spotted towhee
Fringillidae		Finches
	Haemorhous mexicanus	House finch
	Spinus psaltria	Lesser goldfinch
Tyrannidae		Tyrant Flycatchers
	Sayornis saya	Say's phoebe
Apodidae		Swift Family
E	*Aeronautes saxatalis*	White-throated swift

MAMMALS

Scientific Name		Common Name	Comment
Canidae		Canines	
E	*Canis latrans*	Coyote	
Cricetidae		New World Mice and Voles	
E	*Microtus californicus*	California vole	

E	*Peromyscus maniculatus*	Deer mouse
Didelphidae		Opossums
E	*Didelphis virginiana**	Virginia opossum
Geomyidae		Pocket Gophers
E	*Thomomys bottae*	Botta's pocket gopher
Heteromyidae		Pocket Mice and Kangaroo Rats
E	*Perognathus californicus*	California pocket mouse
Leporidae		Hares and Rabbits
E	*Sylvilagus audubonii*	Desert cottontail
Mephitidae		Skunks
E	*Mephitis mephitis*	striped skunk
Procyonidae		Raccoons
E	*Procyon lotor*	Raccoon
Sciuridae		Squirrels and Chipmunks
	Otospermophilus beecheyi	California ground squirrel

INSECTS

Scientific Name	Common Name	Comment
Formicidae	Ants	
Pogonomyrmex sp.	Harvester ants	

Appendix C
Photographic Log

Photo 1 (NW). Photo depicts black willow thickets located within the northern central portion of the study area, below the Perris dam.

Photo 2 (N). Photo depicts brittle brush scrub located within the large rock formation in the northern portion of the study area.

Photo 3 (NW). Photo depicts California buckwheat scrub located within the southeast portion of the study area, between the Perris dam and Ramona Expressway. The proposed placement of the south levee and associated staging areas are situated in the distance.

Photo 4 (NE). Photo depicts coyote brush scrub within the north-central portion of the study area, below the Perris dam.

Photo 5 (NW). Photo depicts red brome grassland within the southern portion of the study area, between the Perris dam and Ramona Expressway. The proposed placement of the south levee and associated staging areas are situated in the foreground.

Photo 6 (N). Photo depicts Russian thistle fields to the north of Ramona expressway, within the western portion of the study area. Staging areas associated with the construction of the proposed channel are situated in the foreground.

Photo 7 (NW). Photo depicts Spanish false fleabane fields located along the bed of the Perris Valley Channel at the westernmost boundary of the study area. The rip-rap associated with the proposed channel construction will be situated in the foreground.

Photo 8 (E). Photo depicts stinknet fields located between the Perris dam and Ramona Expressway, within the southeast portion of the study area.

Photo 9. Photo depicts shortpod fields located between the Perris dam and Ramona Expressway, within the southeast portion of the study area.

Photo 10. Photo depicts wild tarragon patches located along the southeastern boundary of the study area, between the Perris dam and Ramona Expressway.

Photo 11. Photo depicts graded pads, dirt roads and various forms of infrastructure just north of Ramona Expressway, within the southern portion of the study area. Much of the proposed equipment staging associated with the project is expected to take place within this area.

A-2 Burrowing Owl Survey

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300 phone
213.599.4301 fax

July 31, 2019

Gina Radieve
California Department of Water Resources
Division of Engineering
1416 9th Street, Room 452-1
Sacramento, CA 95814

RE: Burrowing Owl Protocol Survey Results for the Perris Dam Emergency Release Facility Project

Dear Ms. Radieve:

The purpose of this letter is to report the results of focused burrowing owl (*Athene cunicularia*) surveys conducted at the Perris Dam Emergency Release Facility Project site. Below is a brief description of the project and location, survey methodology, survey results, conclusions, and recommendations for minimizing impacts to burrowing owls.

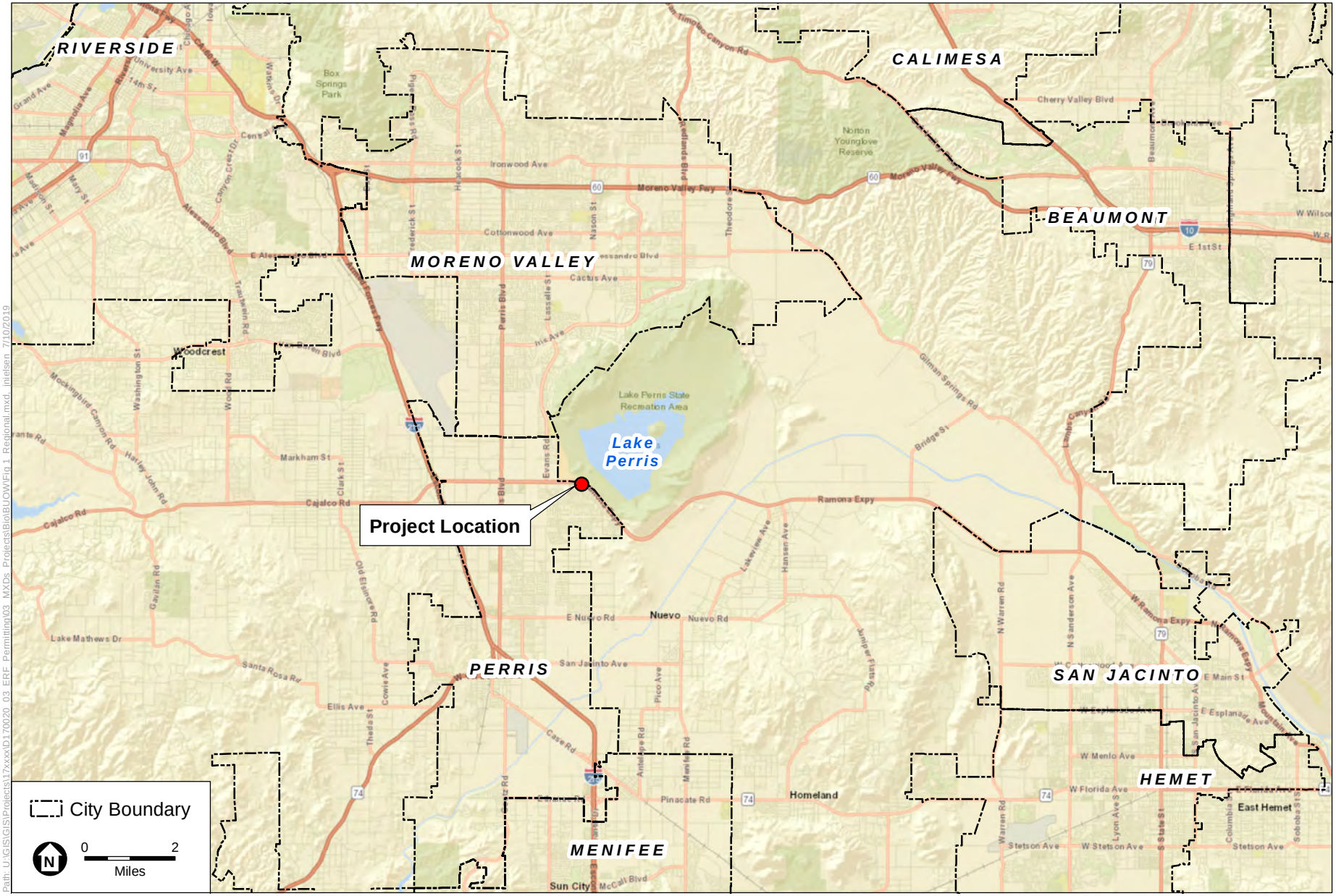
Project Location

The project is located in an unincorporated portion of western Riverside County approximately 15 miles south of the city of Riverside and partially within the city of Perris (**Figure 1, Regional Location**). The project would be constructed partially within the Lake Perris State Recreation Area (SRA), Lake Perris Fairgrounds, and a California Department of Water Resources (DWR) property located immediately to the north of Ramona Expressway (**Figure 2, Project Location**). The project is located within the U.S. Geological Survey (USGS) Perris 7.5-minute quadrangle. Coordinates for the survey area are: 33°50' 48.77"N, 117°12' 49.06"W at the northwest corner, and 33°50' 40.09"N, 117°12' 48.37"W at the southwest corner. The survey area covered the project's construction footprint as well as a 500-foot buffer in all directions (where suitable habitat is present).

Project Description

DWR is proposing to modify the existing Lake Perris release structure and construct a water conveyance facility that would reliably control a reservoir release and convey emergency flows from Lake Perris in the event of an emergency drawdown.

The project would modify the existing emergency release structure by removing the existing bulkhead and replacing it with automated valve, which add flexibility and redundancy to the system and make the emergency release facility safer to operate. The emergency release structure would maintain a maximum of 3,800 cubic feet per second design capacity, but would be operated in accordance with an operation plan for the Perris Dam Emergency Release Facility (Emergency Release Facility Operations and Maintenance Manual) to not exceed the capacity of the downstream Perris Valley Channel. The proposed conveyance facility would convey a maximum release of 3,800 cubic feet per second of water to the Perris Valley Channel.

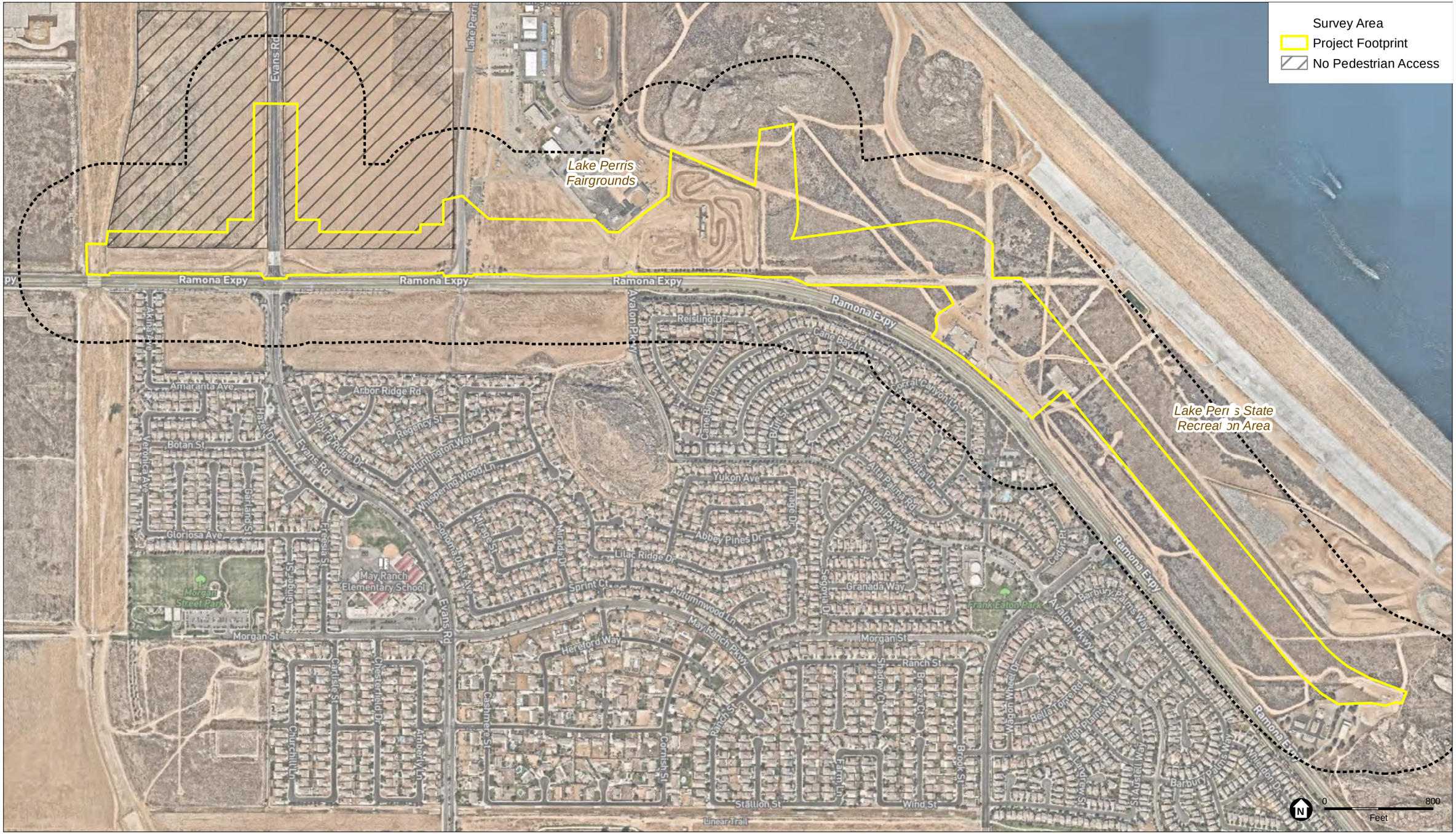


SOURCE: ESRI

Perris Dam Emergency Release Facility Project

Figure 1
Regional Location

ESA



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 2
Project Location

ESA

If water were released during an emergency, the released water would be directed by a levee system across the open SRA land between the dam and the Ramona Expressway, toward an open bottom channel across the starting at the southern end of the Lake Perris Fairgrounds and connecting to the Perris Valley Channel.

Methods

The burrowing owl surveys were conducted pursuant to the guidelines outlined in the California Department of Fish and Wildlife (CDFW) *Staff Report on Burrowing Owl Mitigation* (CDFW staff report) (CDFG 2012). The survey began with an initial habitat assessment that was completed throughout the entire survey area to identify areas containing suitable burrowing owl habitat. Focused visual surveys were also completed to determine presence or absence of the species within the survey area.

Habitat Assessment

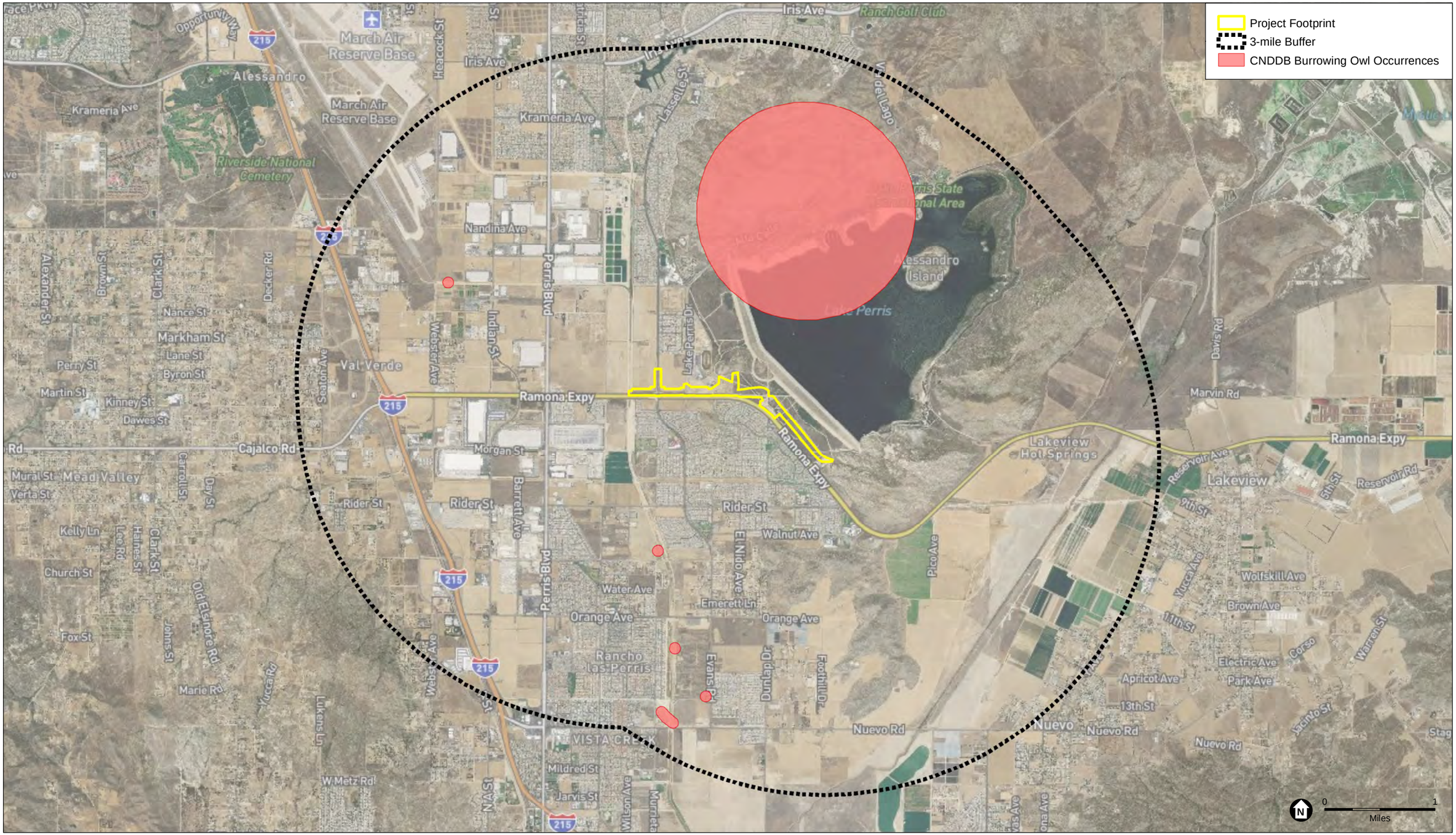
Prior to conducting the habitat assessment, the following resources were queried and/or reviewed to determine the potential for burrowing owls to be present:

- California Department of Fish and Wildlife (CDFW). 2018. California Natural Diversity Database (CNDDB). The database was queried for special-status species records in the Perris USGS 7.5-minute quadrangle and eight surrounding quadrangles, including El Casco, Elsinore, Lakeview, Riverside, Romoland, Steele Peak, Sunnymead, and Winchester. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data: Accessed November 14, 2018.
- Burrowing owl observations reported on eBird within Riverside County. https://ebird.org.
- Environmental Science Associates (ESA). 2013. RE: Burrowing Owl Protocol Survey Results for the Perris Dam Emergency Release Facility Project.
- Previous incidental burrowing owl observations made by ESA staff within the survey area.

Literature Review and Incidental Observations

Figure 3, CNDDB Occurrences, depicts known burrowing owl occurrences within a 3-mile radius of the survey area. One occurrence has been reported within the SRA adjacent to the north of Lake Perris, and a total of five occurrences have been reported to the west and southwest, within 3 miles of the survey area. Additionally, based on review of eBird, eight burrowing owls have also been reported within the vicinity of the SRA, most recently on February 17, 2018, when one individual was spotted at the Lake Perris Marina (eBird 2019).

On January 18, 2019, ESA biologist Dale Hameister incidentally observed one burrowing owl perched at the entrance of a burrow within a private property located immediately to the west of Evans Road in an areas that would be used as the project's proposed haul route. The incidental observation was made from the shoulder of Evans Road and at no time did the biologist walk onto the property. This individual was not observed subsequently, including at any time during the focused surveys.



SOURCE: Mapbox Satellite Streets, 2017; CNDDB.

Perris Dam Emergency Release Facility Project

Figure 3
CNDDB

ESA

Field Reconnaissance

A habitat assessment was conducted throughout the survey area by ESA biologists on October 16, 2018, to assess site conditions and habitat suitability for burrowing owls. Ambient temperatures ranged between 58 and 77 degrees fahrenheit wind speeds ranged between 0 and 10 miles per hour (mph), and skies were clear. The assessment included a combination of walking and driving throughout all accessible portions of the survey area to achieve full visual coverage. As specified in *Appendix C. Habitat Assessment and Reporting Details* in the CDFW staff report, any suitable or active/occupied burrows (>11 cm in diameter and >150 cm in depth), positive sign (e.g., whitewash, feathers, prey pellets), presence of prey species, and/or direct observations of burrowing owls were recorded using a Trimble Geo 7X Series Global Positioning System (GPS) and mapped on an ortho-rectified aerial image using geographical information system software (ArcGIS).

All native and non-native plant communities and land uses were characterized and delineated on aerial photographs during the field survey, and then digitized in ArcGIS. Most descriptions of community and land use types were characterized in the field in accordance with *A Manual of California Vegetation-Second Edition* (Sawyer et al. 2009); however, some were characterized based on species dominance or other visual characteristics if a suitable alliance was not appropriate.

Representative photos of the habitat located within the survey area are provided in **Attachment A, Photograph Exhibit.**

Breeding Season Surveys

As depicted in **Table 1 - Breeding Season Survey Details**, breeding season surveys were completed in March, April, May, and June.

Line transects were conducted throughout all legally accessible portions of the survey area containing suitable habitat in accordance with the CDFW staff report (*Appendix D. Breeding and Non-breeding season surveys and reports)*. Transects were spaced 7 to 20 meters apart depending on site visibility. At the beginning of each transect, and at least every 100 meters, the survey line was scanned with the naked eye as well as with binoculars for sign of burrowing owls. Active/occupied burrows, including those that have potential to be used by burrowing owls (based on size and morphology [>11 centimeters in diameter and >150 centimeters in depth]), were documented using a GPS and mapped in ArcGIS.

Two privately-owned properties, one located between the Perris Valley Channel and Evans Road, and the other between Evans Road and Lake Perris Drive, are within the survey area and the project's construction footprint. These properties are not yet accessible due to pending real estate negotiations; therefore, they were not entered during the surveys and instead assessed based on visual observations made from the public right-of-way. It appears that the central portion of each property is routinely tilled, and numerous California ground squirrels [*Otospermophilus beecheyi*] and burrows capable of supporting burrowing owl, can be seen along the edges of the properties. Burrowing owls prey on California ground squirrel and will occupy squirrel burrows for breeding and overwintering. While conducting the surveys, binoculars were used to inspect suitable habitat from the perimeter of these properties and maximize, to the extent feasible, the potential for detecting burrowing owls in

these areas. Data sheets presenting the data collected and associated notes taken during the breeding season surveys are provided in **Attachment B, Data Sheets**.

TABLE 1
BREEDING SEASON SURVEY DETAILS

Survey	Date	Time	Personnel	Weather Conditions	Notes
Survey 1	3/04/2019	0619-1102	Travis Marella and Robert Sweet	53.2-60 °F, 0-3 mph, 65-75% cloud cover	NA
	3/04/2019	1535-1755	Travis Marella and Robert Sweet	63-61 °F, 1-2 mph, 55-80% cloud cover	NA
	3/05/2019	0606-1035	Travis Marella and Robert Sweet	49-72 °F, 0-1 mph, 20-15% cloud cover	Width of transects reduced during periods of dense fog.
	3/05/2019	1523-1729	Travis Marella and Robert Sweet	70-61 °F, 3-6 mph, 60-70% cloud cover	Favorable weather conditions during majority of survey; limited gusts of 8 mph.
	3/06/2019	0715-0932	Travis Marella and Robert Sweet	67-55 °F, 0-5 mph, 75-100% cloud cover	Break at 0730 due to rain and increase in cloud cover; survey recommenced at 0800 and continued to 0932; when surveying, general avian activity remained high; activity reduced significantly once cloud cover reached 100 percent and rain began.
	3/06/2019	1530-1752	Travis Marella and Robert Sweet	59-61 °F, 1-5 mph, 75-70% cloud cover	Survey began at break of rain and reduction in cloud cover; cloud cover reduced further as survey progressed; temperature was slightly lower than ideal.
	3/07/2019	0603-1121	Travis Marella and Robert Sweet	58-63 °F, 1-4 mph, 65-50% cloud cover	NA
Survey 2	4/16/2019	0618-1030	Travis Marella and Robert Sweet	55-65.3 °F, 2-3 mph, 75% cloud cover	NA
Survey 3	5/15/2019	1603-1941	Travis Marella and Robert Sweet	75-64 °F, 0-6 mph, 60% cloud cover	NA
Survey 4	6/19/2019	1600-1715	Travis Marella and Robert Sweet	89 °F, 5-10 mph, 5% cloud cover	Limited gusts over 8 mph.
	6/20/2019	0904-1011	Travis Marella and Robert Sweet	66-68 °F, 3-5 mph, 75-50% cloud cover	NA

Results

Habitat Assessment

Existing conditions, including soil types, and plant communities and land cover types characterized within the survey area during the habitat assessment are described in detail below.

Soils

Based on review of the Natural Resources Conservation Services (NRCS) web soil survey, the survey area contains eight soil series, including Domino, Exeter, Greenfield, Hanford, Monserate, Ramona, Rockland, and Water (**Figure 4, Soils**) (NRCS 2018). A brief description of the soils mapped within the survey area are described below. Unless otherwise noted, the soils mapped within the survey area are conducive to the construction of fossorial mammal burrows that may be used by burrowing owls for refuge or to breed.

Domino fine sandy loam, eroded; Domino silt loam, saline-alkali. These soil classes are moderately deep, moderately well-drained soils, which typically lie over lime-cemented hardpans. Domino soils have slow runoff and slow permeability. Domino fine sandy loam, eroded is not listed as a hydric soil, while Domino silt loam, saline-alkali is listed as a potentially hydric soil.

Exeter sandy loam, 0 to 2 percent slopes, eroded; 2 to 8 percent slopes, eroded; and deep, 0 to 2 percent slopes. Exeter soils are moderately deep to a duripan and moderately well drained, formed from granitic alluvium parent material. Exeter sandy loam, 0 to 2 percent slopes, is listed as a potentially hydric soils; however, others within this class are not considered potentially hydric.

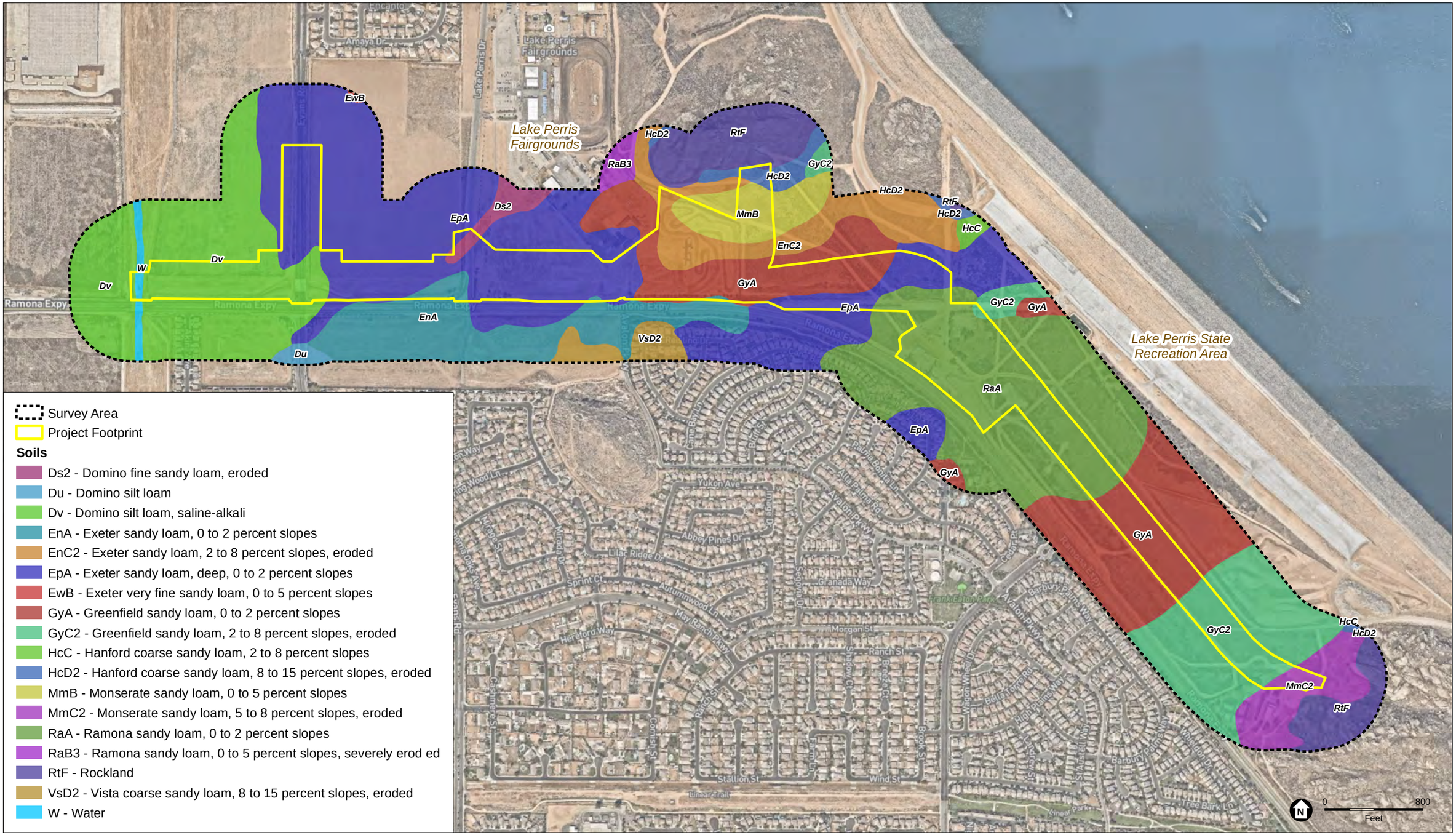
Greenfield sandy loam, 0 to 2 percent slopes; and 2 to 8 percent slopes, eroded. Greenfield soils are deep, well drained, and typically formed from coarse-textured granitic and mixed-rock alluvium parent material. They tend to support slow to medium runoff and moderately rapid permeability and are considered potentially hydric soils.

Hanford coarse sandy loam, 8 to 15 percent slopes, eroded. Hanford soils tend to be very deep and well drained, typically forming from coarse-textured granitic alluvium parent material. They tend to support negligible to low runoff and moderately rapid permeability and are not listed as hydric soils.

Monserate sandy loam, 0 to 5 percent slopes; and 5 to 8 percent slopes, eroded. Monserate soils are moderately well- to well-drained soils typically underlain by a silica-cemented duripan. These soils have slow to rapid runoff and moderately slow permeability above the duripan and very slow permeability within the duripan, and are not listed as a hydric soil.

Ramona sandy loam, 0 to 2 percent slopes. Ramona soils are well drained and typically derived from granitic alluvium. They tend to have slow to rapid runoff and moderately slow permeability. Ramona sandy loam, 0 to 2 percent slopes, is listed as a potentially hydric soil, while Ramona sandy loam, 0 to 5 percent slopes, severely eroded, is not listed as a hydric soil.

Rockland. Rockland consists of well-drained soils formed in loamy colluvium from rotational landslides on slopes of stream valleys and dissections of ground moraines. Saturated hydraulic conductivity is moderate in the upper part of the profile and moderately slow in the lower part. Slopes tend to range from 18 to 70 percent. This portion of the survey area is dominated by large boulders and impenetrable rock; therefore, this soil type is not likely to be utilized by fossorial mammals in the excavation of burrows.



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 4
Soils

ESA

Vista coarse sandy loam, 8 to 15 percent slopes, eroded. Vista soils are well drained, with slow to rapid runoff and moderately rapid permeability. They are typically derived from decomposed granite.

Water. Water is defined as those areas that are at least periodically inundated with open water within systems defined by the Cowardin Classification System as either Riverine, Lacustrine, Palustrine, Marine, or Estuarine. Due to periodic inundation, it is not likely that fossorial mammals would construct burrows or inhabit this area long-term. Similarly, burrowing owls are not likely to find refuge in this area.

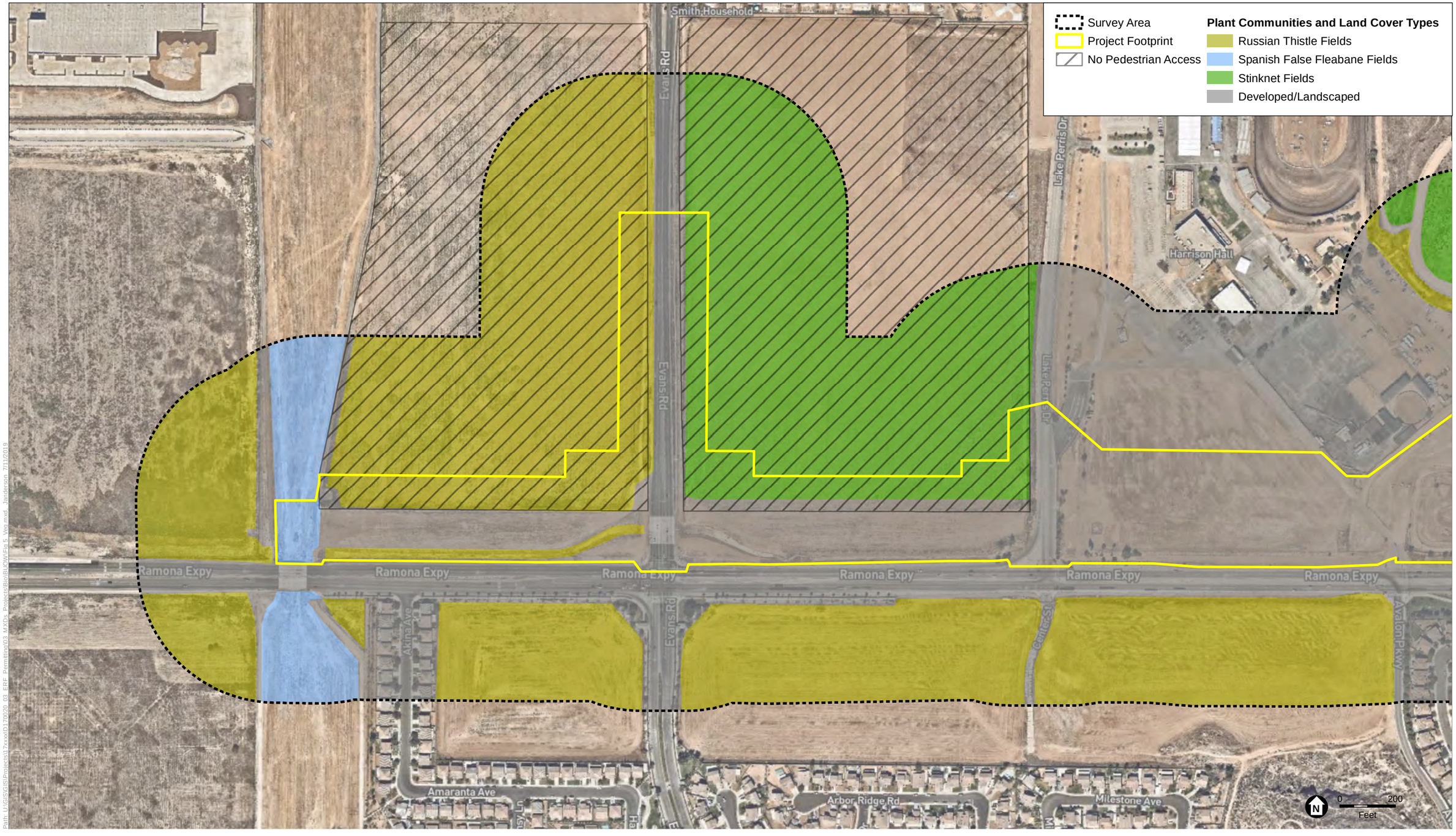
Plant Communities and Land Cover Types

Much of the survey area is dominated by heavily disturbed herbaceous vegetation communities such as red brome (*Bromus madritensis*) grassland and stinknet (*Oncosiphon piluliferum*) fields, with a few native plant communities such as California buckwheat (*Eriogonum fasciculatum*) scrub, brittle bush (*Encelia farinosa*) scrub, and black willow (*Salix gooddingii*). Paved and unpaved roadways (e.g., Ramona Expressway), the Lake Perris Fairgrounds, and Metropolitan Water District's Lake Perris Facility are also present within the survey area. The vegetation within the survey area is depicted in **Figure 5 - Plant Communities and Land Cover Types**.

Black Willow Thickets. Black willow thickets were mapped just west of the toe of Perris dam, within the survey area. This community is characterized by a tree canopy dominated by Goodding's black willow (*Salix gooddingii*), interspersed with various other native and non-native tree species such as narrowleaf willow (*S. exigua*), red willow (*S. laevigata*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), and tamarisk (*Tamarix ramosissima*). The understory of this community is characterized by a mixture of dense shrub cover dominated by coyote brush (*Baccharis pilularis)*, intermixed by dense patches of herbs and forbs, including such species as red brome (*Bromus madritensis* ssp. *rubens*), bull thistle (*Cirsium vulgare*), annual sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*), and Russian thistle (*Salsola tragus*). This plant community does not provide suitable habitat for burrowing owl due to the presence of tall and dense vegetation.

Brittle Brush Scrub. Brittle brush scrub was mapped within the large rock formations, in the northern portion of the survey area, west of Perris dam and north of the Lake Perris Fairgrounds. Available friable substrate is limited in this area; therefore, this community is characterized by a very sparse shrub layer dominated by brittle bush (*Encelia farinosa*) interspersed with various other shrub species, including California buckwheat. Just as described for the shrub cover, this community supports similarly sparse herbaceous cover; species include wild oats (*Avena* sp.), jimson weed (*Datura wrightii*), red brome, and Russian thistle. Suitable habitat for burrowing owl is present in sparse areas between shrubs and along the margins of this community.

California Buckwheat Scrub. California buckwheat scrub was mapped within the survey area in small, fragmented patches between Perris dam and Ramona Expressway. This community is characterized by a shrub layer, varying in density, with a dominance of California buckwheat, interspersed with various other shrub and sub-shrub species such as tarragon (*Artemisia dranunculus*), California brickellia (*Brickellia californica*), sticky monkeyflower (*Diplacus aurantiacus*), broad-scaled Palmer's goldenbush (*Ericameria palmeri* var. *pachylepis*), and skunk bush (*Rhus trilobata*). The herbaceous layer is well developed in areas with less shrub cover and includes various grasses and forbs such as tocalote (*Centaurea melitensis*), turkey-mullein (*Croton setiger*), red brome, stinknet, Russian thistle, Mediterranean grass (*Schismus* sp.), and wild oats. Suitable habitat for burrowing owl is present in sparse areas between shrubs and along the margins of this community.



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SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 5a
Plant Communities and Land Use

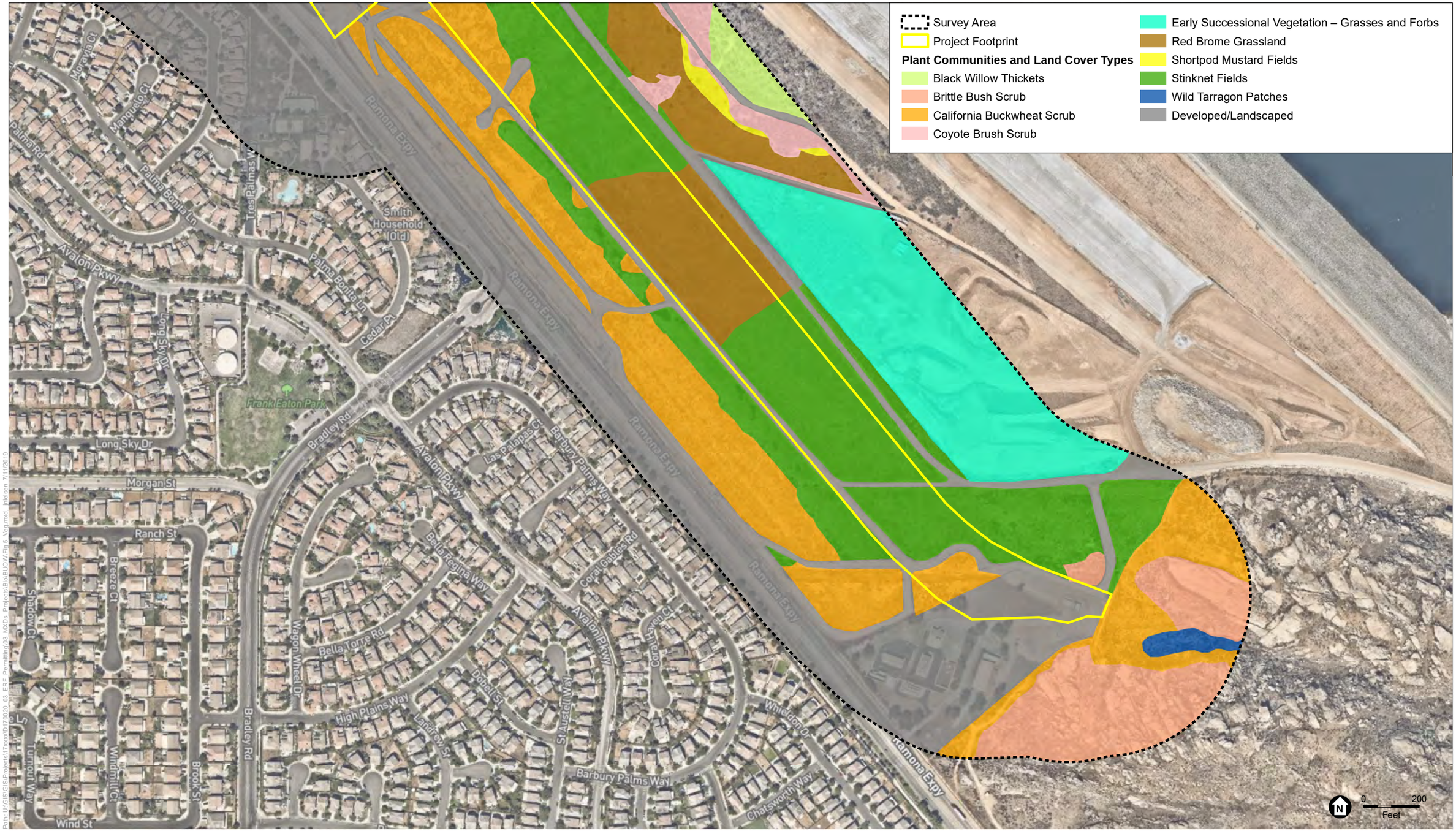
ESA

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 5b
Plant Communities and Land Use

ESA



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 5c
Plant Communities and Land Use

ESA

Coyote Brush Scrub. Coyote brush scrub was mapped within the survey area, between Perris dam and Ramona Expressway. This community is characterized by a dense shrub layer dominated by coyote brush and interspersed with various other shrub or small tree species such as blue elderberry, chaparral bush mallow (*Malacothamnus fasciculatus*), California brickellbush, and tarragon. The herbaceous layer in this community is sparse due to the dense shrub layer; however, grass and forb species observed, primarily along community margins, include annual burrweed (*Ambrosia acanthicarpa*), common sandaster (*Corethrogyne filaginifolia*), Chinese parsley (*Heliotropum curassavicum*), white horehound (*Marrubium vulgare*), and stinknet. Suitable habitat for burrowing owl is present in sparse areas between shrubs and along the margins of this community.

Early Successional Vegetation – Grasses and Forbs. This area is largely devoid of vegetation; however, it is displaying limited successional growth throughout. A native hydroseed mix was applied previously (2018) and weed treatment was implemented in early 2019 to limit the establishment of non-native cover. Currently, both native and non-native grasses and forbs are present, including fiddleneck (*Amsinckia intermedia*), shortpod mustard, smooth barley (*Hordeum murinum*), stinknet, turkey-mullein and Russian thistle. Suitable habitat for burrowing owl is present throughout this sparsely vegetated community.

Red Brome Grassland. Red brome grassland was mapped within the survey area, below the dam. This community is characterized by a dense herbaceous layer dominated by red brome and sub-dominance of stinknet, interspersed by various other weedy grasses and forbs, including Chinese parsley, fiddleneck and shortpod mustard (*Hirschfeldia incana*), Mediterranean grass, Russian thistle, tocalote, and white horehound. Few shrub species were observed speckled throughout this area as well, including fourwing saltbush (*Atriplex canescens*) and California buckwheat. Suitable habitat for burrowing owl is present throughout this low-lying vegetation community.

Russian Thistle Fields. Russian thistle fields were mapped within the survey area between the dam and Ramona Expressway, along ephemeral drainages within the SRA, and within active and fallow agricultural fields located to the north and south of Ramona Expressway. This community is characterized by a dense herbaceous layer dominated by Russian thistle, interspersed with various weedy, herbaceous species such as fiddleneck, red brome, shortpod mustard, small wire lettuce (*Stephanomeria exigua*) and turkey-mullein. Areas hydroseeded following remediation of the dam, to the southwest of the dam face, supported a slightly higher concentration of native species, such as small wire lettuce and turkey-mullein, than other areas. The Russian thistle fields observed to the south of Ramona Expressway appeared recently tilled and were largely devoid of vegetation. Due to the density of this vegetation, suitable habitat for burrowing owl is generally restricted to the margins of this community.

Shortpod Mustard Fields. Shortpod mustard fields were mapped within the survey area in one location, just southwest of the Perris Dam. This community type is characterized by a dense herbaceous layer dominated by shortpod mustard, interspersed with various weedy, herbaceous species such as fiddleneck, Mediterranean grass, red brome, Russian thistle, small wire lettuce, turkey-mullein, and wild oats. A few shrub species were observed within this community, including California buckwheat and brittle bush. Suitable habitat for burrowing owl is present throughout this low-lying vegetation community.

Spanish False Fleabane Fields. Spanish false fleabane fields were mapped within the survey area along the bed of the Perris Valley Channel. This community is characterized by a sparse herbaceous layer almost exclusively

composed of Spanish false fleabane (*Pulicaria paludosa*), interspersed with tamarisk throughout. This community is situated along the bed of the Perris Valley Channel that gets a significant quantity of seasonal inundation; therefore, fossorial mammals are unlikely to construct burrows that may be utilized by burrowing owl in this area.

Stinknet Fields. Stinknet fields were mapped within the survey area in large, fragmented swathes below the Perris dam. This community is characterized by a dense herbaceous layer dominated by stinknet, interspersed with various weedy, herbaceous species such as Mediterranean grass, red brome, Russian thistle, tocalote, turkey-mullein, and wild oats. A significant portion of the stinknet fields were observed adjacent to and intergrading with California buckwheat scrub and, other than the lack of a developed shrub layer, they are very similar in composition. Suitable habitat for burrowing owl is present throughout this low-lying vegetation community.

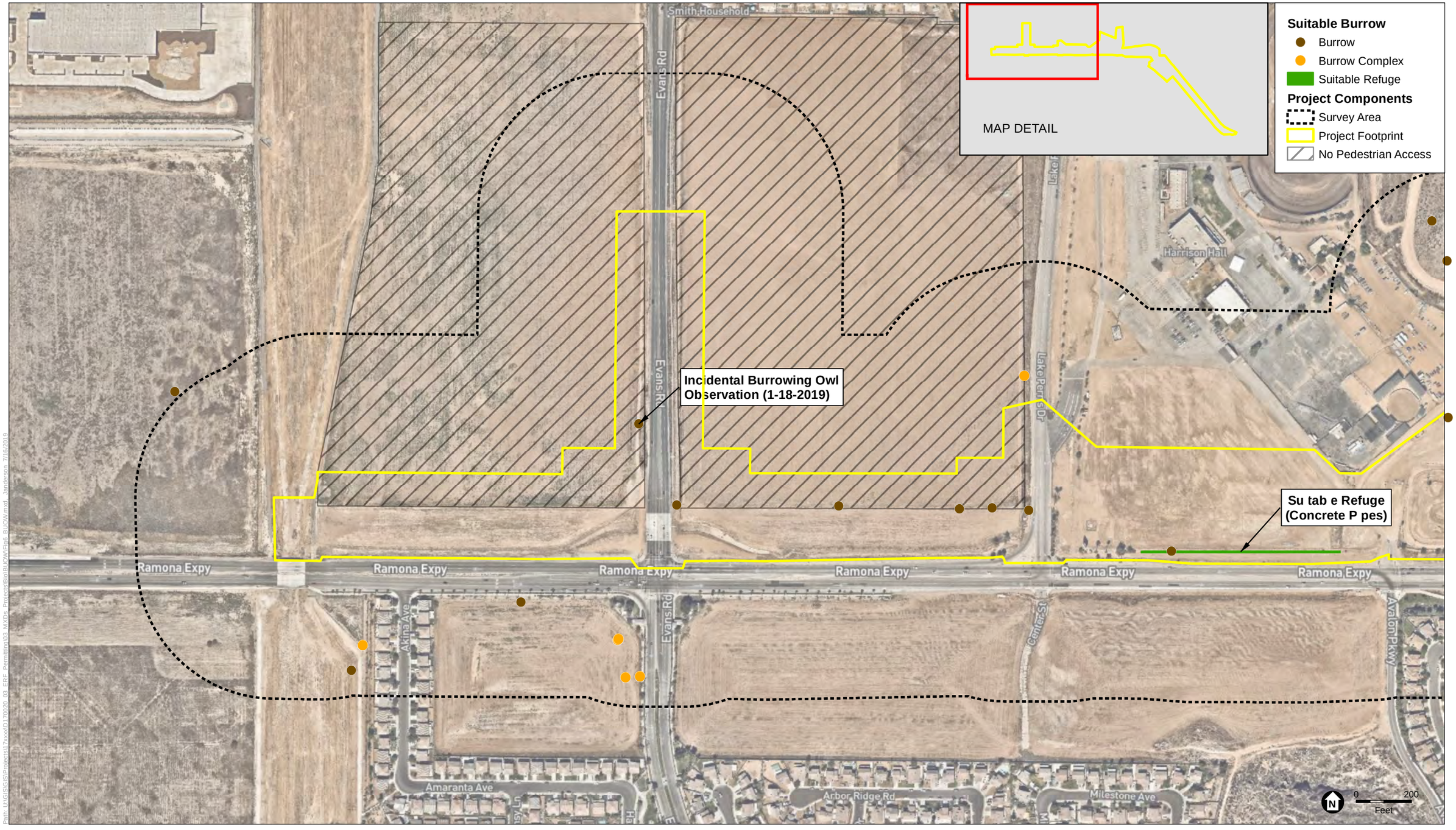
Tamarisk Thickets. Tamarisk thickets were mapped within the survey area in one location, just west of the Lake Perris Fairgrounds and north of Ramona Expressway. This community is characterized by a dense tree canopy exclusive to tamarisk and a very sparse understory consisting of grasses and forbs such as Chinese parsley, fiddleneck, stinknet, and white horehound. This plant community does not provide suitable habitat for burrowing owl due to the presence of tall and dense vegetation.

Wild Tarragon Patches. A stand of wild tarragon patches exists within the southeast portion of the survey area, between the Lake Perris Dam and Ramona Expressway. This community is comprised of a developed shrub/herbaceous layer dominated by tarragon (*Artemisia dranunculus*) and a sub-dominance of California sagebrush (*A. californicus*), interspersed with various other species such as California brickellia, jimson weed (*Datura wrightii*), Mediterranean grass, red brome, turkey-mullein, and wild oats. This community is located within the southernmost tip of the survey area. Suitable habitat for burrowing owl is present in sparse areas between shrubs and along the margins of this community.

Developed/Landscaped. Developed/landscaped land cover was mapped throughout much of the survey area; this includes paved/unpaved roadways and shoulders, including Ramona Expressway, the Lake Perris Fairgrounds, and the residential neighborhoods to the southwest of the SRA. This land use represents heavily disturbed/developed areas generally devoid of vegetation, other than ornamental landscaping and planted trees. Ornamental vegetation observed within these areas include red gum (*Eucalyptus camaldulensis*), Shamel ash (*Fraxinus uhdei*), crape myrtle (*Lagerstroemia indica*), Japanese honeysuckle (*Lonicera japonica*), Canary Island date palm (*Phoenix canariensis*), firethorn (*Pyracantha* sp.), and Peruvian pepper tree (*Schinus molle*). Unpaved, dirt portions of this land cover type, such as road shoulders, dirt banks along concrete channels, rip-rap, etc. provide suitable habitat for fossorial mammals; therefore, may be utilized by burrowing owls.

Breeding Season Surveys

Numerous suitable small mammal burrows and refuge (e.g., shrubs and grasses, rip-rap, culverts/pipes) that can be used by burrowing owls were observed throughout the survey area, specifically within the Lake Perris Fairgrounds and the SRA, as depicted in **Figure 6 - Burrowing Owl Survey Results**. Most suitable burrows (e.g. active California ground squirrel burrows) were observed beneath a barbed-wire fence situated along the southern boundary of one of the two aforementioned private properties. However, several others were observed along concrete channel banks, adjacent to disused concrete pads and other sparsely vegetated areas elsewhere within the survey area.



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SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 6a
Burrowing Owl Survey Results

ESA

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 6b
Burrowing Owl Survey Results

ESA

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 6c
Burrowing Owl Survey Results

ESA

Scat and tracks of potential canine predators (i.e. coyote [*Canis latrans*] and domestic dogs [*Canis lupus* ssp. *familiaris*]) were observed throughout the survey area. Potential avian predators were observed during the surveys as well, including red-tailed hawk (*Buteo jamaicensis*) and great horned owl (*Bubo virginianus*); various other potential predator species are expected to occur as well, including red-shouldered hawk (*Buteo lineatus*), northern harrier (*Circus cyanus*), and Cooper's hawk (*Accipiter cooperii*).

As previously indicated, and as depicted in Figure 6a, one owl was incidentally observed at the entrance of a burrow, within the private property west of Evans Road. White wash was visible at the burrow entrance as well. No burrowing owls or sign of owl presence (e.g., feathers, pellets or whitewash) were observed during the breeding season surveys.

Conclusions and Impact Assessment

As indicated in the CDFW staff report (**Attachment C**), "*Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years*". Therefore, burrowing owl presence may be assumed on the private property west of Evans Road and north of Ramona Expressway, since a positive burrowing owl observation was made in 2018 by ESA. The observed burrow is located where the project's proposed temporary haul route will be situated; therefore, construction of the haul route could result in take of burrowing owls and temporary loss of occupied habitat.

Recommended Mitigation

1. Avoidance and Exclusion

- Relocate the portion of the proposed temporary haul route along Evans Road to avoid direct impact to the burrow or burrowing owls.
- Conduct a burrowing owl clearance survey that includes all areas containing suitable habitat, and within 200 meters of the burrow that was observed on private property prior to the commencement of construction activities to determine whether any burrowing owls are present.
  - In accordance with the CDFW staff report, if a burrowing owl is observed utilizing a burrow during the clearance survey, a qualified biologist should be retained to conduct site surveillance during construction to ensure that the owl(s) are not disturbed. If the qualified biologist determines that the owl(s) are negatively affected by noise generated by the construction, activities should cease until it has been determined that the owl(s) are no longer utilizing the burrow.
  - If an occupied burrow cannot be avoided, develop a Burrowing Owl Exclusion Plan (Passive Relocation). In accordance with the CDFW staff report), the exclusion plan shall include the construction of two artificial burrows for every occupied burrow that would be impacted and locate the artificial burrows within 210 meters of the location of the impacted burrow. To ensure the long-term reliance of artificial burrows, semi-annual/annual cleaning and maintenance and/or replacement is necessary as an ongoing management practice. The status of the occupied burrow should be verified using a camera scope.
  - If a qualified biologist is able to determine that the burrow is not occupied by a burrowing owl, it may be collapsed.

– If it is determined that the burrow is occupied, a one-way door should be installed to prevent re-entry of the owl once it exits the burrow. If follow-up inspection (scoping) of the burrow verifies that the individual(s) are no longer present, the burrow may be collapsed.

2. Restoration

In accordance with the CDFW staff report, where habitat will be temporarily disturbed, restore the disturbed area to pre-project conditions including de-compacting soil and revegetating. Within the restored habitat, two artificial burrows should be constructed within 210 meters of the location of the impacted burrow. To ensure the long-term reliance of artificial burrows, semi-annual/annual cleaning and maintenance and/or replacement is necessary as an ongoing management practice. The status of the occupied burrow should be verified using a camera scope.

3. Permanent Habitat Protection

Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render an active burrow (nesting and/or winteringburrows) unsustainable or unavailable depending on the time frame, resulting in reduced breeding success or abandonment. Options include the following: 1) purchase property that contains suitable burrowing owl habitat (at a ratio approved by the CDFW) to replace the occupied habitat that will be disturbed; 2) place an equivalent amount of property that is owned and maintained by the Permittee into a conservation easement; or 3) establish a Burrowing Owl Mitigation and Conservation Fund.

References

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If you should have any questions regarding this report or should you need any additional information, please feel free to contact May Lau at (213) 599-4300 or email at mlau@esassoc.com.

Sincerely,

Robbie Sweet
Senior Associate Biologist

Greg Ainsworth
Director of Biological Resources

Attachments

Attachment A – Photographic Exhibit
Attachment B – Data Sheets
Attachment C – Staff Report on Burrowing Owl Mitigation

Attachment A
Photographic Exhibit

Photo 1 (NW). Photo depicts black willow thickets located within the northern central portion of the survey area, below the Perris dam. This plant community represents low quality habitat for burrowing owl and unlikely to be utilized by the species.

Photo 2 (N). Photo depicts brittle brush scrub located within the large rock formation in the northern portion of the survey area. Due to the steep topography and dense vegetation, the area in view represents low quality habitat for burrowing owl and unlikely to be utilized by the species.

Photo 3 (NE). Photo depicts California buckwheat scrub located within the southeast portion of the survey area, between the Perris dam and Ramona Expressway. The proposed placement of the south levee and associated staging areas are situated in the distance. This plant community represents high quality habitat for burrowing owl.

Photo 4 (NE). Photo depicts coyote brush scrub within the north-central portion of the survey area, below the Perris dam. The area within and immediately surrounding this dense shrub vegetation represents low quality habitat for burrowing owl; however, habitat quality increases throughout the surrounding grass and forbs.

Photo 5 (NW). Photo depicts red brome grassland within the southern portion of the survey area, between the Perris dam and Ramona Expressway. The proposed placement of the south levee and associated staging areas are situated in the foreground. This plant community represents high quality habitat for the burrowing owl.

Photo 6 (N). Photo depicts Russian thistle fields to the north of Ramona expressway, within the western portion of the survey area. Staging areas associated with the construction of the proposed channel are situated in the foreground. Currently, the dense Russian thistle significantly reduces habitat quality for burrowing owl; however, site conditions may change and support sparser, more suitable conditions for the species.

Photo 7 (N). Photo depicts Spanish false fleabane fields located along the bed of the Perris Valley Channel at the westernmost boundary of the survey area. The rip-rap associated with the proposed channel construction will be situated in the foreground. The channel slopes represent marginal to high quality habitat for burrowing owl.

Photo 8 (E). Photo depicts stinknet fields located between the Perris dam and Ramona Expressway, within the southeast portion of the survey area. This plant community represents high quality habitat for the burrowing owl.

Photo 9 (E). Photo depicts shortpod fields located between the Perris dam and Ramona Expressway, within the southeast portion of the survey area. This plant community represents high quality habitat for the burrowing owl.

Photo 10 (NE). Photo depicts wild tarragon patches located along the southeastern boundary of the survey area, between the Perris dam and Ramona Expressway. Due to the steep topography and dense vegetation, his plant community represents low to marginal habitat quality for the burrowing owl.

Photo 11 (SW). Photo depicts graded pads, dirt roads and various forms of infrastructure just north of Ramona Expressway, within the southern portion of the survey area. Much of the proposed equipment staging associated with the project is expected to take place within this area. Various materials and debris (pipes, rip-rap, scrap metal, etc.) in this area may be utilized by the burrowing owl for refuge and/or breeding.

Photo 12 (E). Photo depicts a rip-rap berm bisecting the central portion of the survey area. This feature provides refuge for burrowing owls and could be utilized by wintering or breeding individuals.

Attachment B
Data Sheets

ERF - BUOW Survey

Date: Mar 4, 2019	**Start Time:** 06:19 **End Time:** 11:02	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 53.2 F **Cloud Cover:** 75% **Wind Speed / Direction:** 0 mph

Weather/End:

Temperature: 60 F **Cloud Cover:** 65% **Wind Speed / Direction:** 2-3 NW mph

Notes: Partly cloudy today with low winds. Very calm. Good survey conditions. Slightly low temps with higher humidity. No BUOW observed.

ERF – Observation Form

Date: Mar 4, 2019	**Time of Observation:** 09:17
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Burrow complex under concrete lines channel. East side. 4 openings. Burrows under concrete slopes. 25 cm wide average for openings. 1-2 feet deep range.

ERF – Observation Form

ERF – Observation Form

Date: Mar 4, 2019	**Time of Observation:** 09:26
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Potential	**Notes:** 12 cm wide, 60 cm deep, then curves to the left. Could be longer. Likely woodrat den. Woodrat scat at entrance.

ERF – Observation Form

ERF – Observation Form

Date: Mar 4, 2019	**Time of Observation:** 10:18
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Rock pile has potential habitat.

ERF – Observation Form

Date: Mar 4, 2019	**Time of Observation:** 10:34
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Suitable rock pile for habitat.

ERF – BUOW Survey

Date: Mar 4, 2019	**Start Time:** 15:35 **End Time:** 17:55	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 63 F **Cloud Cover:** 55% **Wind Speed / Direction:** 1-2 East mph

Weather/End:

Temperature: 61 F **Cloud Cover:** 80% **Wind Speed / Direction:** 1-2 NW mph

Notes: End of PM survey 3/4/19. No BUOW observed. Calm conditions, low wind. Most of survey 50-60% cc.

ERF – Observation Form

Date: Mar 4, 2019	**Time of Observation:** 17:14
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Potential suitable habitat within rock pile. Several deep holes but no wildlife sign.

ERF – Observation Form

ERF – BOUW Survey

Date: Mar 5, 2019	**Start Time:** 06:06 **End Time:** 10:35	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 49 F **Cloud Cover:** 20%. Heavy fog until 630. Burned off at 7am. **Wind Speed / Direction:** 0 mph

Weather/End:

Temperature: 72 F **Cloud Cover:** 15% **Wind Speed / Direction:** 0-1 mph NW

Notes: Transects reduces to 10m apart during fog. 4-6 potential burrows and complexes. No BUOW observed. Overall great, calm conditions.

ERF – Observation Form

Date: Mar 5, 2019	**Time of Observation:** 06:41
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Burrow complex/washout under concrete channel lining on eastside. Near DWR trailers. 3 entrances. Average width 30 cm and 100-150 cm deep.

ERF – BUOW Survey

Date: Mar 5, 2019	**Start Time:** 15:23 **End Time:** 17:29	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 70 F **Cloud Cover:** 60% **Wind Speed / Direction:** 6-7 mph South

Weather/End:

Temperature: 61 F **Cloud Cover:** 70% **Wind Speed / Direction:** 3-6 mph West

Notes: Most of survey mild and calm with winds b/t 3-6 mph, gusts of 8. No burrows observed or sign of BUOW.

ERF – Observation Form

Date: Mar 5, 2019	**Time of Observation:** 07:25
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13 cm wide, approx. 80 cm depth visible. Likely longer. Suitable size however heavily vegetated at burrow opening (Onchosiphon). Likely used previously by CA ground squirrel.

ERF – Observation Form

Date: Mar 5, 2019	**Time of Observation:** 07:41
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** Possible. Small white wash on top rim. Not conclusive.
Suitable Burrow: Yes	**Notes:** 13 cm wide. Greater than 100 cm long. Clear opening. Onchosiphon along edges.

ERF – Observation Form

ERF – Observation Form

Date: Mar 5, 2019	**Time of Observation:** 07:52
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 11 cm wide. 60 cm deep visible. Stick litter in entrance. Clear entrance with onchosiphon. around edges. Buckwheat shrub Behind entrance.

ERF – Observation Form

ERF – Observation Form

ERF – Observation Form

Date: Mar 5, 2019	**Time of Observation:** 09:40
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 11 cm wide. 30 cm deep, then disappears. Clean opening at edge of dirt access road. Very little veg around burrow. Erodium and Schismus.

ERF – Observation Form

ERF – BUOW Survey

Date: Mar 6, 2019	**Start Time:** 07:15 **End Time:** 09:32	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 67 F **Cloud Cover:** 75% **Wind Speed / Direction:** 0 mph

Weather/End:

Temperature: 55 F **Cloud Cover:** 100% **Wind Speed / Direction:** 3-5 mph gusts at 8 West

Notes: Break at 730 due to rain. Will continue once appropriate conditions are suitable. Continued survey at 800. AM survey end at 930 due to rain and cloud cover exceeding 75%. During survey, general bird activity was normal and reduced once rain began.

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 08:06
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Most likely CA ground squirrel complex. 3 openings, average diameter 11 cm. 10 cm visbale depth then disappears. Burrow lined west by black metal fence. Along west side of berm. Dead Russian thistle along fence. Not likely active complex.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 08:15
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Most likely active CA ground squirrel burrow. Diameter 12 cm at lowest point at entrance but starts at 40 cm. 130 cm depth visible. Burrow largely cleared of vegetation. Build up of stick debris at entrance. Possibly used by woodrat, dry scat observed.

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 09:10
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Most likely coyote or fox. Could be used by BUOW. Sorrow whitewash observed two feet from burrow. 40 cm high x 20 cm wide x 100 cm depth visible. Canine dog mound behind opening.

ERF – BUOW Survey

Date: Mar 6, 2019	**Start Time:** 15:30 **End Time:** 17:52	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 59 F **Cloud Cover:** 75% **Wind Speed / Direction:** 1-3 mph gusts of 5

Weather/End:

Temperature: 61 F **Cloud Cover:** 70% **Wind Speed / Direction:** 3-5 mph South

Notes: Survey starts at break of rain and cloud cover. Cloud cover dropped from start of survey to end.

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 15:57
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 4 entrances, average 11 cm width at opening. Depth generally disappears within 10 cm; however, complex appears to be used currently by small mammals. Debris and fresh digging observed.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 16:05
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Clearly ground squirrel complex; however only one entrance is suitable for BUOW. 12 cm width entrance. Depth disappears within 10 cm. Formed by dead log placed on top of mound, surrounded by heavy mustard.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 16:11
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** Fossorial mammal bones observed scattered around burrow entrance. Remains include vertebrae, jawbone, leg bone, etc. Animal could have died naturally or been prey.
Suitable Burrow: Yes	**Notes:** 5 entrances. 12 cm width average diameter. Depth disappears within 10 cm. Fossorial mammal bones observed scattered around burrow entrance. Remains include vertebrae, jawbone, leg bone, etc. Animal could have died naturally or been prey.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 16:24
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13 cm wide at entrance. Disappears at 15 cm depth then turns. Debris in front most likely from small mammal. Active.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:15
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Complex with 3 entrances average width 12 cm at opening. 15 cm deep and then disappears. Likely used by small mammal. Debris placed at burrow entrances.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:27
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Several burrows along barbed wire fence. Three burrows in area appear large enough for BUOW. No clear sign of activity at burrows; however, white wash similar to BUOW observed at base of rebar posts. Likely kestrel.

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:30
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Three burrows along wire fence of size for BUOW. White wash observed at base of rebar posts. Likely kestrel.

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:30
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** White wash and pellet under one of the rebar fence posts. Owl clearly uses this area for foraging purposes. Does not appear to be utilizing the burrows in the immediate area; however, could potentially use one of them due to appropriate morphology.
Suitable Burrow: Yes	**Notes:** Four burrows along wire fence of size for BUOW. No clear BUOW activity or other species but white wash observed at base of rebar posts. Average diameter 12 cm wide depth disappears at approx. 20 cm. White wash and pellet under one of the rebar fence posts. Kestrel seen consuming lizard on rebar fence; clearly uses this area for foraging purposes; likely source of pellets. BUOW does not appear to be utilizing the burrows in the immediate area; however, could potentially use one of them due to appropriate morphology.

ERF – Observation Form

ERF – Observation Form

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:44
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** Top of burrow has a CA ground squirrel skull. Potential prey item.
Suitable Burrow: Yes	**Notes:** 13 cm wide x 30 cm depth before disappears. Two burrows. Top of burrow has a CA ground squirrel skull. Potential prey item.

ERF – Observation Form

Date: Mar 6, 2019	**Time of Observation:** 17:49
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:**

ERF – Observation Form

ERF – BUOW Survey

Date: Mar 7, 2019	**Start Time:** 06:03 **End Time:** 11:21	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 1

Weather/Start:

Temperature: 58 F **Cloud Cover:** 65% **Wind Speed / Direction:** 0-1 mph Northeast

Weather/End:

Temperature: 63 F **Cloud Cover:** 50% **Wind Speed / Direction:** 1-2 mph SW gusts of 4

Notes: Round 1 survey complete today 3/7/19. Weather was suitable. Temps slightly lower than ideal.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 07:11
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Located under k rail. 18 cm wide x 200 cm deep then disappears. Burrow clear of veg.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 07:15
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Complex with one suitable burrow. Onchosiphon west of burrow. 11 cm wide x 10 cm deep then turns left.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 07:18
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 11 cm wide x 20 cm depth then disappears. Dense Onchosiphon behind burrow.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 07:52
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Complex with 4 entrances, 2 large enough for BUOW. 12 cm width x 20 cm deep then disappears. Clear of vegetation. No recent sign or activity.

ERF – Observation Form

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:04
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13.75 cm wide x 10 cm deep then turns left. Clear of vegetation at base of rebar fence. No sign of recent activity.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:06
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Complex with 2 suitable burrows. 13 cm wide x 10 cm deep then disappears. No veg. Appears recent sign of small mammal at entrance at one burrow. Staged trash.

ERF – Observation Form

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:11
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13 cm wide x 10 cm deep then disappears. Under rebar fence, adjacent to vacant field. Clear of veg surrounding burrow. No recent sign observed.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:21
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Complex with two entrances. Located under rebar fence. No current small mammal observed. Dead vegetation at burrow entrances. Cobwebs and debris blocking one entrance. One entrance 20 cm wide the other 11 cm wide. Depth disappears after 10 cm for both.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:26
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** White wash at base of post. Kestrel.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:31
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** White wash at base of post. Kestrel.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:32
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** White wash at base of post. Kestrel.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:34
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** White wash at base of post. Kestrel.

ERF – Observation Form

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:37
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Pellet and whitewash at base of post. Kestrel.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:38
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Private field to north inspected by binoculars from fence line.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:39
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Pellet and whitewash at base of post. Kestrel.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:41
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Pellet and white wash under post. 12 cm wide and disappears after 8 cm deep. Onchosipohn at entrance.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:55
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 12 cm wide x 20 cm deep then disappears. Dense oncho. facing east toward field. White wash on upper rim. Appears too small to be BUOW. Likely sparrow.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 08:59
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13 cm wide x 10 cm deep then turns left. Onchosiphon dense surrounding burrow. Small mammal scat observed.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 09:12
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 12 cm wide x 10 cm deep then turns left. Back digging at entrance. Likely small mammal. Portion of top burrow is collapsed.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 09:15
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 11 cm wide and curves left after 5 cm. Open to field. Debris likely from fossorial mammal.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 09:43
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 13 cm wide x 10 cm deep then disappears. Burrow under granite rock. No clear sign of any activity.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 10:23
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Suitable habitat within concrete pipes.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 10:26
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 12 cm wide x 60 cm deep then turns left. No clear sign of recent activity. Oncho. on either side of burrow.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 10:48
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Empty concrete water pipes. Very marginal habitat. Dense oncho. surrounding pipes. Will return later date.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 10:59
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Space under storage connex. East entrance suitable opening. Small mammal sign observed.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 11:02
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Debris on ground suitable.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 11:04
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** 12 cm width x 10 cm depth then disappears. Debris surrounding burrow.

ERF – Observation Form

Date: Mar 7, 2019	**Time of Observation:** 11:09
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Mixture of debris suitable habitat.

ERF – BUOW Survey

Date: Apr 16, 2019	**Start Time:** 06:18 **End Time:** 10:30	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 2
Weather/Start: **Temperature:** 55 F	**Cloud Cover:** 75%	**Wind Speed / Direction:** 2 mph South
Weather/End: **Temperature:** 65.3 F	**Cloud Cover:** 75%	**Wind Speed / Direction:** 3 mph south
Notes: Start point is across street from burrow on SW corner of Ramona and Evans. End of survey - no BUOW sign observed or found.		

ERF – Observation Form

Date: Apr 16, 2019	**Time of Observation:** 07:54
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation:	**Burrowing Owl Sign:**
Suitable Burrow: Yes	**Notes:** Active Cal gs burrow, in complex of burrows.

ERF – Observation Form

Date: Apr 16, 2019	**Time of Observation:** 08:01
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: No	**Notes:** Likely kestrel pellet with lizard scales inside. White wash also seen at base of post.

ERF – Observation Form

ERF – Observation Form

Date: Apr 16, 2019	**Time of Observation:** 10:00
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation:	**Burrowing Owl Sign:** Rain-washed pellet. 2 ft away from complex opening. Likely another raptor species, as opposed to BUOW.Possibly great horned? Many great horned pellets at base of Washingtonia palms nearby.
Suitable Burrow: Burrow complex under concrete channelized wash. East of channel. Created by runoff. Average opening 30 cm and 150 cm deep. 4 or 5 openings.	**Notes:** Not likely active.

ERF – Observation Form

ERF – Observation Form

ERF – BUOW Survey

Date: May 15, 2019	**Start Time:** 16:03 **End Time:** 19:41	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 3
Weather/Start: **Temperature:** 75 F	**Cloud Cover:** 60%	**Wind Speed / Direction:** 6 mph SE
Weather/End: **Temperature:** 64 F	**Cloud Cover:** 60%	**Wind Speed / Direction:** 0-3 mph
Notes: No BUOW sign observed. Or individuals. Very suitable survey conditions. LBV heard in riparian area (male).		

ERF – Observation Form

Date: May 15, 2019	**Time of Observation:** 16:25
Project: Perris Dam Emergency Release Facility Project	**Survey:** Burrowing Owl Surveys
Burrowing Owl Observation: No	**Burrowing Owl Sign:** No
Suitable Burrow: Yes	**Notes:** Active cgs burrow

ERF – BUOW Survey

Date: Jun 19, 2019	**Start Time:** 16:00 **End Time:** 17:15	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 4
Weather/Start: **Temperature:** 89 F	**Cloud Cover:** 5%	**Wind Speed / Direction:** 5 mph east
Weather/End: **Temperature:** 89 F	**Cloud Cover:** 5%	**Wind Speed / Direction:** 5-10 mph
Notes: No BUOW sign observed or individuals.		

ERF – BUOW Survey

Date: Jun 20, 2019	**Start Time:** 09:04 **End Time:** 10:11	**Surveyor(s):** TSM, RCS
Project: Perris Dam Emergency Release Facility Project		**Survey:** 4

Weather/Start:

Temperature: 66 F **Cloud Cover:** 75% **Wind Speed / Direction:** 3 mph south

Weather/End:

Temperature: 68 F **Cloud Cover:** 50% **Wind Speed / Direction:** 3-5 mph south

Notes: No BUOW or sign observed.

Attachment C

Staff Report on Burrowing Owl Mitigation

Staff Report on Burrowing Owl Mitigation

State of California

Natural Resources Agency

Department of Fish and Game

March 7, 2012[1]

[1] This document replaces the Department of Fish and Game 1995 Staff Report On Burrowing Owl Mitigation.

TABLE OF CONTENTS

INTRODUCTION AND PURPOSE

Maintaining California's rich biological diversity is dependent on the conservation of species and their habitats. The California Department of Fish and Game (Department) has designated certain species as "species of special concern" when their population viability and survival is adversely affected by risk factors such as precipitous declines or other vulnerability factors (Shuford and Gardali 2008). Preliminary analyses of regional patterns for breeding populations of burrowing owls (*Athene cunicularia*) have detected declines both locally in their central and southern coastal breeding areas, and statewide where the species has experienced modest breeding range retraction (Gervais et al. 2008). In California, threat factors affecting burrowing owl populations include habitat loss, degradation and modification, and eradication of ground squirrels resulting in a loss of suitable burrows required by burrowing owls for nesting, protection from predators, and shelter (See Appendix A).

The Department recognized the need for a comprehensive conservation and mitigation strategy for burrowing owls, and in 1995 directed staff to prepare a report describing mitigation and survey recommendations. This report, "1995 Staff Report on Burrowing Owl Mitigation," (Staff Report) (CDFG 1995), contained Department-recommended burrowing owl and burrow survey techniques and mitigation measures intended to offset the loss of habitat and slow or reverse further decline of this species. Notwithstanding these measures, over the past 15+ years, burrowing owls have continued to decline in portions of their range (DeSante et al. 2007, Wilkerson and Siegel, 2010). The Department has determined that reversing declining population and range trends for burrowing owls will require implementation of more effective conservation actions, and evaluating the efficacy of the Department's existing recommended avoidance, minimization and mitigation approaches for burrowing owls.

The Department has identified three main actions that together will facilitate a more viable, coordinated, and concerted approach to conservation and mitigation for burrowing owls in California. These include:

1. Incorporating burrowing owl comprehensive conservation strategies into landscape-based planning efforts such as Natural Community Conservation Plans (NCCPs) and multi-species Habitat Conservation Plans (HCPs) that specifically address burrowing owls.
2. Developing and implementing a statewide conservation strategy (Burkett and Johnson, 2007) and local or regional conservation strategies for burrowing owls, including the development and implementation of a statewide burrowing owl survey and monitoring plan.
3. Developing more rigorous burrowing owl survey methods, working to improve the adequacy of impacts assessments; developing clear and effective avoidance and minimization measures; and developing mitigation measures to ensure impacts to the species are effectively addressed at the project, local, and/or regional level (the focus of this document).

This Report sets forth the Department's recommendations for implementing the third approach identified above by revising the 1995 Staff Report, drawing from the most relevant and current knowledge and expertise, and incorporating the best scientific information

available pertaining to the species. It is designed to provide a compilation of the best available science for Department staff, biologists, planners, land managers, California Environmental Quality Act (CEQA) lead agencies, and the public to consider when assessing impacts of projects or other activities on burrowing owls.

This revised Staff Report takes into account the California Burrowing Owl Consortium's Survey Protocol and Mitigation Guidelines (CBOC 1993, 1997) and supersedes the survey, avoidance, minimization and mitigation recommendations in the 1995 Staff Report. Based on experiences gained from implementing the 1995 Staff Report, the Department believes revising that report is warranted. This document also includes general conservation goals and principles for developing mitigation measures for burrowing owls.

DEPARTMENT ROLE AND LEGAL AUTHORITIES

The mission of the Department is to manage California's diverse fish, wildlife and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitats necessary to maintain biologically sustainable populations of those species (Fish and Game Code (FGC) §1802). The Department, as trustee agency pursuant to CEQA (See CEQA Guidelines, §15386), has jurisdiction by law over natural resources, including fish and wildlife, affected by a project, as that term is defined in Section 21065 of the Public Resources Code. The Department exercises this authority by reviewing and commenting on environmental documents and making recommendations to avoid, minimize, and mitigate potential negative impacts to those resources held in trust for the people of California.

Field surveys designed to detect the presence of a particular species, habitat element, or natural community are one of the tools that can assist biologists in determining whether a species or habitat may be significantly impacted by land use changes or disturbance. The Department reviews field survey data as well as site-specific and regional information to evaluate whether a project's impacts may be significant. This document compiles the best available science for conducting habitat assessments and surveys, and includes considerations for developing measures to avoid impacts or mitigate unavoidable impacts.

CEQA

CEQA requires public agencies in California to analyze and disclose potential environmental impacts associated with a project that the agency will carry out, fund, or approve. Any potentially significant impact must be mitigated to the extent feasible. Project-specific CEQA mitigation is important for burrowing owls because most populations exist on privately owned parcels that, when proposed for development or other types of modification, may be subject to the environmental review requirements of CEQA.

Take

Take of individual burrowing owls and their nests is defined by FGC section 86, and prohibited by sections 3503, 3503.5 and 3513. Take is defined in FGC Section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill."

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the United States and Canada, Japan, Mexico, and Russia for the protection of migratory birds, including the burrowing owl (50 C.F.R. § 10). The MBTA protects migratory bird nests from possession, sale, purchase, barter, transport, import and export, and collection. The other prohibitions of the MBTA - capture, pursue, hunt, and kill - are inapplicable to nests. The regulatory definition of take, as defined in Title 50 C.F.R. part 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect. Only the verb "collect" applies to nests. It is illegal to collect, possess, and by any means transfer possession of any migratory bird nest. The MBTA prohibits the destruction of a nest when it contains birds or eggs, and no possession shall occur during the destruction (see Fish and Wildlife Service, Migratory Bird Permit Memorandum, April 15, 2003). Certain exceptions to this prohibition are included in 50 C.F.R. section 21. Pursuant to Fish & Game Code section 3513, the Department enforces the Migratory Bird Treaty Act consistent with rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.

Regional Conservation Plans

Regional multiple species conservation plans offer long-term assurances for conservation of covered species at a landscape scale, in exchange for biologically appropriate levels of incidental take and/or habitat loss as defined in the approved plan. California's NCCP Act (FGC §2800 et seq.) governs such plans at the state level, and was designed to conserve species, natural communities, ecosystems, and ecological processes across a jurisdiction or a collection of jurisdictions. Complementary federal HCPs are governed by the Endangered Species Act (7 U.S.C. § 136, 16 U.S.C.§ 1531 et seq.) (ESA). Regional conservation plans (and certain other landscape-level conservation and management plans), may provide conservation for unlisted as well as listed species. Because the geographic scope of NCCPs and HCPs may span many hundreds of thousands of acres, these planning tools have the potential to play a significant role in conservation of burrowing owls, and grasslands and other habitats.

Fish and Game Commission Policies

There are a number of Fish and Game Commission policies (see FGC §2008) that can be applied to burrowing owl conservation. These include policies on: Raptors, Cooperation, Endangered and Threatened Species, Land Use Planning, Management and Utilization of Fish and Wildlife on Federal Lands, Management and Utilization of Fish and Wildlife on Private Lands, and Research.

GUIDING PRINCIPLES FOR CONSERVATION

Unless otherwise provided in a statewide, local, or regional conservation strategy, surveying and evaluating impacts to burrowing owls, as well as developing and implementing avoidance, minimization, and mitigation and conservation measures incorporate the following principles. These principles are a summary of Department staff expert opinion and were used to guide the preparation of this document.

1. Use the Precautionary Principle (Noss et al.1997), by which the alternative of increased conservation is deliberately chosen in order to buffer against incomplete knowledge of burrowing owl ecology and uncertainty about the consequences to burrowing owls of potential impacts, including those that are cumulative.
2. Employ basic conservation biology tenets and population-level approaches when determining what constitutes appropriate avoidance, minimization, and mitigation for impacts. Include mitigation effectiveness monitoring and reporting, and use an adaptive management loop to modify measures based on results.
3. Protect and conserve owls in wild, semi-natural, and agricultural habitats (conserve is defined at FGC §1802).
4. Protect and conserve natural nest burrows (or burrow surrogates) previously used by burrowing owls and sufficient foraging habitat and protect auxiliary "satellite" burrows that contribute to burrowing owl survivorship and natural behavior of owls.

CONSERVATION GOALS FOR THE BURROWING OWL IN CALIFORNIA

It is Department staff expert opinion that the following goals guide and contribute to the short and long-term conservation of burrowing owls in California:

1. Maintain size and distribution of extant burrowing owl populations (allowing for natural population fluctuations).
2. Increase geographic distribution of burrowing owls into formerly occupied historical range where burrowing owl habitat still exists, or where it can be created or enhanced, and where the reason for its local disappearance is no longer of concern.
3. Increase size of existing populations where possible and appropriate (for example, considering basic ecological principles such as carrying capacity, predator-prey relationships, and inter-specific relationships with other species at risk).
4. Protect and restore self-sustaining ecosystems or natural communities which can support burrowing owls at a landscape scale, and which will require minimal long-term management.
5. Minimize or prevent unnatural causes of burrowing owl population declines (e.g., nest burrow destruction, chemical control of rodent hosts and prey).
6. Augment/restore natural dynamics of burrowing owl populations including movement and genetic exchange among populations, such that the species does not require future listing and protection under the California Endangered Species Act (CESA) and/or the federal Endangered Species Act (ESA).
7. Engage stakeholders, including ranchers; farmers; military; tribes; local, state, and federal agencies; non-governmental organizations; and scientific research and education communities involved in burrowing owl protection and habitat management.

ACTIVITIES WITH THE POTENTIAL TO TAKE OR IMPACT BURROWING OWLS

The following activities are examples of activities that have the potential to take burrowing owls, their nests or eggs, or destroy or degrade burrowing owl habitat: grading, disking, cultivation, earthmoving, burrow blockage, heavy equipment compacting and crushing burrow tunnels, levee maintenance, flooding, burning and mowing (if burrows are impacted), and operating wind turbine collisions (collectively hereafter referred to as "projects" or "activities"

whether carried out pursuant to CEQA or not). In addition, the following activities may have impacts to burrowing owl populations: eradication of host burrowers; changes in vegetation management (i.e. grazing); use of pesticides and rodenticides; destruction, conversion or degradation of nesting, foraging, over-wintering or other habitats; destruction of natural burrows and burrow surrogates; and disturbance which may result in harassment of owls at occupied burrows.

PROJECT IMPACT EVALUATIONS

The following three progressive steps are effective in evaluating whether projects will result in impacts to burrowing owls. The information gained from these steps will inform any subsequent avoidance, minimization and mitigation measures. The steps for project impact evaluations are: 1) habitat assessment, 2) surveys, and 3) impact assessment. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project. These three site evaluation steps are discussed in detail below.

Biologist Qualifications

The current scientific literature indicates that only individuals meeting the following minimum qualifications should perform burrowing owl habitat assessments, surveys, and impact assessments:

1. Familiarity with the species and its local ecology;
2. Experience conducting habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor;
3. Familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation;
4. Experience with analyzing impacts of development on burrowing owls and their habitat.

Habitat Assessment Data Collection and Reporting

A habitat assessment is the first step in the evaluation process and will assist investigators in determining whether or not occupancy surveys are needed. Refer to Appendix B for a definition of burrowing owl habitat. Compile the detailed information described in Appendix C when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report.

Surveys

Burrowing owl surveys are the second step of the evaluation process and the best available scientific literature recommends that they be conducted whenever burrowing owl habitat or sign (see Appendix B) is encountered on or adjacent to (within 150 meters) a project site

(Thomsen 1971, Martin 1973). Occupancy of burrowing owl habitat is confirmed at a site when at least one burrowing owl, or its sign at or near a burrow entrance, is observed within the last three years (Rich 1984). Burrowing owls are more detectable during the breeding season with detection probabilities being highest during the nestling stage (Conway et al. 2008). In California, the burrowing owl breeding season extends from 1 February to 31 August (Haug et al. 1993, Thompsen 1971) with some variances by geographic location and climatic conditions. Several researchers suggest three or more survey visits during daylight hours (Haug and Diduik 1993, CBOC 1997, Conway and Simon 2003) and recommend each visit occur at least three weeks apart during the peak of the breeding season, commonly accepted in California as between 15 April and 15 July (CBOC 1997). Conway and Simon (2003) and Conway et al. (2008) recommended conducting surveys during the day when most burrowing owls in a local area are in the laying and incubation period (so as not to miss early breeding attempts), during the nesting period, and in the late nestling period when most owls are spending time above ground.

Non-breeding season (1 September to 31 January) surveys may provide information on burrowing owl occupancy, but do not substitute for breeding season surveys because results are typically inconclusive. Burrowing owls are more difficult to detect during the non-breeding season and their seasonal residency status is difficult to ascertain. Burrowing owls detected during non-breeding season surveys may be year-round residents, young from the previous breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, transients or new colonizers. In addition, the numbers of owls and their pattern of distribution may differ during winter and breeding seasons. However, on rare occasions, non-breeding season surveys may be warranted (i.e., if the site is believed to be a wintering site only based on negative breeding season results). Refer to Appendix D for information on breeding season and non-breeding season survey methodologies.

Survey Reports

Adequate information about burrowing owls present in and adjacent to an area that will be disturbed by a project or activity will enable the Department, reviewing agencies and the public to effectively assess potential impacts and will guide the development of avoidance, minimization, and mitigation measures. The survey report includes but is not limited to a description of the proposed project or proposed activity, including the proposed project start and end dates, as well as a description of disturbances or other activities occurring on-site or nearby. Refer to Appendix D for details included in a survey report.

Impact Assessment

The third step in the evaluation process is the impact assessment. When surveys confirm occupied burrowing owl habitat in or adjoining the project area, there are a number of ways to assess a project's potential significant impacts to burrowing owls and their habitat. Richardson and Miller (1997) recommended monitoring raptor behavior prior to developing management recommendations and buffers to determine the extent to which individuals have been sensitized to human disturbance. Monitoring results will also provide detail necessary for developing site-specific measures. Postovit and Postovit (1987) recommended an analytical approach to mitigation planning: define the problem (impact), set goals (to guide mitigation development), evaluate and select mitigation methods, and monitor the results.

Define the problem. The impact assessment evaluates all factors that could affect burrowing owls. Postovit and Postovit (1987) recommend evaluating the following in assessing impacts to raptors and planning mitigation: type and extent of disturbance, duration and timing of disturbance, visibility of disturbance, sensitivity and ability to habituate, and influence of environmental factors. They suggest identifying and addressing all potential direct and indirect impacts to burrowing owls, regardless of whether or not the impacts will occur during the breeding season. Several examples are given for each impact category below; however, examples are not intended to be used exclusively.

Type and extent of the disturbance. The impact assessment describes the nature (source) and extent (scale) of potential project impacts on occupied, satellite and unoccupied burrows including acreage to be lost (temporary or permanent), fragmentation/edge being created, increased distance to other nesting and foraging habitat, and habitat degradation. Discuss any project activities that impact either breeding and/or non-breeding habitat which could affect owl home range size and spatial configuration, negatively affect onsite and offsite burrowing owl presence, increase energetic costs, lower reproductive success, increase vulnerability to predation, and/or decrease the chance of procuring a mate.

Duration and timing of the impact. The impact assessment describes the amount of time the burrowing owl habitat will be unavailable to burrowing owls (temporary or permanent) on the site and the effect of that loss on essential behaviors or life history requirements of burrowing owls, the overlap of project activities with breeding and/or non-breeding seasons (timing of nesting and/or non-breeding activities may vary with latitude and climatic conditions, which should be considered with the timeline of the project or activity), and any variance of the project activities in intensity, scale and proximity relative to burrowing owl occurrences.

Visibility and sensitivity. Some individual burrowing owls or pairs are more sensitive than others to specific stimuli and may habituate to ongoing visual or audible disturbance. Site-specific monitoring may provide clues to the burrowing owl's sensitivities. This type of assessment addresses the sensitivity of burrowing owls within their nesting area to humans on foot, and vehicular traffic. Other variables are whether the site is primarily in a rural versus urban setting, and whether any prior disturbance (e.g., human development or recreation) is known at the site.

Environmental factors. The impact assessment discusses any environmental factors that could be influenced or changed by the proposed activities including nest site availability, predators, prey availability, burrowing mammal presence and abundance, and threats from other extrinsic factors such as human disturbance, urban interface, feral animals, invasive species, disease or pesticides.

Significance of impacts. The impact assessment evaluates the potential loss of nesting burrows, satellite burrows, foraging habitat, dispersal and migration habitat, wintering habitat, and habitat linkages, including habitat supporting prey and host burrowers and other essential habitat attributes. This assessment determines if impacts to the species will result in significant impacts to the species locally, regionally and range-wide per CEQA Guidelines §15382 and Appendix G. The significance of the impact to habitat depends on the extent of habitat disturbed and length of time the habitat is unavailable (for example: minor – several days, medium – several weeks to months, high - breeding season affecting juvenile survival,

or over winter affecting adult survival).

Cumulative effects. The cumulative effects assessment evaluates two consequences: 1) the project's proportional share of reasonably foreseeable impacts on burrowing owls and habitat caused by the project or in combination with other projects and local influences having impacts on burrowing owls and habitat, and 2) the effects on the regional owl population resulting from the project's impacts to burrowing owls and habitat.

Mitigation goals. Establishing goals will assist in planning mitigation and selecting measures that function at a desired level. Goals also provide a standard by which to measure mitigation success. Unless specifically provided for through other FGC Sections or through specific regulations, take, possession or destruction of individual burrowing owls, their nests and eggs is prohibited under FGC sections 3503, 3503.5 and 3513. Therefore, a required goal for all project activities is to avoid take of burrowing owls. Under CEQA, goals would consist of measures that would avoid, minimize and mitigate impacts to a less than significant level. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions. As set forth in more detail in Appendix A, the current scientific literature supports the conclusion that mitigation for permanent habitat loss necessitates replacement with an equivalent or greater habitat area for breeding, foraging, wintering, dispersal, presence of burrows, burrow surrogates, presence of fossorial mammal dens, well drained soils, and abundant and available prey within close proximity to the burrow.

MITIGATION METHODS

The current scientific literature indicates that any site-specific avoidance or mitigation measures developed should incorporate the best practices presented below or other practices confirmed by experts and the Department. The Department is available to assist in the development of site-specific avoidance and mitigation measures.

Avoiding. A primary goal is to design and implement projects to seasonally and spatially avoid negative impacts and disturbances that could result in take of burrowing owls, nests, or eggs. Other avoidance measures may include but not be limited to:

- Avoid disturbing occupied burrows during the nesting period, from 1 February through 31 August.
- Avoid impacting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls.
- Avoid direct destruction of burrows through chaining (dragging a heavy chain over an area to remove shrubs), disking, cultivation, and urban, industrial, or agricultural development.
- Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection.
- Place visible markers near burrows to ensure that farm equipment and other machinery does not collapse burrows.
- Do not fumigate, use treated bait or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting

owls, designated use areas).
- Restrict the use of treated grain to poison mammals to the months of January and February.

Take avoidance (pre-construction) surveys. Take avoidance surveys are intended to detect the presence of burrowing owls on a project site at a fixed period in time and inform necessary take avoidance actions. Take avoidance surveys may detect changes in owl presence such as colonizing owls that have recently moved onto the site, migrating owls, resident burrowing owls changing burrow use, or young of the year that are still present and have not dispersed. Refer to Appendix D for take avoidance survey methodology.

Site surveillance. Burrowing owls may attempt to colonize or re-colonize an area that will be impacted; thus, the current scientific literature indicates a need for ongoing surveillance at the project site during project activities is recommended. The surveillance frequency/effort should be sufficient to detect burrowing owls if they return. Subsequent to their new occupancy or return to the site, take avoidance measures should assure with a high degree of certainty that take of owls will not occur.

Minimizing. If burrowing owls and their habitat can be protected in place on or adjacent to a project site, the use of buffer zones, visual screens or other measures while project activities are occurring can minimize disturbance impacts. Conduct site-specific monitoring to inform development of buffers (see Visibility and sensitivity above). The following general guidelines for implementing buffers should be adjusted to address site-specific conditions using the impact assessment approach described above. The CEQA lead agency and/or project proponent is encouraged to consult with the Department and other burrowing owl experts for assistance in developing site-specific buffer zones and visual screens.

Buffers. Holroyd et al. (2001) identified a need to standardize management and disturbance mitigation guidelines. For instance, guidelines for mitigating impacts by petroleum industries on burrowing owls and other prairie species (Scobie and Faminow, 2000) may be used as a template for future mitigation guidelines (Holroyd et al. 2001). Scobie and Faminow (2000) developed guidelines for activities around occupied burrowing owl nests recommending buffers around low, medium, and high disturbance activities, respectively (see below).

Recommended restricted activity dates and setback distances by level of disturbance for burrowing owls (Scobie and Faminow 2000).

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Based on existing vegetation, human development, and land uses in an area, resource managers may decide to allow human development or resource extraction closer to these area/sites than recommended above. However, if it is decided to allow activities closer than

the setback distances recommended, a broad-scale, long-term, scientifically-rigorous monitoring program ensures that burrowing owls are not detrimentally affected by alternative approaches.

Other minimization measures include eliminating actions that reduce burrowing owl forage and burrowing surrogates (e.g. ground squirrel), or introduce/facilitate burrowing owl predators. Actions that could influence these factors include reducing livestock grazing rates and/or changing the timing or duration of grazing or vegetation management that could result in less suitable habitat.

Burrow exclusion and closure. Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls, or permanently exclude burrowing owls and close burrows after verifying burrows are empty by site monitoring and scoping. Exclusion in and of itself is not a take avoidance, minimization or mitigation method. Eviction of burrowing owls is a potentially significant impact under CEQA.

The long-term demographic consequences of these techniques have not been thoroughly evaluated, and the fate of evicted or excluded burrowing owls has not been systematically studied. Because burrowing owls are dependent on burrows at all times of the year for survival and/or reproduction, evicting them from nesting, roosting, and satellite burrows may lead to indirect impacts or take. Temporary or permanent closure of burrows may result in significant loss of burrows and habitat for reproduction and other life history requirements. Depending on the proximity and availability of alternate habitat, loss of access to burrows will likely result in varying levels of increased stress on burrowing owls and could depress reproduction, increase predation, increase energetic costs, and introduce risks posed by having to find and compete for available burrows. Therefore, exclusion and burrow closure are not recommended where they can be avoided. The current scientific literature indicates consideration of all possible avoidance and minimization measures before temporary or permanent exclusion and closure of burrows is implemented, in order to avoid take.

The results of a study by Trulio (1995) in California showed that burrowing owls passively displaced from their burrows were quickly attracted to adjacent artificial burrows at five of six passive relocation sites. The successful sites were all within 75 meters (m) of the destroyed burrow, a distance generally within a pair's territory. This researcher discouraged using passive relocation to artificial burrows as a mitigation measure for lost burrows without protection of adjacent foraging habitat. The study results indicated artificial burrows were used by evicted burrowing owls when they were approximately 50-100 m from the natural burrow (Thomsen 1971, Haug and Oliphant 1990). Locating artificial or natural burrows more than 100 m from the eviction burrow may greatly reduce the chances that new burrows will be used. Ideally, exclusion and burrow closure is employed only where there are adjacent natural burrows and non-impacted, sufficient habitat for burrowing owls to occupy with permanent protection mechanisms in place. Any new burrowing owl colonizing the project site after the CEQA document has been adopted may constitute changed circumstances that should be addressed in a re-circulated CEQA document.

The current scientific literature indicates that burrow exclusion should only be conducted by qualified biologists (meeting the Biologist's Qualifications above) during the non-breeding

season, before breeding behavior is exhibited and after the burrow is confirmed empty by site surveillance and/or scoping. The literature also indicates that when temporary or permanent burrow exclusion and/or burrow closure is implemented, burrowing owls should not be excluded from burrows unless or until:

- A Burrowing Owl Exclusion Plan (see Appendix E) is developed and approved by the applicable local DFG office;
- Permanent loss of occupied burrow(s) and habitat is mitigated in accordance with the Mitigating Impacts sections below. Temporary exclusion is mitigated in accordance with the item #1 under Mitigating Impacts below.
- Site monitoring is conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Conduct daily monitoring for one week to confirm young of the year have fledged if the exclusion will occur immediately after the end of the breeding season.
- Excluded burrowing owls are documented using artificial or natural burrows on an adjoining mitigation site (if able to confirm by band re-sight).

Translocation (Active relocation offsite >100 meters). At this time, there is little published information regarding the efficacy of translocating burrowing owls, and additional research is needed to determine subsequent survival and breeding success (Klute et al. 2003, Holroyd et al. 2001). Study results for translocation in Florida implied that hatching success may be decreased for populations of burrowing owls that undergo translocation (Nixon 2006). At this time, the Department is unable to authorize the capture and relocation of burrowing owls except within the context of scientific research (FGC §1002) or a NCCP conservation strategy.

Mitigating impacts. Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali, 2008). At a minimum, if burrowing owls have been documented to occupy burrows (see Definitions, Appendix B) at the project site in recent years, the current scientific literature supports the conclusion that the site should be considered occupied and mitigation should be required by the CEQA lead agency to address project-specific significant and cumulative impacts. Other site-specific and regionally significant and cumulative impacts may warrant mitigation. The current scientific literature indicates the following to be best practices. If these best practices cannot be implemented, the lead agency or lead investigator may consult with the Department to develop effective mitigation alternatives. The Department is also available to assist in the identification of suitable mitigation lands.

1. Where habitat will be temporarily disturbed, restore the disturbed area to pre-project condition including decompacting soil and revegetating. Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable depending on the time frame, resulting in reduced survival or abandonment. For the latter potential impact, see the permanent impact measures below.
2. Mitigate for permanent impacts to nesting, occupied and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of burrows and burrowing owls impacted are replaced based on the information provided in Appendix A. Note: A

minimum habitat replacement recommendation is not provided here as it has been shown to serve as a default, replacing any site-specific analysis and discounting the wide variation in natal area, home range, foraging area, and other factors influencing burrowing owls and burrowing owl population persistence in a particular area.

3. Mitigate for permanent impacts to nesting, occupied and satellite burrows and burrowing owl habitat with (a) permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal (i.e., during breeding and non-breeding seasons) comparable to or better than that of the impact area, and (b) sufficiently large acreage, and presence of fossorial mammals. The mitigation lands may require habitat enhancements including enhancement or expansion of burrows for breeding, shelter and dispersal opportunity, and removal or control of population stressors. If the mitigation lands are located adjacent to the impacted burrow site, ensure the nearest neighbor artificial or natural burrow clusters are at least within 210 meters (Fisher et al. 2007).
4. Permanently protect mitigation land through a conservation easement deeded to a non-profit conservation organization or public agency with a conservation mission, for the purpose of conserving burrowing owl habitat and prohibiting activities incompatible with burrowing owl use. If the project is located within the service area of a Department-approved burrowing owl conservation bank, the project proponent may purchase available burrowing owl conservation bank credits.
5. Develop and implement a mitigation land management plan to address long-term ecological sustainability and maintenance of the site for burrowing owls (see Management Plan and Artificial Burrow sections below, if applicable).
6. Fund the maintenance and management of mitigation land through the establishment of a long-term funding mechanism such as an endowment.
7. Habitat should not be altered or destroyed, and burrowing owls should not be excluded from burrows, until mitigation lands have been legally secured, are managed for the benefit of burrowing owls according to Department-approved management, monitoring and reporting plans, and the endowment or other long-term funding mechanism is in place or security is provided until these measures are completed.
8. Mitigation lands should be on, adjacent or proximate to the impact site where possible and where habitat is sufficient to support burrowing owls present.
9. Where there is insufficient habitat on, adjacent to, or near project sites where burrowing owls will be excluded, acquire mitigation lands with burrowing owl habitat away from the project site. The selection of mitigation lands should then focus on consolidating and enlarging conservation areas located outside of urban and planned growth areas, within foraging distance of other conserved lands. If mitigation lands are not available adjacent to other conserved lands, increase the mitigation land acreage requirement to ensure a selected site is of sufficient size. Offsite mitigation may not adequately offset the biological and habitat values impacted on a one to one basis. Consult with the Department when determining offsite mitigation acreages.
10. Evaluate and select suitable mitigation lands based on a comparison of the habitat attributes of the impacted and conserved lands, including but not limited to: type and structure of habitat being impacted or conserved; density of burrowing owls in impacted and conserved habitat; and significance of impacted or conserved habitat to the species range-wide. Mitigate for the highest quality burrowing owl habitat impacted first and foremost when identifying mitigation lands, even if a mitigation site is located outside of

a lead agency's jurisdictional boundary, particularly if the lead agency is a city or special district.

11. Select mitigation lands taking into account the potential human and wildlife conflicts or incompatibility, including but not limited to, human foot and vehicle traffic, and predation by cats, loose dogs and urban-adapted wildlife, and incompatible species management (i.e., snowy plover).
12. Where a burrowing owl population appears to be highly adapted to heavily altered habitats such as golf courses, airports, athletic fields, and business complexes, permanently protecting the land, augmenting the site with artificial burrows, and enhancing and maintaining those areas may enhance sustainability of the burrowing owl population onsite. Maintenance includes keeping lands grazed or mowed with weed-eaters or push mowers, free from trees and shrubs, and preventing excessive human and human-related disturbance (e.g., walking, jogging, off-road activity, dog-walking) and loose and feral pets (chasing and, presumably, preying upon owls) that make the environment uninhabitable for burrowing owls (Wesemann and Rowe 1985, Millsap and Bear 2000, Lincer and Bloom 2007). Items 4, 5 and 6 also still apply to this mitigation approach.
13. If there are no other feasible mitigation options available and a lead agency is willing to establish and oversee a Burrowing Owl Mitigation and Conservation Fund that funds on a competitive basis acquisition and permanent habitat conservation, the project proponent may participate in the lead agency's program.

Artificial burrows. Artificial burrows have been used to replace natural burrows either temporarily or long-term and their long-term success is unclear. Artificial burrows may be an effective addition to in-perpetuity habitat mitigation if they are augmenting natural burrows, the burrows are regularly maintained (i.e., no less than annual, with biennial maintenance recommended), and surrounding habitat patches are carefully maintained. There may be some circumstances, for example at airports, where squirrels will not be allowed to persist and create a dynamic burrow system, where artificial burrows may provide some support to an owl population.

Many variables may contribute to the successful use of artificial burrows by burrowing owls, including pre-existence of burrowing owls in the area, availability of food, predators, surrounding vegetation and proximity, number of natural burrows in proximity, type of materials used to build the burrow, size of the burrow and entrance, direction in which the burrow entrance is facing, slope of the entrance, number of burrow entrances per burrow, depth of the burrow, type and height of perches, and annual maintenance needs (Belthoff and King 2002, Smith et al. 2005, Barclay et al. 2011). Refer to Barclay (2008) and (2011) and to Johnson et al. 2010 (unpublished report) for guidance on installing artificial burrows including recommendations for placement, installation and maintenance.

Any long-term reliance on artificial burrows as natural burrow replacements must include semi-annual to annual cleaning and maintenance and/or replacement (Barclay et al. 2011, Smith and Conway 2005, Alexander et al. 2005) as an ongoing management practice. Alexander et al. (2005), in a study of the use of artificial burrows found that all of 20 artificial burrows needed some annual cleaning and maintenance. Burrows were either excavated by predators, blocked by soil or vegetation, or experienced substrate erosion forming a space beneath the tubing that prevented nestlings from re-entering the burrow.

Mitigation lands management plan. Develop a Mitigation Lands Management Plan for projects that require off-site or on-site mitigation habitat protection to ensure compliance with and effectiveness of identified management actions for the mitigation lands. A suggested outline and related vegetation management goals and monitoring success criteria can be found in Appendix E.

Mitigation Monitoring and Reporting

Verify the compliance with required mitigation measures, the accuracy of predictions, and ensure the effectiveness of all mitigation measures for burrowing owls by conducting follow-up monitoring, and implementing midcourse corrections, if necessary, to protect burrowing owls. Refer to CEQA Guidelines Section 15097 and the CEQA Guidelines for additional guidance on mitigation, monitoring and reporting. Monitoring is qualitatively different from site surveillance; monitoring normally has a specific purpose and its outputs and outcomes will usually allow a comparison with some baseline condition of the site before the mitigation (including avoidance and minimization) was undertaken. Ideally, monitoring should be based on the Before-After Control-Impact (BACI) principle (McDonald et al. 2000) that requires knowledge of the pre-mitigation state to provide a reference point for the state and change in state after the project and mitigation have been implemented.

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Appendix A. Burrowing Owl Natural History and Threats

Diet

Burrowing owl diet includes arthropods, small rodents, birds, amphibians, reptiles, and carrion (Haug et al. 1993).

Breeding

In California, the breeding season for the burrowing owl typically occurs between 1 February and 31 August although breeding in December has been documented (Thompson 1971, Gervais et al. 2008); breeding behavior includes nest site selection by the male, pair formation, copulation, egg laying, hatching, fledging, and post-fledging care of young by the parents. The peak of the breeding season occurs between 15 April and 15 July and is the period when most burrowing owls have active nests (eggs or young). The incubation period lasts 29 days (Coulombe 1971) and young fledge after 44 days (Haug et al. 1993). Note that the timing of nesting activities may vary with latitude and climatic conditions. Burrowing owls may change burrows several times during the breeding season, starting when nestlings are about three weeks old (Haug et al. 1993).

Dispersal

The following discussion is an excerpt from Gervais et al (2008):

> "The burrowing owl is often considered a sedentary species (e.g., Thomsen 1971). A large proportion of adults show strong fidelity to their nest site from year to year, especially where resident, as in Florida (74% for females, 83% for males; Millsap and Bear 1997). In California, nest-site fidelity rates were 32%–50% in a large grassland and 57% in an agricultural environment (Ronan 2002, Catlin 2004, Catlin et al. 2005). Differences in these rates among sites may reflect differences in nest predation rates (Catlin 2004, Catlin et al. 2005). Despite the high nest fidelity rates, dispersal distances may be considerable for both juveniles (natal dispersal) and adults (postbreeding dispersal), but this also varied with location (Catlin 2004, Rosier et al. 2006). Distances of 53 km to roughly 150 km have been observed in California for adult and natal dispersal, respectively (D. K. Rosenberg and J. A. Gervais, unpublished data), despite the difficulty in detecting movements beyond the immediate study area (Koenig et al. 1996)."

Habitat

The burrowing owl is a small, long-legged, ground-dwelling bird species, well-adapted to open, relatively flat expanses. In California, preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography and well-drained soils (Haug et al. 1993). Grassland, shrub steppe, and desert are naturally occurring habitat types used by the species. In addition, burrowing owls may occur in some agricultural areas, ruderal grassy fields, vacant lots and pastures if the vegetation structure is suitable and there are useable burrows and foraging habitat in proximity (Gervais et al 2008). Unique amongst North

American raptors, the burrowing owl requires underground burrows or other cavities for nesting during the breeding season and for roosting and cover, year round. Burrows used by the owls are usually dug by other species termed host burrowers. In California, California ground squirrel (*Spermophilus beecheyi*) and round-tailed ground squirrel (*Citellus tereticaudus*) burrows are frequently used by burrowing owls but they may use dens or holes dug by other fossorial species including badger (*Taxidea taxus*), coyote (*Canis latrans*), and fox (e.g., San Joaquin kit fox, *Vulpes macrotis mutica*; Ronan 2002). In some instances, owls have been known to excavate their own burrows (Thompson 1971, Barclay 2007). Natural rock cavities, debris piles, culverts, and pipes also are used for nesting and roosting (Rosenberg et al. 1998). Burrowing owls have been documented using artificial burrows for nesting and cover (Smith and Belthoff, 2003).

Foraging habitat. Foraging habitat is essential to burrowing owls. The following discussion is an excerpt from Gervais et al. (2008):

> "Useful as a rough guide to evaluating project impacts and appropriate mitigation for burrowing owls, adult male burrowing owls home ranges have been documented (calculated by minimum convex polygon) to comprise anywhere from 280 acres in intensively irrigated agroecosystems in Imperial Valley (Rosenberg and Haley 2004) to 450 acres in mixed agricultural lands at Lemoore Naval Air Station, CA (Gervais et al. 2003), to 600 acres in pasture in Saskatchewan, Canada (Haug and Oliphant 1990). But owl home ranges may be much larger, perhaps by an order of magnitude, in non-irrigated grasslands such as at Carrizo Plain, California (Gervais et al. 2008), based on telemetry studies and distribution of nests. Foraging occurs primarily within 600 m of their nests (within approximately 300 acres, based on a circle with a 600 m radius) during the breeding season."

Importance of burrows and adjacent habitat. Burrows and the associated surrounding habitat are essential ecological requisites for burrowing owls throughout the year and especially during the breeding season. During the non-breeding season, burrowing owls remain closely associated with burrows, as they continue to use them as refuge from predators, shelter from weather and roost sites. Resident populations will remain near the previous season's nest burrow at least some of the time (Coulombe 1971, Thomsen 1971, Botelho 1996, LaFever et al. 2008).

In a study by Lutz and Plumpton (1999) adult males and females nested in formerly used sites at similar rates (75% and 63%, respectively) (Lutz and Plumpton 1999). Burrow fidelity has been reported in some areas; however, more frequently, burrowing owls reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Burrow and nest sites are re-used at a higher rate if the burrowing owl has reproduced successfully during the previous year (Haug et al. 1993) and if the number of burrows isn't limiting nesting opportunity.

Burrowing owls may use "satellite" or non-nesting burrows, moving young at 10-14 days, presumably to reduce risk of predation (Desmond and Savidge 1998) and possibly to avoid nest parasites (Dechant et al. 1999). Successful nests in Nebraska had more active satellite burrows within 75 m of the nest burrow than unsuccessful nests (Desmond and Savidge

1999). Several studies have documented the number of satellite burrows used by young and adult burrowing owls during the breeding season as between one and 11 burrows with an average use of approximately five burrows (Thompsen 1984, Haug 1985, Haug and Oliphant 1990). Supporting the notion of selecting for nest sites near potential satellite burrows, Ronan (2002) found burrowing owl families would move away from a nest site if their satellite burrows were experimentally removed through blocking their entrance.

Habitat adjacent to burrows has been documented to be important to burrowing owls. Gervais et al. (2003) found that home range sizes of male burrowing owls during the nesting season were highly variable within but not between years. Their results also suggested that owls concentrate foraging efforts within 600 meters of the nest burrow, as was observed in Canada (Haug and Oliphant 1990) and southern California (Rosenberg and Haley 2004). James et al. (1997), reported habitat modification factors causing local burrowing owl declines included habitat fragmentation and loss of connectivity.

In conclusion, the best available science indicates that essential habitat for the burrowing owl in California must include suitable year-round habitat, primarily for breeding, foraging, wintering and dispersal habitat consisting of short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey within close proximity to the burrow.

Threats to Burrowing Owls in California

Habitat loss. Habitat loss, degradation, and fragmentation are the greatest threats to burrowing owls in California. According to DeSante et al. (2007), “the vast majority of burrowing owls [now] occur in the wide, flat lowland valleys and basins of the Imperial Valley and Great Central Valley [where] for the most part,...the highest rates of residential and commercial development in California are occurring.” Habitat loss from the State’s long history of urbanization in coastal counties has already resulted in either extirpation or drastic reduction of burrowing owl populations there (Gervais et al. 2008). Further, loss of agricultural and other open lands (such as grazed landscapes) also negatively affect owl populations. Because of their need for open habitat with low vegetation, burrowing owls are unlikely to persist in agricultural lands dominated by vineyards and orchards (Gervais et al. 2008).

Control of burrowing rodents. According to Klute et al. (2003), the elimination of burrowing rodents through control programs is a primary factor in the recent and historical decline of burrowing owl populations nationwide. In California, ground squirrel burrows are most often used by burrowing owls for nesting and cover; thus, ground squirrel control programs may affect owl numbers in local areas by eliminating a necessary resource.

Direct mortality. Burrowing owls suffer direct losses from a number of sources. Vehicle collisions are a significant source of mortality especially in the urban interface and where owls nest alongside roads (Haug et al. 1993, Gervais et al. 2008). Road and ditch maintenance, modification of water conveyance structures (Imperial Valley) and discing to control weeds in fallow fields may destroy burrows (Rosenberg and Haley 2004, Catlin and Rosenberg 2006) which may trap or crush owls. Wind turbines at Altamont Pass Wind Resource Area are known to cause direct burrowing owl mortality (Thelander et al. 2003). Exposure to

pesticides may pose a threat to the species but is poorly understood (Klute et al. 2003, Gervais et al. 2008).

Appendix B. Definitions

Some key terms that appear in this document are defined below.

Adjacent habitat means burrowing owl habitat that abuts the area where habitat and burrows will be impacted and rendered non-suitable for occupancy.

Breeding (nesting) season begins as early as 1 February and continues through 31 August (Thomsen 1971, Zarn 1974). The timing of breeding activities may vary with latitude and climatic conditions. The breeding season includes pairing, egg-laying and incubation, and nestling and fledging stages.

Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls or permanently exclude burrowing owls and excavate and close burrows after confirming burrows are empty.

Burrowing owl habitat generally includes, but is not limited to, short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey.

Burrow surrogates include culverts, piles of concrete rubble, piles of soil, burrows created along soft banks of ditches and canals, pipes, and similar structures.

Civil twilight - Morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon (civil dawn) and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun reaches 6 degrees below the horizon (civil dusk). During this period there is enough light from the sun that artificial sources of light may not be needed to carry on outdoor activities. This concept is sometimes enshrined in laws, for example, when drivers of automobiles must turn on their headlights (called lighting-up time in the UK); when pilots may exercise the rights to fly aircraft. Civil twilight can also be described as the limit at which twilight illumination is sufficient, under clear weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under clear atmospheric conditions.

Conservation for burrowing owls may include but may not be limited to protecting remaining breeding pairs or providing for population expansion, protecting and enhancing breeding and essential habitat, and amending or augmenting land use plans to stabilize populations and other specific actions to avoid the need to list the species pursuant to California or federal Endangered Species Acts.

Contiguous means connected together so as to form an uninterrupted expanse in space.

Essential habitat includes nesting, foraging, wintering, and dispersal habitat.

Foraging habitat is habitat within the estimated home range of an occupied burrow, supports suitable prey base, and allows for effective hunting.

Host burrowers include ground squirrels, badgers, foxes, coyotes, gophers etc.

Locally significant species is a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or occurring in a unique habitat type.

Non-breeding season is the period of time when nesting activity is not occurring, generally September 1 through January 31, but may vary with latitude and climatic conditions.

Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years (Rich 1984). Occupancy of suitable burrowing owl habitat may also be indicated by owl sign including its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance or perch site.

Other impacting activities may include but may not be limited to agricultural practices, vegetation management and fire control, pest management, conversion of habitat from rangeland or natural lands to more intensive agricultural uses that could result in “take”. These impacting activities may not meet the definition of a project under CEQA.

Passive relocation is a technique of installing one-way doors in burrow openings to temporarily or permanently evict burrowing owls and prevent burrow re-occupation.

Peak of the breeding season is between 15 April and 15 July.

Sign includes its tracks, molted feathers, cast pellets (defined as 1-2” long brown to black regurgitated pellets consisting of non-digestible portions of the owls’ diet, such as fur, bones, claws, beetle elytra, or feathers), prey remains, egg shell fragments, owl white wash, nest burrow decoration materials (e.g., paper, foil, plastic items, livestock or other animal manure, etc.), possible owl perches, or other items.

Appendix C. Habitat Assessment and Reporting Details

Habitat Assessment Data Collection and Reporting

Current scientific literature indicates that it would be most effective to gather the data in the manner described below when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report:

1. Conduct at least one visit covering the entire potential project/activity area including areas that will be directly or indirectly impacted by the project. Survey adjoining areas within 150 m (Thomsen 1971, Martin 1973), or more where direct or indirect effects could potentially extend offsite. If lawful access cannot be achieved to adjacent areas, surveys can be performed with a spotting scope or other methods.
2. Prior to the site visit, compile relevant biological information for the site and surrounding area to provide a local and regional context.
3. Check all available sources for burrowing owl occurrence information regionally prior to a field inspection. The CNDDB and BIOS (see References cited) may be consulted for known occurrences of burrowing owls. Other sources of information include, but are not limited to, the Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007), county bird atlas projects, Breeding Bird Survey records, eBIRD (http://ebird.org), Gervais et al. (2008), local reports or experts, museum records, and other site-specific relevant information.
4. Identify vegetation and habitat types potentially supporting burrowing owls in the project area and vicinity.
5. Record and report on the following information:
    a. A full description of the proposed project, including but not limited to, expected work periods, daily work schedules, equipment used, activities performed (such as drilling, construction, excavation, etc.) and whether the expected activities will vary in location or intensity over the project's timeline;
    b. A regional setting map, showing the general project location relative to major roads and other recognizable features;
    c. A detailed map (preferably a USGS topo 7.5' quad base map) of the site and proposed project, including the footprint of proposed land and/or vegetation-altering activities, base map source, identifying topography, landscape features, a north arrow, bar scale, and legend;
    d. A written description of the biological setting, including location (Section, Township, Range, baseline and meridian), acreage, topography, soils, geographic and hydrologic characteristics, land use and management history on and adjoining the site (i.e., whether it is urban, semi-urban or rural; whether there is any evidence of past or current livestock grazing, mowing, disking, or other vegetation management activities);
    e. An analysis of any relevant, historical information concerning burrowing owl use or occupancy (breeding, foraging, over-wintering) on site or in the assessment area;
    f. Vegetation type and structure (using Sawyer et al. 2009), vegetation height, habitat types and features in the surrounding area plus a reasonably sized (as supported with logical justification) assessment area; (Note: use caution in discounting habitat based on grass height as it can be a temporary condition variable by season and conditions (such as current grazing regime) or may be distributed as a mosaic).

g. The presence of burrowing owl individuals or pairs or sign (see Appendix B);
h. The presence of suitable burrows and/or burrow surrogates (>11 cm in diameter (height and width) and >150 cm in depth) (Johnson et al. 2010), regardless of a lack of any burrowing owl sign and/or burrow surrogates; and burrowing owls and/or their sign that have recently or historically (within the last 3 years) been identified on or adjacent to the site.

Appendix D. Breeding and Non-breeding Season Surveys and Reports

Current scientific literature indicates that it is most effective to conduct breeding and non-breeding season surveys and report in the manner that follows:

Breeding Season Surveys

Number of visits and timing. Conduct 4 survey visits: 1) at least one site visit between 15 February and 15 April, and 2) a minimum of three survey visits, at least three weeks apart, between 15 April and 15 July, with at least one visit after 15 June. Note: many burrowing owl migrants are still present in southwestern California during mid-March, therefore, exercise caution in assuming breeding occupancy early in the breeding season.

Survey method. Rosenberg et al. (2007) confirmed walking line transects were most effective in smaller habitat patches. Conduct surveys in all portions of the project site that were identified in the Habitat Assessment and fit the description of habitat in Appendix A. Conduct surveys by walking straight-line transects spaced 7 m to 20 m apart, adjusting for vegetation height and density (Rosenberg et al. 2007). At the start of each transect and, at least, every 100 m, scan the entire visible project area for burrowing owls using binoculars. During walking surveys, record all potential burrows used by burrowing owls as determined by the presence of one or more burrowing owls, pellets, prey remains, whitewash, or decoration. Some burrowing owls may be detected by their calls, so observers should also listen for burrowing owls while conducting the survey.

Care should be taken to minimize disturbance near occupied burrows during all seasons and not to "flush" burrowing owls especially if predators are present to reduce any potential for needless energy expenditure or burrowing owl mortality. Burrowing owls may flush if approached by pedestrians within 50 m (Conway et al. 2003). If raptors or other predators are present that may suppress burrowing owl activity, return at another time or later date for a follow-up survey.

Check all burrowing owls detected for bands and/or color bands and report band combinations to the Bird Banding Laboratory (BBL). Some site-specific variations to survey methods discussed below may be developed in coordination with species experts and Department staff.

Weather conditions. Poor weather may affect the surveyor's ability to detect burrowing owls, therefore, avoid conducting surveys when wind speed is >20 km/hr, and there is precipitation or dense fog. Surveys have greater detection probability if conducted when ambient temperatures are >20º C, <12 km/hr winds, and cloud cover is <75% (Conway et al. 2008).

Time of day. Daily timing of surveys varies according to the literature, latitude, and survey method. However, surveys between morning civil twilight and 10:00 AM and two hours before sunset until evening civil twilight provide the highest detection probabilities (Barclay pers. comm. 2012, Conway et al. 2008).

Alternate methods. If the project site is large enough to warrant an alternate method, consult current literature for generally accepted survey methods and consult with the Department on the proposed survey approach.

Additional breeding season site visits. Additional breeding season site visits may be necessary, especially if non-breeding season exclusion methods are contemplated. Detailed information, such as approximate home ranges of each individual or of family units, as well as foraging areas as related to the proposed project, will be important to document for evaluating impacts, planning avoidance measure implementation and for mitigation measure performance monitoring.

Adverse conditions may prevent investigators from determining presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owls in any given year. Any such conditions should be identified and discussed in the survey report. Visits to the site in more than one year may increase the likelihood of detection. Also, visits to adjacent known occupied habitat may help determine appropriate survey timing.

Given the high site fidelity shown by burrowing owls (see Appendix A, Importance of burrows), conducting surveys over several years may be necessary when project activities are ongoing, occur annually, or start and stop seasonally. (See Negative surveys).

Non-breeding Season Surveys

If conducting non-breeding season surveys, follow the methods described above for breeding season surveys, but conduct at least four (4) visits, spread evenly, throughout the non-breeding season. Burrowing owl experts and local Department staff are available to assist with interpreting results.

Negative Surveys

Adverse conditions may prevent investigators from documenting presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owl in any given year. Discuss such conditions in the Survey Report. Visits to the site in more than one year increase the likelihood of detection and failure to locate burrowing owls during one field season does not constitute evidence that the site is no longer occupied, particularly if adverse conditions influenced the survey results. Visits to other nearby known occupied sites can affirm whether the survey timing is appropriate.

Take Avoidance Surveys

Field experience from 1995 to present supports the conclusion that it would be effective to complete an initial take avoidance survey no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Detection Surveys section above. Implementation of avoidance and minimization measures would be triggered by positive owl presence on the site where project activities will occur. The development of avoidance and minimization approaches would be informed by monitoring the burrowing owls.

Burrowing owls may re-colonize a site after only a few days. Time lapses between project activities trigger subsequent take avoidance surveys including but not limited to a final survey conducted within 24 hours prior to ground disturbance.

Survey Reports

Report on the survey methods used and results including the information described in the Summary Report and include the reports within the CEQA documentation:

1. Date, start and end time of surveys including weather conditions (ambient temperature, wind speed, percent cloud cover, precipitation and visibility);
2. Name(s) of surveyor(s) and qualifications;
3. A discussion of how the timing of the survey affected the comprehensiveness and detection probability;
4. A description of survey methods used including transect spacing, point count dispersal and duration, and any calls used;
5. A description and justification of the area surveyed relative to the project area;
6. A description that includes: number of owls or nesting pairs at each location (by nestlings, juveniles, adults, and those of an unknown age), number of burrows being used by owls, and burrowing owl sign at burrows. Include a description of individual markers, such as bands (numbers and colors), transmitters, or unique natural identifying features. If any owls are banded, request documentation from the BBL and bander to report on the details regarding the known history of the banded burrowing owl(s) (age, sex, origins, whether it was previously relocated) and provide with the report if available;
7. A description of the behavior of burrowing owls during the surveys, including feeding, resting, courtship, alarm, territorial defense, and those indicative of parents or juveniles;
8. A list of possible burrowing owl predators present and documentation of any evidence of predation of owls;
9. A detailed map (1:24,000 or closer to show details) showing locations of all burrowing owls, potential burrows, occupied burrows, areas of concentrated burrows, and burrowing owl sign. Locations documented by use of global positioning system (GPS) coordinates must include the datum in which they were collected. The map should include a title, north arrow, bar scale and legend;
10. Signed field forms, photos, etc., as appendices to the field survey report;
11. Recent color photographs of the proposed project or activity site; and
12. Original CNDDB Field Survey Forms should be sent directly to the Department's CNDDB office, and copies should be included in the environmental document as an appendix. (http://www.dfg.ca.gov/bdb/html/cnddb.html).

Appendix E. Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans

Whereas the Department does not recommend exclusion and burrow closure, current scientific literature and experience from 1995 to present, indicate that the following example components for burrowing owl artificial burrow and exclusion plans, combined with consultation with the Department to further develop these plans, would be effective.

Artificial Burrow Location

If a burrow is confirmed occupied on-site, artificial burrow locations should be appropriately located and their use should be documented taking into consideration:

1. A brief description of the project and project site pre-construction;
2. The mitigation measures that will be implemented;
3. Potential conflicting site uses or encumbrances;
4. A comparison of the occupied burrow site(s) and the artificial burrow site(s) (e.g., vegetation, habitat types, fossorial species use in the area, and other features);
5. Artificial burrow(s) proximity to the project activities, roads and drainages;
6. Artificial burrow(s) proximity to other burrows and entrance exposure;
7. Photographs of the site of the occupied burrow(s) and the artificial burrows;
8. Map of the project area that identifies the burrow(s) to be excluded as well as the proposed sites for the artificial burrows;
9. A brief description of the artificial burrow design;
10. Description of the monitoring that will take place during and after project implementation including information that will be provided in a monitoring report.
11. A description of the frequency and type of burrow maintenance.

Exclusion Plan

An Exclusion Plan addresses the following including but not limited to:

1. Confirm by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding burrow scoping;
2. Type of scope and appropriate timing of scoping to avoid impacts;
3. Occupancy factors to look for and what will guide determination of vacancy and excavation timing (one-way doors should be left in place 48 hours to ensure burrowing owls have left the burrow before excavation, visited twice daily and monitored for evidence that owls are inside and can't escape i.e., look for sign immediately inside the door).
4. How the burrow(s) will be excavated. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow);
5. Removal of other potential owl burrow surrogates or refugia on site;
6. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

7. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take;
8. How the impacted site will continually be made inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

Appendix F. Mitigation Management Plan and Vegetation Management Goals

Mitigation Management Plan

A mitigation site management plan will help ensure the appropriate implementation and maintenance for the mitigation site and persistence of the burrowing owls on the site. For an example to review, refer to Rosenberg et al. (2009). The current scientific literature and field experience from 1995 to present indicate that an effective management plan includes the following:

1. Mitigation objectives;
2. Site selection factors (including a comparison of the attributes of the impacted and conserved lands) and baseline assessment;
3. Enhancement of the conserved lands (enhancement of reproductive capacity, enhancement of breeding areas and dispersal opportunities, and removal or control of population stressors);
4. Site protection method and prohibited uses;
5. Site manager roles and responsibilities;
6. Habitat management goals and objectives:
    a. Vegetation management goals,
        i. Vegetation management tools:
            1. Grazing
            2. Mowing
            3. Burning
            4. Other
    b. Management of ground squirrels and other fossorial mammals,
    c. Semi-annual and annual artificial burrow cleaning and maintenance,
    d. Non-natives control – weeds and wildlife,
    e. Trash removal;
7. Financial assurances:
    a. Property analysis record or other financial analysis to determine long-term management funding,
    b. Funding schedule;
8. Performance standards and success criteria;
9. Monitoring, surveys and adaptive management;
10. Maps;
11. Annual reports.

Vegetation Management Goals

- Manage vegetation height and density (especially in immediate proximity to burrows). Suitable vegetation structure varies across sites and vegetation types, but should generally be at the average effective vegetation height of 4.7 cm (Green and Anthony 1989) and <13 cm average effective vegetation height (MacCracken et al. 1985*a)*.
- Employ experimental prescribed fires (controlled, at a small scale) to manage vegetation structure;

- Vegetation reduction or ground disturbance timing, extent, and configuration should avoid take. While local ordinances may require fire prevention through vegetation management, activities like disking, mowing, and grading during the breeding season can result in take of burrowing owls and collapse of burrows, causing nest destruction. Consult the take avoidance surveys section above for pre-management avoidance survey recommendations;
- Promote natural prey distribution and abundance, especially in proximity to occupied burrows; and
- Promote self-sustaining populations of host burrowers by limiting or prohibiting lethal rodent control measures and by ensuring food availability for host burrowers through vegetation management.

Refer to Rosenberg et al. (2009) for a good discussion of managing grasslands for burrowing owls.

Mitigation Site Success Criteria

In order to evaluate the success of mitigation and management strategies for burrowing owls, monitoring is required that is specific to the burrowing owl management plan. Given limited resources, Barclay et al. (2011) suggests managers focus on accurately estimating annual adult owl populations rather than devoting time to estimating reproduction, which shows high annual variation and is difficult to accurately estimate. Therefore, the key objective will be to determine accurately the number of adult burrowing owls and pairs, and if the numbers are maintained. A frequency of 5-10 years for surveys to estimate population size may suffice if there are no changes in the management of the nesting and foraging habitat of the owls.

Effective monitoring and evaluation of off-site and on-site mitigation management success for burrowing owls includes (Barclay, pers. comm.):

- Site tenacity;
- Number of adult owls present and reproducing;
- Colonization by burrowing owls from elsewhere (by band re-sight);
- Evidence and causes of mortality;
- Changes in distribution; and
- Trends in stressors.

A-3 Rare Plant Survey

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July 19, 2019

Gina Radieve
California Department of Water Resources
Division of Engineering
1416 9th Street, Room 426
Sacramento, CA 95814

Subject: Focused Rare Plant Survey Results for the Perris Dam Emergency Release Facility Project

Dear Ms. Radieve:

The purpose of this letter report is to document the results of focused rare plant surveys conducted at the Perris Dam Emergency Release Facility Project site. This letter report was prepared in accordance with the Mitigation Monitoring and Reporting Program (MMRP) developed in support of the DWR Perris Dam Emergency Release Facility, Final Environmental Impact Report (EIR) (SCH #201391027). Included in this document is a brief description of the project and its location, survey methodology, survey results, and conclusions.

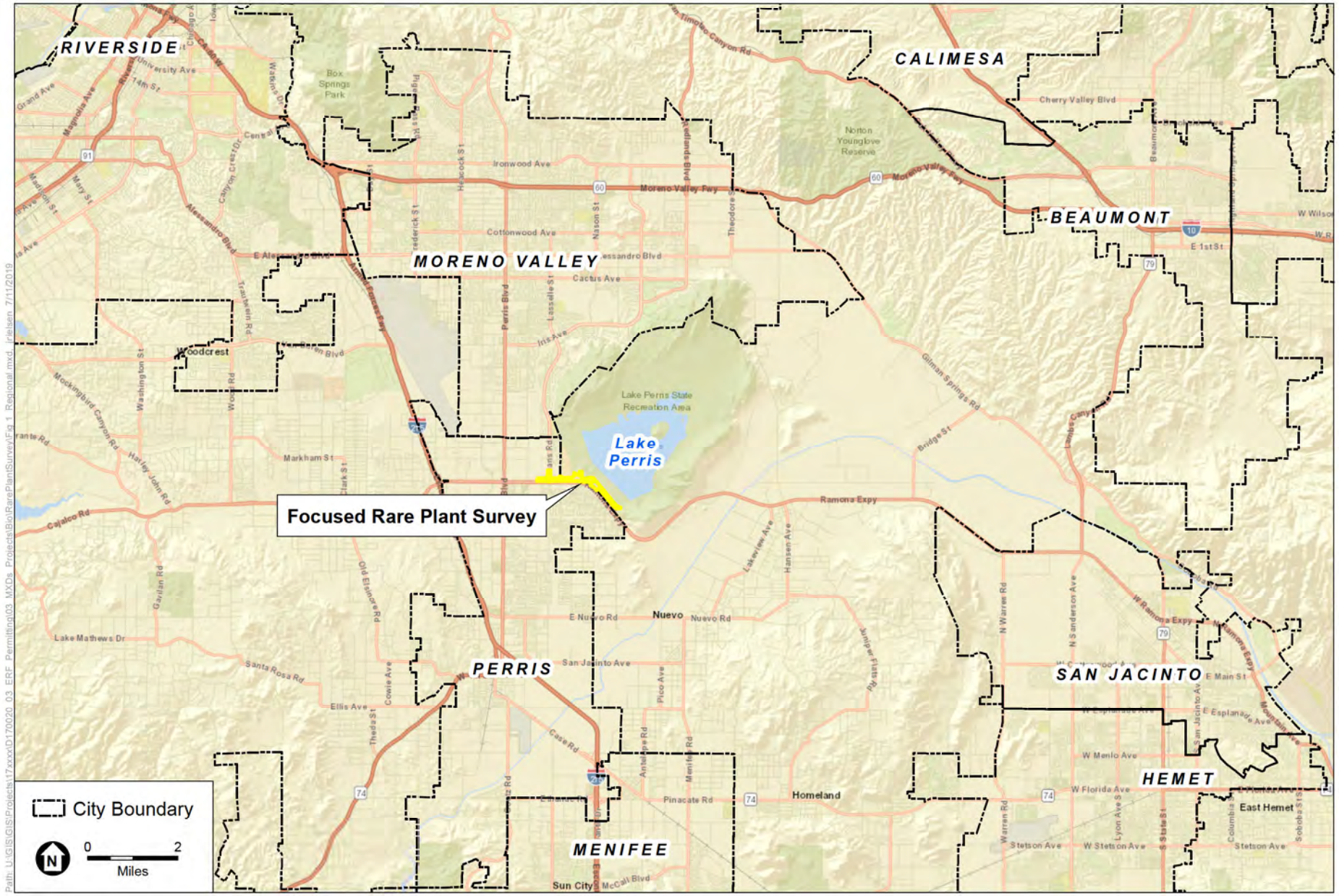
Project Location

The proposed project is located in an unincorporated portion of western Riverside County approximately 15 miles south of the city of Riverside and partially within the city of Perris (**Figure 1, Regional Location**). The proposed project would be constructed partially within the Lake Perris State Recreation Area (SRA), Lake Perris Fairgrounds, and the California Department of Water Resources (DWR) property north of Ramona Expressway (**Figure 2, Project Location**). The project is located within the U.S. Geological Survey (USGS) Perris 7.5-minute quadrangle. The project footprint, including permanent impacts and staging areas are collectively referred to as the survey area; the entire survey area was included during the focused surveys.

Project Description

DWR is proposing to modify the existing Lake Perris release structure and construct a water conveyance facility that would reliably control a reservoir release and convey emergency flows from Lake Perris in the event of an emergency drawdown.

The proposed project encompasses three segments, the State Recreation Area (SRA), Fairgrounds, and Wester Segments. Along the SRA Segment, DWR would modify the existing emergency release structure and construct a conveyance structure connecting the emergency release structure to the Perris Valley Channel. If an emergency release would be required, flows from the emergency release structure would be guided by two levees within the SRA Segment, followed by an open channel along the Fairgrounds and Western Segments terminating at the Perris Valley Channel.



SOURCE: ESRI

Perris Dam Emergency Release Facility Project

Figure 1
Regional Location

ESA

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 2
Project Location

ESA

Methods

Literature Review

Prior to conducting an initial focused rare plant survey, a query of the following inventory databases and existing reports prepared for the project was conducted to analyze the potential for sensitive resources to occur within the survey area:

- Environmental Science Associates (ESA). 2018. DWR Perris Dam Emergency Release Facility, Final Environmental Impact Report. SCH #201391027. February 2019.
- Environmental Science Associates (ESA). 2019. RE: Perris Dam Emergency Release Facility Project – Biological Assessment Update. March 28, 2019.
- Natural Resource Conservation Service (NRCS). 2018. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm: Accessed September 14, 2018.

Focused Rare Plant Surveys

The focused rare plant surveys for the project were completed by ESA biologists Travis Marella and Robert Sweet within the survey area (Figure 2). The surveys were completed during four separate field efforts, the first of which taking place on March 4, 5, 6 and 7; the second on April 16; the third on May 15; and the fourth on June 19 and 20 of 2019. The surveys were conducted pursuant to the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). An initial survey was completed in March that consisted of walking transects throughout the entire survey area to assess the quality of the habitat and to determine the potential for special-status plants to occur within the survey area. Plants that were not identifiable during the initial survey due to a lack of inflorescence or fruit were mapped for later verification. The initial survey also noted areas within the project site that were suitable for supporting special-status plants that have been documented in the region. During the focused surveys conducted in April, May and June, the survey area was reduced to concentrate in areas that were determined to be suitable for supporting special-status plants during the initial survey in March. The dates, survey times and personnel involved in each survey effort are provided in **Table 1 - Focused Rare Plant Surveys**, below. A complete list of plant species observed during the surveys was generated and is provided in **Attachment A, Floral Compendium**.

TABLE 1
FOCUSED RARE PLANT SURVEYS

Survey	Date	Time	Personnel
Survey 1	3/04/2019	0619-1102	Travis Marella and Robert Sweet
		1535-1755	
	3/05/2019	0606-1035	Travis Marella and Robert Sweet
		1523-1729	
	3/06/2019	0715-0932	Travis Marella and Robert Sweet
		1530-1752	
	3/07/2019	0603-1121	Travis Marella and Robert Sweet
Survey 2	4/16/2019	0618-1030	Travis Marella and Robert Sweet
Survey 3	5/15/2019	1603-1941	Travis Marella and Robert Sweet
Survey 4	6/19/2019	1600-1715	Travis Marella and Robert Sweet
	6/20/2019	0904-1011	Travis Marella and Robert Sweet

Existing Conditions

Special-Status Plants

As indicated in **Table 2 - Potentially Occurring Special-Status Plant Species**, a total of 7 special-status plant species that have been recorded in the region have the potential to occur on the project site due to the presence of suitable habitat (e.g., vegetation richness and composition, soils, hydrology, topography and aspect), which include: chaparral sand-verbena (*Abronia villosa* var. *aurita*), thread-leaved brodiaea (*Brodiaea* filifolia), Plummer's mariposa lily (*Calochortus plummerae*), smooth tarplant (*Centromadia pungens* ssp. *laevis*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), chaparral ragwort (*Senecio aphanactis*), and San Bernardino aster (*Symphyotrichum defoliatum*).

TABLE 2
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Common Name	Scientific Name	Status[1] (Federal/State/Other)	Habitat	Blooming Period	Potential to Occur within the Survey Area
Chaparral sand-verbena	*Abronia villosa* var. *aurita*	None/None/1B.1	Found in sandy soils of chaparral, coastal scrub, and desert dunes.	January-September	**Moderate potential to occur.** The survey area contains suitable coastal sage scrub habitat.
Thread-leaved brodiaea	*Brodiaea filifolia*	FT/SE/1B.1	Occurs on gentle slopes in semi-alkaline mudflats, vernal pools, mesic southern needlegrass grassland, mixed native-nonnative grassland and alkali grassland plant communities in association with clay, loamy sand, or alkaline silty-clay soils.	March-June	**Moderate potential to occur.** The survey area contains suitable grassland and coastal sage scrub habitats with suitable soils and substrates to support this plant.

Common Name	Scientific Name	Status[1] (Federal/State/Other)	Habitat	Blooming Period	Potential to Occur within the Survey Area
Plummer's mariposa-lily	*Calochortus plummerae*	None/None/4.2	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grasslands.	May-July	**Moderate potential to occur.** Marginal habitat is present throughout the chaparral communities onsite; however, openings within the dense vegetation are sparse, which marginalizes the habitat suitability for this species.
Smooth tarplant	*Centromadia pungens* ssp. *laevis*	None/None/1B.1	Smooth tarplant occurs in a variety of habitats including alkali scrub, alkali playas, riparian woodland, watercourses, and grasslands with alkaline affinities. Also found on disturbed places.	April-September	**Moderate potential to occur.** The survey area supports marginal habitat for this species throughout the riparian and disturbed scrub habitats.
Long-spined spineflower	*Chorizanthe polygonoides* var. *longispina*	None/None/1B.1	Long-spined spineflower is associated primarily with heavy, often rocky, clay soils in valley and foothill grasslands, and openings in coastal sage scrub, and chaparral.	April-July	**Moderate potential to occur.** The survey area contains suitable soils, valley and foothill grasslands, and coastal sage scrub habitats to support this species.
San Bernardino aster	*Symphyotrichum defoliatum*	None/None/1B.2	Found in cismontane woodlands, coastal scrub, lower montane coniferous forests, meadows and seeps, marshes and swamps, and vernally mesic valley and foothill grasslands. Can be found near ditches, streams, springs or disturbed areas. Grows in seasonally moist fine alluvial soils.	July-November	**Moderate potential to occur.** The survey area contains suitable coastal sage scrub habitat to support this species.
Chaparral ragwort	*Senecio aphanactis*	None/None/2.2	Chaparral, cismontane woodland, coastal scrub (sometimes alkaline) and drying alkaline flats.	January-April	**Moderate potential to occur.** The survey area contains suitable coastal sage scrub habitat to support this species.

[1] Federal/State/Other Status: FT – federally threatened, SE – State endangered; California Native Plant Society (CNPS) Rare Plant Ranks 1B – Plants rare, threatened or endangered in California and elsewhere, 2 – Plants rare, threatened or endangered in California, but more common elsewhere, and 4 – Plants of limited distribution; CNPS Threat Ranks 0.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat and 0.2 – Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat).

Soils

Based on review of the Natural Resources Conservation Services (NRCS) web soil survey, the survey area contains eight soil series, including Domino, Exeter, Greenfield, Hanford, Monserate, Ramona, Rockland, and Water (**Figure 3, Soils**) (NRCS 2018). A brief description of the soils mapped within the survey area are described below.

Domino fine sandy loam, eroded; Domino silt loam, saline-alkali. These soil classes are moderately deep, moderately well-drained soils, which typically lie over lime-cemented hardpans. Domino soils have slow runoff and slow permeability. Domino fine sandy loam, eroded is not listed as a hydric soil, while Domino silt loam, saline-alkali is listed as a potentially hydric soil.

The Domino fine sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species, in particular, the smooth tarplant and thread-leaved brodiaea.

Exeter sandy loam, 0 to 2 percent slopes, eroded; 2 to 8 percent slopes, eroded; and deep, 0 to 2 percent slopes. Exeter soils are moderately deep to a duripan and moderately well drained, formed from granitic alluvium parent material. Exeter sandy loam, 0 to 2 percent slopes, is listed as a potentially hydric soils; however, others within this class are not considered potentially hydric.

The Exeter sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species.

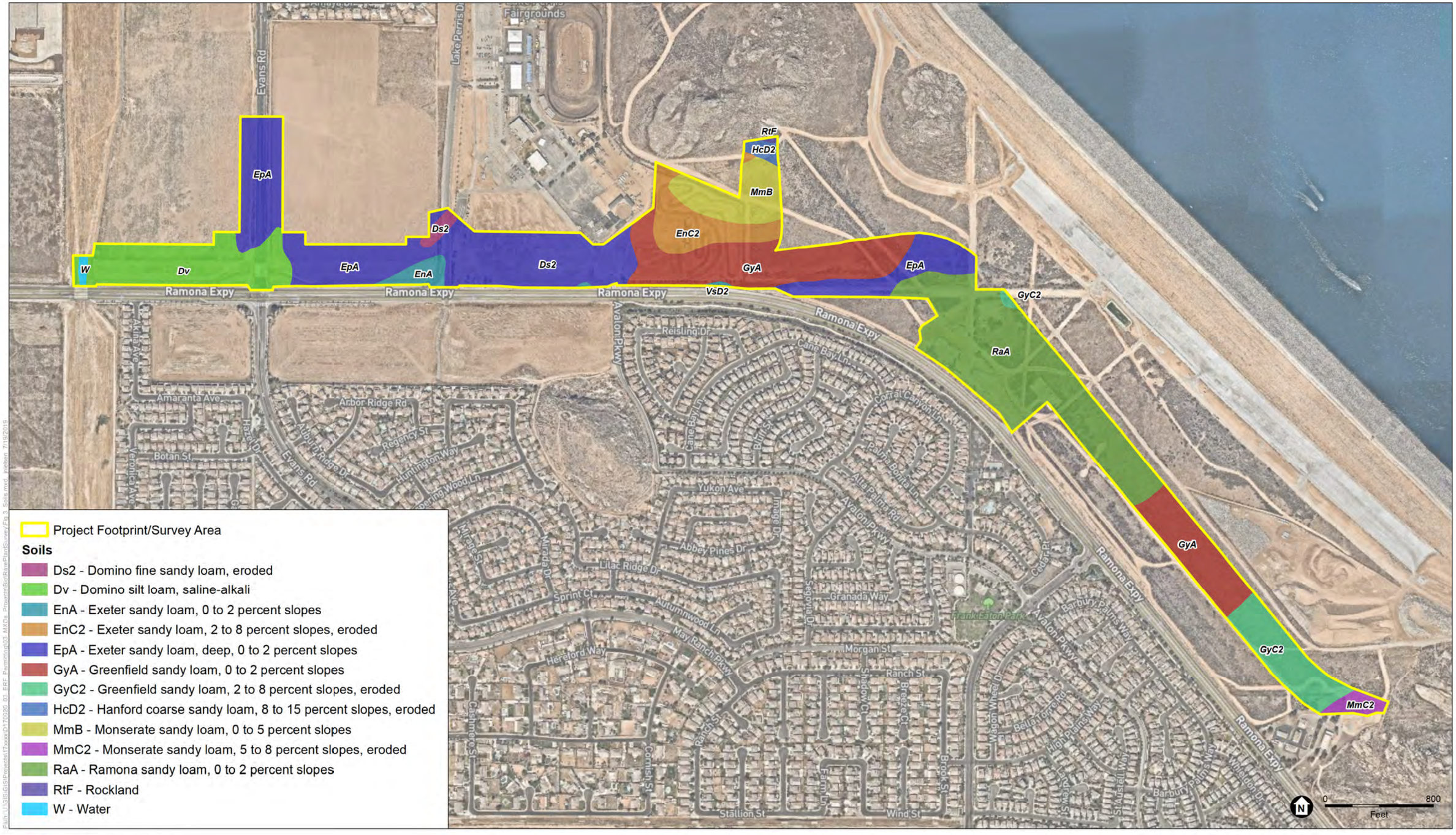
Greenfield sandy loam, 0 to 2 percent slopes; and 2 to 8 percent slopes, eroded. Greenfield soils are deep, well drained, and typically formed from coarse-textured granitic and mixed-rock alluvium parent material. They tend to support slow to medium runoff and moderately rapid permeability and are considered potentially hydric soils.

The Greenfield sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species.

Hanford coarse sandy loam, 8 to 15 percent slopes, eroded. Hanford soils tend to be very deep and well drained, typically forming from coarse-textured granitic alluvium parent material. They tend to support negligible to low runoff and moderately rapid permeability and are not listed as hydric soils.

The Hanford coarse sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species.

Monserate sandy loam, 0 to 5 percent slopes; and 5 to 8 percent slopes, eroded. Monserate soils are moderately well- to well-drained soils typically underlain by a silica-cemented duripan. These soils have slow to rapid runoff and moderately slow permeability above the duripan and very slow permeability within the duripan, and are not listed as a hydric soil.



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 3
Soils

ESA

The Monserate sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species; however, due to the somewhat diminished capacity for drainage, in particular, the smooth tarplant and thread-leaved brodiaea.

Ramona sandy loam, 0 to 2 percent slopes. Ramona soils are well drained and typically derived from granitic alluvium. They tend to have slow to rapid runoff and moderately slow permeability. Ramona sandy loam, 0 to 2 percent slopes, is listed as a potentially hydric soil.

The Ramona sandy loam soil class is considered potentially suitable to support all seven of the special-status plant species.

Rockland. Rockland consists of well-drained soils formed in loamy colluvium from rotational landslides on slopes of stream valleys and dissections of ground moraines. Saturated hydraulic conductivity is moderate in the upper part of the profile and moderately slow in the lower part. Slopes tend to range from 18 to 70 percent.

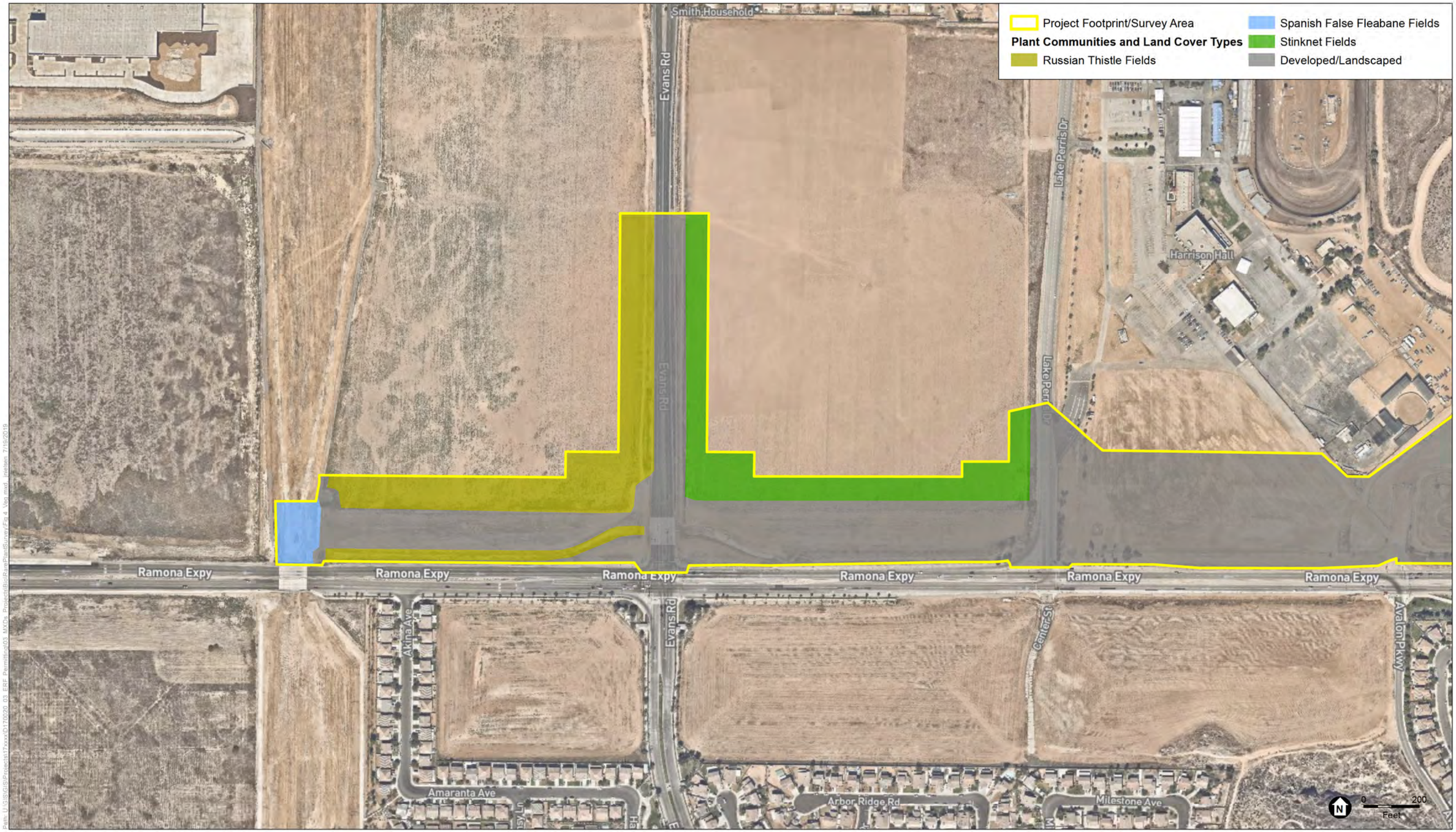
Due to the high boulder content and well-drained soils, rockland is considered potentially suitable to support the long-spined spineflower, less so for the chaparral ragwort and Plummer's mariposa lily and considered unsuitable for the chaparral sand verbena, San Bernardino aster, smooth tarplant and thread-leaved brodiaea.

Water. Water is defined as those areas that are at least periodically inundated with open water within systems defined by the Cowardin Classification System as either Riverine, Lacustrine, Palustrine, Marine, or Estuarine.

The Perris Valley Channel is periodically inundated with water. This area is considered to be potentially suitable to support the San Bernardino aster and smooth tarplant throughout its bed and banks when inundated with water and marginally suitable for the other five species when open water is absent.

Plant Communities and Land Cover Types

Much of the survey area is dominated by developed/landscaped land cover consisting of paved and unpaved roadways (e.g., Ramona Expressway), the Lake Perris Fairgrounds, and the Metropolitan Water District property below the dam. However, fragmented patches of native and non-native herbaceous, scrub and woodland communities are present within the survey area as well. Vegetation onsite was characterized using *A Manual of California Vegetation* (Sawyer et al. 2009) and are depicted in **Figures 4a-c, Plant Communities and Land Use**. Photographs of each of the plant communities and land uses occurring within the survey area were taken and are provided in **Attachment B, Photographic Exhibit**.



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 4a
Plant Communities and Land Use

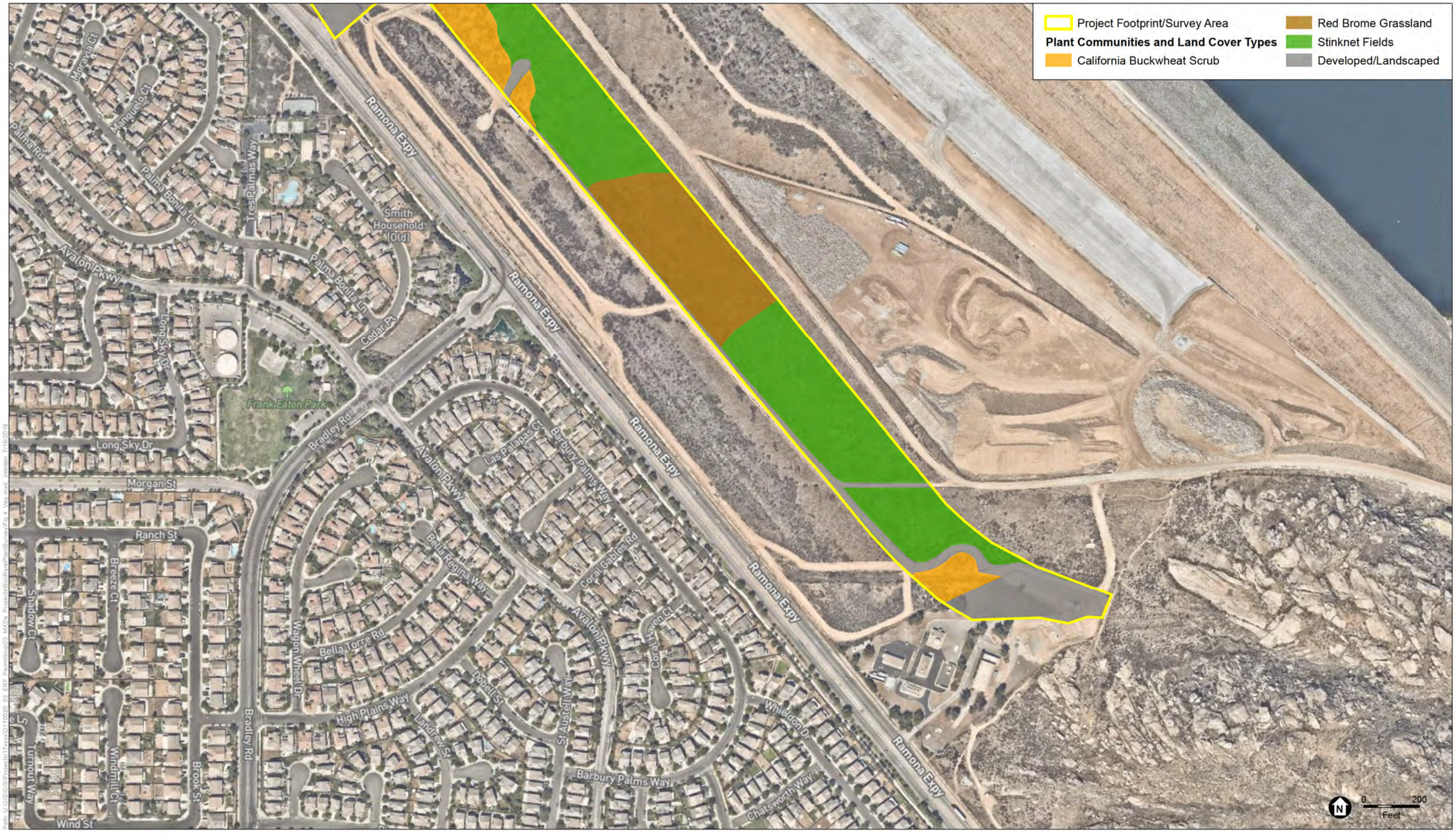
ESA

SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 4b
Plant Communities and Land Use

ESA



SOURCE: Mapbox Satellite Streets, 2017.

Perris Dam Emergency Release Facility Project

Figure 4c
Plant Communities and Land Use

ESA

California Buckwheat Scrub. California buckwheat scrub was mapped within the survey area in small, fragmented patches between Perris dam and Ramona Expressway. This community is characterized by a shrub layer, varying in density, with a dominance of California buckwheat (*Eriogonum fasciculatum*), interspersed with various other shrub and sub-shrub species such as tarragon (*Artemisia dranunculus*), California brickellia (*Brickellia californica*), sticky monkeyflower (*Diplacus aurantiacus*), broad-scaled Palmer's goldenbush (*Ericameria palmeri* var. *pachylepis*), and skunk bush (*Rhus trilobata*). The herbaceous layer is well developed in areas with less shrub cover and includes various grasses and forbs such as tocalote (*Centaurea melitensis*), turkey-mullein (*Croton setiger*), red brome (*Bromus madritensis* ssp. *rubens*), stinknet (*Onchosiphon piluliferum*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus* sp.), and wild oats (*Avena fatua*).

This community provides marginal to high quality habitat for the chaparral ragwort, chaparral sand verbena, long-spined spineflower and Plummer's mariposa lily.

Coyote Brush Scrub. Coyote brush scrub was mapped within the survey area, between Perris dam and Ramona Expressway. This community is characterized by a dense shrub layer dominated by coyote brush (*Baccharis pilularis*) and interspersed with various other shrub or small tree species such as blue elderberry (*Sambucus nigra* ssp. *caerulea*), chaparral bush mallow (*Malacothamnus fasciculatus*), California brickellbush, and tarragon. The herbaceous layer in this community is sparse due to the dense shrub layer; however, grass and forb species observed, primarily along community margins, include annual burrweed (*Ambrosia acanthicarpa*), Common sandaster (*Corethrogyne filaginifolia*), Chinese parsley (*Heliotropum curassavicum*), white horehound (*Marrubium vulgare*), and stinknet.

This community provides marginal to high quality habitat for the chaparral ragwort, chaparral sand verbena, long-spined spineflower and Plummer's mariposa lily.

Red Brome Grassland. Red brome grassland was mapped within the survey area, below the dam. This community is characterized by a dense herbaceous layer dominated by red brome and sub-dominance of stinknet, interspersed by various other weedy grasses and forbs, including fiddleneck (*Amsinckia intermedia*), Chinese parsley, shortpod mustard (*Hirschfeldia incana*), Mediterranean grass, Russian thistle, tocalote, and white horehound. Few shrub species were observed speckled throughout this area as well, including fourwing saltbush (*Atriplex canescens*) and California buckwheat.

This community provides marginal to high quality habitat for the chaparral ragwort, chaparral sand verbena, long-spined spineflower and Plummer's mariposa lily.

Russian Thistle Fields. Russian thistle fields were mapped within the survey area between the dam and Ramona Expressway, along ephemeral drainages within the SRA, and within active and fallow agricultural fields located to the north and south of Ramona Expressway. This community is characterized by a dense herbaceous layer dominated by Russian thistle, interspersed with various weedy, herbaceous species such as fiddleneck, red brome, shortpod mustard, small wire lettuce (*Stephanomeria exigua*) and turkey-mullein. Areas hydroseeded following

remediation of the dam, to the southwest of the dam face, supported a slightly higher concentration of native species, such as small wire lettuce and turkey-mullein, than other areas. The Russian thistle fields observed to the south of Ramona Expressway appeared recently tilled and were largely devoid of vegetation.

This community provides marginal to high quality habitat for the chaparral ragwort, chaparral sand verbena, long-spined spineflower and Plummer's mariposa lily.

Spanish False Fleabane Fields. Spanish false fleabane fields were mapped within the survey area along the bed of the Perris Valley Channel. This community is characterized by a sparse herbaceous layer almost exclusively composed of Spanish false fleabane (*Pulicaria paludosa*), interspersed with tamarisk (*Tamarix ramosissima*) throughout.

This community provides marginal to high quality habitat for the smooth tarplant, San Bernardino aster and thread-leaved brodiaea.

Stinknet Fields. Stinknet fields were mapped within the survey area in large, fragmented swathes below the Perris dam. This community is characterized by a dense herbaceous layer dominated by stinknet, interspersed with various weedy, herbaceous species such as Mediterranean grass, red brome, Russian thistle, tocalote, turkey-mullein, and wild oats. A significant portion of the stinknet fields were observed adjacent to and intergrading with California buckwheat scrub and, other than the lack of a developed shrub layer, they are very similar in composition.

This community provides marginal to high quality habitat for the chaparral ragwort, chaparral sand verbena, long-spined spineflower and Plummer's mariposa lily.

Tamarisk Thickets. Tamarisk thickets were mapped within the survey area in one location, just west of the Lake Perris Fairgrounds and north of Ramona Expressway. This community is characterized by a dense tree canopy exclusive to tamarisk and very sparse understory consisting of grasses and forbs such as Chinese parsley, fiddleneck, stinknet, and white horehound.

This community provides very limited quality habitat for San Bernardino aster, smooth tarplant and thread-leaved brodiaea.

Developed/Landscaped. Developed/landscaped land use was mapped throughout much of the survey area; this includes paved/unpaved roadways and shoulders, including Ramona Expressway, the Lake Perris Fairgrounds, and the residential neighborhoods to the southwest of the SRA. This land use represents heavily disturbed/developed areas generally devoid of vegetation, other than ornamental landscaping and planted trees. Ornamental vegetation observed within these areas include red gum (*Eucalyptus camaldulensis*), Shamel ash (*Fraxinus uhdei*), crape myrtle (*Lagerstroemia indica*), Japanese honeysuckle (*Lonicera japonica*), Canary Island date palm (*Phoenix canariensis*), firethorn (*Pyracantha* sp.), and Peruvian pepper tree (*Schinus molle*).

Portions of this land use, particularly those unpaved, adjacent to herbaceous vegetation communities and areas with potentially alkaline soils provide limited habitat for the smooth tarplant and thread-leaved brodiaea.

Results

No special-status plant species were observed during the focused rare plant surveys conducted within the survey area. While the surveys were appropriately-timed for six of the seven plant species with moderate potential to occur, the survey fell slightly outside of the blooming period for San Bernardino aster, which is July through November (Jepson Flora Project 2019).

Conclusions

Based on the results of the focused rare plant surveys, the chaparral ragwort, chaparral sand-verbena, long-spined spineflower, Plummer's mariposa lily, smooth tarplant and thread-leaved brodiaea are presumed absent from the survey area. Although the survey was not timed to coincide with the blooming period of San Bernardino aster it is likely that this species, or vegetative growth of other plants of this genus, would have been detected during the surveys.

References

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If you should have any questions regarding this report or should you need any additional information, please contact ESA's Project Manager May Lau at (213) 599-4300 or mlau@esassoc.com.

Sincerely,

Robbie Sweet
Senior Associate Biologist

Greg Ainsworth
Director of Biological Resources

Attachments

Attachment A – Floral Compendium
Attachment B – Photographic Exhibit

Attachment A
Floral Compendium

FLORAL COMPENDIUM

EUDICOTS

Scientific Name	Common Name	Comment
Adoxaceae	**Elderberry Family**	
Sambucus nigra ssp. *caerulea*	Blue elderberry	
Apocynaceae	**Dogbane Family**	
Nerium oleander[1]	Oleander	
Anacardiaceae	**Sumac Family**	
Rhus aromatica	Skunkbush	
*Schinus molle**	Peruvian pepper	
Asteraceae	**Aster Family**	
Ambrosia acanthicarpa	Annual burrweed	
Artemisia californica	California sagebrush	
Artemisia dranunculus	Tarragon	
Baccharis pilularis	Coyote brush	
Baccharis salicifolia	Mulefat	
Brickellia californica	Californica brickellia	
*Centaurea melitensis**	Tocalote	
Centromadia pungens ssp. *pungens*	Common tarweed	
Chaenactis glabriuscula	Yellow chaenactis	
*Cirsium vulgare**	Bull thistle	
Corethrogyne filaginifolia	Common sandaster	
Deinandra fasciculata	Clustered tarweed	
Encelia farinosa	Brittle bush	
Ericameria palmeri var. *pachylepis*	Broad scaled Palmer's goldenbush	
*Erigeron bonariensis**	Flax-leaved horseweed	
Erigeron canadensis	Canada horseweed	
Helianthus annuus	Annual sunflower	
Heterotheca grandiflora	Telegraph weed	
*Lactuca serriola**	Prickly lettuce	
Laennecia coulteri	Coulter's horseweed	
Lasthenia californica ssp. *californica*	California goldfields	
*Oncosiphon piluliferum**	Stinknet	
Stephanomeria exigua	Small wire lettuce	
Boraginaceae	**Forget-me-not Family**	
Amsinckia intermedia	Fiddleneck	
Gilia angelensis	Chaparral gilia	
Heliotropium curassavicum	Chinese parsley	
Brassicaceae	**Mustard Family**	
*Hirschfeldia incana**	Short podded mustard	
Sisymbrium irio	Tumble mustard	
Chenopodiaceae	**Goosefoot Family**	
*Amaranthus albus**	Tumbleweed	
Atriplex canescens	Fourwing saltbush	
*Salsola tragus**	Russian thistle	

Crassulaceae	**Stonecrop Family**
Crassula connata	Pigmy weed
Euphorbiaceae	**Spurge Family**
Croton setiger	Turkey-mullein
Stillingia linearifolia	Narrow leaved stillingia
Fabaceae	**Pea Family**
Lupinus bicolor	Miniature lupine
Lupinus succulentus	Arroyo lupine
*Medicago polymorpha**	California burclover
*Melilotus albus**	White sweetclover
Trifolium willdenovii	Tomcat clover
*Vicia villosa**	hairy vetch
Geraniaceae	**Storksbill Family**
*Erodium botrys**	Big heron bill
*Erodium cicutarium**	Redstem filaree
*Erodium mochatum**	Whitestem filaree
Lamiaceae	**Mint Family**
*Marrubium vulgare**	White horehound
Lythraceae	**Loosestrife Family**
*Lagerstroemia indica**	Crapemyrtle
Malvaceae	**Mallow Family**
Malacothamnus fasciculatus	Chaparral mallow
Oleaceae	**Olive Family**
*Fraxinus uhdei**	Shamel ash
Onagraceae	**Evening Primrose Family**
Camissoniopsis bistorta	California sun cup
Phrymaceae	**Lopseed Family**
Diplacus aurantiacus	Sticky monkeyflower
Plantaginaceae	**Plantain Family**
Plantago erecta	*California plantain*
Polygonaceae	**Buckwheat Family**
Eriogonum fasciculatum	California buckwheat
Portulacaceae	**Purslane Family**
*Portulaca oleracea**	Purslane
Salicaceae	**Willow Family**
Salix exigua	Sandbar willow
Salix gooddingii	Gooding's willow
Salix lasiolepis	Arroyo willow
Salix laevigata	Red willow
Solanaceae	**Tomato Family**
Datura wrightii	Jimsonweed
*Nicotiana glauca**	Tree tobacco
Tamaricaceae	**Tamarix Family**
*Tamarix ramosissima**	Tamarisk
Zygophyllaceae	**Caltrop Family**
*Tribulus terrestris**	Puncture vine

[1] Non-native

MONOCOTS

Scientific Name	Common Name	Comment
Poaceae	**Grass Family**	
*Avena fatua**	wild oats	
Bromus carinatus var. *carinatus*	California brome	
Bromus madritensis ssp. *rubens**	red brome	
*Cynodon dactylon**	Bermuda grass	
*Hordeum murinum**	Wild barley	
Muhlenbergia microsperma	Littleseed muhly	
Schismus sp.*	Mediterranean grass	
Stipa cernua	Nodding needle grass	
Mytaceae	**Myrtle Family**	
*Eucalyptus camaldulensis**	River red gum	

Attachment B
Photographic Exhibit

Photo 1 (NW). Photo depicts California buckwheat scrub located within the eastern portion of the survey area, between the Perris dam and Ramona Expressway. The proposed levee and associated staging areas will be placed in the distance.

Photo 2 (NW). Photo depicts red brome grassland within the southern portion of the survey area, between the Perris dam and Ramona Expressway. The proposed levee and associated staging areas will be placed in the foreground.

Photo 3 (N). Photo depicts Russian thistle fields to the north of Ramona expressway, within the western portion of the survey area. Staging areas associated with the construction of the proposed channel will take place in the foreground.

Photo 4 (NW). Photo depicts Spanish false fleabane fields located along the bed of the Perris Valley Channel at the westernmost boundary of the survey area. The rip-rap associated with the proposed channel construction will be placed in the foreground.

Photo 5 (SW). Photo depicts graded pads, dirt roads and various forms of infrastructure just north of Ramona Expressway, within the south-central portion of the survey area. Much of the proposed equipment staging associated with the project is expected to take place within this area.

A-4 Stephens' Kangaroo Rat Habitat Assessment and Focused Survey

SJM BIOLOGICAL CONSULTANTS

MEMO

Date	30 December 2018
Subject:	Results of a habitat assessment for the federally endangered Stephens' kangaroo rat (*Dipodomys stephensi*) (SKR) at the L. Perris Emergency Relief Project (ERF) alignment
From:	Stephen J. Montgomery, SJM Biological Consultants/ECORP Consulting
To:	May Lau/Nicolle Steiner - ESA

A field habitat assessment for SKR was conducted in the Study Area for the ERF (Figures 1 and 2). The Study Area included the primary project components, adjacent staging areas, and a contiguous 100-foot-wide buffer area. The assessment occurred (a) on 10, 11, 19 and 20 November 2018 by Stephen J. Montgomery, permitted SKR biologist (TE745541-11 – in renewal), and (b) on 7 December 2018 by Phillip Brylski, permitted SKR biologist (TE148555-2), assisted by Phil Wasz of ECORP Consulting, permitted San Bernardino kangaroo rat and giant kangaroo rat biologist (TE012973-9.6).

The assessment involved walking all parts of the Survey Area in search of any potential or definite signs of kangaroo rats (burrows, tracks, scat). In addition, the field effort included a search for potential signs of the California Sensitive (CSS) Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) (LAPM), and to a lesser degree northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*) (SDPM). Particular focus was given to the edges of dirt roads and less vegetated areas within extant stands of buckwheat scrub, where conditions of bare ground allowed clearer views of rodent burrows and related signs.

The project alignment, which encompasses both construction and staging areas shown in Figures 1 and 2, begins at the eastern edge of the Perris Valley Storm Channel approximately 2600 feet westward of Lake Perris Drive on the north side of Ramona Expressway. The alignment extends eastward along the northern side of Ramona Expressway past the Riverside County Fairgrounds and onto undeveloped lands westward of the Lake Perris Dam, at which point it turns southeastward and follows an approximately 400-foot-wide path paralleling Ramona Expressway for approximately 4000 feet to its terminus directly west of the southern end of the Dam (Figures 1 and 2). The width of the ERF alignment varies among its different segments, with several expanded areas occurring in and near the Fairgrounds. The 100-foot-wide buffer outside of the actual alignment adds approximately 200 feet to the overall Study Area.

Prior trapping field studies within the current Study Area failed to capture SKR (SJM Biological Consultants 2012, 2013). However, those studies did confirm the presence of SKR at a location at the southeast end of the Lake Perris Dam, immediately below the base of the Dam where it connects to the mountain (see "staging area" in Figure 3).The SKR inhabiting that location were eventually trapped and translocated to a site to the southwest directly eastward of the junction of Ramona Expressway and East Rider Street, in 2014 (SJM Biological Consultants and ECORP Consulting 2018). The trapped area was then graded and served as a staging area for the Lake Perris Dam Remediation Project. In contrast, the LAPM and SDPM were captured at numerous locations exhibiting natural scrub and grassland habitats in the eastern part of the alignment (SJM Biological Consultants 2012, 2013).

The Study Area exhibits the following basic habitat types and conditions:

a) cultivated fields and scraped ground to the west of Lake Perris Drive
b) cleared ground and associated fencing and heavily disturbed areas
on Fairgrounds property, including a previously used motorcycle dirt racing track
c) open grasslands and sage scrub stands, both of which vary in density,
and associated dirt roads, eastward of the Fairgrounds
d) rock pile amidst sage scrub and grassland habitats, east of Fairgrounds
e) open grassland and sage scrub stands, and associated dirt roads,
southeastward of the DWR/CDFW trailer compound

Soils in the Study Area consist of a variety of sandy loams (Domino, Exeter, Greenfield, Monserate, Hanford, Ramona), which are generally suitable for SKR. Low dirt berms (generally a few inches high) are present along the edges of existing dirt roads that traverse the different easterly sections of the alignment. Common plants in the buckwheat scrub and associated areas of disturbed annual grassland included California buckwheat (*Eriogonum fasciculatum*), Russian thistle (*Salsola sp.),* tarweed (*Hemizonia sp.),* Mediterranean grass (*Schismus barbatus*), tocalote (*Centaurea melitensis*), red brome (*Bromus madritensis rubens*), and fiddleneck (*Amsinckia sp*.). Appendix A site photos show examples of the extant habitats throughout the project alignment.

Rodent burrows of the size typically occupied by SKR, which are identical in diameter to those of the common pocket gopher (*Thomomys bottae*), were observed in numerous parts of the ERF alignment. However, clear unmistakable signs of kangaroo rats were not observed. It should be noted that both the SKR and the similar non-endangered Dulzura kangaroo rat (*D. simulans*) (DKR) are known to occur the general project area. Thus, any observed kangaroo rat signs could be those of SKR or DKR. In addition, small-diameter burrows typical of those occupied by LAPM and SDPM (see last two photographs in Appendix A) were observed along dirt roads and amidst grassland and sage scrub stands in a number of areas of the alignment.

The absence of any unmistakable signs of kangaroo rats along and adjacent to the alignment suggests that SKR are absent in the Study Area. However, since scattered locations did exhibit potentially occupied kangaroo rat burrows (see Figure 3), a limited trapping program is recommended to confirm presence/absence of this endangered species at such locations in the Study Area. If no SKR are captured during this survey, the species will be confirmed as absent in the Study Area and no impacts to this species will occur from the implementation of the proposed project.

It is likely that LAPM and SDPM reside in segments of the ERF alignment, as they did during the 2012 field trapping studies. The LAPM, and less commonly the SDPM, typically retreat below ground and enter torpor (a period of inactivity) during the colder months of winter and cannot be reliably assumed to be active on the surface during these months. As a result, trapping to confirm presence of the LAPM, and possibly SDPM as well, are typically invalid during the winter months. Thus, if needed, trapping for LAPM should be conducted during the period between spring and early fall months, in general from April through September. Trapping surveys for SKR can be conducted at any time of the year.

Literature Cited

SJM Biological Consultants and ECORP Consulting. 2018. Results of a Stephens' kangaroo rat translocation program conducted at the Lake Perris Dam Remediation (LPDR) Project site in Riverside County, California in 2014. Prepared for Stacey Love, US Fish and Wildlife Service. Carlsbad, California.

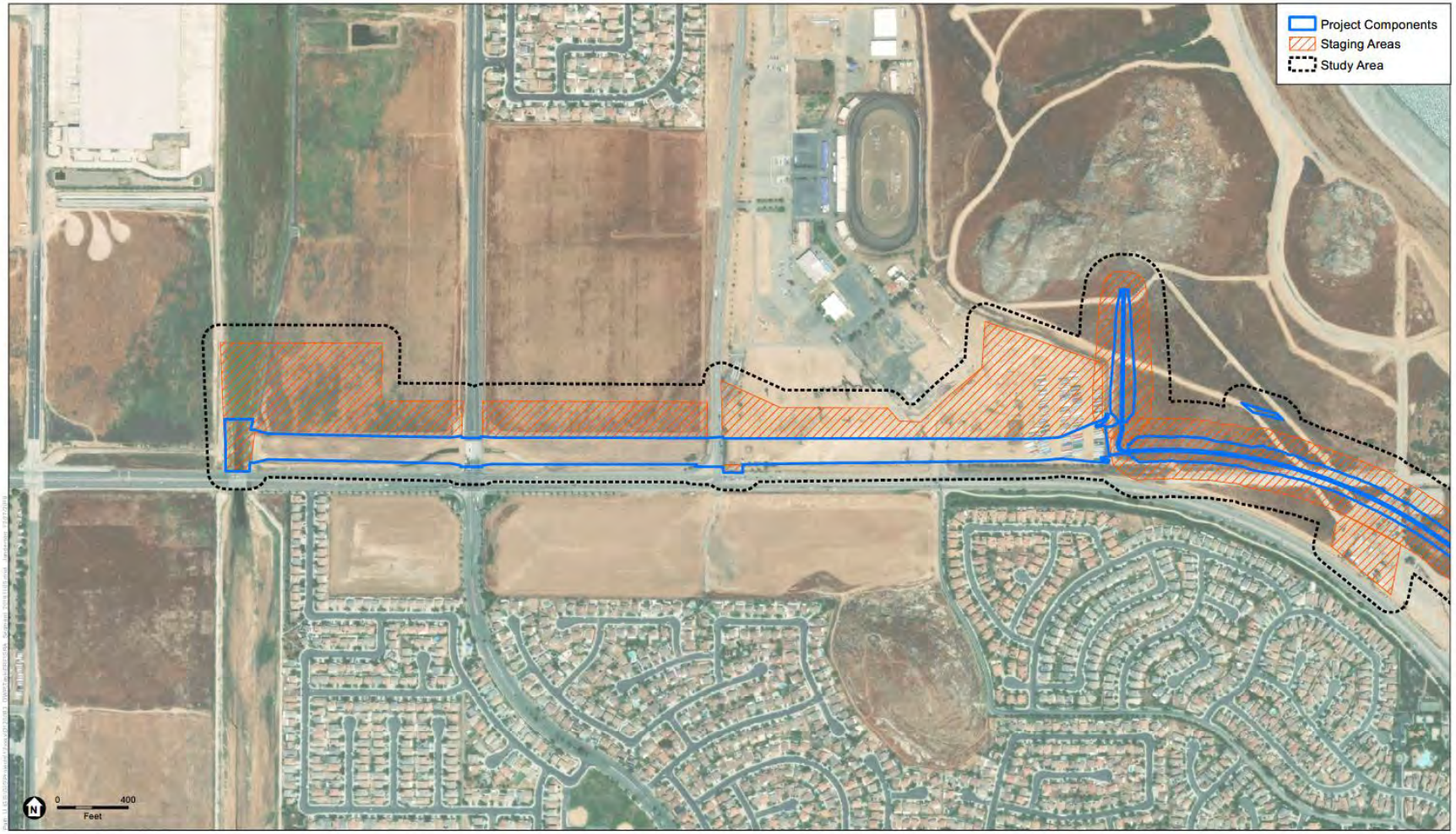
SJM Biological Consultants (SJMBC). 2013. Results of a survey for the Los Angeles pocket mouse and Stephens' kangaroo rat at the Emergency Relief Facility (ERF) project area, at the Perris Lake Dam Rehabilitation Project site, Riverside County, California. Prepared for Nicolle Ianelli Steiner/ESA. Woodland Hills, California.

_____. 2012. Results of a survey for the Stephens' kangaroo rat and Los Angeles pocket mouse for the Lake Perris Dam Remediation Project, Riverside County, California. Prepared for Nicolle Ianelli Steiner/ESA. Woodland Hills, California.

SOURCE: DWR 2018, ESA 2018.

ESA

Figure 1
SKR Habitat Assessment - SRA Segment



SOURCE: DWR 2018, ESA 2018.

ESA

Figure 2
SKR Habitat Assessment - Fairground Segment

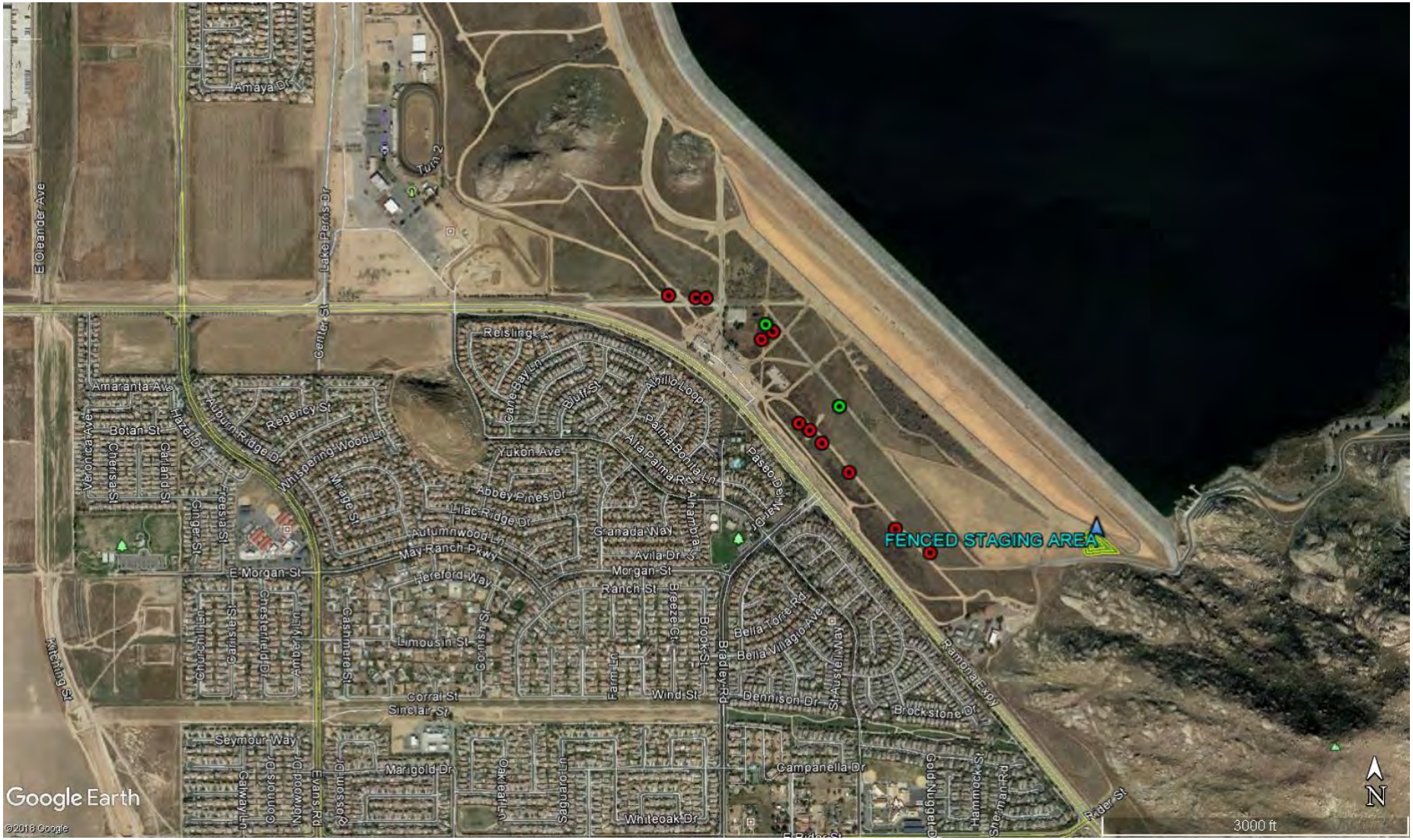


Figure 3. Aerial showing locations with potential kangaroo rat sign (red/green circles). The area designated as the "fenced staging area" is the location where SKR were captured in 2012. Trapping is recommended in areas with red/green circles.

APPENDIX A – SITE PHOTOS

(Photos show habitat conditions beginning in the northwest, moving eastward past the fairgrounds and into open natural lands, then southeastward opposite the dam face to the alignment terminus. The last two photos show typical small burrows likely used by Los Angeles pocket mice, along edges of dirt roads.

SJM BIOLOGICAL CONSULTANTS

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ENVIRONMENTAL CONSULTANTS

August 2, 2019

Ms. Stacey Love
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Subject: **Results of a Trapping Survey for the Federally Listed (Endangered) Stephens' kangaroo rat at the Lake Perris Emergency Release Facility Project (ERF) alignment, Riverside County, California.**

Dear Ms. Love:

This report summarizes the results of a live-trapping survey for Stephens' kangaroo rat (SKR, *Dipodomys stephensi*), a federally endangered species, within the Lake Perris State Recreation Area (LPSRA). The purpose of the survey was to determine presence/absence of SKR in the proposed Project Area of the Emergency Release Facility Project (ERF) alignment. The survey also would have the potential to document the occurrence of the Los Angeles pocket mouse (LAPM, *Perognathus longimembris brevinasus*) if they are active during the survey (LAPM enter torpor in winter months and typically are not predictably active above ground during March).

A habitat assessment encompassing the entire Project Area was conducted (a) on 10, 11, 19 and 20 November 2018 by Stephen J. Montgomery (permitted SKR biologist, TE745541-11 – in renewal), and (b) on 7 December by Phil Brylski (permitted SKR biologist, TE148555-2), assisted by Phil Wasz of ECORP Consulting (permitted San Bernardino kangaroo rat and giant kangaroo rat biologist, TE012973-9.6) (SJM Biological Consultants and ECORP Consulting 2018a). The assessment identified areas with habitat conditions potentially suitable for and possibly occupied by SKR, within the Project Area but also in nearby habitats appearing particularly suitable for SKR. These various areas were identified as locations where traps should be set during a follow-up trapping survey.

The survey area is located on the Riverside East 7.5' quadrangle (Township 4S, Range 4W, Sections 4, 10). The UTM coordinates of the approximate center of the survey area are 11S 482600E/3744620N (NAD 83), and the project site is approximately 1,475 feet in elevation. The trapping effort was carried out by Phil Brylski, Ph.D., who holds a permit from the U.S. Fish and Wildlife Service and Memorandum of Understanding from the California Department of Fish and Wildlife (CDFW) for SKR live-trapping surveys.

INTRODUCTION

The California Department of Water Resources (DWR) proposes to implement the ERF to modify the existing emergency release structure for the Perris Dam and to construct a water conveyance facility to connect with the Perris Valley Channel in the event DWR executes an emergency drawdown to drain the reservoir.

The objectives of the proposed project are to:
* Construct improvements to reduce the risk to public safety and property resulting from the execution of an emergency operation to drawdown Lake Perris;
* Reduce the risk to DWR Operations and Maintenance staff from operating the emergency release structure; and
* Improve the emergency release structure such that it can be reliably operated to drawdown Lake Perris to meet Division of Safety of Dams emergency drawdown requirements.

The proposed project components cover approximately 75 acres. The proposed project is composed of modifications to the existing emergency release structure and the construction of a water conveyance facility connecting the existing emergency release structure to the Perris Valley Channel. The ERF would replace the existing drainage ditch that conveys storm flow to the Perris Valley Channel for the area north of Ramona Expressway and west of Perris Dam. The Riverside County Master Drainage and Area Drainage Plans have determined that this drainage will need to be enlarged to accommodate the full buildout within the sub-watershed. The ERF would provide the full capacity of storm flow protection required by the Riverside County Master Drainage and Area Drainage Plans.

A portion of the project falls within the SKR Habitat Conservation Plan (SKRHCP) Core Reserve lands.

SKR BACKGROUND

The natural history and habitat requirements of SKR are fairly well known. Habitats occupied by SKR typically occur on level to gently sloping terrain, although the species has occasionally been found on relatively steep slopes. SKR typically occupy lands described as disturbed annual grassland characterized by a relatively sparse cover of both shrubs and herbaceous vegetation. Occupied SKR habitat commonly exhibits an abundance of bare (unvegetated) ground during much of the year. When grasslands develop extremely high densities of herb cover following periods of winter/spring rainfall, SKR usually occur only along dirt roads that traverse such dense habitats. Similarly, SKR often will be found along truck or cow trails that traverse dense grasslands. Soils in habitats harboring SKR are typically loamy in nature, while soils dominated by clay or sand rarely support this species (O'Farrell and Uptain 1989, O'Farrell 1990, USFWS 1997).

The SKR is known to occur widely in Riverside County, and in a few localities in southwestern San Bernardino County (O'Farrell and Uptain 1989; RCHCA 1995; USFWS 1997). The project site is located within the historical range of SKR and the California Natural Diversity Database (CNDDB; CDFW 2019) contains a number of SKR records for the project vicinity. Prior trapping field studies within the LPSRA confirmed the presence of SKR at (a) a location at the southeast end of the Lake Perris Dam, immediately below the base of the Dam where it connects to the mountain, and (b) a second location approximately one mile to the northwest and just westward of the dam face (Brylski and Montgomery 2008, SJM Biological Consultants 2012, 2013). Site (a) was ultimately required as a staging area for the Dam Remediation Project, and the SKR inhabiting that location were subsequently trapped and translocated to a site to the southwest directly eastward of the junction of Ramona Expressway and East Rider Street, in 2014 (SJM Biological Consultants and ECORP Consulting 2018b). That trapped area was then graded for the staging area. The LAPM and San Diego pocket mouse (SDPM, *Chaetodipus fallax fallax*) have been captured at numerous locations exhibiting natural scrub and grassland habitats in the current survey area (SJM Biological Consultants 2012, 2013). Several other trapping and habitat assessment efforts have been performed on or near March Air Reserve Base that have resulted in captures of or identification of suitable habitat for SKR (Montgomery 2000, 2003, 2010).

The December 2018 habitat assessment for the ERF project noted that much of the existing non-native grassland cover was too dense to be considered suitable for SKR at that time. In addition, no confirmed

kangaroo rat signs (e.g., potential burrows, tail drag marks, scat) were observed within the designated Project Area in that assessment. It was noted that the non-native grassland cover in the relatively undisturbed parts of the Project Area was generally somewhat denser than observed during earlier field visits, apparently due to recent periods of above-average rainfall. Nonetheless, because SKR can sometimes be found in sub-optimal habitats, it was necessary to conduct trapping in various areas lacking clear kangaroo rat sign but exhibiting less than ideal but generally suitable habitat with some potential for the species.

METHODS

A live-trapping survey, encompassing portions of the Project Area (Figure 2) and several adjacent habitat areas, was carried out over five consecutive nights from March 16-21, 2019, along transects located within selected locations considered to be both suitable for SKR and exhibiting definite or at least some potential signs of kangaroo rat activity based on the December 2018 habitat assessment (Figure 3). The inclusion in the trapping survey of some suitable habitat areas outside of and near to the specific Project Area provided a broader perspective of SKR presence in the vicinity of the Project Area. The live-trapping effort used large (3 x 3.75 x 12") Sherman live-traps with doors shortened to avoid tail damage. A total of 188 large Sherman live-traps were set nightly along ten lines (transects) in the parts of the Project Area and immediate vicinity exhibiting the highest likelihood of harboring SKR. Traps were opened and baited with bird seed within one hour of sunset and checked at night and in the morning. All trapped animals were identified and released immediately at the point of capture. A total of 845 trap-nights were accrued during the field survey. Trapping was conducted by Dr. Phil Brylski (USFWS permit TE148555-2 and CDFW MOU).

RESULTS

Site Description

The Project Area is located within the LPSRA, bordered by the Ramona Expressway to the west and the Lake Perris dam to the north and east. The area is predominantly flat to gently rolling land. Soils on the site consist of a variety of sandy loams (Domino, Exeter, Greenfield, Monserate, Hanford, Ramona), which are generally suitable for SKR. The plant communities within the SKR area are predominantly Riversidean sage scrub, non-native grassland with substantial forb cover, ruderal, and disturbed.

Riversidean sage scrub and non-native grassland were considered potentially suitable habitat for SKR, especially along road edges. Micro-sites within Riversidean sage scrub and non-native grassland which had sparse ground cover, loose soil and clear or potential evidence of rodent activity (scat, trails, tracks, dust baths, and burrows) were determined to have the greatest probability of supporting SKR.

The characteristic plant species of Riversidean sage scrub in the survey area include California buckwheat (*Eriogonum fasciculatum*), brittlebush (*Encelia californica*), California sagebrush (*Artemisia californica*), and deerweed (*Lotus scoparius*). The characteristic plant species of non-native grassland include filaree (*Erodium* sp.), soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis rubens*), ripgut brome (*Bromus diandrus*), and foxtail barley (*Hordeum murinum*). Other exotic plant species found in this plant community include black mustard (*Brassica nigra*) and sweet fennel (*Foeniculum vulgare*). Within and adjacent to the proposed Project Area, non-native grassland is generally dense with cover ranging from 70-100 percent with tall (one to two feet) grasses. Soils in some areas are hard-packed and show very little evidence of recent rodent burrowing. The dirt roads that cross the non-native grassland below the dam provide the only substantial open ground, and the road edges (berms) provide soils that are loose enough for rodents to easily burrow in. A large area eastward of the southeast part of the Project Area has been disked during the past several years.

Small Mammal Survey Results

Weather conditions during morning trap checks were moderate and included air temperatures of 54-62 degrees Fahrenheit (°F), light winds of 0-3 mph, and skies ranging from clear to cloudy. Night-time conditions were typically the same as morning conditions but with air temperatures one to five degrees (°F) lower. Table 1 summarizes these representative weather conditions.

Table 1. Weather Conditions (morning/night-time)

Date	Temperature (F)	Cloud Cover (%)	Wind (mph)
3/17	54	0	0
3/18	62	0	0-2
3/19	56	20-30	0-3
3/20	55	70-95	0-2
3/21	54	40-65	0-3

The small mammal survey yielded four SKR captures and 80 captures of the native deer mouse (*Peromyscus maniculatus*). No other species were captured. The absence of LAPM captures can likely be attributed to the survey taking place when the species was apparently still inactive underground. Table 2 summarizes the locations of the trap lines and SKR capture locations, which are shown in Figure 3.

Table 2. Summary of Small Mammal Captures

Date Traps Checked	Transect	Trap Numbers	Species		
			SKR	UTMs (11 S, NAD 83)	PMAN
3-17.	A	15	2 (1F, ad; 1M ad scr)	483280, 3744161 483237, 3744155	
	B	10			
	C	10			
	D	15			1
	E	25			
	F	60			4
	G	8			
	H	25			
	I	10	1 (M ad, scr)	4832083, 3745222	
	J	10			
3-18.	A	5	1 (M ad, scr)	483207, 3744160	
	B	10			1
	C	10			
	D	15			4
	E	25			2
	F	60			6
	G	8			
	H	25			1
	J	10			
3-19.	B	10			
	C	10			2
	D	15			4
	E	25			2
	F	60			4
	G	8			
	H	25			3
	J	10			

Table 2. Summary of Small Mammal Captures					
Date Traps Checked	**Transect**	**Trap Numbers**	**Species**		
			SKR	**UTMs (11 S, NAD 83)**	**PMAN**
3-20.	B	10			1
	C	10			3
	D	15			5
	E	25			2
	F	60			2
	G	8			
	H	25			5
	J	10			
3-21.	B	10			
	C	10			2
	D	15			5
	E	25			6
	F	60			10
	G	8			
	H	25			5
	J	10			
	Totals	**845 trap nights**	**4**		**80**
SKR, Stephens' kangaroo rat (ad, adult; scr, testes scrotal) PMAN, deer mouse (*Peromyscus maniculatus*)					

DISCUSSION

The areas for the current survey effort were selected to maximize the opportunity for SKR captures, both within and near the specific Project Area. Four SKR were captured during the trapping survey in the overall survey area and within the SKRHCP Core Reserve. However, all of these captures occurred outside of the current ERF Project Area. Three of the four SKR captures occurred at Transects A in the southeastern part of the survey area in an area that adjoins where SKR had been captured in a 2012 survey (SJM Biological 2012). The fourth SKR capture occurred along Transect I, also in the vicinity of where an SKR had been captured in 2012. Grassland and sparse sage scrub habitats with loamy soils similar to those in the project area are generally suitable for SKR. However, the majority of the survey area currently contains non-native grass and forb cover that is excessively dense for typical SKR occupation, a long-term trend that has been intensified by recent rainfall. Nonetheless, the dirt roads traversing the area provide open ground that could be used by the species. For unknown reasons the species is only present in very restricted parts of the overall area covered by the trapping survey.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work. Please contact me if you have any questions regarding this survey report.

Sincerely,

Phil Brylski, Ph.D.
Permit 148555-2; Email – pbrylski@gmail.com
Subcontracted to ECORP Consulting, Inc.

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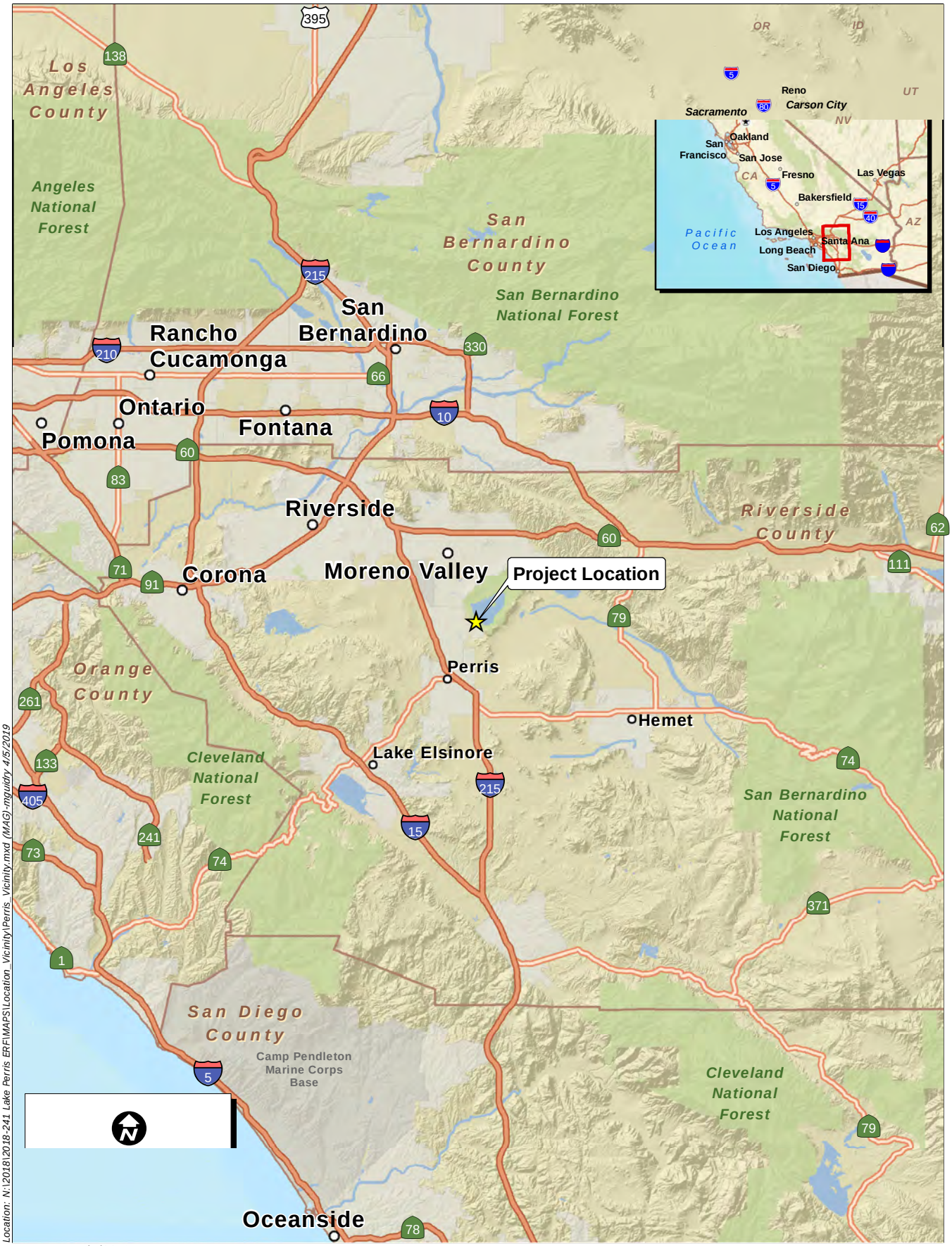

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Map Date: 4/5/2019
Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 1. Project Vicinity

2018-241 Lake Perris ERF

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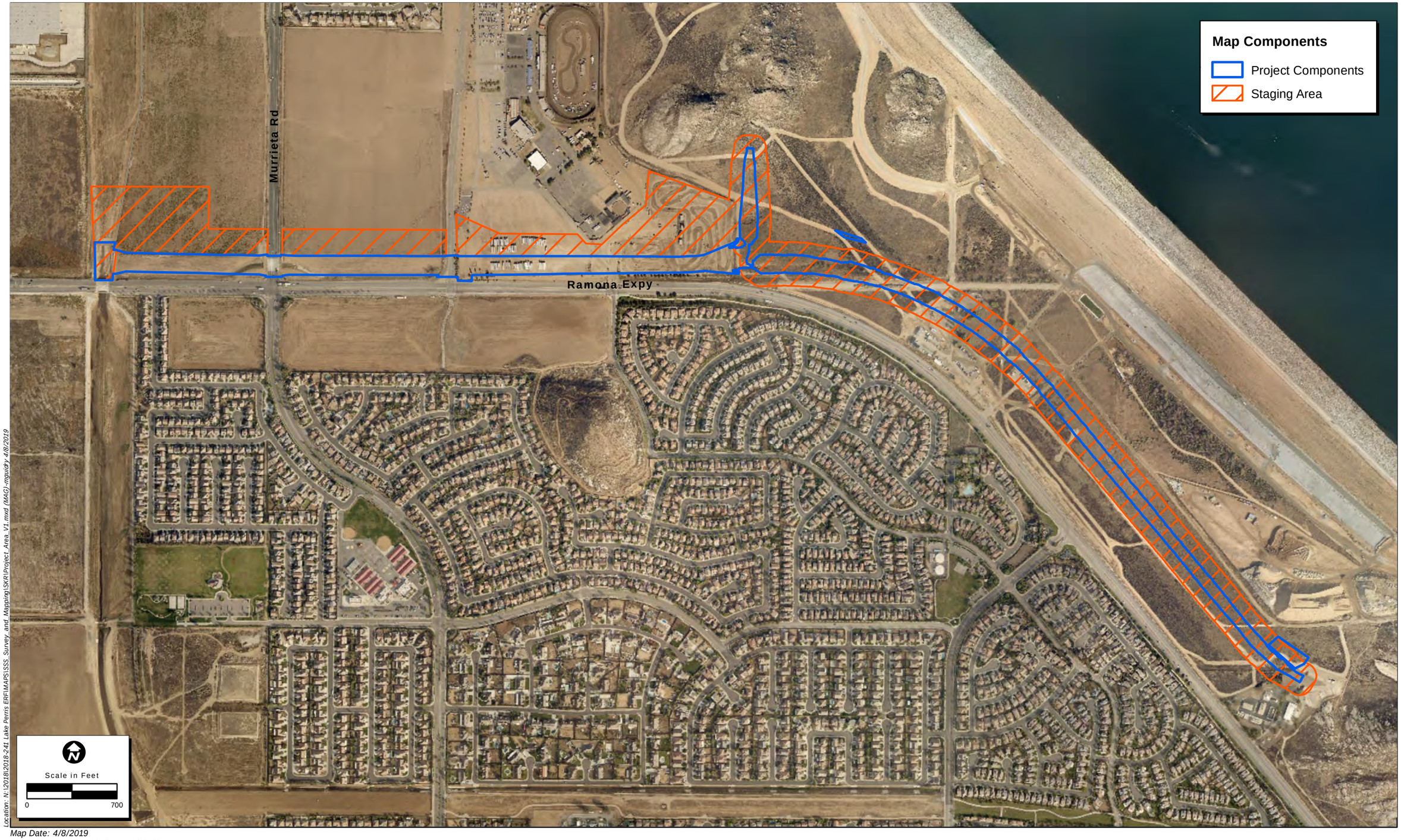

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Map Date: 4/8/2019
Photo Source: Riverside County (2016)

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Figure 2. Project Area

2018-241 Lake Perris ERF

Location: N:\2018\2018-241 Lake Perris ERF\MAPS\SSS_Survey_and_Mapping\SKR\Transect_Loc_V1.mxd (MAG)-mguidry 4/8/2019

Map Date: 4/8/2019
Photo Source: Riverside County (2016)

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Figure 3. SKR Transect Locations and Captures

2018-241 Lake Perris ERF

Appendix A – PHOTOGRAPHS OF SURVEY AREA

Photo 1. Transect A. Two SKR were captured in open grassland on this transect - looking east.

Photo 2. Transect B, forb, grass, and shrub cover. View looking west.

Photo 3. Transect E, ruderal habitat - looking north.

Photo 4. Transect F, forb and grass roadside habitat - looking north.

Photo 5. Dense forb and grass cover east of Transect F - looking north.

Photo 6. Transect G - ooking east/northeast.

Photo 7. Transect I. Single SKR captured in foreground - looking southeast.

Appendix B
Cultural Resources

ESA

B-1 Cultural Resources Survey Memorandum

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memorandum

date 4/29/20

to California Department of Water Resources

from Candace Ehringer, M.A., R.P.A.
Michael Vader, B.A.

subject Perris Dam Emergency Release Facility Project– Cultural Resources Survey Update

Introduction

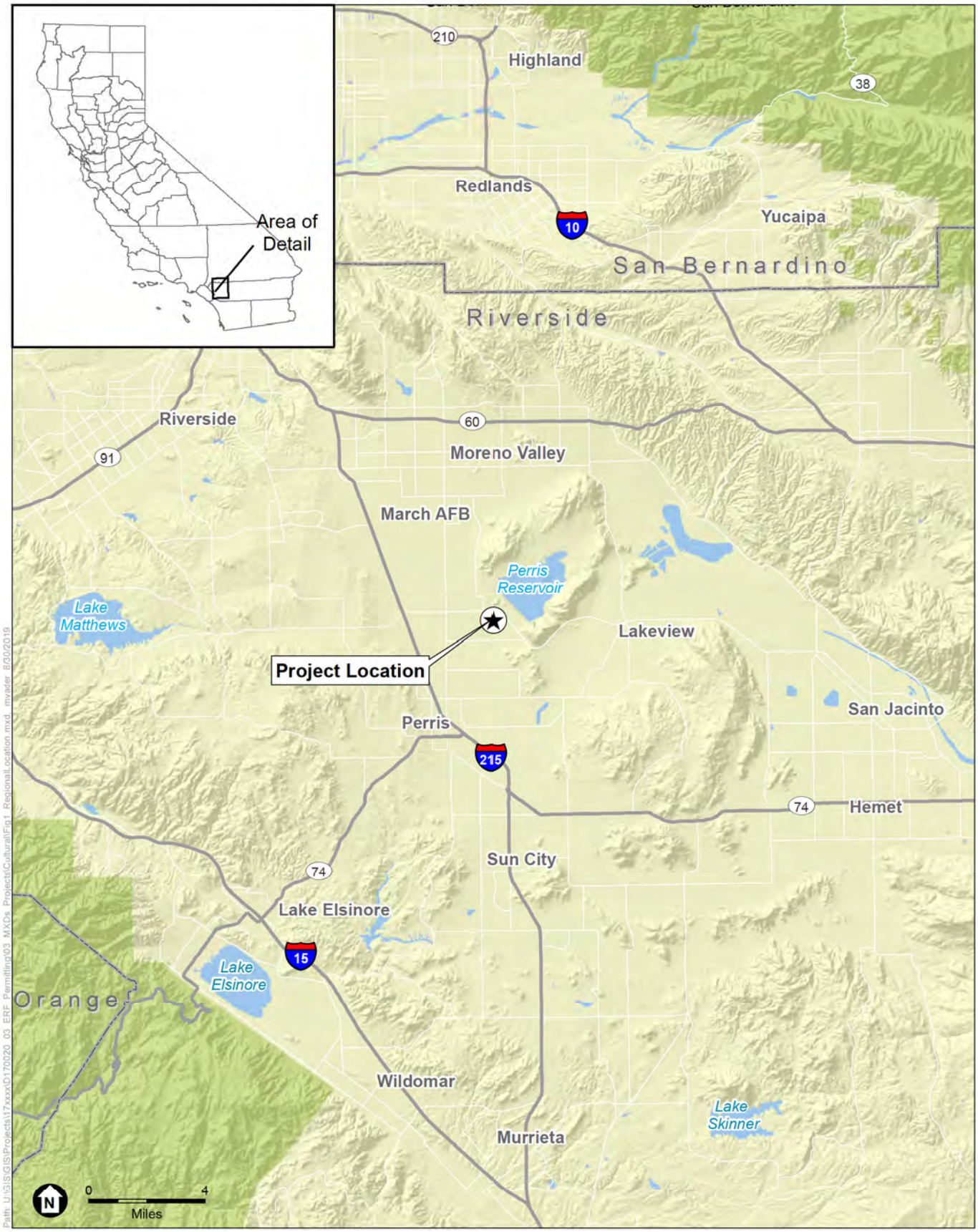
The California Department of Water Resources (DWR) retained Environmental Science Associates (ESA) to conduct a cultural resources survey update for the Perris Dam Emergency Release Facility Project (Project). The Project would modify the existing emergency release structure for the Perris Dam and would construct a water conveyance facility to connect with the Perris Valley Channel in the event DWR executes an emergency drawdown to drain the reservoir. DWR recently added additional areas to the Project to refine haul routes, relocate existing utilities, and install an underground water pipeline to reduce potential impacts to biological resources. This memorandum documents the methods and results of a survey conducted for these additional areas.

Project Location

The Project is located in an unincorporated portion of western Riverside County approximately 15 miles south of the city of Riverside (**Figure 1**). Specifically, the Project is located within Sections 4, 9, and 10 of Township 4 South, Range 3 West on the Perris USGS 7.5-minute topographic quadrangle (**Figure 2**). The Project would be constructed partially within the Lake Perris State Recreation Area (SRA), the Lake Perris Fairgrounds, and DWR property north of Ramona Expressway and would connect to the Perris Valley Channel. The Project is composed of three distinct sections: SRA Segment, Fairgrounds Segment, and Western Segment (**Figure 3**).

Previous Cultural Resources Studies

ESA has previously conducted two cultural resources studies that included portions of the Project area, one in 2014 and one in 2018 (Ehringer et al., 2014; Ehringer and Clark, 2018). These studies included records searches at the California Historical Resources Information System (CHRIS) Eastern Information Center (EIC), Sacred Lands File (SLF) searches through the California Native American Heritage Commission (NAHC), a desktop geoarchaeological review, and cultural resources surveys. No cultural resources were identified within the Project area as a result of these two studies. The 2014 and 2018 survey coverage of the Project area is shown in **Figure 4**.

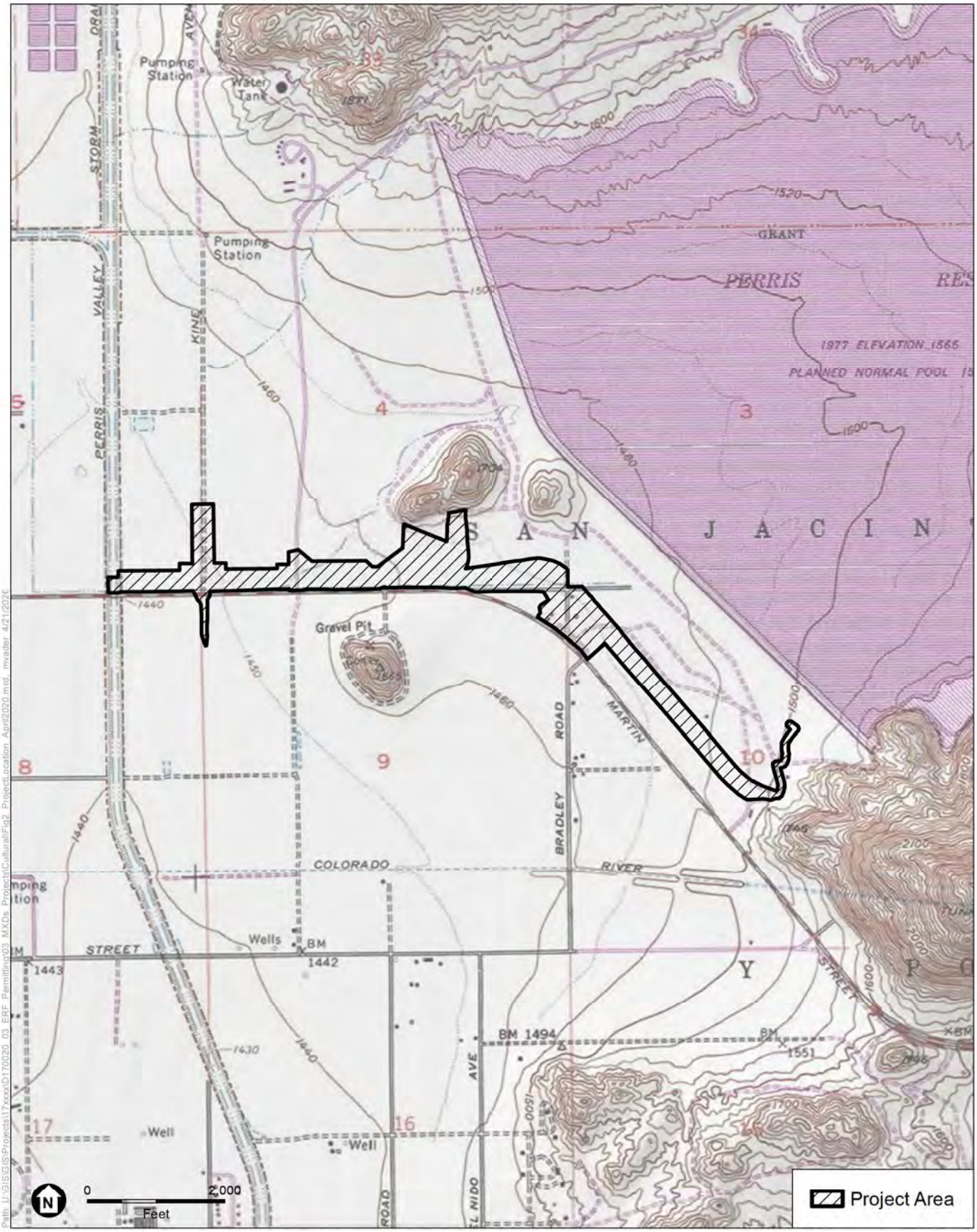


SOURCE: ESRI

Perris Dam Emergency Release Facility Project

Figure 1
Regional Location

ESA

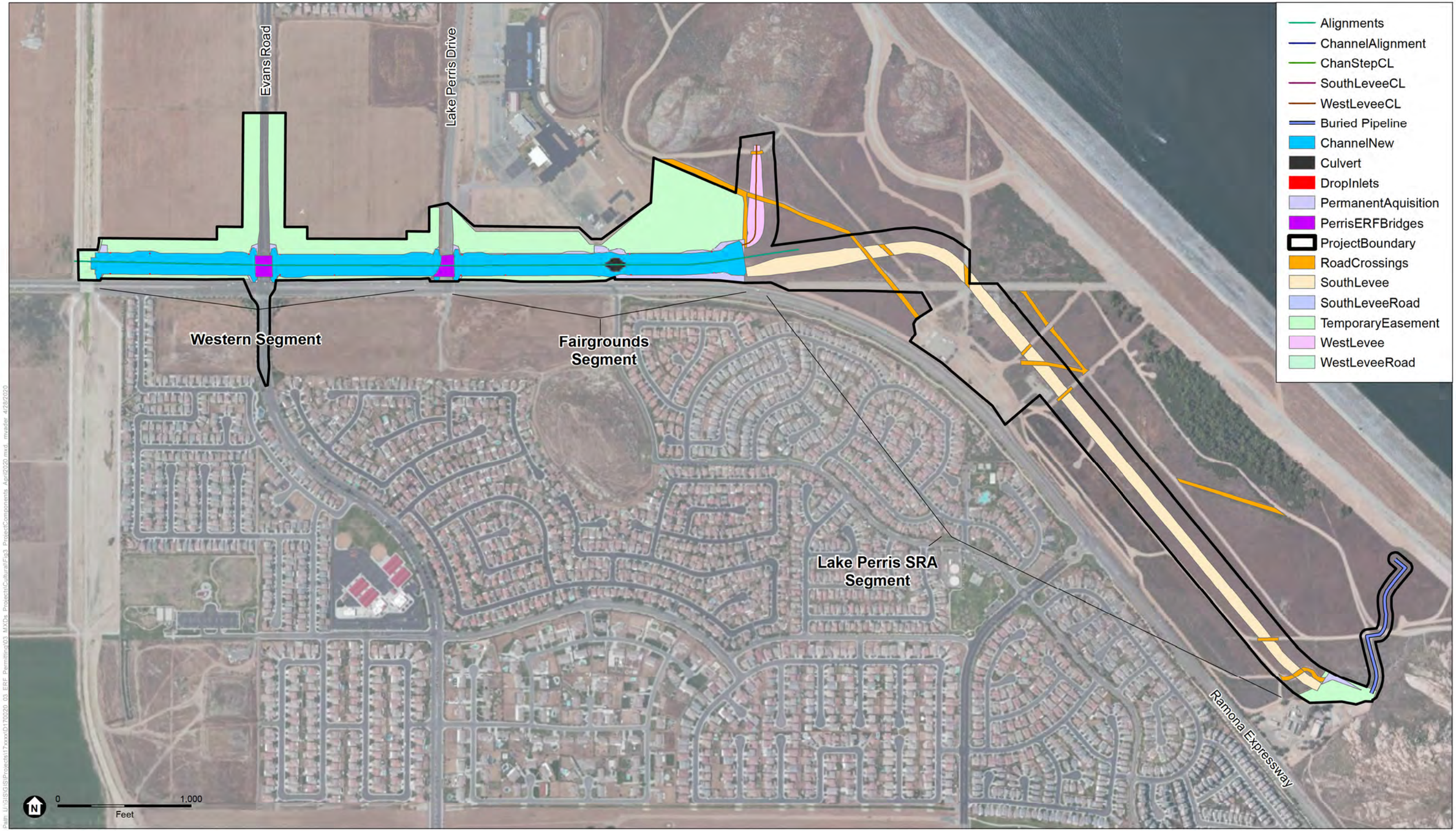


TOPO QUAD: Perris, CA 7.5-minute

Perris Dam Emergency Release Facility Project

Figure 2
Project Location

ESA

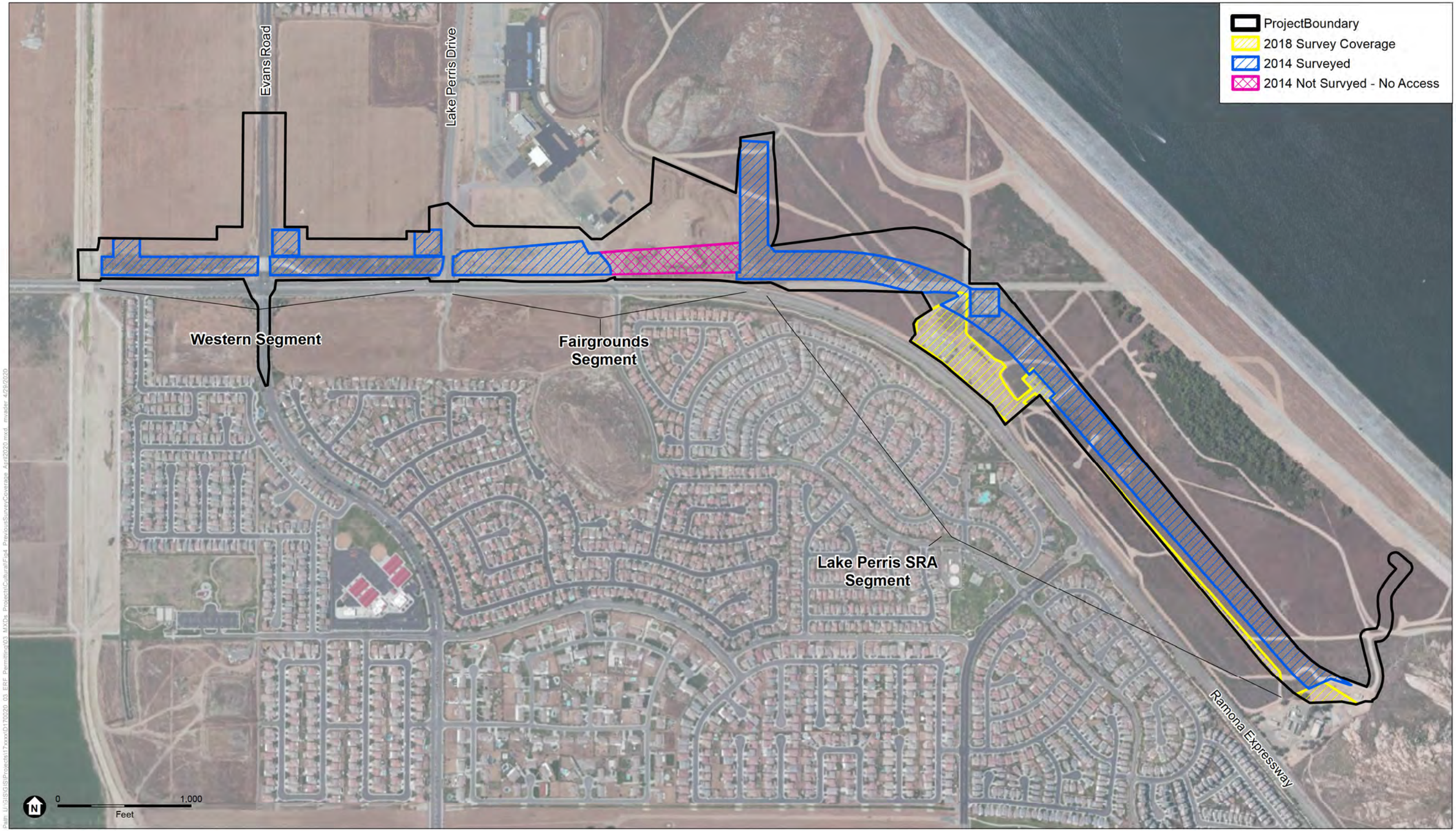


SOURCE: DWR, 2019

Perris Dam Emergency Release Facility Project

Figure 3
Project Components

ESA



SOURCE: DWR, 2019

Perris Dam Emergency Release Facility Project

Figure 4
2014 and 2018 Survey Coverage

ESA

Cultural Resources Survey Update

ESA conducted a survey update for approximately 61 acres that have been added to the Project, but that had not been previously surveyed (referred to hereafter as the 2019/2020 survey area). ESA cultural resources specialists Joel Levanetz, M.A., RPA, architectural historian/archaeologist, and Michael Vader, B.A., archaeologist, conducted a pedestrian survey on June 28, 2019, and Mr. Vader conducted a survey on April 13, 2020. Field methods employed both systematic and reconnaissance survey strategies, depending on accessibility. All accessible areas were subject to systematic survey using transect intervals spaced at no more than 15 meters (50 feet). Inaccessible areas were subject to a reconnaissance level survey wherein the margins of these areas were subject to inspection.

Approximately 42.1 acres of the 2019/2020 survey area was subject to systematic survey, 6.7 acre was subject to reconnaissance-level survey, 10.8 acres could not be surveyed due to being located on privately-owned lands, and 1.4 acres was not surveyed because it was obscured by a large linear stockpile of granitic rock. The 2019/2020 survey coverage of the Project area is shown in **Figure 5**.

No archaeological resources were encountered or documented during the survey. One historic architectural resource, the Perris Valley Channel, was documented during the survey, but is being addressed under separate cover (see *Perris Valley Channel Historic Resources Evaluation Report*, Levanetz et al., 2019). The following paragraphs provide surface conditions and observations for the 2019 survey area by Project segment.

1) **Western Segment:** Newly added portions of the Western Segment are comprised of privately-owned agricultural fields located north of Ramona Expressway and on the east and west sides of Evans Road and west of Lake Perris Drive. The agricultural fields were not accessible during the survey due to the lack of landowner permission. However, the portions of the survey areas on the eastern and western shoulders of Evans Road and the western shoulder of Lake Perris Drive were subject to systemic survey. The eastern shoulder of Evans Road consisted of a concrete paved sidewalk bounded by an earthen berm and the western shoulders of Evans Road and Lake Perris Drive both consisted of dirt and gravel roadbed with 100 percent ground surface visibility (**Figure 6**).

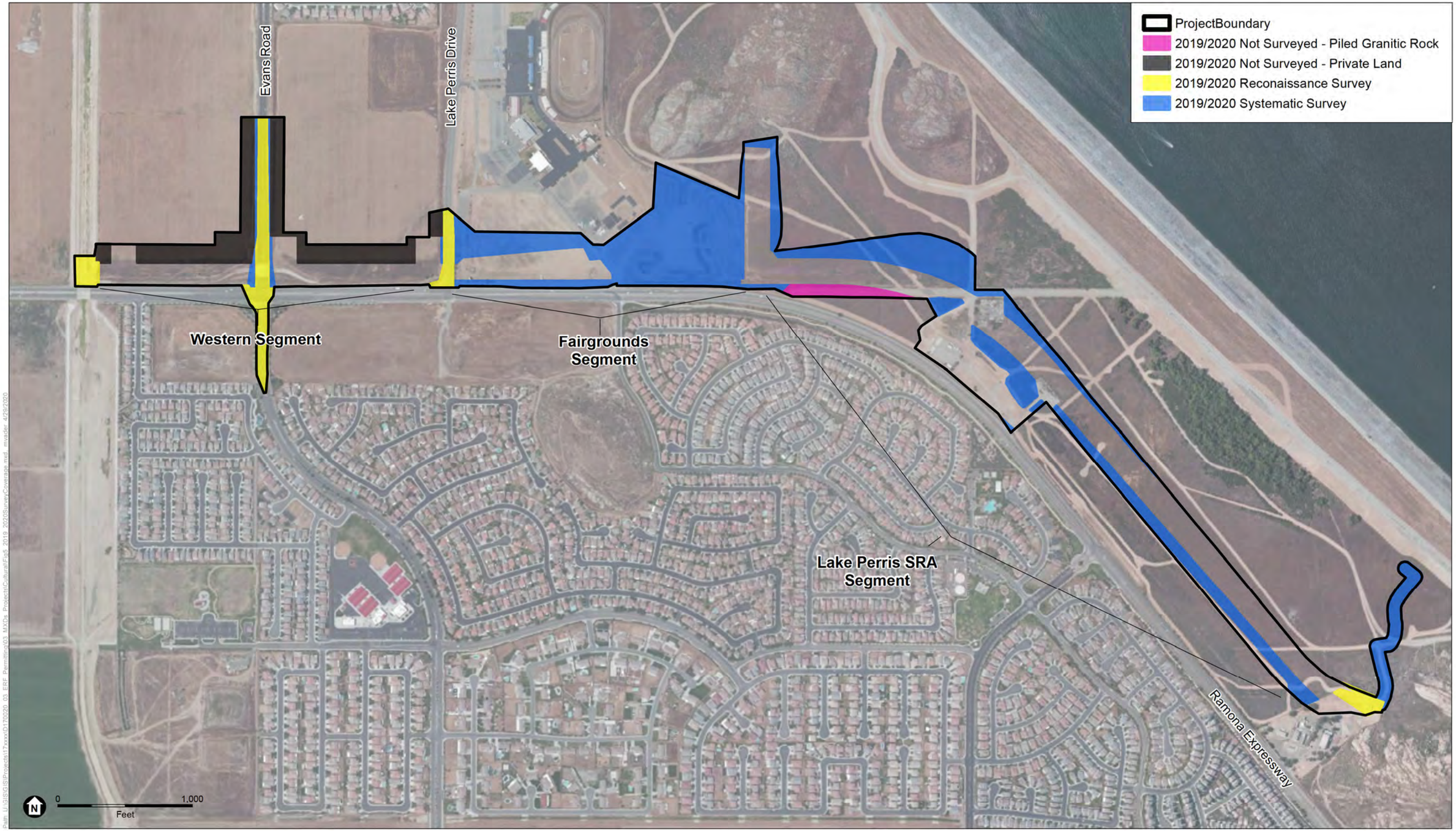
2) **Fairgrounds Segment:** This portion consists of a parking lot in the western half and a motocross arena in the eastern half. Both areas were subject to systematic survey. The parking lot was composed of graded dirt with no vegetation, resulting in 100 percent ground surface visibility (**Figure 7**). The motocross arena included earthen ramps, as well as flat graded areas within 100 percent ground surface visibility punctuated by dense patches of weedy vegetation and non-native grasses, which reduced visibility to approximately 25 percent (see Figure 7).

3) **SRA Segment:** The portions of the 2019/2020 survey area within the SRA Segment included an approximately 200-foot long proposed road segment, a proposed drain line within an existing dirt road, the northeastern end of the Metropolitan Water District's pump station, which was fenced and inaccessible, and a number of discontinuous areas not previously surveyed where no proposed work would occur. The proposed road segment, proposed drain line, and most of the discontinuous areas were subject to a systematic survey. The road segment and proposed drain line were clear of vegetation and had 100 percent ground surface visibility. The remaining areas subject to survey were largely covered in dense, ankle to waist high vegetation which reduced ground surface visibility to approximately 0-15 percent (**Figure 8**). One of the discontinuous areas was obscured by large linear stockpiles of granitic

stone and could not be surveyed (see Figure 8). The northeastern portion of the fenced pump station was subject to a reconnaissance-level survey from the fence line. The area is comprised of a graded dirt surface with a concrete structure in its eastern half.

Summary of Results

Approximately 80 percent of the Project area was surveyed, while 20 percent was not surveyed (due to being located on privately-owned land or being obscured by granitic rock stockpiles). Survey coverage for the entire Project area is shown in **Figure 9**. No archaeological resources were identified within the Project area. One historic architectural resource, the Perris Valley Channel, was identified within the Project area, but is being addressed under separate cover.



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SOURCE: DWR, 2019

ESA

Perris Dam Emergency Release Facility Project

Figure 5
2019/2020 Survey Coverage

Overview of eastern shoulder of Evans Road (view to south)

Overview of western shoulder of Evans Road (view to north)

SOURCE: ESA, 2019

Perris Dam Emergency Release Facility Project

Figure 6
Survey Photos

Overview of parking lot in western portion of the Fairgrounds Segment (view to west)

Overview of motocross arena in eastern portion of Fairgrounds Segment (view to SE)

SOURCE: ESA, 2019

Perris Dam Emergency Release Facility Project

Figure 7
Survey Photos

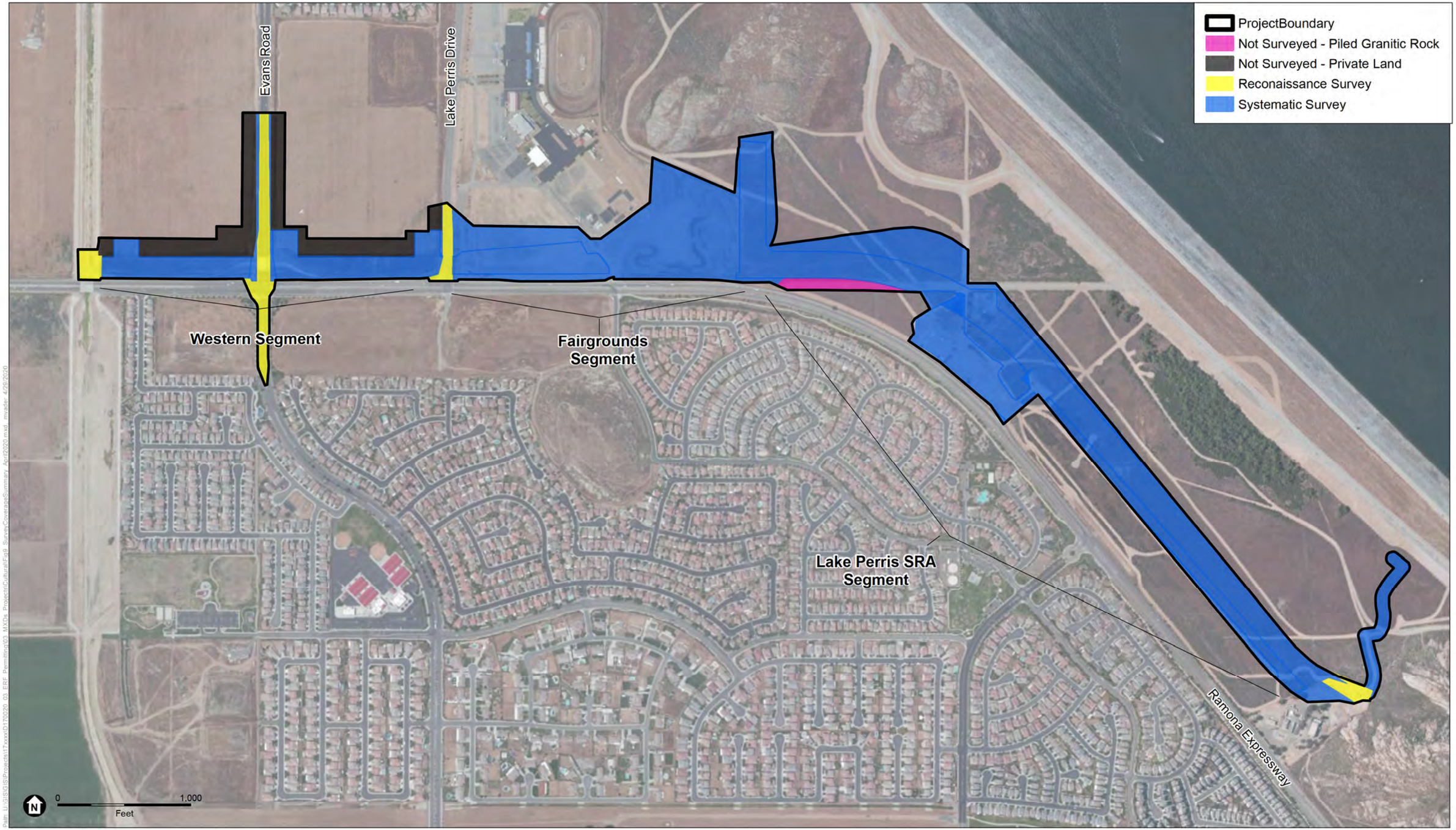
Overview of dense vegetation within the SRA Segment (view to east)

Overview of large linear granitic rock stockpile (view to west)

SOURCE: ESA, 2020

Perris Dam Emergency Release Facility Project

Figure 8
Survey Photos



SOURCE: DWR, 2019

Perris Dam Emergency Release Facility Project

Figure 9
Summary of Survey Coverage

ESA

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B-2 Historic Resources Evaluation Report

PERRIS VALLEY CHANNEL

Historic Resources Evaluation Report

Prepared for
California Department of Water Resources
and U.S. Army Corps of Engineers

August 2019

DRAFT

PERRIS VALLEY CHANNEL

Historic Resources Evaluation Report

Prepared for
California Department of Water Resources
and U.S. Army Corps of Engineers

August 2019

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Perris Valley Channel – Historic Resources Evaluation Report

Appendices

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EXECUTIVE SUMMARY

The California Department of Water Resources (DWR) retained Environmental Science Associates (ESA) to prepare an Historic Resources Evaluation Report for the Perris Valley Channel in support of compliance with the National Historic Preservation Act (NHPA) of 1966, as amended, and the California Environmental Quality Act (CEQA). The U.S. Army Corps of Engineers (USACE) is the lead agency responsible for compliance with NHPA Section 106, and DWR is the lead agency responsible for compliance with CEQA.

DWR proposes to modify an existing emergency release structure for the Perris Dam and would construct a water conveyance facility to connect with the Perris Valley Channel in the event an emergency drawdown is necessary to drain the reservoir (Undertaking or Project). This document does not include a full review of the Undertaking or Project under Section 106 or CEQA, but rather is an evaluation of the Perris Valley Channel in support of the addendum to the Perris Dam Emergency Release Facility Project Environmental Impact Report, which has expanded the Area of Potential Effects (APE), and it serves as supplemental documentation in support of the Section 106 and CEQA review processes.

The Perris Valley Channel is a man-made drainage channel that serves as a primary collector of storm water in the northern part of the cities of Perris and Moreno Valley. The Perris Valley Channel is located in a portion of western Riverside County approximately 15 miles south of the city of Riverside and partially within the city of Perris. The Perris Valley Channel was initially constructed in 1955 and meets the 50-year age threshold for consideration as a historic property under Section 106 of the NHPA and as a historical resource under CEQA.

ESA conducted a pedestrian field survey of the Perris Valley Channel on June 28, 2019. The survey was aimed at documenting the current condition of the Perris Valley Channel. The Perris Valley Channel is an approximately 9-mile-long water conveyance conduit that extends from Heacock Street at the southeastern perimeter of March Air Reserve Base (formerly March Field and later March Air Force Base) in the city of Moreno Valley through the city of Perris to its terminus at the San Jacinto River. It was initially constructed in 1955 by the Riverside County Flood Control and Water Conservation District to alleviate drainage problems associated with the March Field Air Reserve Base. Since its initial construction, numerous improvements have been made to the channel, including erosion control features, modern box drains, and paving the channel shoulders for bike paths, as well as alterations to the depth and width to allow for capacity expansions. During the current investigation, the entire 9-mile linear property was not visually inspected, however, online data, aerial imagery, and historical research materials provided information for those portions of the 9-mile channel that were not inspected.

The Perris Valley Channel was evaluated for listing in the National Register of Historic Properties (NRHP) and California Register of Historical Resources (CRHR) under Criteria A/1-D/4. As a result of the current investigation, ESA recommends the Perris Valley Channel ineligible for listing in the NRHP or the CRHR. As a result, the Perris Valley Channel does not qualify as a historic property under NHPA Section 106 or as a historical resource under CEQA.

PERRIS VALLEY CHANNEL

Historic Resources Evaluation Report

Introduction

The California Department of Water Resources (DWR) retained Environmental Science Associates (ESA) to prepare an Historic Resources Evaluation Report for the Perris Valley Channel in support of compliance with the National Historic Preservation Act (NHPA) of 1966, as amended, and the California Environmental Quality Act (CEQA). The U.S. Army Corps of Engineers (USACE) is the lead agency responsible for compliance with Section 106 of the NHPA and DWR is the lead agency responsible for compliance with CEQA.

DWR proposes to modify an existing emergency release structure for the Perris Dam and would construct a water conveyance facility to connect with the Perris Valley Channel in the event an emergency drawdown is necessary to drain the reservoir (Undertaking or Project). The Perris Valley Channel was initially constructed in 1955 and meets the 50-year age threshold for consideration as a historic property under Section 106 of the NHPA and as a historical resource under CEQA. This document does not include a full review of the Undertaking or Project under Section 106 or CEQA, but rather is an evaluation of the Perris Valley Channel in support of addendum to the Perris Dam Emergency Release Facility Project Environmental Impact Report, which has expanded the Area of Potential Effects (APE), and it serves as supplemental documentation in support of the Section 106 and CEQA review processes

This report details the methods and results of an assessment for the Perris Valley Channel, which includes archival research, a site visit, and evaluation for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR). Alison Garcia Kellar, M.S., Millie Mujica, M.F.A., and Joel Levanetz, M.A., AICP, are the primary authors of this report and meet the Secretary of the Interior's Professional Qualification Standards for both history and architectural history. Resumes of key personnel are included in **Appendix A**.

The Perris Valley Channel, sometimes referred to as the Perris Valley Storm Drain, is a man-made drainage channel that serves as a primary collector of storm water in the northern part of the cities of Perris and Moreno Valley. It is located in a portion of western Riverside County approximately 15 miles south of the city of Riverside and partially within the city of Perris (**Figure 1**). Specifically, the Perris Valley Channel is located within Sections 5, 8, 16, 17, 21, 28, 30, 31, 32, and 33 of Township 3S, Range 3W and Section 33 of Township 4S, Range 3W on the U.S. Geologic Survey (USGS) 7.5-minute Perris, CA topographic quadrangle, and Section 29 of Township 3S, Range 3W on the USGS 7.5-minute Sunnymead topographic quadrangle (**Figure 2**). The portion of the Perris Valley Channel that intersects the Undertaking is within Sections 5 and 8, Township 3S, Range 3W on the USGS 7.5-minute Perris, CA topographic quadrangle and is located near the intersection of East Oleander Avenue and Ramona Expressway (**Figure 3**).

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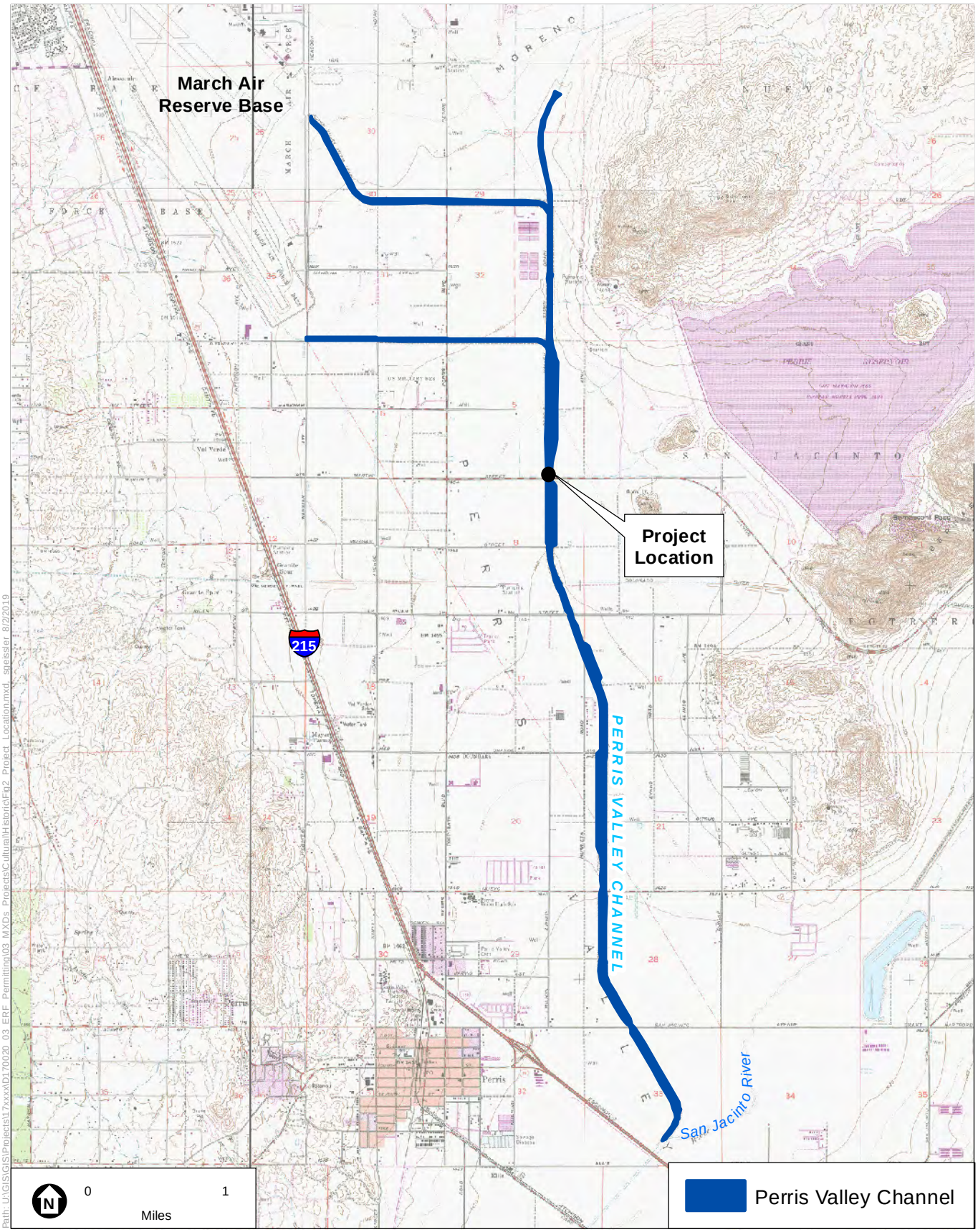
SOURCE: ESRI; National Hydrography Dataset

Figure 1
Regional Location

ESA



SOURCE: USGS Topographic Series (Sunnymead, Perris, CA).

Perris Valley Channel Historic Resources Evaluation Report

Figure 2
Project Location

ESA

SOURCE: ESRI, 2019; DWR, 2019; ESA, 2019.

Perris Valley Channel Historic Resources Evaluation Report

Figure 3
Perris Valley Channel Detail

ESA

Regulatory Requirements

Federal Regulations

National Historic Preservation Act, as amended (1966)

Historic resources are protected through the NHPA of 1966, as amended (16 U.S.C. 470 et seq.), and its implementing regulation, Protection of Historic Properties (36 CFR Part 800). Under the NHPA, a historic resource is considered significant if it meets the Criteria for Evaluation (36 CFR 60) for the NRHP.

Prior to implementing an "undertaking" (i.e., "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval"), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that would potentially affect properties listed or eligible for listing in the NRHP. The lead federal agency is responsible for project compliance with Section 106 of the NHPA.

National Register of Historic Places

The NRHP was established by the NHPA of 1966, as "an authoritative guide to be used by federal, state, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). The NRHP recognizes both historic and prehistoric properties that are significant at the national, state, and local levels.

To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. As indicated in Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to an Indian tribe are eligible for inclusion in the NRHP. Districts, sites, buildings, structures, and objects of potential significance must meet one or more of the following four established criteria (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

Unless the property possesses exceptional significance, it must be at least 50 years old to be eligible for NRHP listing (36 CFR 60.4).

In addition to meeting the criteria of significance, a property must have integrity, meaning the ability of a property to convey its significance. The NRHP recognizes seven qualities that, in various combinations, define integrity. To retain historic integrity a property must possess several of these seven aspects. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association (36 CFR 60.4).

State Regulations

California Environmental Quality Act

CEQA (codified at California Public Resources Code [PRC] Section 21000 et seq.) is the principal statute governing environmental review and approval of discretionary projects occurring in the State. CEQA requires lead agencies to determine, prior to approval, if a project would have a significant adverse effect on historical resources.

The state CEQA Guidelines generally recognize that a historical resource includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR) (PRC Section 5024.1); (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record (CEQA Guidelines, Section 15064.5[a]).

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the CRHR are based upon NRHP criteria (PRC Section 5024.1[b]; 14 California Code of Regulations Section 4850 et seq.).

To be eligible for the CRHR, a historic-period property can be considered significant at the local and/or state level under one or more of the following four criteria, based on the NRHP significance criteria. A resource may be eligible for the CRHR if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

The CRHR generally follows the age requirement set forth in the National Register, that is, resources may be considered for evaluation if they are more than 50 years old. Historical resources achieving significance less than 50 years may also be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand it historical importance (California Code of Regulations, Title 14, Chapter 11.5, 4852[d][2]). For this reason, and to give sufficient time for reporting and review, resources more than 45 years of age can be considered.

A resource eligible for the CRHR must meet one or more of the criteria of significance described above, and also retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance.*

Additionally, the CRHR consists of resources that are automatically listed and those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed in the NRHP and those formally determined eligible for the NRHP;
- California Registered Historical Landmarks from No. 770 onward; and
- Those California Points of Historical Interest that the state Office of Historic Preservation (OHP) has evaluated and recommended to the State Historical Resources Commission for inclusion on the CRHR.

Other resources that may be nominated to the CRHR include:

- Historical resources with an NRHP code of 3 through 5 (those properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register);
- Individual historical resources;
- Historical resources contributing to historic districts; and
- Historical resources designated or listed as local landmarks, or designated under any local ordinance.

* The seven aspects of integrity are the same as those used for NRHP eligibility.

Historic Context

History of the Project Vicinity

In 1850, two years after the discovery of gold in the mountains of eastern California, the land entered into the Union as the 31st state of the United State of America. As a result of the discovery of gold and the mass migration of fortune hunters to both southern and northern California, the population of the region increased dramatically and development of urban areas swelled with new residents. The transcontinental railroad came to the region in 1869, facilitating industry and drawing additional settlers to the area. As a result, the city of Riverside became the first of the relatively high population areas in what is now Riverside County. In 1893, voters living within San Bernardino County (to the north) and San Diego County (to the south), approved the formation of Riverside County. On May 9, 1893, the County was officially formed, and the County Board of Supervisors was elected. The County's early years were linked to the agriculture industry, especially to ranching. As the 1800s gave way to the 20th century, in many places, cattle ranches were gradually replaced by citrus farming and agriculture. Concurrently, commerce, construction, manufacturing, transportation, and tourism took hold. Together these efforts fueled an economic engine that contributed substantially to the region's rapid growth in recent years (County of Riverside, 2019a; City-data.com, 2012).

As the area that eventually became incorporated as the city of Perris, authorities of the Santa Fe Railway recognized the burgeoning economy and constructed the Santa Fe Railway, connecting the area southward en route to San Diego in 1881. With this new transportation corridor, settlers amassed in the area and by 1885, the city of Perris experienced a period of rapid construction. Even with the passing of the railroad, the region’s development as a substantial agricultural-based economy kept development in the Perris Valley relevant to the larger commercial economy (City of Perris, 2012).

March Air Reserve Base

March Air Reserve Base, previously known as March Air Force Base, opened in 1917 as the United States anticipated the nation’s entry into World War I. At this time, the War Department had announced its intentions to build new military installations on the west coast, and California notables such as Frank Miller (owner of the Mission Inn in Riverside) and California Governor Hiram Johnson succeeded in securing government approval to construct an airfield at Alessandro Field located near Riverside. In 1918, within 60 days of commencement of the construction program, the plain of Moreno Valley had been transformed to include twelve airplane hangars, six barracks equipped with 150 airmen each, mess halls, a machine shop, a post exchange, a hospital, a supply depot, an aero repair building, a bachelor officer’s quarters and a residence for the commanding officer. By 1927, March Field, as it was then called, began constructing new structures, quickly becoming a permanent military installation. This permanence was further realized in the decade before World War II when March Field took on much of its current appearance (March Air Reserve Base, 2010).

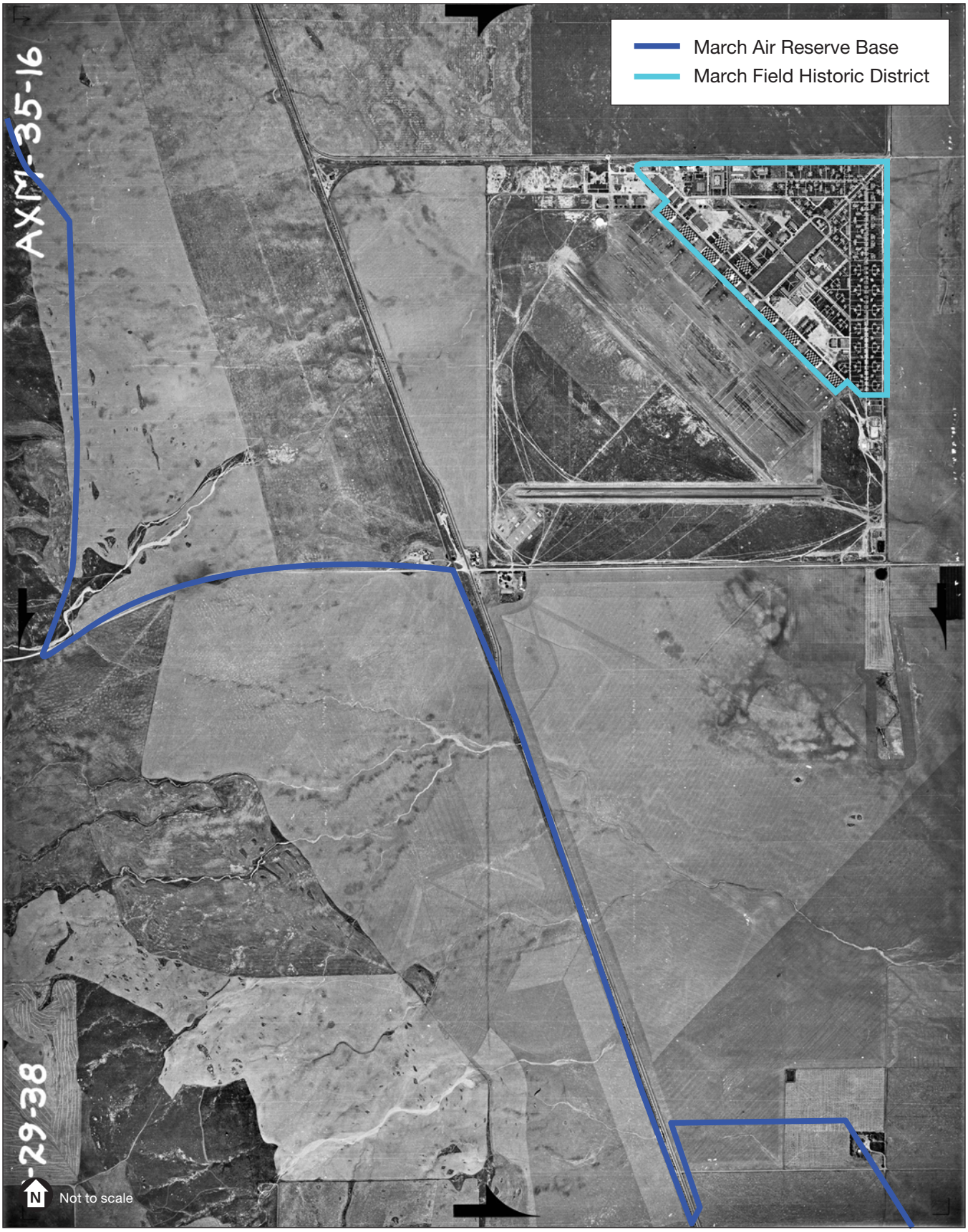
The first phase of permanent buildings was completed in 1934. During the period of World War II, the base doubled its footprint (March Air Reserve Base, 2010). In 1941, the original 640 acres reserved for the military installation were more than doubled through acquisition of 950 acres adjoining the site (*Los Angeles Times*, January 8, 1941). Also around this time, the government procured a similarly-sized tract west of the San Diego Freeway that bordered the base and established Camp Hahn as an anti-aircraft artillery training facility. This new construction included six mess halls, 215 tents, two warehouses, a post exchange, infirmary, a gas station, an administration building, a recreation building, a motor repair shop, and two magazines. The proposed plans included construction for utilities and telephone services, and would be supported by 85,00 troops at the height of its activity (*Los Angeles Times*, April 4, 1941). In 1946, Camp Hahn became a part of March's real estate holdings when operations at the base returned to peacetime procedures (March Air Reserve Base, 2010).

Figures 4 and 5 show the growth and development of the base between the years of 1938 and 1953. As the March Air Force Base grew both in size and in numbers of service members needed to support the facility, so grew its need for further resources and improvements to its infrastructure. The creation of the Perris Valley Channel in the 1950s helped resolve drainage issues associated with the growing population at the base. Hancock Street, which marks the southeastern perimeter of the base, includes the location where the March Air Reserve Base drains into the Perris Valley Channel at the intersection of Hancock Street and East Oleander Avenue.

A portion of the March Air Reserve Base was listed in the NRHP as March Field Historic District in 1994 (Mikesell and Wee, 1992). The March Field Historic District was found to be significant under Criterion A in the area of military history for its association with the development of the Air Corps on the West Coast, serving as the key training and bombardment post on the West Coast. The March Field Historic District was additionally found to be significant under NRHP Criterion C for its architectural merit as a monumental example of the work of Myron Hunt and his approach to site planning. Hunt, a nationally renowned master designer from Pasadena, was recognized for implementing city planning ideas in military base design during the 1930s. March Field represents an exceptionally large and intact collection of hollow wall concrete buildings resulting from Hunt's influence (Mikesell and Wee, 1992).

March Field Historic District covers 158 acres and includes a total of 228 buildings, structures, and objects, of which 199 contribute to its significance. In addition to other built environment components, the plan or formal layout of the base and landscaping elements contribute to the significance of the district. March Field Historic District is triangular in shape and is bound by Meyer Drive on the north, Riverside Drive on the east, and a line of hangars paralleling Graeber Street on the west (see Figure 4). The period of significance was identified as 1928 to 1943 (Mikesell and Wee, 1992).

One of the contributing elements of the Historic District is a stone-lined drainage canal, which extends along Meyer and Riverside Drives, at the northern and eastern perimeters of the Historic District. This canal was installed in 1942 by Works Progress Administration workers. While the canal extends beyond the Historic District's boundaries, only those portions within the Historic District are considered contributing (Mikesell and Wee, 1992).

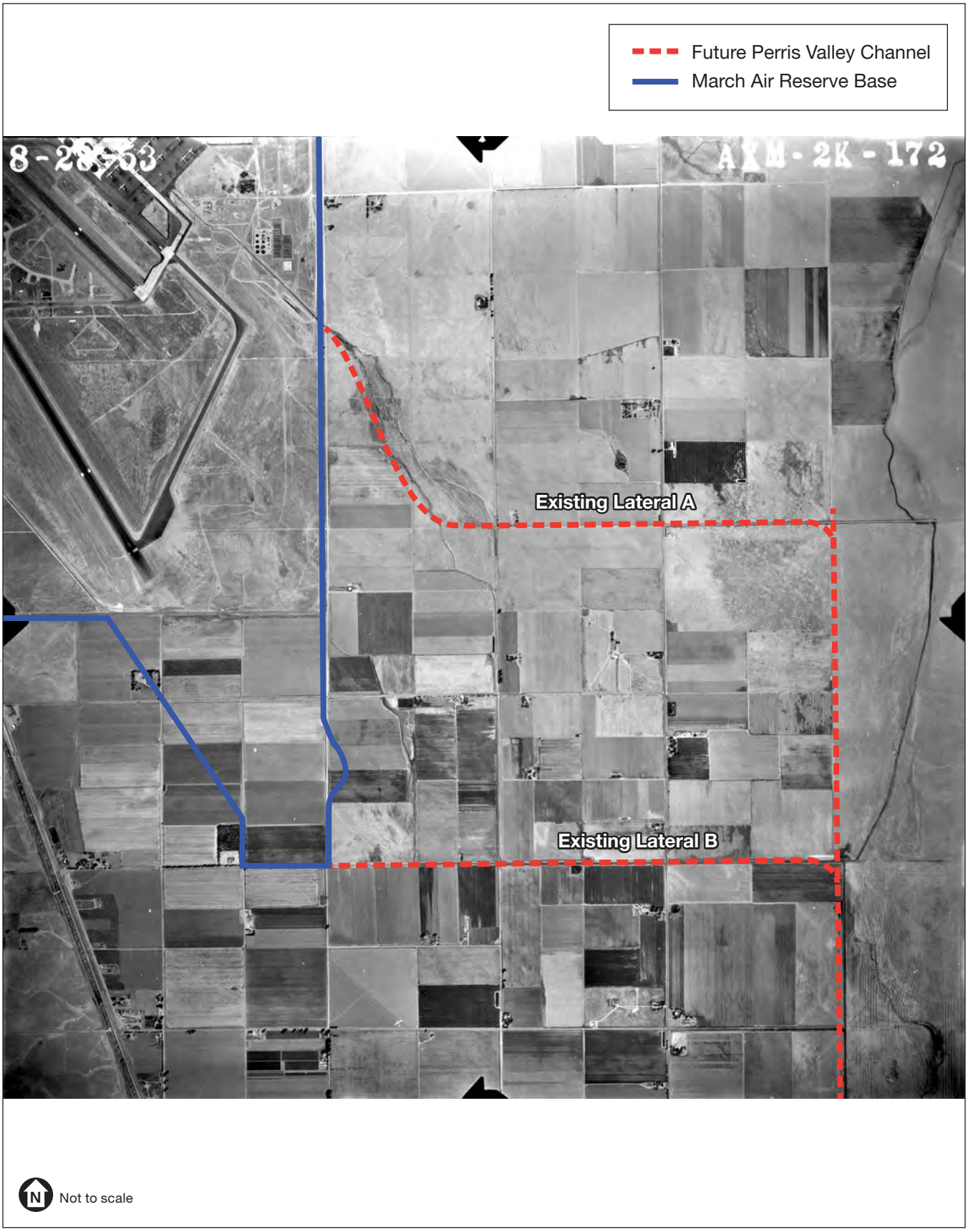


SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 4
Aerial of March Air Reserve Base, May 1938

ESA



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SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 5
Aerial Photograph, August 1953

ESA

Water Management in Riverside County

Water has been an important factor in the agricultural, commercial and residential development of the area, but its control has proved difficult and past flooding has resulted in overwhelming consequences for the region. According to information provided by the Riverside County Flood Control and Water Conservation District (RCFCWCD), 15 years after the creation of the county, citizens in the San Jacinto Valley formed the San Jacinto Levee District to address the devastating damage wrought by storm waters since the area's first historic-era habitation. Efforts to control flood waters began in 1908 with local property owners levying assessments on one another in an effort to build and maintain a levee along the San Jacinto River. The sum raised locally was bolstered by financial contributions from the County, State and Federal government treasuries. This represented the initial centralized water management effort in the area and other communities soon recognized its utility and began to emulate San Jacinto's model. "Citizens in the Coachella Valley formed the Coachella Valley Storm Water District in 1915, and the Valle Vista Levee District was formed in 1932 to control flooding along Bautista Creek east of Hemet. San Bernardino County, through action of the State Legislature, created its flood control district in 1939" (County of Riverside, 2019b).

The nascent county government, still in its first 50 years of existence, also took up the mantle of a centralized water management program. Alexander Chope Fulmor, a licensed engineer and land surveyor born on August 27, 1876, in Humboldt, California, played a prominent role in the creation of the RCFCWCD. The massive 1938 floods experienced throughout the county (the largest since 1884) essentially severed the economic lifeline of a rapidly urbanizing area as the flooded Santa Ana River cut Riverside off from important markets, including Los Angeles. Following continued flood events several years thereafter, in 1943 the County Board of Supervisors asked Fulmor to document the flooding history of Riverside County and to provide a recommended course of action to manage the flood risks experienced by the county's citizens. In his report, Fulmor documented the loss of life and economic costs of flood events from 1862 to 1943. He concluded that the current ad hoc approach to protecting citizens and their property from flooding was not a viable practice as the county grew and became more urbanized. Fulmor recommended the creation of a flood control district, similar to the one that had been recently created in San Bernardino County in response to the same 1938 flood. Here, and largely attributed to Fulmor's recommendations, the Riverside Flood Control District was created by an Act of the California State Legislature on July 7, 1945 (County of Riverside, 2019b).

Brief Description of Flood Control Systems

Flood control systems are necessary to manage the flood risk for development within floodplains during severe storms. Typical components of flood control systems include dams and reservoirs, debris basins, sediment placement sites, channels, pump stations, spreading grounds, and storm drains. The system is constructed so that water is impounded behind a dam, reducing the probability of downstream flooding, while also ensuring that debris is contained. Sediments that build up are periodically removed. A series of channels function to contain and funnel water to ocean outlets. Spreading grounds receive overflow and are used to help recharge groundwater supplies (County of Los Angeles, 2015).

Conduits – Open Canals

As a means of depicting the evolution of this property type, the following context is excerpted from *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures* prepared by Caltrans and JRP Historical Consulting Services in December 2000. The context describes common components of similar water conveyance features, as well as the challenges presented by this property type, such as controlling disbursement of large quantities of water at high rates of speed, and how these issues were ultimately resolved.

> The cross section or profile of open canals varied with the material through which the conduit was constructed and with the method of construction employed. If constructed in rock, the canal tended to be more rectangular with side slopes as steep as 1:0.5; in earth, the canal shape became more trapezoidal, with side slopes varying from 1:1 to 1:5, depending on material. Early canals that were built with scrapers in the alluvial soils of the Central Valley had rounded bottoms and long side slopes, with rounded berms mounded up on each side of the cut. In similar locations, irrigation channels cut with modern machinery and blades have a V-shape, with steep side slopes and flat broad berms.
>
> In terms of the ratio between width and depth, the most hydraulically efficient canal would have a hydraulic radius one-half the water's depth. Therefore, the canal's width would be twice the depth. However, in sidehill locations, is it more economical to construct a narrower, deeper canal, and in practice, canal builders often adopted a design based on economy, rather than the most hydraulically efficient one. A 1934 study noted that in California the hydraulic radius on hydroelectric canals varied from 0.5 to 0.8 the water depth, with the average being about 0.6. Figures for hydraulic mining canals and irrigation canals seem similar. The reason for any substantial variation from this ratio should be investigated. For example, a different ratio might be used to reduce ice formation in a cold climate, where narrow, deep canals are less subject to freezing over than wide, shallow ones of the same capacity.
>
> In general, in any arid or semi-arid climate, water systems operators and managers try to minimize losses due to evaporation and seepage. In California, hundreds of miles of previously earthen ditches have been lined with some less permeable surface or placed in pipe. Lined canals can also carry more water by moving it faster, and the lining can prevent scour of banks and bottom from running water at high velocity.
>
> In the nineteenth century, canals were lined with randomly coursed stone paving or cobblestone, usually drylaid, 12 to 18 inches thick. In the twentieth century, concrete and shotcrete (gunite) linings averaging between two and four and one-half inches in thickness have been standard. Concrete canals have a greater carrying capacity than a rough stone or earthen canal, carrying about twice the water in the same space. Thus, if an irrigation company or agency had sufficient capital, lining canals in concrete achieved many potential goals: it decreased maintenance costs, lessened loss by seepage, and increased carrying capacity.

Perris Valley Channel

The Perris Valley Channel is an approximately 9-mile-long man-made drainage channel constructed in 1955 by the RCFCWCD to convey storm water runoff. It currently serves as the primary collector of storm water in the northern part of the cities of Perris and Moreno Valley. The channel extends from its initial origin at Heacock Street at the southeastern perimeter of March Air Reserve Base (formerly March Field and later March Air Force Base) in the city of Moreno Valley through the city of Perris to the San Jacinto River. The RCFCWCD currently owns the right-of-way and maintains the channel along its entire reach (County of Riverside, 1987; 2019b).

The Perris Valley Channel, sometimes referred to as the Perris Valley Storm Drain, is a largely unlined canal originally constructed in the 1950s to alleviate drainage issues associated with a late, post-war expansion at the March Air Reserve Base. Since its initial installation, the Perris Valley Channel has been broadened, deepened and improved to allow for further non-historic period commercial, residential, and industrial development in the drainage area. As a result of these modifications, the Perris Valley Channel currently runs from the southern boundary of March Air Reserve Base and conveys storm water in a southerly direction until it terminates in the San Jacinto River. According to the city of Perris, the Perris Valley Channel is currently among the main drainage features in the San Jacinto watershed, conveying water from March Air Reserve Base south to its natural headwaters in the San Jacinto Mountains towards Canyon Lake and ultimately to Lake Elsinore (City of Perris, 2017).

Originally, the Perris Valley Channel was only meant to handle water flow associated with minor storm events. At the time the *Master Drainage Plan for the Perris Valley Channel* (County of Riverside, 1987) was created, only the Ramona Expressway and Nuevo Road were bridged, while all other streets surrounding the channel had dip crossings, which became impassable during storm events. As development in the surrounding areas increased and transformed from predominantly agricultural uses to industrial and residential uses, so did the need for adjustments and alterations to the channel and its drainage capacity. Several alternatives were investigated in the 1987 plan for improvements to the channel. These ranged from a fully concrete-lined trapezoidal channel to an unlined graded earth channel, which could also be utilized as a greenbelt. Where feasible, the unlined graded earth channel was chosen as the recommended plan as it provided for flood protection while offering the option of developing recreational joint uses.

Since its initial construction in 1955, the Perris Valley Channel has been deepened, broadened and expanded to allow for significant commercial and residential development in the area. As a result of the non-historic period development and current reliance on the water conveyance feature, the Perris Valley Channel is considered to be an important modern component of present-day Perris' storm draining system (County of Riverside, 1987).

Additionally, the plan recommended that downstream of the Ramona Expressway, the channel should be an unlined graded earth section with flat 12:1 side slopes and a 250-foot bottom width. Due to the low flow velocities, the channel could be grass lined and even maintained as a park, in the region reaching from the San Jacinto River corridor to the Lake Perris Recreational Area.

Upstream of the Ramona Expressway, however, a conventional channel was proposed with concrete side slopes and a soft bottom. This was due to the higher velocities of water flow in this area. The *Master Drainage Plan for the Perris Valley Channel* (County of Riverside, 1987) also suggested a fully incised channel from the San Jacinto River to the upper terminus at Heacock Street.

Over time, the channel has been not only modified as new approaches to water management challenges have been employed, but the water conveyance structure has also been expanded. In order to accommodate future storm water volumes from adjacent development, the channel has been significantly deepened and lengthened to reach all areas of Perris. As a result of these modifications implemented since the 1987 release of the *Master Drainage Plan for the Perris Valley Channel* nearly all city storm drains flow laterally into the Perris Valley Channel from both the east and west.

The Perris Valley Channel Lateral A was completed in 1996. The Perris Valley Line J, Stage 3 was completed in 1998. The Perris Valley Channel Stage 1 was completed in 1999. The Perris Valley Channel Lateral B was completed in 2006 (County of Riverside, 2019b).

As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had been constructed to its fully planned width with a designed capacity of 16,000 cfs. However, the portion south of Ramona Expressway had yet to be constructed to its full width and designed capacity of 17,300 cfs (ESA, 2016).

Archival Research

Archival research included a review of the following sources:

- University of California Santa Barbara (UCSB) online aerial photography collection
- Library of Congress Digital Collections available online
- Calisphere – University of California Libraries, Digital Library Database
- Los Angeles Times Historical Archives available online through the Los Angeles Public Library Database

Aerial photographs of the site demonstrate the development of the area over time. The first aerial available for this location is from 1938 (**Figure 6**). The image depicts the Project area as undeveloped rural land. Land partitions are visible, as well as rock formations, and to the east, only the Bernasconi Hills and surrounding fields are present. The aerial from 1953 focused on the area of the Perris Valley Channel near the March Air Reserve Base – little appears to have changed in terms of development of the area (**Figure 7**). However, an irrigation ditch within the Perris Valley Channel footprint is visible near the present intersection of East Evans Road and the Ramona Expressway (**Figure 8**). The historic aerial depicted in **Figure 9** demonstrates the location of the where the Perris Valley Channel would be installed just two years later, in 1955 at its southernmost point, near the San Jacinto River, in the same year (1953). However, early formations of the channel are not yet visible in this location at this time. The following 1957

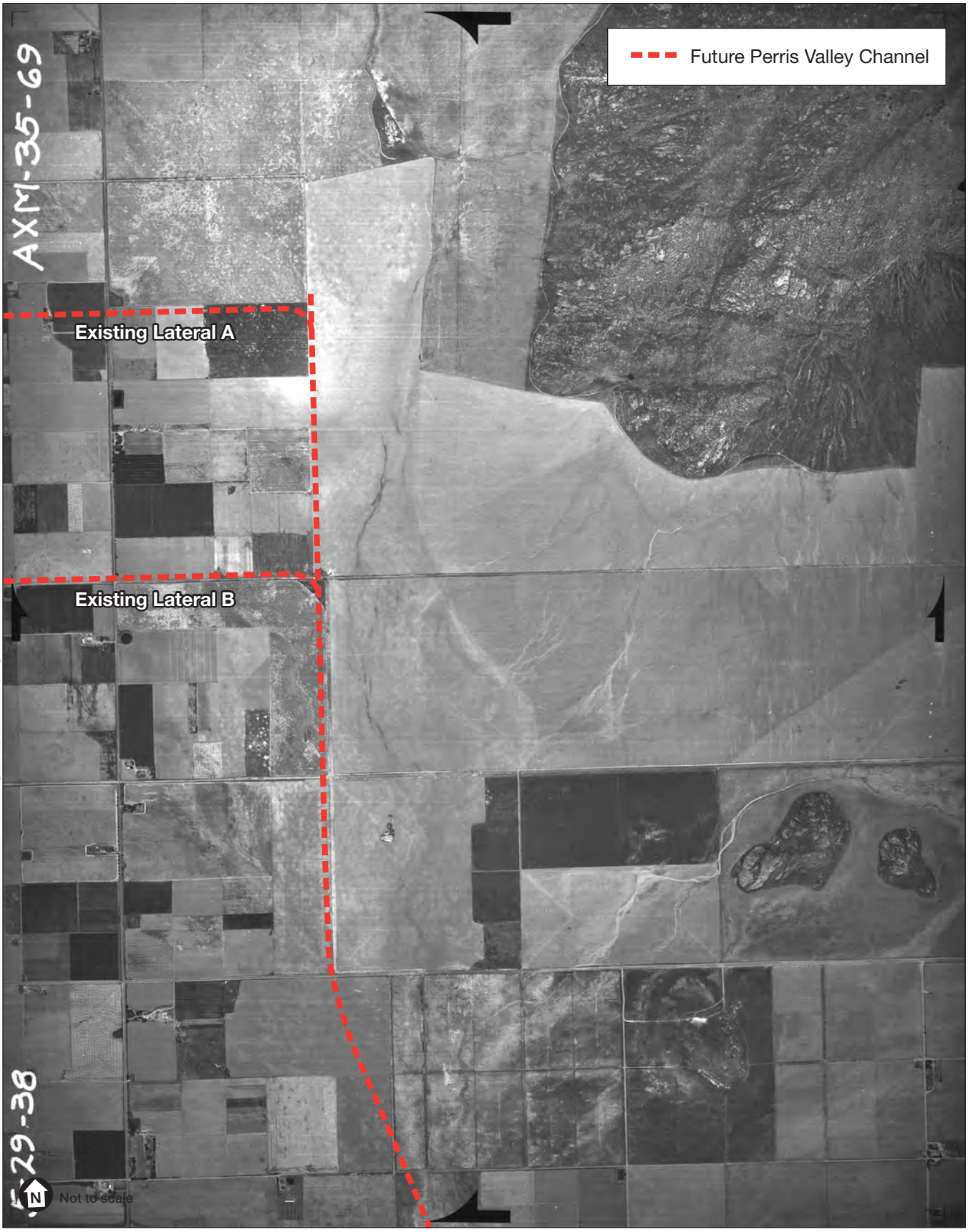
aerial subsequently shows the Perris Valley Channel already in place and in function near East Evans Road and the Ramona Expressway (**Figure 10**). Apart from the channel, the rest of the area remains undeveloped farmland with some structures, most likely houses or other buildings utilized for farming purposes, also beginning to appear in the area.

In the next available aerial from 1962, the Perris Valley Channel appears to be fully installed and functional near the March Air Reserve Base (**Figure 11**)**.** In the next aerial image from that year, the Perris Valley Channel is visible, and signs of water management have begun to appear east of the channel, starting from what is now Lake Perris Drive, towards the area where the reservoir currently lies (**Figure 12**). At this time, the channel appears to be fully constructed and in function at this location.

The 1976 aerial clearly shows the extent of the Perris Valley Channel, as it starts (from the northern terminus) from the March Air Reserve Base and travels southeast towards East Evans Road, then further south, past the Ramona Expressway and the city of Perris to the San Jacinto River (**Figure 13**).

Field Survey

A pedestrian field survey of the Perris Valley Channel was completed by ESA Managing Architectural Historian Joel Levanetz, M.A., RPA, AICP on June 28, 2019. The survey was aimed at documenting the current condition of the Perris Valley Channel. To this end, the Perris Valley Channel was recorded on California Department of Parks and Recreation (DPR) 523 Series forms (**Appendix B**).



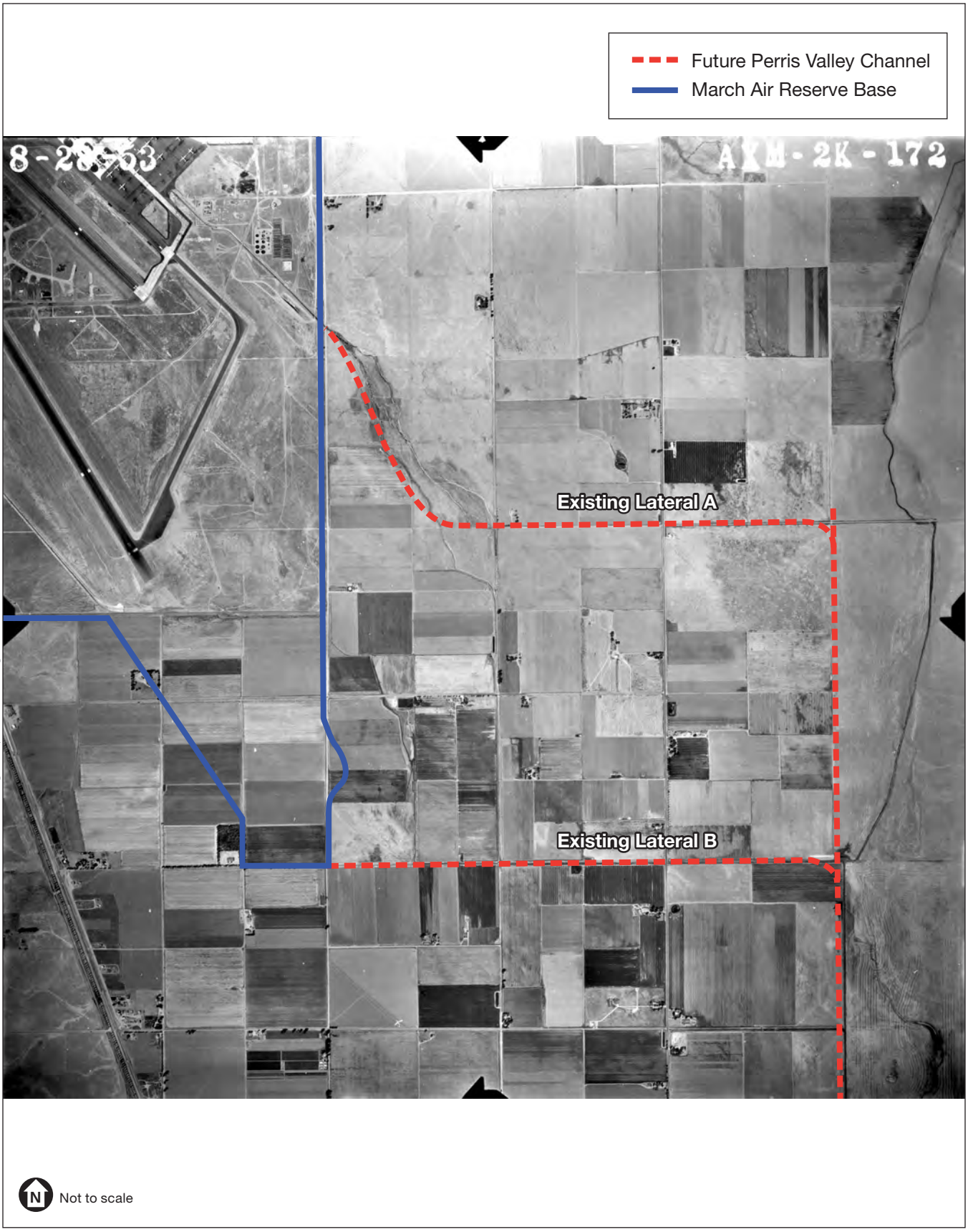
D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 6
Aerial Photograph, May 1938

ESA



D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 7
Aerial Photograph, August 1953

ESA

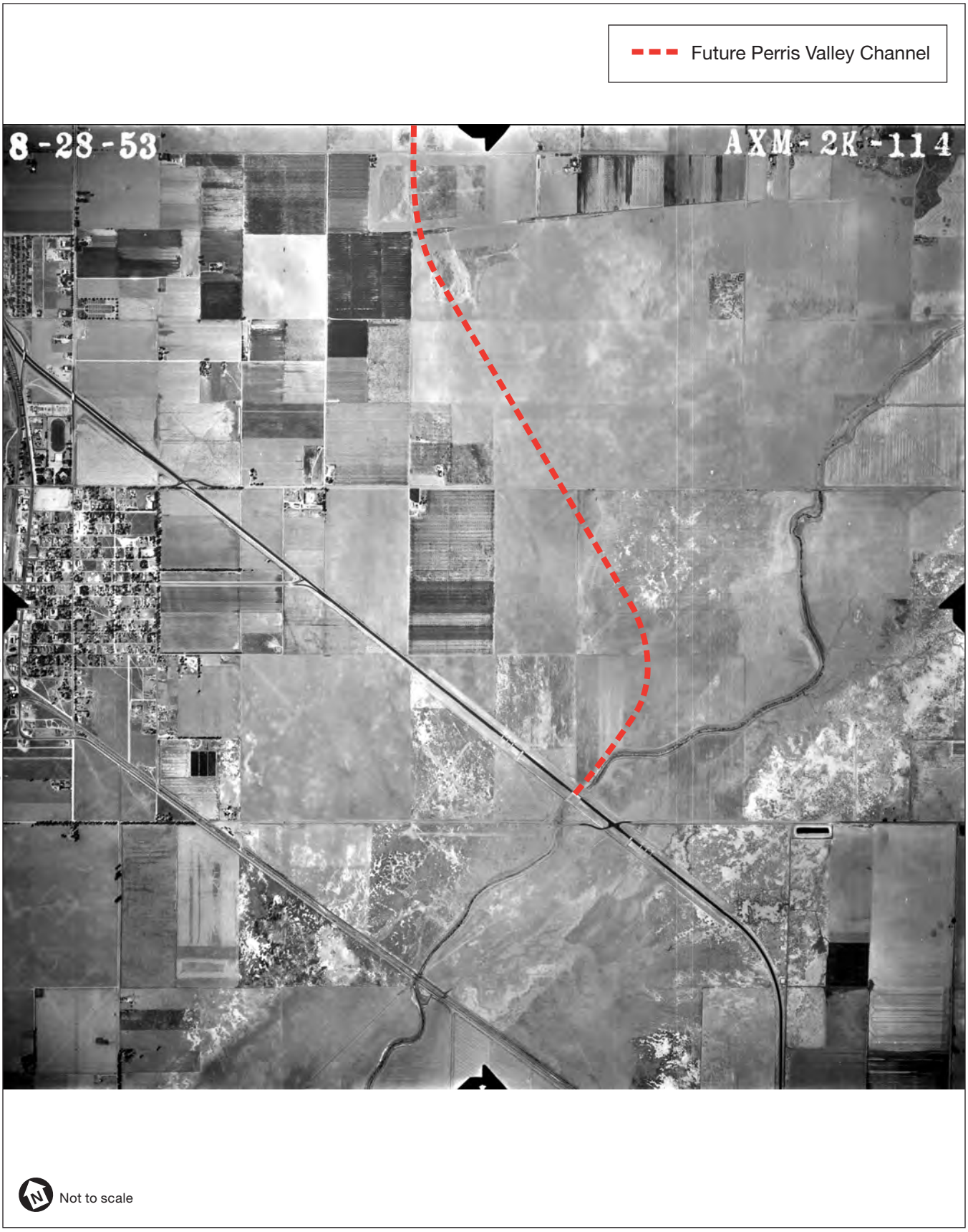
D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 8
Aerial Photograph, August 1953

ESA



D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 9
Aerial Photograph, August 1953

ESA

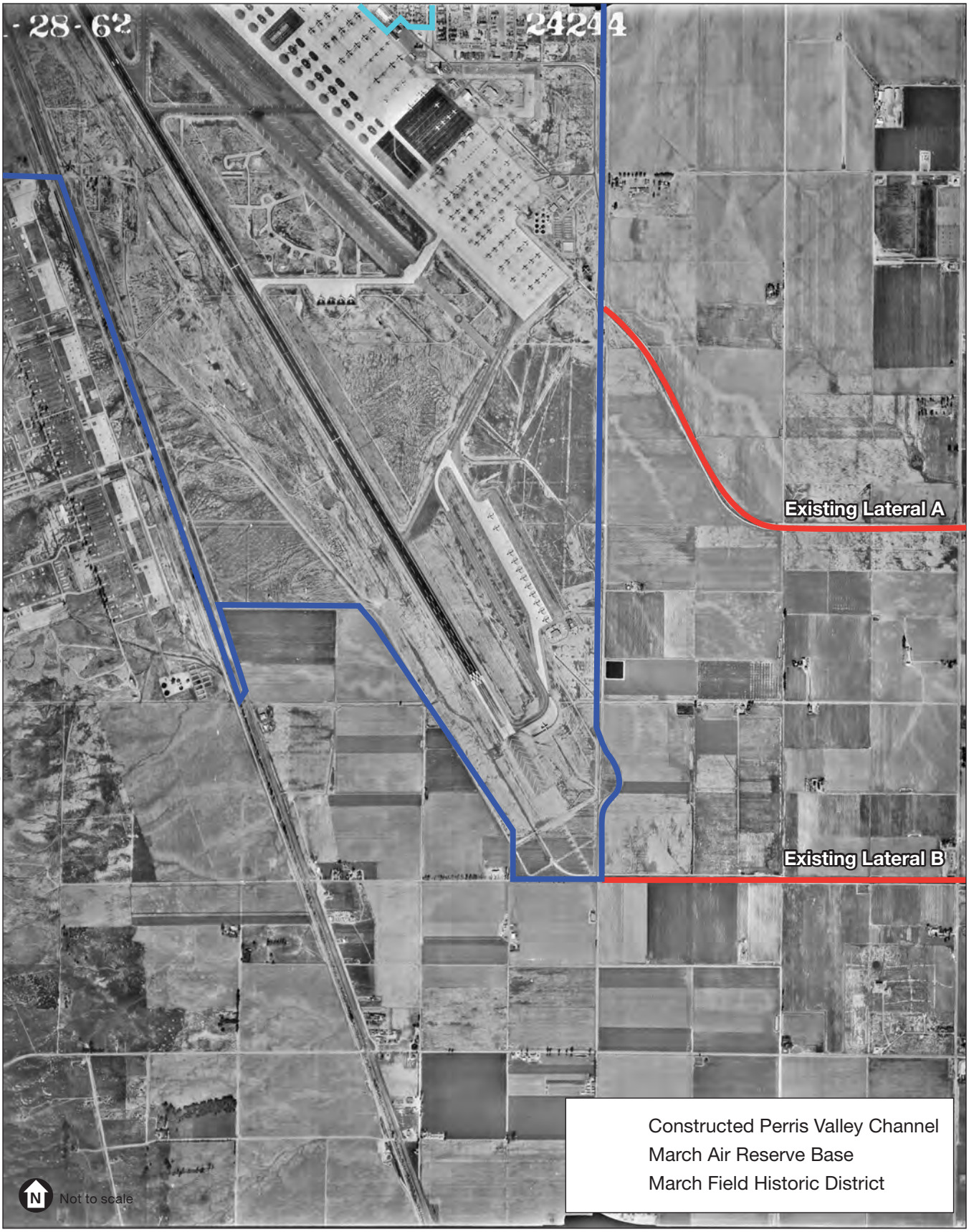
D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 10
Aerial Photograph, December 1957

ESA



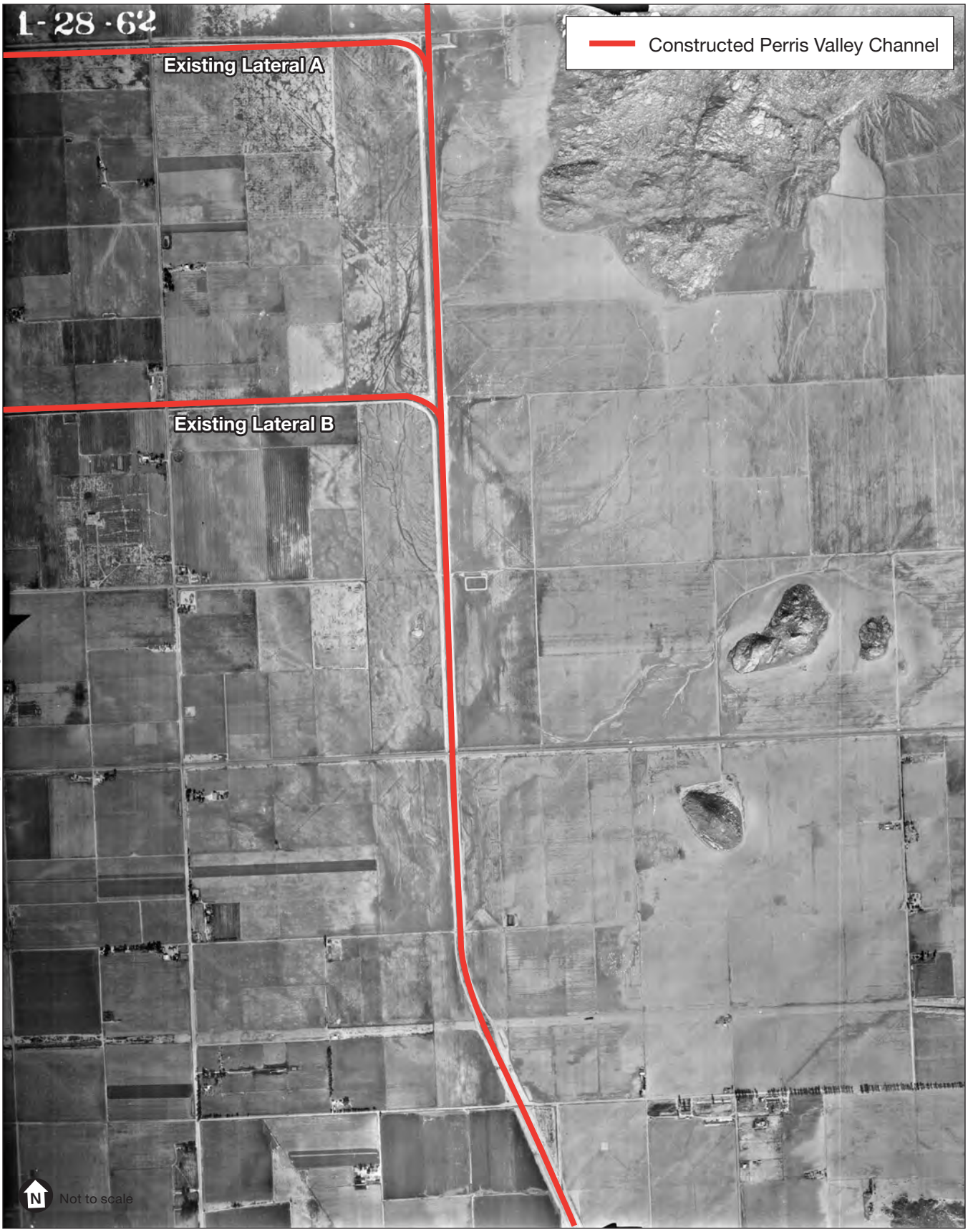
D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 11
Aerial Photograph, January 1962

ESA



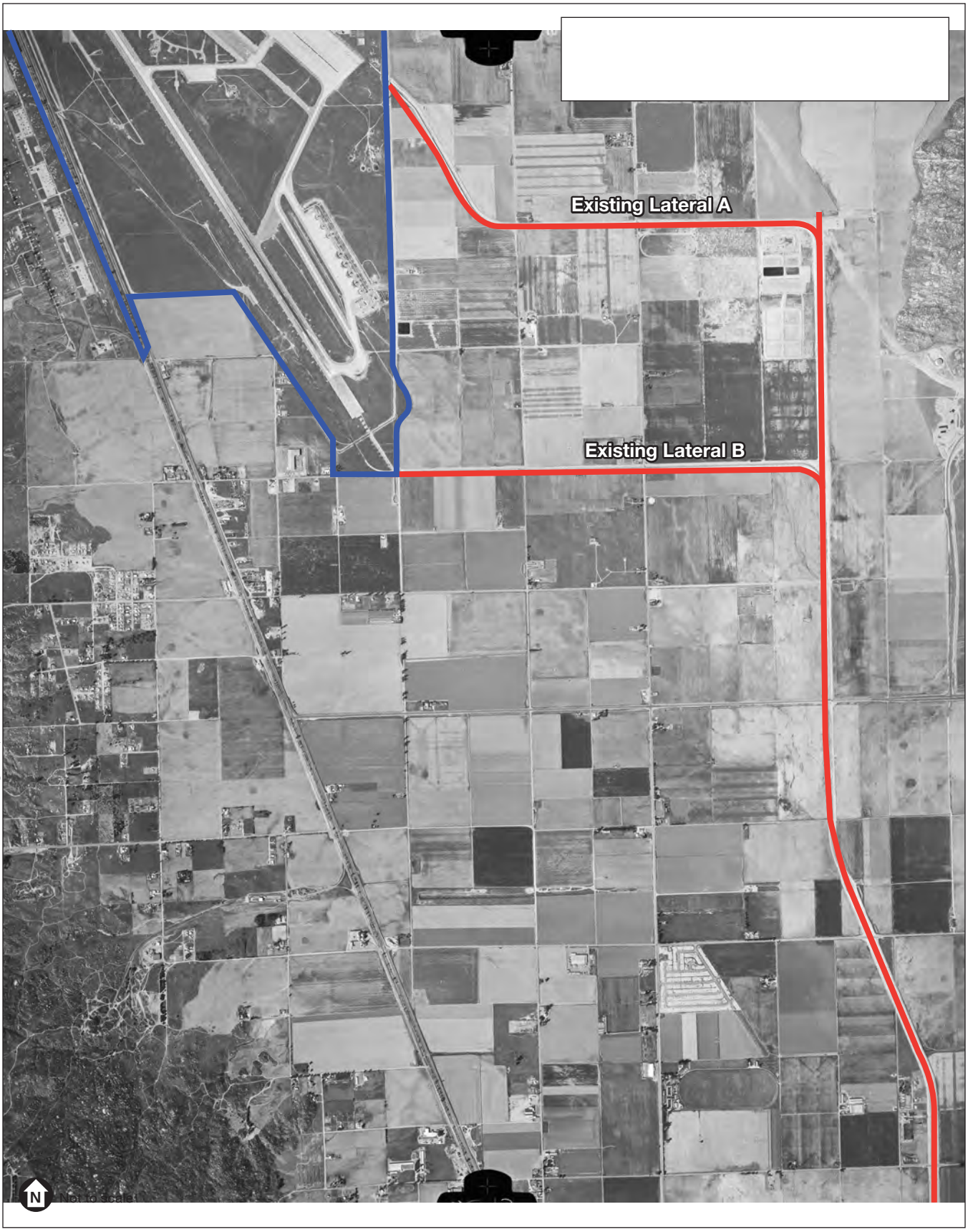
D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evalu ation Report

Figure 12
Aerial Photograph, January 1962

ESA



D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: UCSB

Perris Valley Channel Historic Resources Evaluation Report

Figure 13
Aerial Photograph, 1976

ESA

During the site survey, the qualified architectural historian observed, recorded and photographed numerous improvements to the Perris Valley Channel constructed within the last two decades. Among the most notable improvements was a large pre-cast concrete box culvert immediately northeast of where the Perris Valley Channel extends below the Ramona Expressway (**Figure 14**). Additional improvements observed during the field visit evidenced the channel's role in diverting floodwaters to allow for development opportunities and the infrastructure needed to sustain an increase in population. As depicted in **Figure 15**, a recent single-family residential development was constructed just south of the Ramona Expressway within the last two decades. Concurrently improvements to the shoulder of the Perris Valley Channel were implemented to serve as a recreational feature for the new residents of the area (**Figure 16**).

Alongside the residential development, improvements to the channel, such as its widening and the installation of box drains to improve floodwater drainage, have attracted commercial interest to the vicinity (**Figure 17**). Here, a number of large commercial facilities have been erected to the northwest of the Project area. As noted during the field survey, these expansive, recently-constructed centers, alongside the sprawling new subdivisions to the southeast, characterize the new profile of the built environment facilitated by the significant improvements to the Perris Valley Channel that are otherwise difficult to perceive for this property type (**Figure 18**).

Resource Description

Constructed in 1955 as a man-made drainage channel, the Perris Valley Channel conveys storm water from the greater Perris area to the San Jacinto River. Alongside improvements initiated by the RCFCWCD, the Perris Valley Channel was installed to help alleviate drainage problems associated with the expansion of March Air Reserve Base. As a whole, the channel is considered an important element of Perris' storm draining system. It is currently constructed to its full width north of Ramona Expressway with the southeastern wall just north of the Ramona Expressway serving as the western perimeter of the current Project area (see Figures 17 and 18).

Resource Evaluation

Although not visually inspected in its entirety as part of the current investigation, the following discussion provides an evaluation of the of the Perris Valley Channel as a whole under Criteria A/1 – D/4 of the NRHP and the CRHR, respectively. The evaluation includes approximately 9 miles of the linear water conveyance resource that stretches from March Air Reserve Base northwest of the current Project area to the San Jacinto River to the south. The National Park Service's Bulletin 15, *How to Apply the National Register Criteria for Evaluation* (U.S. Department of the Interior, 1997) was used for guidance when evaluating the Perris Valley Channel.

Based on the evaluation, the Perris Valley Channel is recommended not eligible for listing in the NRHP and CRHR under criteria A/1-D/4.

SOURCE: ESA, 2019

Perris Valley Channel Historic Resources Evaluation Report

Figure 14
Looking South at Perris Valley Channel and Ramona Expressway, June 2019

ESA

D170020.00 - DWR SoCal On-Call for Env Services\01 Active Contract Tasks\D170020.03_ERF Permitting\05 Graphics-GIS-Modeling\Illustrator

SOURCE: Google Earth, 2019

Perris Valley Channel Historic Resources Evaluation Report

Figure 15
Aerial Photograph, 2019

ESA

SOURCE: ESA, 2019

Perris Valley Channel Historic Resources Evaluation Report

Figure 16
View of the Perris Valley Channel (left) and Bike Path (center) North of Ramona Expressway, view to the South

ESA

SOURCE: ESA, 2019

Figure 17
View of the Perris Valley Channel (right) and Bike Path (center) North of Ramona Expressway, view to the North

ESA

SOURCE: ESA, 2019

Figure 18
Overview of the Perris Valley Channel, view to the North

Criterion A/1

Efforts to control flood waters in the region began in 1908, with local property owners levying assessments on one another in an effort to build and maintain a levee along the San Jacinto River. This represented the initial centralized water management effort in the area. The massive 1938 floods caused extensive and costly damage, loss of life, and severed the economic lifeline of a rapidly urbanizing area as floodwaters cut ties to important markets, such as Los Angeles. Damage sustained during continued flood events spurred the Riverside County Board of Supervisors to take action. In 1943, the Board commissioned a report on how to manage future flood risks. Alexander Chope Fulmor, author of the report, recommended creation of a flood control district, similar to the one that had been recently formed in San Bernardino County in response to the same 1938 flood. As a result, the Riverside Flood Control District (later known as the RCFWCD) was created by an Act of the California State Legislature in 1945.

In the 1950s, March Air Reserve Base was under expansion, creating drainage issues in the Perris Valley. The base served as the key training and bombardment facility on the West Coast between 1928 and 1943 and is significant in the annals of history for its association with the development of the Air Corps on the West Coast. In 1994, a portion of the base was designated as the March Field Historic District and is listed in the NRHP under Criterion A for its association key training and bombardment facility in the region from 1928 to 1943 (the Historic District is located about 1 mile from the Perris Valley Channel).

The Perris Valley Channel was constructed in 1955 by the RCFCWCD, concurrent with federally funded initiatives. The largely earthen, man-made drainage channel was designed to help alleviate drainage problems associated with the expansion of the March Air Reserve Base. As the area attracted more residents and businesses, the channel later served as one of the main components of the flood control system within the Perris Valley, carrying runoff from neighboring residential and commercial developments (Riverside County, 1987).

While the creation of the Perris Valley Channel alleviated drainage issues associated with the growth of the March Air Reserve Base, the timeframe of its construction falls outside of the period of significance for the March Field Historic District and fails to contribute to the established Historic District. Further, the channel's creation has allowed for development of the surrounding area, such as residential neighborhoods, commercial ventures, and associated infrastructure. Despite its recent relevance in supporting local land development, the Perris Valley Channel is not associated with early 19th century settlement of the Perris Valley, nor is it directly related to the 1938 flood and creation of the Riverside Flood Control District (precursor of the RCFWCD) in 1945. Rather, as noted, it was constructed to alleviate drainage issues on March Air Reserve Base and its relevance has become more closely associated with allowing for non-historic period regional growth and development within the last two decades.

The Perris Valley Channel does not appear to be associated with a specific event or pattern of events or trends that have made a significant contribution to the history, settlement, or development of March Air Reserve Base or Perris Valley. The Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion A/1.

Criterion B/2

Under Criterion B/2, a property is eligible for listing in the NRHP/CRHR if it is associated with a significant individual or the life of a person important in our past. Additionally, the property must be associated with the individual's productive life, and is typically the individual's home, business, office, laboratory, or studio (the property that best represents their contribution). Furthermore, an individual's association with the property must be well documented and not merely speculative. Research did not reveal that the Perris Valley Channel is strongly associated with significant individuals or the lives of persons important in our past. The Perris Valley Channel was designed and constructed by the RCFCWCD, and no specific government official, engineer, project manager, or other individual was identified as associated with its design or construction. While Alexander Chope Fulmor, a prominent engineer and land surveyor, was integral to the creation of the first flood control district in Riverside County, research did not indicate that he was directly tied to or responsible for the creation of the Perris Valley Channel. Regardless of any speculative ties to the Perris Valley Channel, Fulmor's productive life would be better represented by his office, home, or studio. As such, the Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion B/2.

Criterion C/3

The Perris Valley Channel was originally constructed in 1955 as an earthen channel used to alleviate drainage issues associated with the expanding March Air Reserve Base. As a largely earthen water conveyance feature, the Perris Valley Channel is representative of a rudimentary method of construction. It did not introduce design innovations nor is it an example of an evolutionary trend in engineering. By the 1950s, use of a concrete lining had been well established as a construction method, and unlined earthen channels are more representative of an outmoded method of construction. Lined canals were able to transport more water by moving it faster. In the 20th century, when the Perris Valley Channel was constructed, concrete and shotcrete (gunite) linings were standard as they decreased maintenance costs and increased carrying capacity.

The channel's design and construction elements are not considered momentous in the history of water conveyance design, engineering, or construction. Additionally, archival research did not reveal that the Perris Valley Channel was designed by a master craftsman – it was designed and constructed by the RCFWCD and is not associated with a particular individual.

Since the original construction of the Perris Valley Channel, contemporary commercial and residential development in the area has introduced non-historic materials, such as culverts, concrete boxed drains and modern paved pathways for bicycle and pedestrian use. Particularly, the Perris Valley Channel has been heavily modified (widened, deepened and lengthened) over the last half of the 20th century in order to facilitate greater regional growth and attempts to address the demand for flood control mitigation. Major modifications took place as a result of the 1987 *Master Drainage Plan for the Perris Valley Area* – Lateral A was completed in 1996; Line J, Stage 3 was completed in 1998; Stage 1 was completed in 1999; and Lateral B was completed

in 2006. As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had also been constructed to its fully planned width with a designed capacity of 16,000 cfs.

In addition, more substantial visual modifications along the public right-of-way were constructed after 2006, according to a review of aerial photographs and supported by field observations. Here, the portion of the Perris Valley Channel at the intersection of East Oleander Avenue and Ramona Expressway (where it intersects with the Undertaking) was altered within the last two decades with the introduction of box drains and culverts, as well as a modern bike path installed along reinforced, paved shoulders. These significant alterations introduced new materials, broadened the footprint of the property, and modified its profile as readily observed from the public right-of-way.

Given the modern-day modifications, the channel fails to embody significance as a historic-period water conveyance system. It does not possess distinctive characteristics of a historic type, period, or method of construction, nor does it possess high artistic values or represent the work of a master. As such, the Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion C/3.

Criterion D/4

While most often applied to archaeological districts and sites, Criterion D/4 can also apply to buildings, structures, and objects that contain important information. In order for these types of properties to be eligible under Criterion D/4, they themselves must be, or must have been, the principal source of the important information, and the information must be considered important. The Perris Valley Channel does not appear to yield significant information that would expand our current knowledge or theories of design, methods of construction, operation, or other information that is not already known about the period in which it was constructed, its method of construction, or its design. As noted above, the channel is a largely earthen water conveyance feature and represents a rudimentary method of construction found throughout the region, state and country. By the 1950s, the decade in which the channel was constructed, use of a concrete lining had been well established as a construction method, and unlined earthen channels came to represent an outmoded method of construction. As a primitive, earthen water conveyance feature, the Perris Valley Channel represents a property type that is commonplace and well-documented in our history. The 1987 *Master Drainage Plan for the Perris Valley Area*, as well as past and current plans and as-built specifications, provide sufficient data on the design and construction of the Perris Valley Channel. Additional study of the channel itself is unlikely to yield information beyond that which can be obtained by review of these existing sources and that was noted during the field survey.

Further, the property has undergone numerous and significant changes since its initial construction that have impacted its integrity. To accommodate contemporary commercial and residential development in the area, non-historic materials, such as culverts, concrete boxed drains and modern paved pathways for bicycle and pedestrian use have been introduced. Previous to these more recent developments, the Perris Valley Channel had been heavily modified (widened, deepened and lengthened) over the last half of the 20th century in order to facilitate greater regional growth and address the need for flood control. Lateral A was completed in 1996,

Line J; Stage 3 was completed in 1998; Stage 1 was completed in 1999; and Lateral B was completed in 2006. As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had also been constructed to its fully planned width with a designed capacity of 16,000 cfs. These alterations have undermined any data potential regarding 1950s methods of construction that may have been present and that could have illustrated the historical design of the Perris Valley Channel.

As such, the Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion D/4.

Summary

The Perris Valley Channel was evaluated for listing in the NRHP and CRHR under Criteria A/1-D/4 as a historic-period water conveyance feature constructed and maintained by the RCFCWCD. As a result of the current investigation, the Perris Valley Channel is recommended not eligible for listing in the NRHP and CRHR under all applicable criteria. As such, the Perris Valley Channel does not qualify as a historic property under Section 106 of the NHPA or as a historical resource under CEQA.

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Appendix A
Professional Qualifications

Margarita Jerabek, PhD

Historic Resources Director

EDUCATION

Ph.D., Art History, University of California, Los Angeles

M.A., Architectural History, School of Architecture, University of Virginia

Certificate of Historic Preservation, School of Architecture, University of Virginia

B.A., Art History, Oberlin College

30 YEARS EXPERIENCE

AWARDS

2014 Preservation Award, The Dunbar Hotel, L.A. Conservancy

2014 Westside Prize, The Dunbar Hotel, Westside Urban Forum

2014Design Award: Tongva Park & Ken Genser Square, Westside Urban Forum

Preservation Design Awards, RMS Queen Mary Conservation Plan 2012; and Restoration and Exhibit Design for Home Savings, Montebello,2016, California Preservation Foundation

PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Santa Monica Conservancy

Society of Architectural Historians, Life Member

American Institute of Architects (AIA), National Allied Member

Margarita Jerabek has 30 years of professional practice in the United States with an extensive background in historic preservation, architectural history, art history and decorative arts, and historical archaeology. She specializes in Visual Art and Culture, 19th-20th Century American Architecture, Modern and Contemporary Architecture, Architectural Theory and Criticism, Urbanism, and Cultural Landscape, and is a regional expert on Southern California architecture. Her qualifications and experience meet and exceed the Secretary of the Interior's Professional Qualification Standards in History, Archaeology, and Architectural History. Margarita has managed and conducted a wide range of technical studies in support of environmental compliance projects, developed preservation and conservation plans, and implemented preservation treatment projects for public and private clients in California and throughout the United States.

Relevant Experience

Margarita has prepared a broad range of environmental documentation and conducted preservation projects throughout the Los Angeles metropolitan area and Southern California. She provides expert assistance to public agencies and private clients in environmental review, from due diligence through planning/design review and permitting and when necessary, implements mitigation and preservation treatment measures on behalf of her clients. As primary investigator and author of hundreds of technical reports, plan review documents, preservation and conservation plans, HABS/HAER/HALS reports, construction monitoring reports, salvage reports and relocation plans, she is a highly experienced practitioner and expert in addressing historical resources issues while supporting and balancing project goals.

She is an expert in the evaluation, management and treatment of historic properties for compliance with Sections 106 and 110 of the NHPA, NEPA, Section 4(f) of the Department of Transportation Act, CEQA, and local ordinances and planning requirements. Margarita regularly performs assessments to ensure conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, and assists clients with adaptive reuse/rehabilitation projects by providing preservation design and treatment consultation, agency coordination, legally defensible documentation, construction monitoring and conservation treatment.

Margarita is a regional expert on Southern California architecture. She has prepared a broad range of environmental documentation and conducted preservation projects throughout the Los Angeles metropolitan area as well as in Ventura, Orange, Riverside, San Bernardino and San Diego counties. Beyond her technical skill, she is a highly experienced project manager with broad national experience throughout the United States. She currently manages ESA's on-call historic preservation services with the City of Santa Monica, and Los Angeles Unified School District.

EDUCATION

M.A., Public History and Teaching, University of San Diego, 2008

B.S., Anthropology and Archaeology, University of Wisconsin-Madison, 2004

15 YEARS EXPERIENCE

CERTIFICATIONS/ REGISTRATION/ EDUCATION

Registered Professional Archaeologist

PROFESSIONAL AFFILIATIONS

American Institute of Certified Planners

American Planning Association

National Trust for Historic Preservation

California Preservation Foundation

AWARDS

[insert text]

JOEL LEVANETZ, M.A., AICP, RPA

Senior Architectural Historian/Cultural Resources Specialist

Mr. Levanetz is a Secretary of Interior Professional Qualified Archaeologist, Historian and Architectural Historian. Mr. Levanetz has 15 years of experience specializing in projects involving cultural and historic resource assessments, Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) documentation, and DPR 523 series form preparation.

Mr. Levanetz has overseen projects that range in scale and complexity. As project manager, Mr. Levanetz has coordinated surveys, supervised staff and subcontractors, provided quality control for data collection and technical report writing, interacted with regulatory agency personnel, maintained client communications, tracked budgets, met crucial project deadlines and established strong networks through business development.

Mr. Levanetz has a detailed understanding of relevant regulations and ordinances that affect cultural resources and historic properties, such as Sections 106 and 110 of National Historic Preservation Act (NHPA), the National Environmental Protection Act (NEPA), the California Environmental Quality Act (CEQA), and the Secretary of Interior Standards for the Treatment of Historic Properties. He has completed numerous impacts assessments and determinations of eligibility across a range of administrative levels including local, state, and National Register of Historic Places (NRHP). Among the agencies served by Mr. Levanetz are the California Department of Transportation (Caltrans), Federal Rail Administration (FRA), California High Speed Rail Authority, Federal Highway Administration, Department of Defense (DOD), Federal Emergency Management Agency (FEMA), Bureau of Land Management (BLM), National Park Service (NPS), California Energy Commission (CEC), Federal Communications Commission (FCC), Federal Aviation Administration (FAA), Department of Housing and Urban Development (HUD) and the General Services Administration (GSA)

DEVELOPMENT

Weatherization Assistance Program Historic Architectural Resources Evaluations, Department of General Services, State of California. Senior Architectural Historian. Mr. Levanetz has conducted over 70 remote investigations and evaluations of historic period residences under this large-scale federal program. Using background research and NRHP criteria, he undertakes historical significance evaluations for the numerous built environment resources and assesses potential impacts that may result from the program. Each

analysis complies with Section 106 of the National Historic Preservation Act (NHPA) and the guidelines executed in the Programmatic Agreement.

GOVERNMENT & MILITARY

MCB Camp Pendleton Coastal Training Installation Phase III, Cultural Resources Investigation, Department of Defense, San Diego County, CA. Archaeologist. Mr. Levanetz served as cultural resource specialist to mitigate impacts to archaeological resources resulting from the construction of a close-quarters combat exercise facility near the coastline. He participated in an extensive subsurface investigation in an effort to recover data that would otherwise be lost as a result of construction activities. Mr. Levanetz completed systematic excavations at numerous sites and assisted in evaluating the potential direct and indirect impacts to cultural resources.

INFRASTRUCTURE DEVELOPMENT

Verizon Wireless Telecommunication Projects, Section 106 Compliance, Verizon Wireless, CA and NV. Cultural Resources Specialist. Mr. Levanetz performed over 100 National Register of Historic Places (NRHP) compliance studies for the Federal Communications Commission on behalf of Verizon Wireless for new tower support structures and collocated towers throughout California and Nevada. He completed determinations of eligibility, analyses of integrity, and identifications of effect. Resources identified and evaluated have dated from the late nineteenth century to the recent past, were located in various settings (dense urban, suburban, rural, and industrial), and have included numerous property types (residential and commercial buildings, churches, educational institutions, hospitals, water towers, windmills, farm and ranch landscapes, refineries, and irrigation canals).

Publications and Presentations

- Chambers Group, Inc., Senior Architectural Historian, San Diego, 2013—Present
- URS Corporation, Senior Architectural Historian, San Diego/La Jolla, California, 2010—2013.
- New School of Architecture & Design, Adjunct Professor, San Diego, California, 2007—Present.
- Heritage Architecture and Planning, Historian, San Diego, California, 2007—2010.
- San Diego History Center, Curator, San Diego, California, 2003—2007.
- Archaeology Field Technician, ASM Affiliates, Carlsbad, California 2004—2007.

Gabrielle Harlan, Ph.D.

Architectural Historian

EDUCATION

Doctor of Philosophy, History of Art and Architecture, University of Virginia

Master of Arts, Architectural History, University of Virginia

BA, Architecture, University of Arizona

20 YEARS OF EXPERIENCE

AWARDS

Andrew Mellon Foundation Fellowship Recipient, Huntington Library, San Marino, California, 2010

Helen Bing Fellowship Recipient, Huntington Library, San Marino, California, 2010

Du Pont Fellowship Recipient, University of Virginia, Charlottesville, Virginia, 2005

William Rucker Art and Architecture Fellowship Recipient and Du Pont Fellowship Recipient, University of Virginia, Charlottesville, Virginia, 2004

Dean's Forum Fellowship Recipient, University of Virginia, Charlottesville, Virginia, 2003

Arizona Women in Construction Scholarship Recipient, University of Arizona, Tucson, Arizona, 1994

Gabrielle is a senior architectural historian with more than 20 years of academic and professional experience preparing documentation to address the restoration, rehabilitation, and adaptive reuse of historic properties—including historic structures reports, preservation and interpretation plans, and National Register of Historic Places nominations. Gabrielle also has experience contributing to California Environmental Quality Act (CEQA)-level documents. She continues to expand her knowledge of Southern California history by conducting primary source research and developing historic contexts.

Relevant Experience

Long Beach Airport (LGB) Terminal Phase II Improvements, Los Angeles County, CA. *Architectural Historian*. LGB is proposing improvements to the terminal building and related facilities in order to accommodate recent increases in flight activity and to improve the passenger experience through a variety of terminal, security, and parking improvements. The Federal Aviation Administration (FAA) is the lead federal agency charged with conducting Section 106. ESA is conducting an archaeological and historic resources inventory and evaluation, and is preparing a Historic Properties Inventory Report that documents historic properties and potential adverse effects resulting from the project. Gabrielle is the architectural historian on the project, and is preparing the Historic Properties Inventory Report.

Hollywood Burbank Airport Replacement Terminal EIS, Los Angeles County, CA. *Architectural Historian*. The Burbank-Glendale-Pasadena Airport Authority (Authority) is proposing to replace the existing passenger terminal to enhance airport safety and meet ADA standards, to consolidate passenger and baggage screening functions, and to provide a new, modern, energy-efficient passenger terminal. The project would replace the existing 14-gate, 232,000-square-foot passenger terminal with a 14-gate passenger terminal that meets current California seismic design and FAA airport design standards. The replacement passenger terminal would be developed in accordance with modern design standards to provide enhanced passenger amenities; security screening facilities that meet the latest TSA requirements; and other airport facilities (including holdrooms, baggage claim areas, and public areas) that are designed and sized for the kinds of aircraft the airlines routinely operate. Gabrielle is the architectural historian for the project, and is providing peer review of historic resources reports to ensure they meet Section 106 requirements. She will also co-author the cultural resources section of the EIS, and analyze effects to historic architectural resources.

National Historic Landmark Ahwahnee Hotel Comprehensive Rehabilitation Project in Yosemite National Park, CA. *Historical Architect.* The project entailed addressing seismic issues, ADA accessibility, and fire life safety concerns.

Gabrielle's responsibilities on the project included working as a primary reviewer of all architectural planning documents for the project (including the schematic and design development drawings, an HSR, and an HFR) in order to minimize adverse effects to this National Historic Landmark and to make an assessment of effect in compliance with Section 106 of the National Historic Preservation Act.

Hollywood Historic Resources Survey for the Los Angeles Community Redevelopment Agency, Los Angeles, CA. *Architectural Historian.* This project was to survey potential historic resources in Hollywood and to prepare multiple historic context statements for the various property types, from film studios to small-scale domestic architecture. Gabrielle's primary responsibility on the project was to research and write historic context statements, as well as to oversee the preparation of historic context statements by other staff.

Historical Resource Assessment for Mariners' Medical Arts Building, Newport Beach, CA. *Architectural Historian.* This project for the City of Newport Beach established the historic significance of a medical office building complex designed by architect Richard Neutra in the early 1960s. Gabrielle was responsible for the original historic research and to write the historic context, as well as to direct and supervise junior staff in the production of the final document.

Update to Historic Structures Report for Hollyhock House and Historic Structures Report for the Director's House at the National Historic Landmark Barnsdall Art Park for the City of Los Angeles, Los Angeles, CA. *Architectural Historian.* The City of Los Angeles owns and manages these buildings designed by master architect Frank Lloyd Wright. Gabrielle's responsibilities as a project manager entailed working in collaboration with another Los Angeles-based firm to prepare HSRs for two buildings, Hollyhock House and the Director's House. Both HSRs required extensive primary historic research, detailed condition assessments, and the identification and engagement of appropriate sub-consultants, such as a structural engineer well-versed in approaches to historic preservation, a forensic water infiltration specialist, a materials conservator, and an historic fountain specialist.

Rehabilitation and Reconstruction of Bob's Big Boy Broiler for the City of Downey, Los Angeles County, CA. *Architectural Historian.* This project entailed assisting the City of Downey in identifying the remaining historic features of a 1950s Googie coffee shop, which had been subject to an illegal partial demolition. Gabrielle's responsibilities as a project manager were to identify and document extant character-defining features of the building, to provide design collaboration for a successful rehabilitation project, and to assist in the negotiation of a Memorandum of Understanding between the city and the California Office of Historic Preservation. In 2010, the Los Angeles Conservancy awarded the project team it's top honor, the President's Preservation Award.

Victor Clothing Company Building, Los Angeles, CA. *Architectural Historian.* This project was to assist the owner of an early twentieth-century commercial mid-rise building located in downtown Los Angeles in developing a successful approach for historic restoration of the façade, interior commercial space, and elevator lobby in order to comply with the terms for final approval of a Historic Preservation Certification Application necessary for the property owner to take advantage of available federal tax incentives. Gabrielle's responsibilities as project manager were to gather research, to coordinate the work of sub-consultants, to consult with the

California Office of Historic Preservation, and to prepare the required documentation for the certification process.

Multiple Property Document Nomination to the National Register of Historic Places for the City of Casa Grande, Pinal County, AZ. *Architectural Historian.* This project was to identify for the City of Casa Grande a concentrated and cohesive area of historic properties eligible for nomination to the national Register of historic Places as supported by a single historic context submitted as part of a Multiple Property Documentation Form. Gabrielle's responsibilities as project manager included surveying properties as part of a two-person team, writing the historic context statement and property type descriptions, and preparing the nominations forms for twenty-three properties successfully nominated in 2002 to the National Register of Historic Places.

Hanna Winzenried

Architectural Historian

EDUCATION

MSc Historic Conservation, Oxford Brookes University

BA, European Studies, Brigham Young University

2 YEARS EXPERIENCE

PROFESSIONAL AFFILIATIONS

The Society for the Protection of Ancient Buildings

Historic England

National Trust for Places of Historic Interest or Natural Beauty

Hanna is an architectural historian intern with 3 years of academic and professional experience performing building conservation, historic research, and field surveys and conducting plan reviews for conformance with local regulations and ordinances. She has 1.5 years of experience with the City of Los Angeles, Department of Planning, in the Office of Historic Resources Historic Preservation Overlay Zones (HPOZ) Unit. Her experience and education both in California and abroad have given her a wide set of interdisciplinary skills, including strong technical and research skills.

Relevant Experience

9120 W. Olympic Boulevard Preliminary Assessment and Character Defining Features Analysis for the Harkham Hillel Hebrew Academy, Beverly Hills, CA. *Contributor.* ESA prepared a Phase I Historic Resources Assessment for the modernist educational building at 9120 W. Olympic Boulevard. The purpose of the report is to identify and evaluate potential historic resources. The subject property was built in 1963 as the largest Jewish day school. It was built in the Modernist architectural style by the renowned architect Sydney Eisenshtate. The Academy enrollment has outgrown the existing space, and the school is looking for a way to expand its square footage. Hanna is performing research and assisting in the preparation of the reports.

3325 Monterey Road Historic Resources Assessment for 3325 Monterey Road, San Marino, CA. *Contributor*. ESA prepared a Historic Resources Assessment for the Moderne residence at 3325 Monterey road. The purpose of the report is to identify and evaluate potential historic resources. The subject property was built in 1927 as a retirement residence for William F. Tempel, a real estate broker from Chicago. It was designed by Frederick Hust, an architect from Salt Lake City who would go on to design the new China Town in Los Angeles. The homeowners are looking for a way to expand square footage of the residence. Hanna is performing research and assisting in the preparation of the report.

Universal Hilton Environmental Impacts Report and Historic Resources Technical Report for 555 W Universal Terrace Parkway, Los Angeles, CA. *Contributor.* ESA prepared an Environmental Impacts Report including a Historic Resources Technical Report. The Universal Hilton Hotel was designed by master architect, William L. Pereira in 1983 in the postmodern style. The hotel was designed to accommodate visitors to the Universal Theme Parks. The hotel management wants to expand the number of rooms by building a large addition. Hanna is performing research and assisting in the preparation of the report.

361 Myrtle Street Peer Review Letter for the residence at 361 Myrtle Street, Glendale, CA. *Contributor.* ESA prepared a peer review letter to conduct a peer review of previous historic resource evaluations and analyze potential cumulative impacts of the demolition for the property at 361 Myrtle Street. Previous

evaluations and the impact of demolishing the residence were reviewed and analyzed. Hanna is performing research and assisting with the preparation of the report.

Previous Work Experience

Department of City Planning, City of Los Angeles. *Student, Professional Worker.* Hanna assisted HPOZ staff with client walk-ins, which included conducting design review, drafting casework letters/certificates, and performing public outreach/presentations regarding adoption of HPOZs. She conducted field surveys of several HPOZs, using photography and making note of historical elements. She corrected technical elements on databases of HPOZ properties and research historical patterns of neighborhood growth. Hanna also communicated with project applicants to improve their projects' conformance with preservation guidelines.

Museum of Peoples and Cultures, Brigham Young University. *Collections Manager.* Hanna made an itinerary of the entire Brigham Young University (BYU) ethnographic collection. Hanna designed and implemented a social media marketing campaign. She took pictures of 400 objects for the digital collection. She helped develop a new way to house kachina dolls and Polynesian necklaces. She cataloged 25 objects in a collection and housed them for storage.

History Department, Brigham Young University. *Intern.* As part of her duties as an intern, Hanna cataloged and transcribed historic letters to and from Senator Bancroft found in the BYU digital collections. Hanna also created a marketing plan to raise campus awareness for "Europe in a Nutshell" and helped to inaugurate the international event with prominent world leaders.

Publications and Presentations

"Knobs and Knockers: The Conservation of Arts and Crafts Metal Fixtures and Fittings," Oxford Brookes University (2015).

Appendix B

California Department of Parks and Recreation 523 Forms

State of California ☐ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI # _____
Trinomial
NRHP Status Code 6Z

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 18 *Resource Name or #: (Assigned by recorder) Perris Valley Channel
P1. Other Identifier: Perris Valley Storm Drain
*P2. Location: ☐ Not for Publication ☒ Unrestricted
*a. County Riverside County and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad Perris Date 2003 T __; R __; __ ☐ of __ ☐ of Sec __; ____B.M.
c. Address NA City Perris Zip 92571
d. UTM: (Give more than one for large and/or linear resources) Zone __, _____ mE/ _____ mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)
See Continuation Sheet

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Perris Valley Channel is an approximately 9-mile-long man-made drainage channel constructed in 1955 by the Riverside County Flood Control and Water Conservation District (RCFCWCD) to convey storm water runoff. It currently serves as the primary collector of storm water in the northern part of the cities of Perris and Moreno Valley. The channel extends from its initial origin at Heacock Street at the southeastern perimeter of March Air Reserve Base (formerly March Field and later March Air Force Base) in the city of Moreno Valley through the city of Perris to the San Jacinto River. The RCFCWCD currently owns the right-of-way and maintains the channel along its entire reach).

*P3b. Resource Attributes: (List attributes and codes) HP20 (Canal/Aqueduct)
*P4. Resources Present:
☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District
☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: (view, date, accession #) View to southeast with channel in middle ground (left) and Ramona Expressway in the background
*P6. Date Constructed/Age and Source: ☒ Historic ☐ Prehistoric ☐ Both
1955/Riverside County
*P7. Owner and Address:
RCFCWCD
1995 Market Street
Riverside, Ca 92501
*P8. Recorded by: (Name, affiliation, and address) Joel Levanetz
ESA
626 Wilshire Blvd., Suite 1100
Los Angeles, CA 90017
*P9. Date Recorded: June 28, 2019
*P10. Survey Type: (Describe)
Intensive Pedestrian

*P11. Report Citation: (Cite survey report and other sources, or enter "none.")
ESA, Perris Valley Channel Historic Resources Evaluation Report, August 2019

*Attachments: ☐NONE ☒Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☒Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☒Other (List): Sketch Map

State of California ☐ The Resources Agency Primary # _____
DEPARTMENT OF PARKS AND RECREATION HRI# _____

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Perris Valley Channel ***NRHP Status Code** 6Z
Page 2 **of** 18

B1. Historic Name: Perris Valley Channel
B2. Common Name: Perris Valley Channel
B3. Original Use: Storm water runoff B4. Present Use: Storm water runoff
***B5. Architectural Style:** Industrial
***B6. Construction History:** (Construction date, alterations, and date of alterations)
1955 – initial construction
1996 – Lateral A completed
1998 – Line J, Stage 3 completed
1999 – Stage 1 completed
2006 – Lateral B completed
2016 – Portion of the Perris Valley Channel north of Ramona Expressway constructed to its fully planned width with a designed capacity of 16,000 cubic feet per second (cfs)
2009-2019 – culverts, concrete boxed drains, and modern paved pathways for bicycle and pedestrian use have been added

***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** _____ **Original Location:** _____
***B8. Related Features:**

B9a. Architect: Riverside County Flood Control District **b. Builder:** Riverside County Flood Control District
***B10. Significance: Theme** Flood Control **Area** Riverside County
Period of Significance 1955 **Property Type** Water Conveyance System **Applicable Criteria** NA
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)
[See Continuation Sheets]

B11. Additional Resource Attributes: (List attributes and codes) None
***B12. References:**
[See Continuation Sheets]

B13. Remarks:

***B14. Evaluator:** Joel Levanetz, M.A.
***Date of Evaluation:** August 2019

(Sketch Map with north arrow required.)
See attached sketch map

(This space reserved for official comments.)

State of California ♘ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LINEAR FEATURE RECORD

Primary
HRI #
Trinomial

 Resource Name or #: (Assigned by recorder) Perris Valley Channel

L1. Historic and/or Common Name: Perris Valley Channel

L2a. Portion Described: × Entire Resource ☐ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: (Provide UTM coordinates, decimal degrees, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)

See Field P2a on Continuation Sheets for UTMs.

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

Constructed in 1955 as a man-made drainage channel, the Perris Valley Channel conveys storm water from the greater Perris area to the San Jacinto River. Alongside improvements initiated by the RCFCWCD, the Perris Valley Channel was installed to help alleviate drainage problems associated with the expansion of March Air Reserve Base. As a whole, the channel is considered an important element of Perris' storm draining system. It is currently constructed to its full width north of Ramona Expressway.

L4. Dimensions: (In feet for historic features and meters for prehistoric features)

- **a. Top Width** ~150 ft.
- **b. Bottom Width** ~90 ft.
- **c. Height or Depth** ~8 ft.
- **d. Length of Segment** ~9 mi.

L5. Associated Resources:

Not Applicable

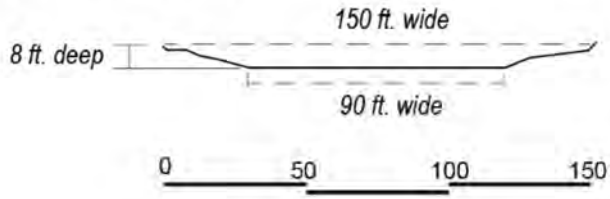
L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.):

See Continuation Sheets

L7. Integrity Considerations:

See Continuation Sheets

L4e. Sketch of Cross-Section (include scale)
Facing: North from Ramona Expressway



L8b. Description of Photo, Map, or Drawing (View, scale, etc.)
Looking northeast over the Perris Valley Channel from the paved bike path at the northwest corner of the intersection formed by East Oleander Avenue and Ramona Expressway.

L9. Remarks:

Not Applicable

L8a. Photograph, Map or Drawing

L10. Form Prepared by: (Name, affiliation, and address)

Hanna Winzenried
ESA
626 Wilshire Blvd, Suite 1100
Los Angeles, CA 90017

L11. Date: August 2019

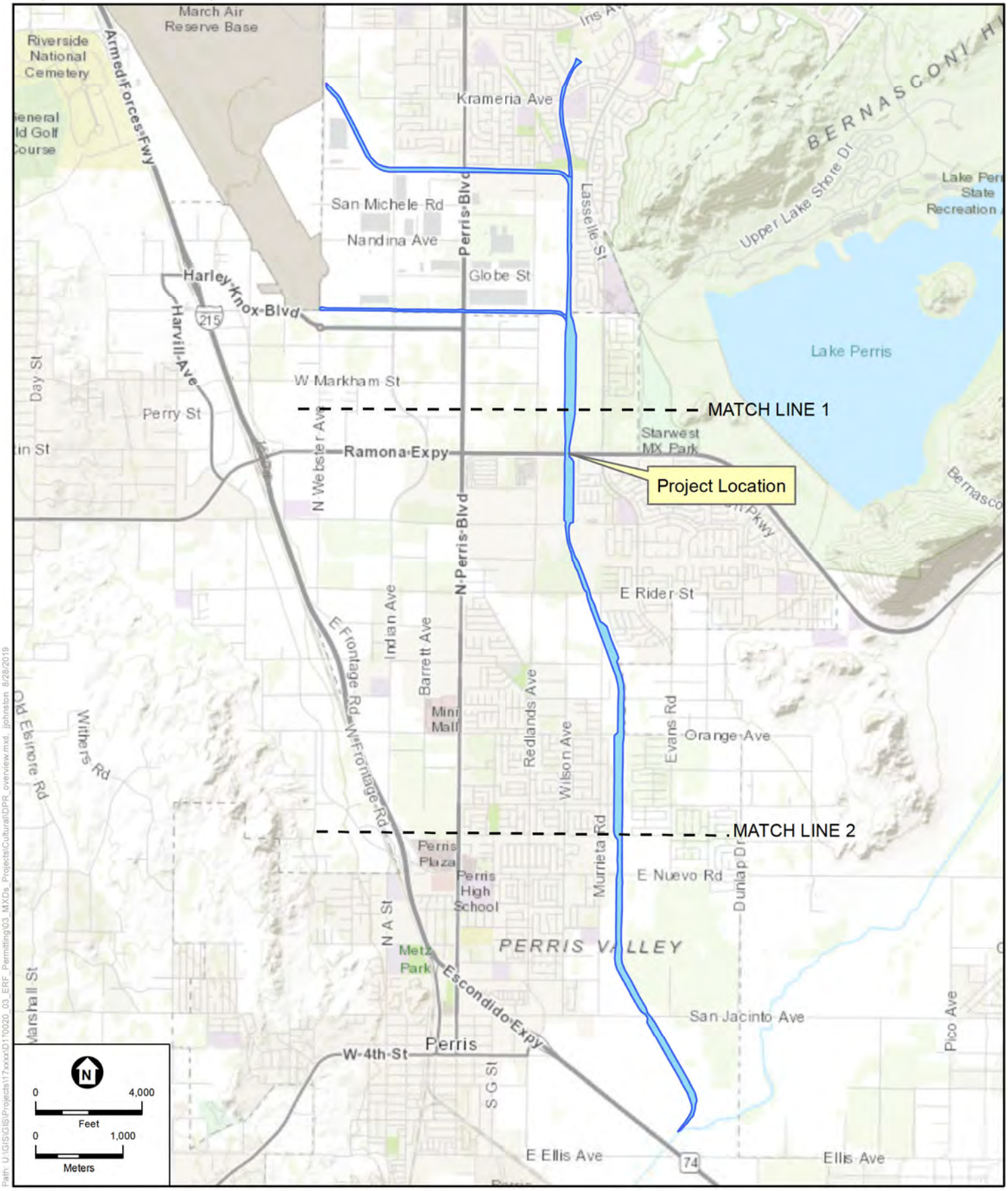
State of California- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

* Resource Name or Number: Perris Valley Channel

*Map name: USGS 7.5' Topo Quad Perris, CA *Scale: 1:60,000 *Date: 1978, 1980



* Required Information

State of California- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

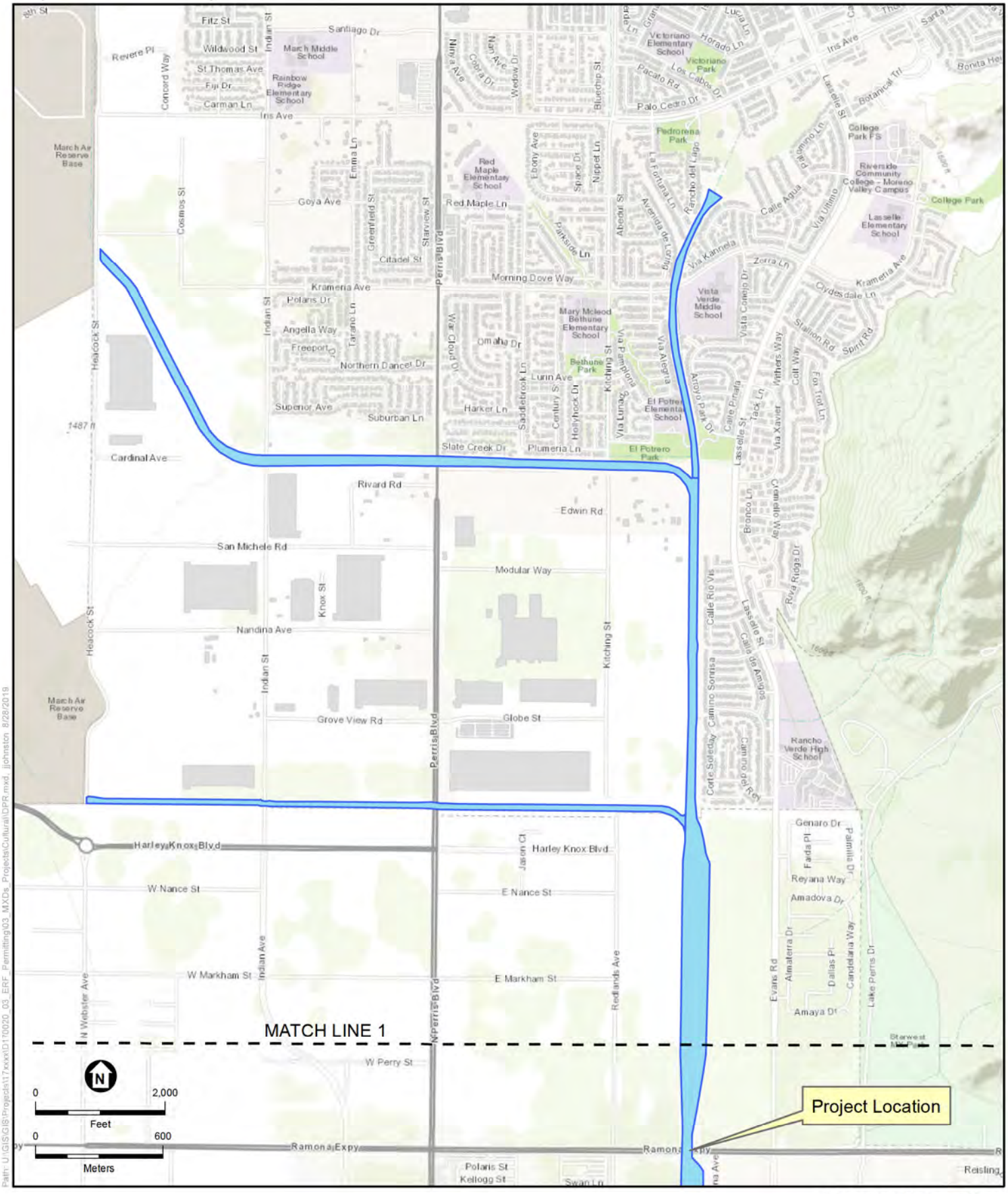
Primary #
HRI #
Trinomial

* Resource Name or Number: Perris Valley Channel

*Map name: USGS 7.5' Topo Quad Perris, CA

*Scale: 1:24,000

*Date: 1978, 1980



* Required Information

State of California- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

* Resource Name or Number: Perris Valley Channel

*Map name: USGS 7.5' Topo Quad Perris, CA *Scale: 1:24,000 *Date: 1978, 1980

Path: U:\GIS\GIS\Projects\17xxxx\D170020_03_ERF_Permitting\03_MXDs_Projects\Cultural\DPR.mxd, jjohnston, 8/28/2019

* Required Information

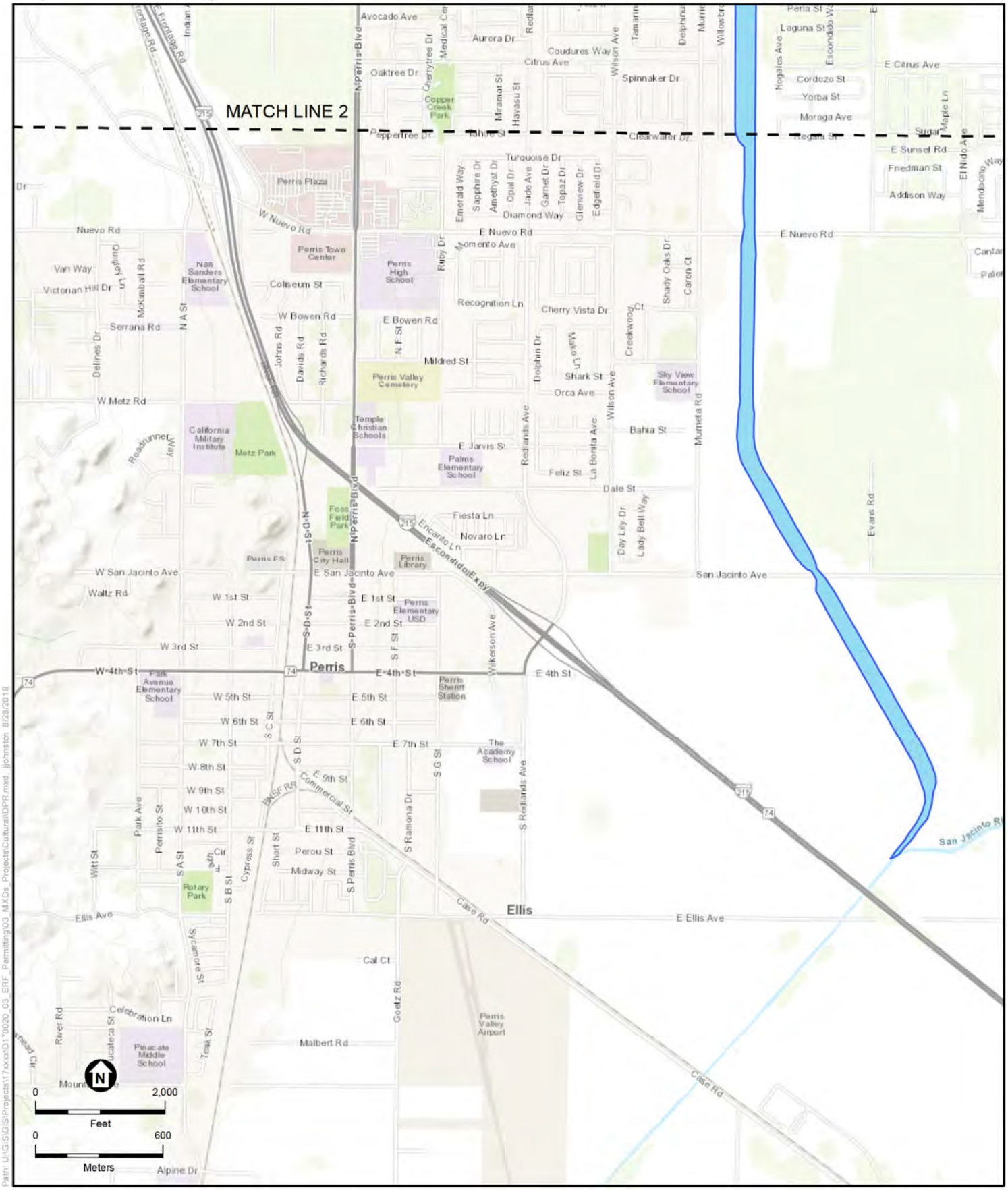
State of California- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI #
Trinomial

* Resource Name or Number: Perris Valley Channel

*Map name: USGS 7.5' Topo Quad Perris, CA *Scale: 1:24,000 *Date: 1978, 1980



Path: U:\GIS\GIS\Projects\17xxxx\D170020_03_ERF_Permitting\03_MXDs_Projects\Cultural\DPR.mxd, jjohnston, 8/28/2019

* Required Information

State of California -- Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SKETCH MAP

Primary #
HRI#
Trinomial

 ***Resource Name or #** (Assigned by recorder) Perris Valley Channel

***Drawn by:** Stephan Geissler ***Date of map:** August 9, 2019

***P2a. Location (continued)**:

Perris, CA USGS 7.5-minute topographic quadrangle

TOWNSHIP	RANGE	SECTION
0030S	0030W	30
0030S	0030W	32
0030S	0030W	31
0040S	0030W	21
0040S	0030W	28
0040S	0030W	33
03S	03W	32
04S	03W	8
04S	03W	5
04S	03W	16
04S	03W	17
04S	03W	21
04S	03W	5*

*Indicates portion of channel that was visually inspected

***B10. Significance (continued):**

Historic Context

Perris Valley Channel

The Perris Valley Channel, sometimes referred to as the Perris Valley Storm Drain, is a largely unlined canal originally constructed in the 1950s to alleviate drainage issues associated with a late, post-war expansion at the March Air Reserve Base. Since its initial installation, the Perris Valley Channel has been broadened, deepened and improved to allow for further non-historic period commercial, residential, and industrial development in the drainage area. As a result of these modifications, the Perris Valley Channel currently runs from the southern boundary of March Air Reserve Base and conveys storm water in a southerly direction until it terminates in the San Jacinto River. According to the city of Perris, the Perris Valley Channel is currently among the main drainage features in the San Jacinto watershed, conveying water from March Air Reserve Base south to its natural headwaters in the San Jacinto Mountains towards Canyon Lake and ultimately to Lake Elsinore (City of Perris, 2017).

Originally, the Perris Valley Channel was only meant to handle water flow associated with minor storm events. At the time the *Master Drainage Plan for the Perris Valley Channel* (County of Riverside, 1987) was created, only the Ramona Expressway and Nuevo Road were bridged, while all other streets surrounding the channel had dip crossings, which became impassable during storm events. As development in the surrounding areas increased and transformed from predominantly agricultural uses to industrial and residential uses, so did the need for adjustments and alterations to the channel and its

drainage capacity. Several alternatives were investigated in the 1987 plan for improvements to the channel. These ranged from a fully concrete-lined trapezoidal channel to an unlined graded earth channel, which could also be utilized as a greenbelt. Where feasible, the unlined graded earth channel was chosen as the recommended plan as it provided for flood protection while offering the option of developing recreational joint uses.

Since its initial construction in 1955, the Perris Valley Channel has been deepened, broadened and expanded to allow for significant commercial and residential development in the area. As a result of the non-historic period development and current reliance on the water conveyance feature, the Perris Valley Channel is considered to be an important modern component of present-day Perris' storm draining system (County of Riverside, 1987).

Additionally, the plan recommended that downstream of the Ramona Expressway, the channel should be an unlined graded earth section with flat 12:1 side slopes and a 250-foot bottom width. Due to the low flow velocities, the channel could be grass lined and even maintained as a park, in the region reaching from the San Jacinto River corridor to the Lake Perris Recreational Area. Upstream of the Ramona Expressway, however, a conventional channel was proposed with concrete side slopes and a soft bottom. This was due to the higher velocities of water flow in this area. The *Master Drainage Plan for the Perris Valley Channel* (County of Riverside, 1987) also suggested a fully incised channel from the San Jacinto River to the upper terminus at Heacock Street.

Over time, the channel has been not only modified as new approaches to water management challenges have been employed, but the water conveyance structure has also been expanded. In order to accommodate future storm water volumes from adjacent development, the channel has been significantly deepened and lengthened to reach all areas of Perris. As a result of these modifications implemented since the 1987 release of the *Master Drainage Plan for the Perris Valley Channel* nearly all city storm drains flow laterally into the Perris Valley Channel from both the east and west.

The Perris Valley Channel Lateral A was completed in 1996. The Perris Valley Line J, Stage 3 was completed in 1998. The Perris Valley Channel Stage 1 was completed in 1999. The Perris Valley Channel Lateral B was completed in 2006 (County of Riverside, 2019).

As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had been constructed to its fully planned width with a designed capacity of 16,000 cfs. However, the portion south of Ramona Expressway had yet to be constructed to its full width and designed capacity of 17,300 cfs (ESA, 2016).

March Air Reserve Base

March Air Reserve Base, previously known as March Air Force Base, opened in 1917 as the United States anticipated the nation's entry into World War I. At this time, the War Department had announced its intentions to build new military installations on the west coast, and California notables such as Frank Miller (owner of the Mission Inn in Riverside) and California Governor Hiram Johnson succeeded in securing government approval to construct an airfield at Alessandro Field located near Riverside. In 1918, within 60 days of commencement of the construction program, the plain of Moreno Valley had been transformed to include twelve airplane hangars, six barracks equipped with 150 airmen each, mess halls,

a machine shop, a post exchange, a hospital, a supply depot, an aero repair building, a bachelor officer's quarters and a residence for the commanding officer. By 1927, March Field, as it was then called, began constructing new structures, quickly becoming a permanent military installation. This permanence was further realized in the decade before World War II when March Field took on much of its current appearance (March Air Reserve Base, 2010).

The first phase of permanent buildings was completed in 1934. During the period of World War II, the base doubled its footprint (March Air Reserve Base, 2010). In 1941, the original 640 acres reserved for the military installation were more than doubled through acquisition of 950 acres adjoining the site (*Los Angeles Times*, January 8, 1941). Also around this time, the government procured a similarly-sized tract west of the San Diego Freeway that bordered the base and established Camp Hahn as an anti-aircraft artillery training facility. This new construction included six mess halls, 215 tents, two warehouses, a post exchange, infirmary, a gas station, an administration building, a recreation building, a motor repair shop, and two magazines. The proposed plans included construction for utilities and telephone services, and would be supported by 85,00 troops at the height of its activity (*Los Angeles Times*, April 4, 1941). In 1946, Camp Hahn became a part of March's real estate holdings when operations at the base returned to peacetime procedures (March Air Reserve Base, 2010).

As the March Air Force Base grew both in size and in numbers of service members needed to support the facility, so grew its need for further resources and improvements to its infrastructure. The creation of the Perris Valley Channel in the 1950s helped resolve drainage issues associated with the growing population at the base. Hancock Street, which marks the southeastern perimeter of the base, includes the location where the March Air Reserve Base drains into the Perris Valley Channel at the intersection of Hancock Street and East Oleander Avenue.

A portion of the March Air Reserve Base was listed in the NRHP as March Field Historic District in 1994 (Mikesell and Wee, 1992). The March Field Historic District was found to be significant under Criterion A in the area of military history for its association with the development of the Air Corps on the West Coast, serving as the key training and bombardment post on the West Coast. The March Field Historic District was additionally found to be significant under NRHP Criterion C for its architectural merit as a monumental example of the work of Myron Hunt and his approach to site planning. Hunt, a nationally renowned master designer from Pasadena, was recognized for implementing city planning ideas in military base design during the 1930s. March Field represents an exceptionally large and intact collection of hollow wall concrete buildings resulting from Hunt's influence (Mikesell and Wee, 1992).

March Field Historic District covers 158 acres and includes a total of 228 buildings, structures, and objects, of which 199 contribute to its significance. In addition to other built environment components, the plan or formal layout of the base and landscaping elements contribute to the significance of the district. March Field Historic District is triangular in shape and is bound by Meyer Drive on the north, Riverside Drive on the east, and a line of hangars paralleling Graeber Street on the west (see Figure 4). The period of significance was identified as 1928 to 1943 (Mikesell and Wee, 1992).

One of the contributing elements of the Historic District is a stone-lined drainage canal, which extends along Meyer and Riverside Drives, at the northern and eastern perimeters of the Historic District. This canal was installed in 1942 by Works Progress Administration workers. While the canal extends beyond

the Historic District's boundaries, only those portions within the Historic District are considered contributing (Mikesell and Wee, 1992)..

Water Management in Riverside County

Water has been an important factor in the agricultural, commercial and residential development of the area, but its control has proved difficult and past flooding has resulted in overwhelming consequences for the region. According to information provided by the Riverside County Flood Control and Water Conservation District (RCFCWCD), 15 years after the creation of the county, citizens in the San Jacinto Valley formed the San Jacinto Levee District to address the devastating damage wrought by storm waters since the area's first historic-era habitation. Efforts to control flood waters began in 1908 with local property owners levying assessments on one another in an effort to build and maintain a levee along the San Jacinto River. The sum raised locally was bolstered by financial contributions from the County, State and Federal government treasuries. This represented the initial centralized water management effort in the area and other communities soon recognized its utility and began to emulate San Jacinto's model. "Citizens in the Coachella Valley formed the Coachella Valley Storm Water District in 1915, and the Valle Vista Levee District was formed in 1932 to control flooding along Bautista Creek east of Hemet. San Bernardino County, through action of the State Legislature, created its flood control district in 1939" (County of Riverside, 2019).

The nascent county government, still in its first 50 years of existence, also took up the mantle of a centralized water management program. Alexander Chope Fulmor, a licensed engineer and land surveyor born on August 27, 1876, in Humboldt, California, played a prominent role in the creation of the RCFCWCD. The massive 1938 floods experienced throughout the county (the largest since 1884) essentially severed the economic lifeline of a rapidly urbanizing area as the flooded Santa Ana River cut Riverside off from important markets, including Los Angeles. Following continued flood events several years thereafter, in 1943 the County Board of Supervisors asked Fulmor to document the flooding history of Riverside County and to provide a recommended course of action to manage the flood risks experienced by the county's citizens. In his report, Fulmor documented the loss of life and economic costs of flood events from 1862 to 1943. He concluded that the current ad hoc approach to protecting citizens and their property from flooding was not a viable practice as the county grew and became more urbanized. Fulmor recommended the creation of a flood control district, similar to the one that had been recently created in San Bernardino County in response to the same 1938 flood. Here, and largely attributed to Fulmor's recommendations, the Riverside Flood Control District was created by an Act of the California State Legislature on July 7, 1945 (County of Riverside, 2019).

Brief Description of Flood Control Systems

Flood control systems are necessary to manage the flood risk for development within floodplains during severe storms. Typical components of flood control systems include dams and reservoirs, debris basins, sediment placement sites, channels, pump stations, spreading grounds, and storm drains. The system is constructed so that water is impounded behind a dam, reducing the probability of downstream flooding, while also ensuring that debris is contained. Sediments that build up are periodically removed. A series of channels function to contain and funnel water to ocean outlets. Spreading grounds receive overflow and are used to help recharge groundwater supplies (County of Los Angeles, 2015).

Conduits - Open Canals

As a means of depicting the evolution of this property type, the following context is excerpted from *Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures* prepared by Caltrans and JRP Historical Consulting Services in December 2000. The context describes common components of similar water conveyance features, as well as the challenges presented by this property type, such as controlling disbursement of large quantities of water at high rates of speed, and how these issues were ultimately resolved.

> The cross section or profile of open canals varied with the material through which the conduit was constructed and with the method of construction employed. If constructed in rock, the canal tended to be more rectangular with side slopes as steep as 1:0.5; in earth, the canal shape became more trapezoidal, with side slopes varying from 1:1 to 1:5, depending on material. Early canals that were built with scrapers in the alluvial soils of the Central Valley had rounded bottoms and long side slopes, with rounded berms mounded up on each side of the cut. In similar locations, irrigation channels cut with modern machinery and blades have a V-shape, with steep side slopes and flat broad berms.
>
> In terms of the ratio between width and depth, the most hydraulically efficient canal would have a hydraulic radius one-half the water's depth. Therefore, the canal's width would be twice the depth. However, in sidehill locations, is it more economical to construct a narrower, deeper canal, and in practice, canal builders often adopted a design based on economy, rather than the most hydraulically efficient one. A 1934 study noted that in California the hydraulic radius on hydroelectric canals varied from 0.5 to 0.8 the water depth, with the average being about 0.6. Figures for hydraulic mining canals and irrigation canals seem similar. The reason for any substantial variation from this ratio should be investigated. For example, a different ratio might be used to reduce ice formation in a cold climate, where narrow, deep canals are less subject to freezing over than wide, shallow ones of the same capacity.
>
> In general, in any arid or semi-arid climate, water systems operators and managers try to minimize losses due to evaporation and seepage. In California, hundreds of miles of previously earthen ditches have been lined with some less permeable surface or placed in pipe. Lined canals can also carry more water by moving it faster, and the lining can prevent scour of banks and bottom from running water at high velocity.
>
> In the nineteenth century, canals were lined with randomly coursed stone paving or cobblestone, usually drylaid, 12 to 18 inches thick. In the twentieth century, concrete and shotcrete (gunite) linings averaging between two and four and one-half inches in thickness have been standard. Concrete canals have a greater carrying capacity than a rough stone or earthen canal, carrying about twice the water in the same space. Thus, if an irrigation company or agency had sufficient capital, lining canals in concrete achieved many potential goals: it decreased maintenance costs, lessened loss by seepage, and increased carrying capacity.

Evaluation

Criterion A/1

Efforts to control flood waters in the region began in 1908, with local property owners levying assessments on one another in an effort to build and maintain a levee along the San Jacinto River. This represented the initial centralized water management effort in the area. The massive 1938 floods caused extensive and costly damage, loss of life, and severed the economic lifeline of a rapidly urbanizing area as floodwaters cut ties to important markets, such as Los Angeles. Damage sustained during continued flood events spurred the Riverside County Board of Supervisors to take action. In 1943, the Board commissioned a report on how to manage future flood risks. Alexander Chope Fulmor, author of the report, recommended creation of a flood control district, similar to the one that had been recently formed in San Bernardino County in response to the same 1938 flood. As a result, the Riverside Flood Control District (later known as the RCFWCD) was created by an Act of the California State Legislature in 1945.

In the 1950s, March Air Reserve Base was under expansion, creating drainage issues in the Perris Valley. The base served as the key training and bombardment facility on the West Coast between 1928 and 1943 and is significant in the annals of history for its association with the development of the Air Corps on the West Coast. In 1994, a portion of the base was designated as the March Field Historic District and is listed in the NRHP under Criterion A for its association key training and bombardment facility in the region from 1928 to 1943 (the Historic District is located about 1 mile from the Perris Valley Channel).

The Perris Valley Channel was constructed in 1955 by the RCFCWCD, concurrent with federally funded initiatives. The largely earthen, man-made drainage channel was designed to help alleviate drainage problems associated with the expansion of the March Air Reserve Base. As the area attracted more residents and businesses, the channel later served as one of the main components of the flood control system within the Perris Valley, carrying runoff from neighboring residential and commercial developments (Riverside County, 1987).

While the creation of the Perris Valley Channel alleviated drainage issues associated with the growth of the March Air Reserve Base, the timeframe of its construction falls outside of the period of significance for the March Field Historic District and fails to contribute to the established Historic District. Further, the channel's creation has allowed for development of the surrounding area, such as residential neighborhoods, commercial ventures and associated infrastructure. Despite its recent relevance in supporting local land development, the Perris Valley Channel is not associated with early 19th century settlement of the Perris Valley, nor is it directly related to the 1938 flood and creation of the Riverside Flood Control District (precursor of the RCFWCD) in 1945. Rather, as noted, it was constructed to alleviate drainage issues on March Air Reserve Base and its relevance has become more closely associated with allowing for non-historic period regional growth and development within the last two decades.

The Perris Valley Channel does not appear to be associated with a specific event or pattern of events or trends that have made a significant contribution to the history, settlement, or development of March Air Reserve Base or Perris Valley. The Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion A/1.

Criterion B/2

Under Criterion B/2, a property is eligible for listing in the NRHP/CRHR if it is associated with a significant individual or the life of a person important in our past. Additionally, the property must be associated with the individual's productive life, and is typically the individual's home, business, office, laboratory, or studio (the property that best represents their contribution). Furthermore, an individual's association with the property must be well documented and not merely speculative. Research did not reveal that the Perris Valley Channel is strongly associated with significant individuals or the lives of persons important in our past. The Perris Valley Channel was designed and constructed by the RCFCWCD, and no specific government official, engineer, project manager, or other individual was identified as associated with its design or construction. While Alexander Chope Fulmor, a prominent engineer and land surveyor, was integral to the creation of the first flood control district in Riverside County, research did not indicate that he was directly tied to or responsible for the creation of the Perris Valley Channel. Regardless of any speculative ties to the Perris Valley Channel, Fulmor's productive life would be better represented by his office, home, or studio.

Criterion C/3

The Perris Valley Channel was originally constructed in 1955 as an earthen channel used to alleviate drainage issues associated with the expanding March Air Reserve Base. As a largely earthen water conveyance feature, the Perris Valley Channel is representative of a rudimentary method of construction. It did not introduce design innovations nor is it an example of an evolutionary trend in engineering. By the 1950s, use of a concrete lining had been well established as a construction method, and unlined earthen channels are more representative of an outmoded method of construction. Lined canals were able to transport more water by moving it faster. In the 20th century, when the Perris Valley Channel was constructed, concrete and shotcrete (gunite) linings were standard as they decreased maintenance costs and increased carrying capacity.

The channel's design and construction elements are not considered momentous in the history of water conveyance design, engineering, or construction. Additionally, archival research did not reveal that the Perris Valley Channel was designed by a master craftsman – it was designed and constructed by the RCFWCD and is not associated with a particular individual.

Since the original construction of the Perris Valley Channel, contemporary commercial and residential development in the area has introduced non-historic materials, such as culverts, concrete boxed drains and modern paved pathways for bicycle and pedestrian use. Particularly, the Perris Valley Channel has

been heavily modified (widened, deepened and lengthened) over the last half of the 20th century in order to facilitate greater regional growth and attempts to address the demand for flood control mitigation. Major modifications took place as a result of the 1987 *Master Drainage Plan for the Perris Valley Area* – Lateral A was completed in 1996; Line J, Stage 3 was completed in 1998; Stage 1 was completed in 1999; and Lateral B was completed in 2006. As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had also been constructed to its fully planned width with a designed capacity of 16,000 cfs.

In addition, more substantial visual modifications along the public right-of-way were constructed after 2006, according to a review of aerial photographs and supported by field observations. Here, the portion of the Perris Valley Channel at the intersection of East Oleander Avenue and Ramona Expressway (where it intersects with the Undertaking) was altered within the last two decades with the introduction of box drains and culverts, as well as a modern bike path installed along reinforced, paved shoulders. These significant alterations introduced new materials, broadened the footprint of the property, and modified its profile as readily observed from the public right-of-way.

Given the modern-day modifications, the channel fails to embody significance as a historic-period water conveyance system. It does not possess distinctive characteristics of a historic type, period, or method of construction, nor does it possess high artistic values or represent the work of a master. As such, the Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion C/3.

Criterion D/4

While most often applied to archaeological districts and sites, Criterion D/4 can also apply to buildings, structures, and objects that contain important information. In order for these types of properties to be eligible under Criterion D/4, they themselves must be, or must have been, the principal source of the important information, and the information must be considered important. The Perris Valley Channel does not appear to yield significant information that would expand our current knowledge or theories of design, methods of construction, operation, or other information that is not already known about the period in which it was constructed, its method of construction, or its design. As noted above, the channel is a largely earthen water conveyance feature and represents a rudimentary method of construction found throughout the region, state and country. By the 1950s, the decade in which the channel was constructed, use of a concrete lining had been well established as a construction method, and unlined earthen channels came to represent an outmoded method of construction. As a primitive, earthen water conveyance feature, the Perris Valley Channel represents a property type that is commonplace and well-documented in our history. The 1987 *Master Drainage Plan for the Perris Valley Area*, as well as past and current plans and as-built specifications, provide sufficient data on the design and construction of the Perris Valley Channel. Additional study of the channel itself is unlikely to yield information beyond that which can be obtained by review of these existing sources and that was noted during the field survey.

Further, the property has undergone numerous and significant changes since its initial construction that have impacted its integrity. To accommodate contemporary commercial and residential development in

the area, non-historic materials, such as culverts, concrete boxed drains and modern paved pathways for bicycle and pedestrian use have been introduced. Previous to these more recent developments, the Perris Valley Channel had been heavily modified (widened, deepened and lengthened) over the last half of the 20th century in order to facilitate greater regional growth and address the need for flood control. Lateral A was completed in 1996, Line J, Stage 3 was completed in 1998; Stage 1 was completed in 1999; and Lateral B was completed in 2006. As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had also been constructed to its fully planned width with a designed capacity of 16,000 cfs. These alterations have undermined any data potential regarding 1950s methods of construction that may have been present and that could have illustrated the historical design of the Perris Valley Channel. As such, the Perris Valley Channel is recommended not eligible for listing under NRHP/CRHR Criterion D/4.

***B12. References (continued):**

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***L6. Setting (continued):**

A recent single-family residential development was constructed just south of the Ramona Expressway within the last two decades. Concurrently, improvements to the shoulder of the Perris Valley Channel were implemented to serve as a recreational feature for the new residents of the area. A number of large commercial facilities have also been erected in the vicinity of the channel.

***L7. Integrity Considerations (continued):**

The property has undergone numerous and significant changes since its initial construction that have reduced its integrity. Since the original construction of the Perris Valley Channel, contemporary commercial and residential development in the area has introduced non-historic materials, such as culverts, concrete boxed drains and modern paved pathways for bicycle and pedestrian use. Particularly, the Perris Valley Channel has been heavily modified (widened, deepened and lengthened) over the last half of the 20th century in order to facilitate greater regional growth and attempts to address the demand for flood control mitigation. Major modifications took place as a result of the 1987 *Master Drainage Plan for the Perris Valley Area* – Lateral A was completed in 1996; Line J, Stage 3 was completed in 1998; Stage 1 was completed in 1999; and Lateral B was completed in 2006. As of 2016, the portion of the Perris Valley Channel north of Ramona Expressway had also been constructed to its fully planned width with a designed capacity of 16,000 cfs.

In addition, more substantial visual modifications along the public right-of-way were constructed after 2006, The portion of the Perris Valley Channel at the intersection of East Oleander Avenue and Ramona Expressway was altered within the last two decades with the introduction of box drains and culverts, as well as a modern bike path installed along reinforced, paved shoulders. These significant alterations introduced new materials, broadened the footprint of the property, and modified its profile as readily observed from the public right-of-way.