Biological Technical Report
REDLANDS PASSENGER RAIL PROJECT
Redlands, San Bernardino County, California

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Acronyms

ACB	Articulated Concrete Block
AMSL	Above Mean Sea Level
BMP	Best management practice
BNSF	Burlington Northern Santa Fe Railroad
BTR	Biological Technical Report
BUOW	Burrowing owl
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CISS	Cast-in-steel-shell
CMF	Central Maintenance Facility
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CWA	Clean Water Act
DH	Disturbed habitat
DSBPRP	Downtown San Bernardino Passenger Rail Project
DW	Disturbed Wetland
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EW	Eucalyptus Woodland
FBS	Flat-top Buckwheat Scrub
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GLA	Glenn Lukos Associates
HA	Hydrologic Area
HAS	Hydrologic Subarea
HDR	HDR Engineering, Inc.
HCP	Habitat Conservation Plan
IEMF	Inland Empire Maintenance Facility
I-10	Interstate 10
I-215	Interstate 215
MBTA	Migratory Bird Treaty Act
MFS	Mulefat Scrub
MOU	Memoranda of Understanding
MP	Mile Post
NCCP	Natural Communities Conservation Planning
NEPA	National Environmental Policy Act
NJD	Non-Jurisdictional Ditch
NNG	Non-native grasslands
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
OV	Orchards and Vineyards
OW	Oak Woodland
PCE	Primary Constituent Elements
ROW	Right-of-Way

RPRP	Redlands Passenger Rail Project
RWQCB	Regional Water Quality Control Board
SANBAG	San Bernardino County Associated Governments
SAR	Santa Ana River
SAS	Santa Ana Sucker
SBCFCD	San Bernardino County Flood Control
SBKR	San Bernardino kangaroo rat
SCRRA	Southern California Regional Railroad Authority
SCWRF	Southern Cottonwood Willow Riparian Forest
SP	Soil Pit
SWIFL	Southwestern Willow Flycatcher
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWS	Southern Willow Scrub
TDA	Tom Dodson and Associates
TS	Tamarisk Scrub
UD	Urban developed
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WYBC	Western Yellow-billed Cuckoo

EXECUTIVE SUMMARY

The Redlands Passenger Rail Project (RPRP or Project) was developed by the San Bernardino Associated Governments (SANBAG) to address the transportation needs of the Redlands Corridor, which encompasses an approximate nine (9) mile corridor extending from the City of San Bernardino southeast to the City of Redlands. The Project proposes the construction of new track and bridge infrastructure to support passenger and freight service from E Street in the City of San Bernardino east to University Avenue in the City of Redlands. Construction of the new track would occur along an approximately 9.1 mile section of existing railroad right-of-way owned by SANBAG.

This Biological Technical Report (BTR) has been prepared for the proposed project with the Federal Transit Administration (FTA) as the lead agency under the National Environmental Policy Act (NEPA), and SANBAG as lead agency under the California Environmental Quality Act (CEQA). The BTR addresses the federal Endangered Species Act (ESA), California ESA, NEPA, CEQA, and other applicable federal, state, and local requirements for analysis of potential impacts on biological resources resulting from the construction of the proposed project.

This BTR integrates information collected from a variety of literature sources and field surveys to describe the biological resources within the vicinity of the survey area. Information was gathered from publicly available literature, data provided by relevant land management agencies, reviews of aerial photography and U.S. Geological Survey (USGS) topographic maps, data from the State of California, data from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), and the results of field surveys conducted in 2012. The purpose of the data collection and analysis for this report is to: (1) assemble a vascular plant and vertebrate animal inventory of the site; (2) determine whether any sensitive species or habitats could be significantly impacted by development of the proposed project; and (3) propose mitigation measures that could avoid or minimize impacts of construction, and maintenance and operation of the proposed project.

Surveys

Various field surveys have been conducted for the proposed project and include:

- Jurisdictional Delineation of federal wetlands and waters, and California Department of Fish and Wildlife jurisdictional features;
- Protocol Surveys for the federally endangered least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and San Bernardino kangaroo rat (*Dipodomys merriami parvus*),
- Habitat assessment for the federally endangered Santa Ana sucker (*Catostomus santaanae*);
- Protocol surveys for the California Species of Special Concern, western burrowing owl (*Athene cunicularis hypugaea*);
- Focused rare plant surveys; and
- General vegetation mapping and floral and faunal compendium.

Sensitive Species

Multiple sensitive plant and wildlife species were observed or have critical habitat mapped within the survey area for the proposed project. These sensitive plant and wildlife species include the following:

- One individual Santa Ana River woolly star (federally listed as Threatened) was observed within the study area at the Santa Ana River.

- Five individual least Bell's vireo (federally listed as Endangered) were observed within the study area at the confluence of the Mission Zanja Flood Control Channel.
- A single western burrowing owl (State special status species) was observed north of the East Street Platform outside of the breeding season in downtown San Bernardino.
- Critical habitat for Santa Ana sucker and San Bernardino kangaroo rat occurs within the study area at the Santa Ana River.
- Presence of western spadefoot toads is assumed within the vicinity of the SAR and Mission Zanja Flood Control Channel due to suitable habitat conditions.
- Implementation of the proposed project would impact up to 6.82 acres of U. S. Army Corps of Engineers (USACE) jurisdictional area. Permanent impacts to USACE jurisdiction are 0.39 acres. Temporary impacts to USACE jurisdiction are the remaining 6.43 acres.
- Implementation of the proposed project would impact up to 16.39 acres of CDFW jurisdiction. Permanent impacts to CDFW jurisdiction are 0.92 acres. Temporary impacts to CDFW jurisdiction are 15.47 acres.

1.0 PROJECT DESCRIPTION AND LOCATION

1.1 DESCRIPTION OF THE PREFERRED PROJECT

The Redlands Passenger Rail Project (RPRP or Project) would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Appendix A, Figure 1 depicts the project location.

Construction of the Project would occur within an existing railroad right-of-way (ROW) owned by the San Bernardino Associated Governments (SANBAG). SANBAG's ROW averages 50 to 100 feet in width with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the preferred Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (Mile Post [MP] 5.5 to MP 7.4). The proposed track ballast and sub-grade along the 9-mile project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the passenger trains and track foundation. These structural crossings consist of existing bridge structures located at Warm Creek (Historic) at MP 1.1; Twin Creek at MP 2.2; the Santa Ana River at MP 3.4; the Gage Canal at MP 3.8; Bryn Mawr Avenue at MP 5.78; and Mill Zanja Creek at MP 9.4.

Water Crossings

The project will include preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify Best Management Practices (BMPs) to address potential short-term impacts and post-construction (long-term) measures to be implemented for the project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order No. 2009-0009-DWQ.

Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the channel, the structural improvements would be constructed in two or more phases to the minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures. To minimize the sedimentation, in-channel construction activities would be limited to the period between April 15 and October 15 to the extent feasible.

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. New structural supports would be constructed behind a temporary cofferdam constructed of sheet piling or similar method, such as the use of cast-in-steel-shell (CISS) piles. The structural foundation

would consist of a reinforced concrete supported by piling, with conventional reinforced concrete piers extending up to the bridge decks.

To minimize the potential for falling debris into local waterways during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried down stream.

Roadway Grade Crossings and Signaling

The survey area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadways grade crossing not subject to closure would be re-designed in accordance with the latest *Grade Crossing Design* guidelines that require in certain cases raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the California Public Utilities Commission (CPUC), and swing gates.

Proposed Rail Platforms

There are currently five (5) station stops proposed for the Project with new rail platforms proposed at four (4) locations. Two (2) station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (3) (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. The E Street Rail Platform would be constructed in conjunction with the already approved Downtown San Bernardino Passenger Rail Project (DSBPRP) and, therefore, only track improvements would be required west of E Street to align the Project tracks with the planned rail platforms.

Rail platforms would in most instances be less than 200 feet long[1]. Pedestrian crossovers would be provided for each platform with accessible parking provided adjacent to pedestrian crossovers.

Train Layover Facility

The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street and would contain up to seven spur tracks.

Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the project. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

[1] A minimum of 170 feet is required to accommodate two 85-foot Bombardier passenger coaches.

Mission Zanja Channel Improvements. Mission Zanja Flood Control Channel runs parallel to the rail line from the Santa Ana River (SAR) to approximately 900 feet west of California Street for a distance of approximately 2.6 miles where it diverges from the Survey Area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja , where it passes under the railroad just west of the I-10 overcrossing.

Mission Zanja Channel is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). To ensure the structural integrity of the track improvements along sections of Mission Zanja Channel, the Project may include bank stabilization improvements (e.g., armoring, slope keying, etc.) to the northern bank of the Mission Zanja Channel, from MP 3.5 to just east of MP 6, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is considering the use of an articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which maintains the Mission Zanja Channel.

Maintenance

Maintenance of the railroad ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g., replacement of lighting fixtures). Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from the west of E Street to the SAR and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, an retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new, standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and,
- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor. The total construction area for the proposed Project is estimated at 137.3 acres.

1.1.1 ALTERNATIVES AND DESIGN OPTIONS

In conjunction with the environmental review for RPRP, SANBAG is considering several alternatives and design options for the project. The alternatives and design options evaluated in this BTR are identified and summarized below:

- ***Reduced Project Footprint Alternative.*** This alternative would involve a reduced construction area (130.1 acres) to minimize impacts to sensitive habitats. These reductions in the construction area occur at Twin Creek, the SAR, and along the Mission Zanja Flood Control Channel. Additionally, this alternative would include an alternate bridge design for Bridge 3.4 to further minimize permanent impacts to the SAR as a result of the placement of the new bridge pier foundations. All other aspects of this alternative would be similar to the Preferred Project.
- ***Design Option 1 (Layover at Waterman Avenue).*** Design Option 1 would entail the placement of the proposed layover facility at an alternative location, just east of Waterman Avenue and north of the railroad corridor. The total construction area under the design option would slightly increase to 143.1 acres. All other aspects of this design option would be similar to the Preferred Project.
- ***Design Options 2 (Use of Existing Layover Facilities).*** Design Option 2 would entail the use of existing layover facilities to the west of the Survey Area in place of constructing a new layover facility. The total construction area under the design option would decrease to 130.5 acres. All other aspects of this design option would be similar to the Preferred Project.
- ***Design Option 3 (Waterman Station).*** Design Option 3 would entail the construction of a new station platform just east of Waterman Avenue and south of the railroad corridor in place of the Tippecanoe Avenue platform. The total construction area under the design option would slightly increase to 139.0 acres. All other aspects of this design option would be similar to the Preferred Project.

Additionally, a No Build Alternative is under consideration as part of the environmental review. Under this alternative, SANBAG would not construction the project, but would still be required to perform regularly scheduled maintenance of the existing track and corresponding improvements at grade crossings and bridges to facilitate continued freight service per SANBAG's obligations with BNSF. As a result, the some renovation and rehabilitation of the railroad corridor, including replacement, would still be required. Impacts resulting from the No Build Alternative are not quantified in this BTR.

1.1.2 DEFINITIONS

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- ***Project area*** is defined as the limits of impacts associated with full build-out of the proposed project. The project area is synonymous with the proposed project's construction footprint, which is estimated at 137.3 acres.
- ***Survey area*** is defined as the area within 200 feet on either side of the centerline of the existing rail corridor that was mapped and evaluated for potential direct and indirect impacts to biological resources. In several instances, additional areas were added to the survey to include entire properties given uncertainties related to the actual placement of physical improvements. The survey area for the project is approximately 534 acres.

1.2 PROJECT LOCATION

The proposed action extends from the City of San Bernardino east to the City of Redlands within southwestern County of San Bernardino, California (Appendix A, Figure 1, RPRP Survey area). The

proposed action limits include the existing track and right-of-way along with adjacent areas beginning at E Street in San Bernardino and extend east to the University of Redlands, just east of University Avenue (Appendix A, Figures 2a and 2b, USGS Topographic Map).

1.2.1 PROJECT SOILS AND TOPOGRAPHY

Soils within the survey boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2008). The proposed project crosses eight different soil types (Appendix A, Figure 3, Soils), including:

- ***Grangeville Fine Sandy Loam (Gr)*** – This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy Sand (TvC), 0-9 percent slopes*** – This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.
- ***Hanford Coarse Sandy Loam (HaC), 2-9 percent slopes*** – This soil occurs on stream bottoms, floodplains and alluvial fans and is used for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of very deep, well drained soils that formed in moderately coarse textured alluvium dominantly from granite. Runoff is well drained or low and permeability is moderately rapid. The elevation ranges from 150 to 3,500 feet.
- ***Psamments and Fluvents, Frequently Flooded (Ps)*** – Psamment soils are sandy in all layers and are among the most productive rangeland soils. Psamments are used mostly as rangeland, pasture, or wildlife habitat. Fluvents are more the more or less freely drained entisols that have formed in recent water-deposited sediments on flood plains, fans, and deltas along rivers and small streams. Fluvents are used as rangeland, forest, pasture, or wildlife habitat and sometimes used as cropland. Most fluvents are frequently flooded with normal stratification of materials unless they are protected by dams or levees.
- ***Tujunga Loamy Sand (TvB), 0-5 percent slope*** – This soil occurs in somewhat excessively drained soils formed in alluvium and is used for growing citrus, grapes and other fruits but mainly used for grazing. Tujunga series consists of mostly weathered granitic sources. Runoff is very low to negligible with rapid permeability. The elevation ranges from 5-4,300 feet.
- ***Grangeville Fine Sandy Loam, Saline-Alkali (Gs)*** – This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Formerly, most areas of Grangeville soils were occasionally flooded. Runoff is negligible, with moderate permeability in saline-sodic phases. The elevation ranges from 50 to 200 feet.
- ***Hanford Sandy Loam (HbA), 0-2 percent slopes*** – This soil occurs on stream bottoms, floodplains and alluvial fans and is used mostly for growing a wide range of fruits, vegetables, and general farm crops. Hanford series consists of mostly granite and other quartz bearing rocks. Runoff is well drained, negligible to low runoff, and with moderately rapid permeability. The elevation ranges from 150-3,500 feet.

- ***Ramona Sandy Loam (RmC), 2-9 percent slopes –*** This soil occurs on terraces and fans and used mostly for production of grain, irrigated citrus and deciduous fruits. Ramona series consists of mostly granitic and related rock sources. Runoff is slow to rapid and permeability is moderately slow. The elevation ranges from 250-3,500 feet.

1.3 TOPOGRAPHY

The survey area is located in the southeastern margin of the San Bernardino Basin, in un-sectioned portions of Township 1 South; Range 4 West and Township 1 South at elevations above 1,000 feet above mean sea level (AMSL) (Appendix A, Figures 2a and 2b). Survey area topography is typical of low land valley areas with gentle slopes ranging from 1 to 3 percent. The general topography within the survey area grades towards the SAR from the cities of San Bernardino and Redlands, respectively. Topographical elevations in the general proximity of the Santa Ana River averages 1,028 feet AMSL and extend up to 1,078 feet AMSL in the vicinity of downtown San Bernardino and 1,474 feet AMSL in downtown Redlands.

1.4 HYDROLOGY

The survey area is located within the SAR Watershed[2], which is approximately 2,800 square miles in area, originates at San Gorgonio Peak in San Bernardino County and drains southwesterly towards northwesterly through Riverside and Orange Counties prior to emptying into the Pacific Ocean at Newport Beach. The survey area is located with the Upper SAR Watershed, which corresponds with Hydrologic Area (HA) 801.50 and, more specially, Hydrologic Subareas (HAS) 801.52 (Bunker Hill) and 801.53 (Redlands). The boundary of these two HASs on generally corresponds with New York Street in the City of Redlands.

[2] Note the SAR Watershed is located within the South Coast Hydrologic Region and corresponds to Hydrologic Unit Code (HUC) 18070203 accordingly to the U.S. Geological Survey.

2.0 SURVEY METHODS AND LIMITATIONS

Numerous surveys have been conducted in and around the survey area in association with the proposed project. These surveys include a biological constraints memorandum; general biological survey with a focus on vegetation community classification and mapping and sensitive species habitat assessment; springtime rare plants; focused sensitive species including least Bell's vireo, southwestern willow flycatcher, western burrowing owl, Santa Ana sucker, and San Bernardino kangaroo rat; and a jurisdictional wetland and waterway delineation. Surveys were undertaken based on consultation with regulatory agencies including USFWS, California Department of Fish and Wildlife (CDFW), and United States Army Corps of Engineers (USACE) and based on the results of a California Natural Diversity Database (CNDDB) search of nine quadrangles including and surrounding the survey area (Appendix N). Surveys were conducted for sensitive species known to occur, or with the potential to occur within or adjacent to onsite habitat. A complete list of surveys conducted in association with this project and the dates they were conducted is shown in Appendix B. The methods used for these studies, as well as survey limitations, are discussed below. A discussion of the survey results can be found in Sections 2.1.1 through 2.2, and Section 3. All vascular plants and wildlife encountered during the survey periods are listed in Appendices C and D. Tables of sensitive botanical and zoological species with the potential to occur on-site are located in Appendices E and F.

2.1 GENERAL BIOLOGICAL SURVEY

2.1.1 HABITAT TYPES/VEGETATION

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris and Summer Adleberg conducted vegetation mapping of the proposed alignment in February of 2012 (Appendix B). Where access permitted, the survey area was surveyed on-foot. Where access was prohibited (i.e., residences, gated properties, etc.) habitat type and vegetation was mapped opportunistically from adjacent areas with the use of binoculars, when necessary. Vegetation communities in this report generally follow Holland (1986). Botanical species discussed in this report follow both Latin and common names taken from the Jepson Manual (Hickman 1993). A comprehensive list of botanical species observed within the survey area during the field surveys is presented in Appendix C.

2.1.2 WILDLIFE

All wildlife species observed or detected during general biological, jurisdictional delineation, and focused species surveys were noted. Nomenclature for wildlife species follows Stebbins (2003) for reptiles and amphibians, American Ornithologists' Union (2009) for birds, Reid (2006) for mammals, and Emmel and Emmel (1973) for butterflies. A list of zoological species observed within the survey area during the field surveys is presented in Appendix D.

2.1.3 RARE PLANT SURVEY

A CNDDB search of nine quads surrounding and including the site identified several federal and state sensitive species known to occur in the region. From this search, seven (7) species of federally/state or CNPS list 2 (or above; CNPS 2010a) species were identified to have a low to high potential to occur within onsite habitat and include: federally endangered Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum*), federally endangered slender-horned spineflower (*Dodecahema leptoceras*), federally endangered Gambel's water cress (*Nasturtium gambelii*), CNPS list 1B.1 Horn's milk-vetch (*Astragalus hornii* var. *hornii*), CNPS list 2.2 smooth tarplant (*Centromadia pungens* ssp. *laevis*), CNPS list 2.2 salt spring checkerbloom (*Sidalcea neomexicana)*, and CNPS list 2.1 California satintail (*Imperata brevifolia*) (Appendices E and N).

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris, Summer Adleberg, Joseph Schroeder, and Dustin Janeke conducted focused surveys for sensitive plants known to occur, or with the potential to occur in the survey area. Rare plant survey dates, times, weather conditions, and surveyors are summarized in Table 1 below. Three separate surveys were conducted to capture the peak blooming period for smooth tarplant (Appendix B). The blooming period for the remaining sensitive species with potential to occur onsite is shorter than for the tarplant. Two surveys were conducted during the peak blooming period for these species. All areas supporting suitable habitat for sensitive species was surveyed on foot and at 10-meter transects where appropriate.

Table 1. Rare Plant Surveys-Survey Date, Time, Weather Conditions, and Surveyors

Date	Surveyors**	Time (Start/End)	Weather Conditions	Plants Surveyed
05/08/2012	AS/AN/SA/JS	1000/1700	0%cc, 75F, winds 1-2 mph	All species
05/09/2012	AS/AN/SA/JS	0800/1300	0%cc, 75F, winds 1-2 mph	All species
06/04/2012*	AS/AN	1747/1930 hours	0% cc, 76F, winds 1-6 mph	Smooth tarplant
06/05/2012*	AS/AN	0745/0957 hours	0% cc, 66F, winds 0-3 mph	Smooth tarplant
06/12/2012	AS/DJ	0830/1200 hours	0% cc, 80F, winds 0-3 mph	All species except for tarplant
07/09/2012*	SH	1800/2000 hours	0% cc, 100F, winds 3-4 mph	Smooth tarplant
07/10/2012*	SH	0546/0746 hours	15% cc, 70F, no wind	Smooth tarplant
07/10/2012*	SH	1803/1943 hours	15% cc, 107F, winds 2-4 mph	Smooth tarplant
07/11/2012*	SH	0625/0745 hours	10%cc, 73F, winds 3-6 mph	Smooth tarplant

* These surveys were conducted concurrently with western burrowing owl surveys as the two species share similar habitat. Suitable habitat for smooth tarplant extended beyond what was suitable for burrowing owl, thus, the remainder of tarplant habitat was surveyed once owl surveys were completed for the day.

** (AN) Aaron Newton, (AS) Allegra Simmons, (DJ) Dustin Janeke, (JS) Joseph Schroeder, (SA) Summer Adleberg, and (SH) Sean Harris.

Prior to surveying the SAR for Woolly Star (*Eriastrum densifolium* ssp. *sanctorum*), a reference population located east of highway 215 in the City of Highland was visited on May 7, 2012 and observed blooming. A complete list of all plant species observed during the rare plant survey and those observed opportunistically is presented in Appendix C.

2.1.4 LEAST BELL'S VIREO

Suitable habitat for the federally and state endangered least Bell's vireo (*Vireo bellii pusillus*; LBV) occurs within the survey area, primarily where the alignment crosses the SAR and adjacent to the western terminus of Mission Zanja Channel. HDR biologists Allegra Simmons and Aaron Newton conducted three of the eight required focused surveys for LBV between April 16 and May 8, 2012. Glenn Lukos Associates (GLA) biologist, Jeff Ahrens completed the remaining five surveys between May 21 and July 5, 2012. Survey methodology followed guidelines identified in Least Bell's Vireo Survey Guidelines prepared by the United States Fish and Wildlife Service (USFWS) on January 19, 2001 (USFWS 2001). Per the guidelines, surveys of the project area were conducted between dawn and 11:00a.m. and were surveyed where appropriate habitat was found. A detailed discussion of survey methods can be found in the Least Bell's Vireo Presence/Absence Survey Report located in Appendix G of this BTR. The surveys detected three non-mated male LBV, and one nested pair, all within the immediate vicinity of SAR corridor.

2.1.5 SOUTHWESTERN WILLOW FLYCATCHER

Protocol surveys for the southwestern willow flycatcher (*Empidonax traillii extimus*; SWIFL) were performed in all areas of suitable habitat on site. Suitable habitat occurs primarily where the alignment transects the SAR and runs adjacent to the western terminus of the Mission Zanja Channel.

Surveys were conducted in accordance with the 2010 USFWS guidelines[3], which stipulate that for Projects, five surveys (divided into three survey periods) shall be conducted in all areas of suitable habitat. One survey was conducted during the first survey period (May 15 to May 31). Two surveys were conducted during the second survey period (June 1 to June 24), and two surveys were conducted during the third survey period (June 25 to July 17).

GLA biologist Jeff Ahrens (TE052159-3) conducted the protocol surveys on May 21, June 1, June 11, June 25, and July 5, 2012. All surveys were conducted during the morning hours and were completed before 10:30 A.M. No surveys were conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95ºF). All areas of suitable habitat were surveyed on foot by walking slowly and methodically. Taped vocalizations primarily using the willow flycatcher's main contact call "fitz-bew" was used to elicit responses from SWIFLs that might be present on site. No detection of SWIFL within the survey area was documented based on both sight and call. A detailed discussion of survey methods can be found in the Southwest Willow Flycatcher Presence/Absence Survey Report located in Appendix H of this BTR.

2.1.6 WESTERN BURROWING OWL

HDR biologists Allegra Simmons, Aaron Newton, Sean Harris, Summer Adleberg, and Joseph Schroeder conducted focused surveys for the California Species of Concern, western burrowing owl (*Athene cunicularis hypugaea*; BUOW). Surveys were conducted on April 10, May 7-8, June 4-5, and July 9-11, 2012. Survey methodology followed guidelines identified in the Staff Report on Burrowing Owl Mitigation prepared by the Department of Fish and Game on March 7, 2012 (CDFG 2012a). Per the guidelines, the project area and a 150-meter (500-foot) buffer surrounding the site were surveyed where appropriate habitat was found. No evidence of BUOW was documented during the focused surveys.

Following focused surveys in 2012, an individual BUOW was observed by HDR biologist Aaron Newton on January 9, 2013 during a site inspection at the western end of the survey area (near the intersection of West Rialto Avenue and E Street in the City of San Bernardino, CA). This area had previously been surveyed during focused burrowing owl surveys conducted for the project in 2012. Based on the results of the 2012 focused survey, this individual is likely wintering onsite or passing through the area. A detailed discussion of survey methodology can be found in the Burrowing Owl Survey Report prepared for the project and located in Appendix I.

2.1.7 SANTA ANA SUCKER

The portion of the survey area within the SAR occurs within critical habitat for the Santa Ana sucker (*Catostomus santaanae*; SAS). Specifically, this portion occurs within critical habitat Unit 1, Subunit 1a in an area that is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Substrate at the SAR/Bridge 3.4 is primarily sand with some coarser material mixed in. Sand dominates the river bed downstream to the Prado Basin. Course materials (gravel and cobbles) from upstream sources pass through the project area during larger runoff events when water velocity is high enough to transport them.

A number of barriers to upstream fish movement occur downstream of the Bridge 3.4 within the SAR. These include grade control structures at the I-10 freeway crossing and La Cadena Drive. Downstream distance to occupied habitat from the project site is approximately 2.25 miles.

Since Santa Ana suckers do not occur within the project area, a field survey was not required. A detailed description of the methodology used in the habitat assessment for Santa Ana sucker is provided in the Santa Ana Sucker Habitat Evaluation prepared by Cardno-Entrix in Appendix J.

[3] *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher*, prepared by the USGS.

2.1.8 SAN BERNARDINO KANGAROO RAT

The survey area supports suitable habitat for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*; SBKR). HDR contracted Tom Dodson and Associates (TDA) to conduct a focused SBKR habitat assessment of the survey area. On May 8, 2012, TDA Biologist, Shay Lawrey conducted a habitat suitability assessment for SBKR along the entire alignment. Ms. Lawrey walked the alignment to visually assess the site conditions. During the site walk over, Ms. Lawrey looked for burrows, tail drags, tracks, and scat indicative of kangaroo rats. She also looked at the soil type and level of friability as well as habitat type and habitat structure. Ms. Lawrey found that the area surrounding the SAR bridge crossing was the only area along the alignment suitable for SBKR. Since this area warranted follow-on surveys, Ms. Lawrey conducted a focused trapping survey between May 18 and May 23, 2012.

The trapping protocol calls for five consecutive nights of trapping, when the animal is active above ground at night. During the trapping session, a total of 100 traps (five trap lines consisting of 20 traps) were set. The trap lines consisted of 12-inch, Sherman live traps placed 10 meters apart. Traps were placed in suitable habitat areas, concentrating on locating traps in areas containing sandy soils, relatively free of debris and containing suitable vegetation. Areas with kangaroo rat/small mammal sign (scat, burrows, tail drags) were also targeted. Each trap was baited with a mixture of bird seed and rolled oats placed at the back of the traps. The traps were set at dusk each night and inspected once during the night and at dawn each morning. All animals were identified and released unharmed at the point of capture. No SBKR were trapped over the course of the 5-night trapping survey. A detailed discussion of survey methodology can be found in the San Bernardino Kangaroo Rat Report prepared for the project and located in Appendix K of this BTR.

2.2 JURISDICTIONAL WETLAND AND WATERWAY DELINEATION SURVEY

HDR biologists Allegra Simmons and Sean Harris conducted a jurisdictional delineation survey for the proposed project in February 2012. The survey area extends 200 feet from the project centerline to capture jurisdictional features within and adjacent to the proposed project footprint. HDR biologists examined the project site to determine the limits of: (1) USACE jurisdiction pursuant to Section 404 of the Clean Water Act (CWA); and (2) California Department of Fish and Wildlife jurisdiction pursuant to Section 1600-1616 of the California Fish and Game Code. The site was evaluated in accordance with the 1987 USACE Wetland Delineation Manual (Environmental Laboratory, 1987), the 2008 Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Supplement (Arid West Supplement) (USACE 2008a), the Regulatory Program CWA Guidance to Implement the U.S. Supreme Court Decision for the Rapanos and Carabell Cases (USACE 2008b) and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) on the Arid West Region of the United States (USACE 2008c). A detailed description of delineation methodology can be found in the Jurisdictional Delineation Report prepared for this project located in Appendix L.

2.3 LITERATURE SEARCH

Prior to surveying the survey area, background research was performed to identify any sensitive species that may occur within the survey area. This was conducted using the CNDDB RareFind Version 4 (CDFG 2012b), the USFWS website, the California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants (CNPS 2010B), and other pertinent scientific literature.

2.4 REGULATORY FRAMEWORK

2.4.1 FEDERAL

Federal Endangered Species Act

The federal ESA defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

Section 7(a)(2) of the federal ESA requires that all federal agencies, including the USFWS, evaluate projects with respect to any species proposed for listing or already listed as endangered or threatened and any proposed or designated critical habitat for the species. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat.

As defined in the federal ESA, individuals, organizations, states, local governments, and other nonfederal entities are affected by the designation of critical habitat only if their actions occur on federal lands; require a federal permit, license, or other authorization; or involve federal funding (USFWS 2011).

The project does not occur within an approved Habitat Conservation Plan (HCP). Therefore, potential impacts to threatened or endangered species, as considered by the USFWS or CDFW, are not covered under an existing HCP. Consequently, should any listed species be detected during the associated focused species surveys, incidental take permits will need to be obtained.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 Code of Federal Regulations (C.F.R.) Part 10, including feathers, or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3505, 3503.5, and 3800 of the CDFG Code also prohibit the take, possession, or destruction of birds, their nests, or eggs.

Section 404 Permit (Clean Water Act)

The Clean Water Act establishes a program to regulate the discharge of dredge and fill material into waters of the U.S. including wetlands. Activities regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. Either an individual 404b permit or authorization to use an existing USACE Nationwide Permit will need to be obtained if any portion of the construction requires fill into a river, stream, or stream bed that has been determined to be a jurisdictional waterway. When applying for a permit a company or organization must show that they would avoid wetlands when practicable, minimize wetland impacts, and provide compensation for any unavoidable destruction of wetlands (CWIS 2007).

Section 401 Water Quality Certification (Clean Water Act)

The Clean Water Act protects water quality by regulating the dumping or flow of pollutants into streams, lakes, and rivers. A water quality certification, obtainable through the State Water Resources Control

Board (SWRCB) and Regional Water Quality Control Boards (RWQCB), must be obtained in order to receive a 404 permit or be authorized under the 404 nationwide permits (USEPA 2011).

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4321-4347) is a Federal statute requiring the identification and analysis of potential environmental effects associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. The process for implementing NEPA is outlined in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations define major Federal actions to include adoption of official policy (i.e., rules and regulations), adoption of formal plans, adoption of programs, and approval of specific projects (40 CFR 1508.18). The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis.

FTA is the federal lead agency under NEPA for the proposed project. As a federal agency, the FTA must meet NEPA requirements whenever it is the FTA's decision that would result in an impact on the human environment, even if the impact would be beneficial and regardless of who proposes the action or where it would take place (40 CFR 1508.18). FTA is requiring the preparation of an Environmental Impact Statement (EIS) for the Project to fulfill the requirements of NEPA.

2.4.2 STATE

California Endangered Species Act

The California ESA prohibits the *take* of listed species, except as otherwise provided in state law. The *take* for the California ESA is defined as it is in the federal ESA; however, unlike the federal ESA, the California ESA also applies the *take* prohibitions to species petitioned for listing as state candidates rather than only those listed species. State lead agencies are required to consult with the CDFW to ensure that any actions undertaken by the lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFW is authorized to enter into a Memorandum of Understanding (MOU) with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the proposed project area (e.g., least Bell's vireo, San Bernardino Kangaroo Rat, etc.), compliance with the California ESA was considered in the evaluation of the proposed project.

Section 2080 and 2081 of the State Fish and Game Code

Section 2080 of the State Fish and Game Code (Code) states:

> No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter [Chapter 1.5, Endangered Species], or the Native Plant Protection Act, or the California Desert Native Plants Act (Justia 2010).

Pursuant to Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or MOUs: (1) if the *take* is incidental to an otherwise lawful activity, (2) if impacts of the authorized *take* are minimized and fully mitigated, (3) if the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and (4) if the applicant ensures adequate funding to implement the measures required by CDFW. CDFW shall make this determination based on available scientific information and shall include consideration of the ability of the species to survive and reproduce.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the proposed project area, Sections 2080 and 2081 of the Code were considered in the evaluation of the proposed project.

Sections 3503 and 3503.5 of the State Fish and Game Code

These sections of the Code provide regulatory protection to resident and migratory birds and all birds of prey within the State of California, including the prohibition of the taking of nests and eggs, unless otherwise provided for by the Code. Specifically, these sections of the Code make it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code.

Due to the presence of resident and migratory breeding birds within the proposed project area, Sections 3503 and 3503.5 of the Code were considered in the evaluation of the proposed project.

Sections 1600 to 1603 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFW pursuant to Sections 1600 through 1603 of the State Fish and Game Code (Code) and require preparation of a Streambed Alteration Agreement. Pursuant to the Code, a *stream* is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Based on this definition, a watercourse with surface or subsurface flows that support or have supported riparian vegetation is a stream and is subject to CDFW jurisdiction (CDFG 2004).

Altered or artificial waterways valuable to fish and wildlife are subject to CDFW jurisdiction. Due to the presence of ephemeral streams within the project area, Sections 1600 through 1603 of the Code were considered in the evaluation of the proposed project.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires state and local agencies to identify impacts to the environment that might be caused by their actions. Projects undertaken by public or private agencies must comply with this act if there is any approval given by a state agency (CEQA 2012). CEQA is a self-regulating statute; however, agencies that do not comply may face litigation from the public. CEQA is a statute that requires state agencies to provide information about environmental impacts of their actions and requires that actions be taken to avoid, minimize, or mitigate those impacts. All listed species are protected as well as candidates and those listed by the CNPS (Lists 1A, 1B, and 2) and CDFW (CEQA 2012). Any plants listed by the CNPS existing within the project area would be avoided to the extent possible. SANBAG is preparing an Environmental Impact Report (EIR) for the Project to comply with the requirements of CEQA.

2.4.3 LOCAL

The Cities of Redlands and San Bernardino have adopted tree protection ordinance to implement policies described in each City's respective General Plans. These ordinances apply to incorporated portions of each jurisdiction and include several native and non-native tree species. These species include, but are

not limited to: oak, willow, cottonwood, walnut, citrus, and palm. The intent of these ordinances is to regulate the removal or disturbance of the trees within each city's jurisdiction.

City of San Bernardino Tree Ordinance

Section 19.28.090, Removal or Destruction of Trees, of the City of San Bernardino's municipal code discourages the removal of healthy, shade providing, and aesthetically valuable trees. More specifically, in the event that more than 5 trees are to be cut down, uprooted, destroyed or removed within a 36 month period, the City will require the securing of a tree removal.

City of Redlands Ordinance

Section 12.52.140, Work on Public Trees, of the Redlands Municipal Code requires that no person shall plant, chemically spray, fertilize, preserve, prune, remove, cut or otherwise disturb any public tree without first procuring a permit from the City. Additionally, Section 12.52.190, Protection of Trees During Improvements, of the Redlands Municipal Code requires that all trees on any street or other public place near any excavation or construction of any building, structure or street work, shall be guarded with a substantial fence, frame or box not less than four feet (4') high and eight feet (8') square, or at a distance in feet from the tree equal to the diameter of the trunk in inches at breast height, whichever is greater, and all building material, dirt or other debris shall be kept outside that barrier. Further, no person shall excavate any ditches, tunnels, trenches, or lay any driveway within a radius of ten feet (10') from any public tree without first obtaining a permit from the City (Ord. 2554 §1, 2004).

3.0 SURVEY RESULTS

The following discussion identifies biological resources (e.g., vegetation communities, botanical and zoological species, and jurisdictional areas) observed during the various biological surveys conducted for the project.

3.1 GENERAL BIOLOGICAL SURVEY

3.1.1 HABITAT TYPES/VEGETATION

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation was classified using the R.F. Holland system of natural communities as described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The survey area supports 15 distinct vegetation communities (Table 2); however, the predominant land cover was identified as being urban/developed. Two State-ranked sensitive vegetation communities occur within the survey area, southern cottonwood willow riparian forest and southern willow scrub. These communities are considered sensitive by the CDFW. The majority of the survey area is made up of paved roadways, man-made structures, adjacent lands that are unvegetated, and landscaped parcels. A vegetation communities map depicting the location of these communities is included as Appendix A, Figures 4a-4t.

Table 2. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	**533.88**

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have

been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.

Disturbed habitat in the survey area consists of abandoned staging areas, home sites, and parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix M, Photograph 1). Characteristic species include invasive, non-native forbs, such as prickly Russian-thistle/ tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition, a limited amount of annual grasses typical of non-native grassland (42200) occur but do not dominate DH.

Disturbed Wetland (Holland Code 11200)

Disturbed Wetland (DW) is generally associated with areas of wetlands that have been disturbed in the past by clearing, grubbing, or mowing. The vegetation community has indicators of wetland species that have been disturbed and non-native species such as castor bean (*Ricinus communis*), giant reed grass (*Arundo donax*), pampas grass (*Cortaderia selloana*), and other invasive species.

Within the survey area, a small area of DW occurs along the northern portion of the streambed in Twin Creek just west of the existing railroad bridge. Vegetation is sparse and consists of young arroyo willow (*Salix lasiolepis*), mulefat (*Baccharis salicifolia*), Typha (*Typha* sp.), and water speedwell (*Veronica anagallis-aquatica*). Within the DW a significant amount of trash and debris has accumulated such as mattresses, clothing, and shopping carts (Appendix M, Photograph 2). There is evidence of vegetation maintenance (i.e., mowing) within the streambed. The DW does not connect upstream or downstream to wetland habitats.

Eucalyptus Woodland (Holland Code 11100)

Eucalyptus woodland (EW) is characterized by landscaped areas around homes or roadways. The primary indicator in EW is eucalyptus (*Eucalyptus* spp.), which is a non-native tree species from Australia. The understory is sparse and mostly dominated by leaf litter and weedy species including brome grasses.

Within the survey area, EW occurs adjacent to the SAR with individuals and smaller stands of Eucalyptus occurring throughout the survey area (Appendix M, Photograph 3).

Flat-top Buckwheat Scrub (Holland Code 37K00)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* vars. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street. This habitat is disturbed due to frequent mowing.

Mulefat Scrub (Holland Code 63310)

Mulefat scrub (MFS) is generally characterized by tall, herbaceous riparian scrub dominated by mulefat. This vegetation community is frequently flooded and absent floods this community would likely succeed to cottonwood- or sycamore-dominated riparian forest or woodlands.

Within the survey area this habitat occurs primarily within the SAR.

Non-native Grassland (Holland Code 42200)

Non-native grassland (NNG) is often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens)*, four-spot clarkia *(Clarkia purpurea)*, sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained.

Proposed Non-jurisdictional Ditch (no Holland Code)

Several proposed non-jurisdictional ditches (NJD) occur within the survey area. These ditches occur entirely within upland areas and are generally associated with the railroad ROW. These features are typically unvegetated, or vegetated with weedy ruderal species, and do not provide significant wildlife habitat. These features serve to drain road runoff from the ROW and are often connected through a series of culverts running parallel with the ROW.

Non-Vegetated Channel (Holland Code 64200)

Non-Vegetated Channel (NVC) consists primarily of engineered/leveed channels maintained by the SBCFCD or local municipality. The channels consist of a concrete, fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap.

Within the SAR are small patchy areas of Riversidean Alluvial Fan Sage Scrub (Holland Code 32720), which includes scalebroom (*Lepidospartum squamatum*), broom matchweed (*Gutierrezia sarothrae*), and coastal goldenbush (*Isocoma menziesii*). These areas are considerably less than 15 percent vegetated and were therefore left out of the larger vegetation assessment.

Within the survey area, NVC occurs primarily in Warm Creek, and portions of Twin Creek (Appendix M, Photographs 2 and 5).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak (*Quercus berberidifolia*) with an occasional live oak (*Quercus agrifolia*) and a disturbed understory made up of non-native grasses that appear to be maintained (Appendix M, Photograph 6). The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and Vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets.

Southern Cottonwood Willow Riparian Forest (Holland Code 61330)

Tall, open, broad-leafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species.

Within the survey area, Southern cottonwood willow riparian forest (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR. SCWARF is a State-ranked S3.2 (threatened) sensitive habitat.

Southern Willow Scrub (Holland Code 63320)

Southern willow scrub (SWS) is usually made up of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory.

Within the survey area, SWS occurs as small patches within the SAR and Twin Creek (Appendix M, Photographs 4 and 7). SWS is a State-ranked S2.1 (very threatened) sensitive habitat.

Tamarisk Scrub (Holland Code 63810)

Tamarisk scrub (TS) is made up of almost a monoculture of any of several tamarisk (*Tamarix* spp.) species. This vegetation community is often associated with major disturbances in areas where native vegetation is being supplemented by tamarisk.

Within the survey area Tamarisk Scrub occurs in primarily within the SAR and the Mission Zanja Channel.

Urban/Developed (Holland Code 12000)

Urban/Developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants (Appendix M, Photograph 8).

3.1.2 BOTANICAL RESOURCES

During the general biological and rare plant surveys conducted by HDR, all native and naturalized botanical species observed were recorded and are included in Appendix C. The species detected are representative of the vegetation communities located within the survey area. One individual sensitive plant (SAR woolly star, *Eriastrum densifolium* ssp. *sanctorum*) was observed onsite during rare plant surveys. This is discussed in detail in Section 4.1 of this report.

3.1.3 ZOOLOGICAL RESOURCES

Birds

A large diversity of birds were observed during the surveys that reflect an assemblage of typical species encountered in riparian habitats, southern willow scrub, oak woodland, non-native grasslands, disturbed areas, and urban habitats. A total of 62 species of birds were observed in the larger survey area during site surveys (Appendix D). Sensitive avifauna observed or with the potential to occur within the survey area is discussed in Sections 4.2 of this biological technical report.

Mammals

A total of 11 species of mammals were observed or detected in the survey area during the general biological survey and focused species surveys including: coyote (*Canis latrans*), raccoon (*Procyon lutor*), California ground squirrel (*Spermophilus beecheyi*), and desert cottontail (*Sylvilagus audubonii*) (Appendix D). These species are commonly found in the vegetation communities occurring within the

survey area. Sensitive mammalian species observed or with the potential to occur within the survey area are discussed in Section 4.2, Sensitive Wildlife Species of this biological technical report.

Reptiles and Amphibians

Amphibian and reptilian species observed during the general biological survey are commonly found in local habitats. Amphibians detected during the surveys were associated with stream courses and riparian habitats encountered in the survey area. Two reptilian species and one amphibian species were observed within the survey area and include: western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), and Pacific tree frog (*Pseudacris regilla*) (Appendix D).

3.2 JURISDICTIONAL WETLAND AND WATERWAY DELINEATION SURVEY

A jurisdictional delineation was conducted to identify the limits of waters of the U.S., including wetlands, pursuant to the Clean Water Act and subject to USACE jurisdiction as well as wetlands and non-wetland waters subject to CDFW jurisdiction pursuant to Section 1600 of the Fish and Game Code. The following is a summary of the jurisdictional delineation conducted within the site, further detail of findings can be found in the delineation report prepared for the project and located in Appendix L. Appendix A, Figures 6a through 6t, (Preferred Project) and Figure 7 (Reduced Project) illustrate the USACE and CDFW jurisdictional areas within the survey area.

A total of five major offsite drainage features either cross or is located longitudinally to the rail corridor. The crossings from west to east are known as Warm Creek (Historic) [Bridge 1.1], Twin Creek [Bridge 2.2], SAR [Bridge 3.4], and Mill Creek Zanja [Bridge 9.4]. Mission Zanja Channel occurs adjacent and to the south of the railroad corridor from MP 3.5 to MP 6. The following is a description of these features.

Santa Ana River

The main drainage feature within the Santa Ana Watershed is the SAR which is approximately 96 miles long, with its major upstream tributaries, including Bear Creek and Mill Creak. Other tributaries just downstream of the survey area include Lytle Creek originating in the San Gabriel Mountains and the San Jacinto River originating in the San Jacinto Mountains. The SAR bisects the survey area at MP 3.4 (or Bridge 3.4), which corresponds with approximately River Mile 28.62 (or Reach 4) (Appendix A, Figure 6g [Preferred Project]).

A portion of the SAR occurs within the survey area between Waterman and Tippecanoe Streets. The streambed consists primarily of unvegetated fine sandy substrate with some cobble and areas of raised vegetated bars/islands. The bars and islands are primarily dominated by willow (*Salix* sp.) scrub, cottonwood, and mulefat with some upland species occurring in the understory such as California sagebrush (*Artemisia californica*) and flat-top buckwheat (Appendix M, Photograph 9). Within the survey area the river is generally confined to the east and west by development or maintained (i.e., reinforced) floodplain. The northeastern and southeastern banks of the river are vegetated with cottonwood and willow scrub vegetation. The northwest portion of the river bank is leveed with concrete and metal mesh rip rap and the southwest bank supports a large stand of eucalyptus trees (Appendix M, Photograph 3). Off-road vehicles tracks are common within the unvegetated portion of the channel. Within the SAR are small patchy areas of Riversidean alluvial fan sage scrub (Holland Code 32720), which includes scalebroom (*Lepidospartum squamatum*), broom matchweed (*Gutierrezia sarothrae*), and coastal goldenbush (*Isocoma menziesii*). These areas are considerably less than 15 percent vegetated and where therefore left out of the larger vegetation assessment.

The portion of the SAR within the survey area supports an ephemeral flow regime. Ponded water was observed in the low points of the riverbed up to several weeks after winter and spring rains. However,

during various biological surveys, the riverbed was generally observed to be dry. Within the survey area, the SAR supports federal waters of the U.S. and CDFW riparian and unvegetated streambed.

Mission Zanja Flood Control Channel

The Mission Zanja Flood Control Channel (Mission Zanja Channel) parallels the rail corridor to the south from its confluence with the SAR to approximately 1,000 feet west of California Street; a total distance of approximately 2.5 miles (Appendix A, Figure 6g-6m [Preferred Project]). The Mission Zanja Channel consists of an un-improved trapezoidal earthen channel with some segments supported by wire revetment (Appendix M, Photograph 10) and is maintained by SBCFCD, The western terminus of the channel (outlet into the SAR) supports dense native riparian vegetation and is heavily incised (15-20 feet) (Appendix M, Photograph 7). Trash and debris can be found throughout the channel.

Mission Zanja Channel is culverted where it is crossed by paved roads through the cities of Loma Linda and Redlands. The channel has been artificial levied to decrease the risk of flooding to near by communities as a result to surrounding urban encroachment. Due to the surrounding urbanization there are many storm water drains that discharge into the channel.

Within the survey area, Mission Zanja Channel is ephemeral and supports federal waters of the U.S. and CDFW riparian and unvegetated streambed.

Twin Creek

Twin Creek (also known as "East Twin Creek and Warm Creek Channel") is a major channel that conveys flows from the Twin Creek Spreading Grounds in northern San Bernardino to its confluence with the SAR at the northeast quadrant of I-10/Interstate 215 (I-215) separation. Twin Creek is owned, operated, and maintained by the San Bernardino County Flood Control District (SBCFCD). According to USACE record drawings, Twin Creek consists of a 60-foot wide by 14-foot high rectangular concrete channel (RCC) through the survey area (Appendix A, Figure 6c and 6d (Preferred Project); Appendix M, Photograph 2). Further downstream, the channel transitions to an unimproved (earthen) 202-foot wide base trapezoidal channel (with 2 to 1 side slopes) prior to discharging into Reach 5 of the SAR. The portion crossing the rail corridor was constructed in 1958.

Twin Creek primarily occurs as a large, unvegetated, concrete-lined channel, with vertically incised banks, and flows northeast to southwest through the survey area. The southern portion of the creek occurring in the survey area transitions to a sandy substrate with steeply sloped concrete banks. The sandy streambed supports sparse wetland vegetation, primarily low herbaceous plants and early successional shrub (mulefat) and sapling tree species (*Salix* spp., *Populus fremontii*).

Within the survey area, Twin Creek is ephemeral and supports federal wetlands and waters of the U.S. and CDFW riparian and unvegetated streambed.

Warm Creek

Warm Creek extends from north of the City of Highland downstream to its confluence with the SAR at the southwest quadrant of the I-10/I-215 separation (Appendix A, Figure 6a (Preferred Project); Appendix M, Photograph 5). The East Twin and Warm Creek improvements constructed by the USACE in 1961 diverted most of the original flows to the SAR at a point 1.4 miles upstream of its original confluence, resulting in a rerouting of the portion of Warm Creek from about 5th Street south to Central Avenue. Hence, the remaining portion of the channel is referred to as Warm Creek (Historic) throughout the BTR. Currently, the City of San Bernardino owns, operates, and maintains Warm Creek (Historic).

Within the survey area, Warm Creek primarily occurs as a narrow, unvegetated, concrete-lined channel, with vertically incised banks, and flows north to south through the survey area. Warm Creek supports federal waters of the U.S. and CDFW unvegetated streambed.

Mill Creek Zanja

Mill Creek Zanja occurs within the survey area at MP 9.5 (Appendix A, Figure 6r and 6s (Preferred Project); Appendix M, Photograph 11). The ephemeral creek was originally built by Native Americans as a ditch for water supply in 1819. As the area developed, the use of the Mill Creek transformed from water supply to a flood control and drainage channel. The Mill Creek Zanja, from 9th Street to Mill Creek, is designated as a State and Federal Historic Structure. SBCFCD owns the portion of the Mill Creek upstream and downstream of the Survey area. Mill Creek is covered with grouted rip rap as it conveys flow under I-10 (east crossing). The creek supports sparse non-native vegetation, sandy substrate, riprap banks, and substantial urban trash and debris.

Within the survey area, Mill Creek Zanja is ephemeral and supports federal waters of the U.S. and CDFW unvegetated streambed.

3.2.1 NON-JURISDICTIONAL FEATURES

Throughout the survey area, storm water from adjacent urban areas is channeled into the railroad ROW and transported through a series of ditches (Appendix A, Figure 6a-6t (Preferred Project); Appendix M, Photograph 12). These features occur entirely within upland areas, exhibit indistinct or intermittent OHWM and do not support hydrophytic vegetation. Within the survey area there are 1.39 acres of proposed non-jurisdiction ditches. A summary of acreages by non-jurisdictional ditch is found in Appendix L, Table 2.

3.2.2 FEDERAL WETLANDS

Potential jurisdictional areas were field checked for the presence of an Ordinary OHWM, definable channels and/or wetland vegetation, soils and hydrology. Suspected wetland habitats within the survey area were evaluated using the methodology set forth in the USACE 1987 *Wetland Delineation Manual*[4] (Wetland Manual), Regional Supplement to the USACE *Wetland Delineation Manual: Arid West Region* (USACE 2008), and *A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States* (USACE 2008b). Where distinct boundaries between wetland vegetation communities, those that are dominated by obligate species, and upland vegetation communities, those that are dominated by facultative upland or upland species, occurred, wetland limits were based upon vegetation mapping. Where the presence of wetlands was suggested by either hydrophytic vegetation or indicators of hydrology, a soil pit was established (Appendix A, Figures 6a-6t [Preferred Project]). In some instances, soil pits were not conducted even with the presence of the hydrophytic vegetation and hydrology, such as in the SAR and Mission Zanja Channel, because the presence of well drained sandy substrate would prohibit the development of hydric soils. Four soil pits were conducted within the survey area. The following is a summary of the results; soil data sheets can be found in the attached delineation report (Appendix L):

Soil Pit 1

Soil Pit 1 (SP1) was located in a depressional area located north of the railroad tracks (Appendix A, Figure 6h (Preferred Project); Appendix M, Photographs 13 and 14). The area is supported by stormwater runoff from the ROW and is located adjacent to Mission Zanja Channel. Hydrophytic vegetation is dominant at SP1 and includes: arroyo willow (FACW), Fremont cottonwood (FAC), mulefat (FAC), and desert wild grape (*Vitis girdiana*; FAC). SP1 soils supported a loam matrix of very dark brown (10YR 3/2) and exhibited redoximorphic concentrations of strong brown (7.5YR 5/6) within 25 percent of the soil matrix. Hydric soils were identified as redox depression (F8). Hydrologic indicators at SP1 included water-stained leaves and biotic crust. SP1 meets the criteria for wetlands.

[4] Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

Soil Pit 2

Soil Pit 2 (SP2) was located in a depressional area located north of SP1 and the railroad tracks on land owned and maintained by the City of Riverside (Appendix A, Figure 6h (Preferred Project); Appendix M, Photograph 15). The depressional area is supported by stormwater runoff from adjacent, industrially-zoned properties which flows south-southwest towards the railroad ROW and is obstructed by the existing track profile (Appendix M, Photograph 16). The area supports moderately dense cover of 50 percent tamarisk (*Tamarisk* sp.; FAC) and 15 percent Johnson grass (*Sorghum halipense*; FACU). Using both the hydrophytic dominance test and prevalence index worksheets, SP2 does not meet USACE hydrophytic vegetation criteria. SP2 supported a silty clay loam dusky red (2.5YR 3/2) matrix at 0-2 inches and a silty clay loam olive (5Y 4/3) matrix at 2-15 inches. Soils did not exhibit redoximorphic features. Soils were not determined to be hydric. Hydrologic indicators at SP2 included surface soil cracks and inundation on aerial imagery. SP2 does not meet the criteria for wetlands.

Soil Pit 3

Soil Pit 3 (SP3) was located on the northern side of the Twin Creek streambed (Appendix A, Figure 6d (Preferred Project); Appendix M, Photographs 2 and 17). Hydrophytic vegetation is dominant at SP1 and includes sparse coverage of mulefat (FAC) and Typha (*Typha* sp.; OBL). The area occurs at the transition from concrete-lined channel bottom to sandy substrate. This area is highly disturbed with a significant amount of urban trash and debris (Appendix M, Photograph 2). SP3 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP3 included surface water, saturation, water-stained leaves, and muck surface. SP3 meets the criteria for wetlands.

Soil Pit 4

Soil Pit 4 (SP4) was located on the southern side of the Twin Creek streambed (Appendix A, Figure 6d [Preferred Project]); Appendix M, Photograph 2). Hydrophytic vegetation is dominant at SP1 and includes: *Salix* sp. (FACW) and mulefat (FAC). Similar to SP3 area, SP4 occurs at the transition from concrete-lined channel bottom to sandy substrate and supports urban trash and debris (Appendix M, Photograph 2). SP4 soils were inundated and had a hydrogen sulfide smell when agitated. Hydric soils were identified as redox hydrogen sulfide (A4). Hydrologic indicators at SP4 included saturation, water marks, water-stained leaves, inundation on aerial imagery, and muck surface. SP4 meets the criteria for wetlands.

In summary, the survey area primarily supports federal waters of the U.S. including several small areas of federal wetlands (Appendix A, Figures 6a-6t [Preferred Project]). Federal jurisdictional areas mapped within the survey area are summarized in Table 3 below.

Table 3. USACE Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area
USACE Waters of the US*	16.70
USACE Wetlands**	0.05
Total	**16.75**
Proposed Non-Jurisdictional Ditch	1.39

* Includes DH, non-vegetated channel, southern willow scrub, and southern cottonwood willow riparian forest.
** Includes disturbed wetland, southern willow scrub, and southern cottonwood willow riparian forest.

3.2.3 WATERS OF THE STATE

All USACE jurisdictional drainages within the survey area are considered jurisdictional by the CDFW. CDFW jurisdiction is similar to that of USACE jurisdiction, but also extends to the top of the bank and encompasses riparian vegetation when present. CDFW jurisdictional areas occurring within the survey area are summarized in Table 4 and identified in Appendix A, Figure 6.

Table 4. CDFW Jurisdictional Areas within the Survey Area

Jurisdiction	Existing Acreage within the Survey Area
CDFW Riparian	8.77
CDFW Unvegetated Streambed*	29.84
Total	**38.61**
Proposed Non-jurisdictional Ditch	1.39

*This includes DH and non-vegetated channel.

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4.0 SENSITIVE BIOLOGICAL RESOURCES

This section documents the potential occurrence within the survey area of sensitive plant and animal species, sensitive natural communities, and wildlife dispersal corridors or linkages. Sensitive species are those recognized by the USFWS (or other federal agencies) and/or CDFW as sensitive due to their declining, limited, or threatened populations. Sensitive natural communities are defined by city ordinances.

4.1 SENSITIVE BOTANICAL SPECIES

Sensitive plants include those listed by USFWS and CDFW as threatened or endangered, candidates for listing by the USFWS and CDFW, and/or are considered sensitive by the CDFW and/or the CNPS. CNDDB record searches indicated 26 known occurrences of rare or sensitive botanical species within nine quadrangles surrounding the survey area (Appendix N). The following is a description of sensitive plant species with a moderate to high potential for occurring within the survey area. The majority of suitable habitat for sensitive plants is located within the SAR crossing. A list of all the sensitive plant species with potential for occurrence are identified in Appendix E.

4.1.1 FEDERALLY THREATENED AND ENDANGERED BOTANICAL SPECIES

The following federally and/or state listed botanical species have been identified as having a moderate to high potential to occur within the project and survey areas. In general, suitable habitat for these species is limited to portions of the survey area within close proximity to the SAR.

Santa Ana River woolly star (*Eriastrum densifolium ssp. sanctorum*)
Federal: Endangered
State: Endangered
CNPS List: 1B.1

The Santa Ana River Woolly Star is a perennial herb that is native to California at elevations of 298 to 2,001 feet (91 to 610 meters) above mean sea level. This species is associated with sandy or gravelly chaparral and coastal scrub (alluvial fan). This species blooms and is best surveyed for in May through September (CNPS 2010B).

Habitat for the federally endangered species occurs as sandy areas associated with all sandy-bottomed drainages located within the survey area (e.g., SAR, Warm Creek, Mission Zanja Channel, etc.) The species is known to occur upstream and downstream of where the SAR transects the survey area. The nearest elemental occurrence of this species is located within approximately 1,700 feet of the survey area. One individual was observed during the 2012 springtime rare plant survey located within approximately 50 feet of Bridge 3.4 in the SAR (Figure 4g [Preferred Project]).

Slender-horned spineflower (*Dodecahema leptoceras*)
Federal: Endangered
State: Endangered
CNPS List: 1B.1

The Slender-horned Spineflower is an annual herb that is native to California at elevations of 656 to 2,493 feet (200 to 760 meters) above mean sea level (Calflora 2010). This species is associated with sandy chaparral, cismontane woodland and coastal scrub (alluvial fan) (CNPS 2010B). This species blooms and is best surveyed for in April through June (CNPS 2010B).

Habitat for the federally endangered species occurs as sandy areas associated with all sandy-bottomed drainages located within the survey area (e.g., SAR, Warm Creek, Mission Zanja Channel, etc.) The species is known to occur upstream and downstream of where the SAR transects the survey area and upstream of the survey area in Warm Creek. CNDDB data indicate that there is one elemental occurrence

of this species within the survey area; however, this record was in 1983. Although moderately suitable habitat occurs within the survey area, this species was not observed during focused rare plant surveys.

4.1.2 STATE THREATENED, ENDANGERED AND SPECIES OF SPECIAL CONCERN

The following species are CNPS listed sensitive botanical species.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*)
Federal: None
State: None
CNPS List: 1B.1

The Smooth tarplant is an annual herb that is native to California at elevations 0 to 2,099 feet (0 to 640 meters) above mean seal level. This species is associated with chenopod scrub, playas, riparian woodland, valley and foothill grassland, and meadows and seeps. This species blooms and is best surveyed for April through September (CNPS 2010B). CNDDB data indicate that there are elemental occurrences of this species within the survey area; however, the most recent record was in 1925. A single individual was observed within the survey corridor where the railroad tracks go under I-10 (the west crossing) during general biological surveys conducted in June and July, 2010. This species was not observed during 2012 focused rare plant surveys.

Salt spring checkerbloom (*Sidalcea neomexicana)*
Federal: None
State: None
CNPS List: 2.2

The Salt Spring checkerbloom is a perennial herb that is native to California and the western North America at elevations 49 to 5,019 feet (15 to 1,530 meters) above mean sea level. This species is associated with chaparral, coastal scrub, lower montane coniferous forest, mojavean desert scrub and playas. This species blooms and is best surveyed for March through June (CNPS 2010B). CNDDB data indicate that there is one record of elemental occurrence of this species within the survey area; however, no observation date is provided. Although moderately suitable habitat occurs within the survey area, this species was not observed during focused rare plant surveys.

4.2 SENSITIVE WILDLIFE SPECIES

Sensitive animals are species or subspecies listed as threatened, endangered, or being evaluated (proposed) for listing by the USFWS or by the CDFW, and/or are considered sensitive by the CDFW. A sensitive designation includes those listed as rare or of “Special Concern,” and includes a number of migratory bird species protected under the MBTA. CNDDB record searches indicated 32 known occurrences of rare or sensitive zoological species within 9 quadrangles surrounding the survey area (Appendix N). Species not considered federally or state sensitive were eliminated from consideration.

4.2.1 FEDERAL THREATENED AND ENDANGERED SPECIES

Least Bell’s vireo (*Vireo bellii pusillus*)
Federal: Endangered
State: Endangered

The least Bell’s vireo historically occurred throughout California, from the coastal ranges, Central Valley, Sierra Nevada foothills, Owens Valley, Death Valley, Mojave Desert and northwestern Baja California (Matthews and Moseley 1990). In 1990, 80 percent of the U.S. population occurred along just five drainages: Santa Margarita River, Sweetwater River, San Luis Rey River, San Diego River and the SAR (Prado Basin) (Ehrlich et al. 1992).

Habitat for the LBV ranges from riparian, shrubland/chaparral, and woodland. LBV prefer dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak in arid regions but often near water (AOU 1983). They often return to the same breeding territory in successive years and only make nests in shrubs or low trees usually averaging about 1 meter aboveground (Franzreb 1989). The loss of about 95 percent of the former U.S. range and the loss of breeding habitat due to agricultural, urban and commercial development, flood control, river channelization and cowbird parasitism have lead to a dramatic decline in population and distribution (1994 End. Sp. Tech. Bull. 19(5):12; Saul 1995, Greaves 1997) (Franzreb 1989).

The LBV usually has a clutch size of 3-5 with incubation lasting 14 days. The LBV eats almost exclusively insects, spiders, snails, fruits, and forages in dense brush and occasionally tree tops (Terres 1980, NGS 1983). This species was observed within the survey area during general biological surveys conducted in June and July 2012. During focused protocol surveys several LBV were detected. On April 16, 2012 a male was observed calling approximately 600 feet to the northeast of the bridge crossing along the eastern side of the river in the riparian scrub. This male was also observed again on April 27, 2012 and May 8, 2012. On April 27, 2012, another male was observed approximately 500 feet south of the bridge along the east bank in the riparian forest floodplain. GLA observed a pair of LBV displaying breeding behavior which was detected south of the railroad within the Mission Zanja Channel. Several single male LBV were also detected outside of the survey area. A single male LBV (LBV 1) was observed approximately 400 feet sound of the railroad crossing on June 1, 11, 25, and July 5, 2012. LBV 2 was a single male that was observed approximately 500 feet north of the bridge crossing on June 1 and June 11, 2012. LBV 3 was a male that was observed on June 11, 2012, approximately 600 feet south of the railroad crossing. LBV 3 arrived south of the project site, was observed briefly counter singing with LBV 1 and then flew back south out of the survey area.

Southwestern willow flycatcher (*Empidonax traillii extimus*)
Federal: Endangered
State: Endangered

The southwestern willow flycatcher breeds throughout the southwestern U.S. as far west as Texas and possibly northern Baja California. SWIFL typically nest in relatively dense riparian vegetation where surface water is present for part of the year, or soil moisture is high enough to maintain the appropriate vegetation characteristics. SWIFL breeding habitat is restricted to relatively dense growths of trees and shrubs in riparian ecosystems and can be composed of a single species of willow (*Salix* sp.) or a mixture of native and nonnative trees and shrubs (Bent 1960). Species decline is a result of destruction and fragmentation of riparian habitat by the way of dams, reservoirs, diversions, channelization, groundwater pumping, and mismanagement of livestock, recreational development and cowbird parasitism (USFWS 2002) (USFWS 2011).

SWIFL eat mainly insects (wasps, bees, flies, beetles, spittlebugs butterflies/moths and caterpillars) caught in flight while occasionally gleaning insects from foliage and berries (Bent 1960). breeding usually occurs from early June through the end of July with incubation of normally one brood lasting 12-15 days. The riparian scrub/forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat for SWIFL. Habitat ranges from around 1,460 feet in elevation.

Suitable habitat for this species was observed in the surveys area during general biological surveys conducted in February 2012. Although suitable habitat for this species exists on site, no SWIFL were detected during the five protocol surveys within the project site (Appendix H).

San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
Federal: Endangered
State: Species of Special Concern

The historical range of the San Bernardino kangaroo rat (SBKR) extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (Lidicker 1960). SBKR occur on sandy soils and sandy loam soils within relatively open vegetation, generally along rivers, streams and drainages. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than eolian (wind) processes. Burrows are dug in loose soil, usually near or beneath shrubs. While the general habitat preference for the species is alluvial scrub, it mainly occurs in early and intermediate seral stages of this plant community (McKernan 1997).

The project site is within the historical range of SBKR. The USFWS (2008) has designated parts of the SAR as critical habitat for the species. CNDDB data indicate there is one record of elemental occurrence of this species within the survey area, this occurred in 1993. The disturbed and relatively undisturbed habitat that occurs where the project site intersects Warm Creek and the SAR are potential SBKR habitat. Elsewhere along the project site, the ROW does not contain floodplain and agricultural habitats that could support SBKR, and is separated from such habitats by urban development. Robust populations of SBKR are documented approximately 1 mile upstream of the survey area. According to recent surveys conducted in the vicinity of the Project, SBKR have recently (2010 and 2012) been located approximately 0.25 mile upstream of the SAR crossing.

The trapping results show that SBKR do not currently occupy habitat within the survey area (Appendix K). No SBKR were trapped over the course of the 5-night trapping survey.

Santa Ana sucker (*Catostomus santaaneae*)
Federal: Threatened
State: State Species of Concern

The Santa Ana sucker (SAS) is a small fish that occurs in the rivers, larger streams and tributaries in southern California and is believed that the species' historical occupancy varied depending on suitability and access to these different areas (USFWS 2000, p. 19686). Santa Ana sucker generally inhabits perennial streams that have water depths ranging from a few inches to several feet and water currents from slight to swift (Smith 1966, p. 57).

The Santa Ana sucker's population has declined due to habitat availability/modification as a result to surrounding urban encroachment. Modifications to the watershed such as diversions, dams and recharge basins along with the volume and flow rate of water are key factors that shape the watershed and impact the Santa Ana sucker population. The Santa Ana sucker has lost approximately 70 percent of its historic range in the SAR watershed and 75 percent of its historic range (USFWS 2000, pp. 19687-19688).
The project is located near the upstream edge of Unit 1 (SAR), Subunit 1B, in an area that is not currently occupied by Santa Ana sucker due to the barrier to upstream movement at La Cadena Drive. This area is not currently occupied by the species but provides transit of water and coarse materials downstream to occupied habitat. Downstream distance to occupied habitat from the SAR (Bridge 3.4) is approximately 2.25 miles. Based on these circumstances, no Santa Ana suckers are expected to occur within the survey area.

4.2.2 STATE THREATENED, ENDANGERED AND SPECIES OF SPECIAL CONCERN

Western spadefoot toad (*Spea hammondii*)
Federal: None
State: Species of Special Concern

The Western Spadefoot toad's range includes the Central Valley and bordering foothills of California and the Coast Ranges (south of San Francisco Bay) and extends southward into northwestern Baja California, Mexico (NatureServe 2009).

Since this species spends most of its time underground in burrows, the aboveground observations may not be appropriate criteria for determining estimated population density, range, and abundance. Recent scientific literature does not discuss population densities of western spadefoot toad. No vernal pools or open water were mapped or observed within the survey area. Appropriate breeding locations occur within the proposed project footprint among portions of disturbed wetlands, the Mission Zanja Channel, and other areas that have temporary or permanent water associated with them (Jennings and Hayes 1994; Stebbins 1972; Ruibal et al. 1969). No western spadefoot toads were observed within the survey area during 2012 surveys.

Species-specific surveys for western spadefoot toads were not conducted. For the purposes of this BTR, presence is assumed. Suitable habitat occurs in the Mission Zanja Channel, in portions of Twin Creek, and in some non-jurisdictional ditches.

Loggerhead shrike (*Lanius ludovicianus*)
Federal: None
State: Species of Special Concern

The loggerhead shrike has a breeding range that extends from central and southern Canada, throughout the continental U.S. and through most of Mexico. The loggerhead shrike is a permanent resident in California and breeds from as early as January or February to July (Shuford and Gardali 2008). Loggerhead Shrike is diurnal and their diet consists primarily of large insects, other invertebrates, small birds, lizards, frogs, and rodents (Fraser and Luukonen 1986). However diet varies with season and location (Terres 1980). Primary threats across the North America of the Loggerhead Shrike are habitat loss and degradation, pesticides and fragmentation (USFWS).

The loggerhead shrike is associated with grassland habitats throughout their annual cycle, although have shifted over time to include altered landscapes such as agricultural areas (USFWS). Loggerhead Shrikes often perch on poles, wires or fence posts. These elevated perches are used for hunting, pair maintenance, and territory advertisement (USFWS). An individual was observed during 2012 surveys foraging within the survey area in an open field adjacent to MP 5.5 (location of MP on Figure 5k, Impacts on Vegetation Communities [Preferred Project]). No additional loggerhead shrikes were observed during avian surveys of the survey area.

Western burrowing owl (*Athene cunicularis hypugaea*)
Federal: None
State: Species of Special Concern

Western burrowing owl has a broad distribution that includes open country throughout the Midwest, western United States, Texas, southern Florida, parts of central Canada, Mexico, and the drier regions of Central and South America. In southern California, the species is known to occur in lowlands over much of the region, particularly in agricultural areas. In California, the BUOW has been extirpated as a breeding species during the last 10-15 years from approximately 8 percent of its former range (Klute 2003). Primary threats across the North American range of the BUOW are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986, Haug

et al. 1993, Dundas and Jensen 1994/95, Rodriguez- Estrella et al. 1998, Sheffield 1997a, Dechant et al. 1999).

BUOW is primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity (Shuford and Gardali 2008, references found therein). The overriding characteristics of suitable habitat appear to be burrows for roosting and breeding and relatively short vegetation with only sparse shrubs and taller vegetation (Green and Anthony 1989, Haug et al. 1993). Owls in agricultural environments nest along roadsides and water conveyance structures (open canals, ditches, drains) surrounded by crops (DeSante et al. 2004, Rosenberg and Haley 2004). Burrowing Owls often nest near and under runways and associated structures (Thomsen 1971, Gervais et al. 2003). Individual Burrowing Owls have moderate to high site fidelity to general breeding areas, prairie dog colonies, and even to particular nest burrows (Klute 2003). Burrow fidelity has been reported in some areas; however, more frequently, Burrowing Owls reuse traditional breeding areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Occupancy of suitable habitat can be verified at a site by observing owls during the spring and summer months or, alternatively, the presence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow entrance.

BUOW follow a crepuscular habit, being most active during the early morning and evening hours. Their diet consists predominantly of large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey.

Migratory individuals arrive on the breeding areas either singly or paired. Non-migratory owls retain pair bonds throughout the year (Haug et al. 1993). The breeding season for BUOW generally begins in the month of April.

Habitat Assessment

The habitat assessment for BUOW was conducted by HDR biologists Summer Adleberg and Aaron Newton and was conducted on February 7th and 8th, 2012. Weather was conducive for surveying with cloudy/clearing skies, temperatures ranging from 53 to 71 degrees Fahrenheit and a light winds (3-5 mph). The alignment was surveyed on foot to identify the potential suitable habitat. The survey area included the 500 foot buffer from the centerline of the alignment and extended for approximately nine miles.

Within the survey area there are both vacant parcels and stretches of streambed slope that occur adjacent to the ROW and are separated by developed urban land uses. Vacant parcels were organized into three categories, urbanized/disturbed, low potential and medium/high potential. The vacant parcels range from low potential to medium/high potential and are generally flat and mowed/disked, and with sparse ruderal vegetation (i.e., DH). Low potential habitats consisted of few small animal burrows on sandy soils with less then 30% vegetation covering. High potential habitats were comprised of uneven sandy soils with animal burrows and less then 30 percent vegetation. Both the low and high potential habitats have non-native grasses.

Protocol Survey

Four focused surveys were conducted between April 10 and July 11, 2012 (Appendix I). Survey methodology followed guidelines identified in the Staff Report on Burrowing Owl Mitigation prepared by the Department of Fish and Game on March 7, 2012 (CDFG 2012a). Per the guidelines, the project area and a 150-meter (500 foot) buffer surrounding the site were surveyed where appropriate habitat was found. No BUOW or their sign were observed within the survey area or within 500 feet (150-meters) of the project centerline. While the survey area supports open habitat, the lack of large burrows, other birds of prey, regularly mowed and disked fields, makeshift homeless camps, surrounding commercial/urban development and several feral cats have created less then ideal conditions to support high populations of burrowing owls and breeding/foraging habitat. Although moderately suitable habitat occurs within the

survey area, this species was not observed during focused surveys. However, an individual burrowing owl was observed in the western portion of the survey area on January 09, 2013 by HDR biologist Aaron Newton during a site inspection (Appendix A, Figure 4A). The burrowing owl was observed using a ground squirrel burrow located near the top of a large dirt berm. The berm occurs adjacent to the railroad tracks approximately 300 feet southwest of the intersection of E Street and West Rialto Avenue in the City of San Bernardino, CA. This area experiences heavy pedestrian traffic and is highly urbanized. However, the berm occurs within a moderately large undeveloped lot which provides marginal foraging habitat. The lot has been graded in the past, is partially covered by decomposing asphalt and is dominated by ruderal and non-native grass species. The burrowing owl was observed in an area that had been surveyed (with negative results) during 2012 focused protocol burrowing owl surveys. Based on the previous focused survey results, the individual is likely wintering on the site or passing through.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis)*
Federal: Candidate for listing
State: Species of Special Concern

The western yellow-billed cuckoo (WYBC) range extends from as far east as Montana to the north and Texas to the south. Primary threats to population declines are the loss, fragmentation, and alternation of native riparian habitat and pesticide use on breeding and wintering grounds (Gaines and Laymon 1984, Franzreb 1987, Laymon and Halterman 1987, Hughes 1999). WYBC require structurally complex riparian habitats with tall trees and dense woody vegetative understory (Halterman 1991, Hughes 1999). WYBC nest in dense riparian woodlands consisting of willows and cottonwoods (*Populus* spp.). Like populations of other riparian obligate species, WYBC populations have suffered sever range contraction during the last 80 years. The lower Colorado River area has seen an 80-90 percent decline in population between 1976 and 1986 (Laymon and Halterman 1987).

WYBC primarily eats large insects including caterpillars, cicadas and occasionally, small frogs and lizards (USFWS 2008). WYBC breeds throughout north Mexico, the United States, and southern Canada (Hughes 1999). Breeding season coincides with the emergence of cicadas and tent caterpillar (USFWS 2008).The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat for WYBC. No WYBC were observed within the survey area during the general biological surveys or focused avian surveys.

Yellow-breasted chat (*Icteria virens*)
Federal: None
State: Species of Special Concern (Breeding)

The yellow-breasted chat breeds from southern British Columbia to south-central Baja California. Breeding yellow-breasted chats occupy early successional riparian habitats with a well-developed shrub layer and an open canopy. Breeding habitat is usually restricted to the narrow border of streams, creeks, sloughs, and rivers and seldom forms extensive tracts. Blackberry (*Rubus* spp.), wild grape (*Vitis* spp.), willow, and other plants that form dense thickets and tangles are frequently selected as nesting strata (Grinnell and Miller 1944). This species occurs in California as a migrant and summer resident primarily from late march to late September (Garrett and Dunn, 1981; Unitt, 2004) and breeds from late April through early August (Eckerle and Thompson, 2001; Unitt, 2004). Yellow-breasted chats feed predominantly on spiders, insects, wild fruits and berries (Shuford and Gardali 2008).

Suitable habitat occurs within the survey area, primarily along Mission Zanja Channel and the SAR. This species was not observed within the survey area (SAR and Mission Zanja Channel) during general biological surveys or focused avian surveys.

Yellow warbler (*Dendroica petechia*)
Federal: None
State: Species of Special Concern

The yellow warbler had a breeding range from Alaska across Canada and as far south as Panama. The yellow warbler is a migrant and summer resident in California from late March to early October and breeds from April to late July (Shuford and Gardali 2008). This species occupies riparian habitats with close proximity to water along streams and in wet meadows. They are commonly found in willows (*Salix* sp.), cottonwoods (*Populus* sp.), and a number of other riparian trees and shrubs (Shuford and Gardali 2008). The loss of riparian habitat combined with cowbird parasitism has resulted in threats to the species (Ehrlich et al. 1992).

Yellow warblers are invertivores, eating insects (especially caterpillars) and spiders while occasionally eating small fruits or probes in flowers (Lack 1976).Migratory individuals arrive on the breeding areas solitary and territorial in winter (Stiles and Skutch 1989, Greenberg and Salgado Ortiz 1994). Breeding occurs mainly in May-June but may continue into July or rarely August (NatureServe 2009). This species was observed within the survey area (SAR and Mission Zanja Channel) during general biological surveys conducted in February 2012 and during focused avian surveys.

4.2.3 MIGRATORY BIRDS

As previously discussed in Section 2.4.1, migratory birds are protected under the MBTA. Several migratory bird species were observed in the survey area and include: lesser goldfinch (*Carduelis psaltria*), Loggerhead shrike (*Lanius ludovicianus*), Yellow warbler (*Dendroica petechia*), bushtit (*Psaltriparus minimus*), and red-tailed hawk (*Buteo jamaicensis*) (Appendix D). Suitable habitat that would support breeding, roosting, and foraging migratory birds occurs throughout the survey area, on and off-site. Suitable habitat includes mature trees (>24-inch diameter), ornamental vegetation, utility poles, and building rafters and eves.

4.3 WILDLIFE DISPERSAL CORRIDORS OR LINKAGES

Wildlife movement corridors, also called dispersal corridors or landscape linkages, are linear features primarily connecting at least two significant habitat areas. Wildlife corridors and linkages are important features in the landscape, and the viability and quality of a corridor or linkage are dependent upon site-specific factors. Topography and vegetative cover are important factors for corridors and linkages. These factors should provide cover for both predator and prey species. They should direct animals to areas of contiguous open space or resources and away from humans and development. The corridor or linkage should be buffered from human encroachment and other disturbances (e.g., light, loud noises, domestic animals) associated with developed areas that have caused the habitat fragmentation (Schweiger et al. 2000). Wildlife corridors and linkages may function at various levels depending upon these factors and, as such, the most successful wildlife corridors and linkages will accommodate all or most of the necessary life requirements of predator and prey species.

The majority of the survey area occurs within an urban/developed area, except for a portion occurring within the SAR. Within the survey area, the SAR supports mature and successional riparian habitat which provides cover, breeding, and foraging habitat for wildlife species. In addition, the river functions as a wildlife corridor that connects the San Bernardino National Forest and Cleveland National Forest. Several other drainages transect the survey area, such as Twin Creek, Warm Creek, and the Mission Zanja Channel. However, these drainages are completely channelized, concrete-lined, and except for the lower 2,100 feet of the Mission Zanja Channel, they are nearly or entirely devoid of native vegetation. These drainages do not provide substantial cover, foraging, or breeding habitat for wildlife species. Although felids such as bobcat (*Lynx rufus*) and mountain lion (*Felis concolor*) were not observed directly there is a low potential for these species to occur along the SAR within the survey area.

5.0 IMPACT ASSESSMENT

5.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The significance criteria for impacts to special status species are based on CEQA Guidelines (CEQA 2012). When determining significance of the effects of the proposed project, consideration was given to whether the project will have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a sensitive or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

Specifically, Section 15065(a) states that a project may have a significant effect where:

> *"The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species, ..."*

Appendix G of the 2012 State CEQA Guidelines indicate that a project may be deemed to have a significant effect on the environment if the project is likely to:

a) *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service (including protections provided pursuant to Section 1600 et seq.).*

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

5.2 IMPACT ASSESSMENT METHODOLOGY

Impacts to biological resources from the project include construction and operational-related direct and indirect impacts (or adverse effects). Direct impacts are changes in the environment caused by the project that are immediately related to the project; they occur in the same time and place as the project (e.g., direct take, dust, noise, and heavy equipment traffic associated with construction of a project, etc.). Indirect impacts are changes in the environment that are not immediately related to the project but that are caused indirectly by the project and are reasonably foreseeable. Indirect impacts are changes to the

environment that occur later in time or farther removed in distance than direct impacts. Both direct and indirect impacts may be considered temporary or permanent depending upon the situation.

The impact analysis focuses on foreseeable changes to existing habitat conditions in the context of the significance criteria presented above for the preferred Project and Reduced Project Footprint Alternative. In conducting the following impact analysis for biological resources, three principal factors were taken into consideration when determining the significance of the project:

- Level of the impact (e.g., substantial/not substantial);
- Uniqueness of the affected resource (i.e., rarity of the resource); and
- Resource sensitivity.

The significance evaluation considers the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species or associated habitat would be considered significant if the species is very rare and is believed to be very susceptible to disturbance (e.g., LBV). Conversely, common wildlife species found in urban areas are not rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact.

5.3 DIRECT IMPACTS

5.3.1 SENSITIVE VEGETATION COMMUNITIES

Construction

Construction of the Project would involve direct impacts to existing vegetation communities within the project area both within and adjacent to the railroad corridor as a result of direct removal or disruption to root systems (Appendix A, Figures 4 and 5 (Preferred and Reduced Project, respectively). A vast majority of the direct impacts associated with construction would occur within existing urban/developed and disturbed habitats (see Table 5). However, direct impacts to sensitive vegetation communities, including SCWRF and SWS would also occur as a result of Project implementation (see Table 5). These habitats are concentrated between MP 3.3 and 4 of the railroad corridor. Of the 8.91 acres of sensitive vegetation communities within the Survey area, a total of 3.47 acres would be impacted under the Preferred Project and a total of 1.36 acres would be impacted under the Reduced Project Footprint (see Table 5). Of these total areas, 0.54 acres would be permanently impacted under both the Preferred Project and Reduced Project Footprint. A complete breakdown of impacts can be found in Table 5. Based on these considerations, direct impacts to sensitive vegetation communities are considered significant prior to mitigation. Implementation of Mitigation Measure A would reduce direct impacts to less than significant levels.

Operations

Routine maintenance activities (e.g., vegetation clearing) along the railroad corridor would be required to maintain SANBAG's ROW free of obstructions between MP 3.3 and 4 over the long term operation of the Project. These activities would be limited to the existing ROW in order to maintain the track free of debris, including vegetation, and would not occur in adjacent sensitive habitats. As a result, no long-term conversion of adjacent sensitive habitat to non-sensitive habitat is expected and this direct impact is considered less than significant.

Table 5. Direct Impacts to Vegetation Communities within the Survey Area

Vegetation Community	Existing Acreages	Preferred Project								Reduced Project Footprint (acres)	
		Proposed Layover		Design Option 1		Design Option 2		Design Option 3			
		T	P	T	P	T	P	T	P	T	P
Disturbed Habitat	24.54	2.02	4.35	2.02	9.66	2.02	4.35	2.02	4.35	1.77	4.35
Disturbed Wetland	0.02	0.02	--	0.02	--	0.02	--	0.02	--	0.02	--
Eucalyptus Woodland	2.78	0.25	0.12	0.25	0.12	0.25	0.12	0.25	0.12	0.25	0.12
Flat-top Buckwheat Scrub	0.91	0.02	--	0.02	--	0.02	--	0.02	--	0.02	--
Mulefat Scrub	0.04	--	--	--	--	--	--	--	--	--	--
Non Jurisdictional Ditch	1.31	0.12	1.12	0.12	1.12	0.12	1.12	0.12	1.12	0.12	1.12
Non-native Grassland	61.90	2.02	12.40	2.02	9.78	2.02	5.22	2.02	12.40	1.60	12.40
Non-vegetated Channel	29.22	12.33	0.65	12.33	0.65	12.33	0.65	12.33	0.65	10.32	0.52
Oak Woodland	9.62	--	0.00**	--	0.00**	--	0.00**	--	0.00**	--	0.00**
Orchard and Vineyards	5.28	0.44	0.91	0.44	0.91	0.44	0.91	0.44	0.91	0.01	0.40
Southern Cottonwood Willow Riparian Forest*	8.27	2.83	0.52	2.83	0.52	2.83	0.52	2.83	0.52	0.72	0.52
Southern Willow Scrub*	0.64	0.10	0.02	0.10	0.02	0.10	0.02	0.10	0.02	0.10	0.02
Tamarisk Scrub	0.47	--	--	--	--	--	--	--	--	--	--
Urban/ Developed	388.88	11.41	86.15	11.41	86.46	11.41	82.73	11.41	85.06	10.49	82.96
Total	***533.88***	***31.55***	***106.25***	***31.55***	***109.25***	***31.55***	***95.66***	**31.55**	**105.16**	***25.42***	***102.41***
Combined Total	**533.88**	**137.80**		**140.80**		**127.16**		**136.71**		**127.83**	

* Indicates the community is considered sensitive by CDFW based on a state (S) ranking from S1-S3. Southern cottonwood willow riparian scrub is ranked S3.2 and southern willow scrub is ranked S2.1.
**Impacts to Oak Woodland would be 0.002.
Note: T = Temporary; P = Permanent

5.3.2 SENSITIVE BOTANICAL SPECIES

Santa Ana River Woolly Star

Construction

Based on springtime rare plant surveys within the Survey area, a single federally endangered Santa Ana River woolly star was observed within the vicinity of the proposed improvements for Bridge 3.4 at the SAR (Appendix A, Figures 4g and 5g [Preferred and Reduced Projects, respectively]). The observed individual is located approximately 0.7 miles downstream from the closest, locally established population

and, therefore, not considered part of a larger population in the survey area. The plant is located within the proposed temporary impact footprint and although construction crews would make every attempt to avoid the individual, construction activities associated with the installation of cofferdam (or CISS piles) carries a potential to directly impact the Santa Ana River woolly star individual. The potential for direct impacts to sensitive plant species occurs with both the Preferred and Reduced Project Alternatives and is considered significant prior to mitigation. Implementation of Mitigation Measures A and B would reduce this direct impact to a less than significant level. Potential direct impacts would require consultation with USFWS pursuant to the ESA.

Operations

Future operations would be restricted to the existing railroad ROW with maintenance activities required to maintain the track free of debris, including vegetation. These activities would be restricted to SANBAG's ROW and would not extend into adjacent sensitive habitats. For this reason, the potential for direct impact is considered less than significant.

Smooth Tarplant

Although a single smooth tarplant was observed within the railroad ROW in 2010, the absence of the species in 2012 indicates that the railroad ROW does not support a significant population. Given that the Western Riverside County Multiple Species Habitat Conservation Area includes 6,700 acres of suitable habitat for the species and over 150 occurrences are known in the region, the loss of marginal suitable habitat associated with the project is considered less than significant (County of Riverside 2000, Regents of University of California 2010).

5.3.3 SENSITIVE ZOOLOGICAL SPECIES AND MIGRATORY BIRDS

Implementation of the Project would result in the potential to directly impact one or more special status species or suitable habitat for special status species during construction and long-term operation. These species include the federally and state endangered least Bell vireo, the federally and state endangered southwestern willow flycatcher, the federally endangered San Bernardino kangaroo rat, the federally threatened Santa Ana sucker, the yellow-billed cuckoo, which has been proposed for listing under the federal endangered species act, and the western burrowing owl, loggerhead shrike, yellow-breasted chat, yellow warbler, and western spadefoot toad designated as state species of concern. A discussion of potential adverse direct impacts for each species is provided below.

Federal and State Listed Species

Least Bell's Vireo

Construction

Several sensitive bird species were observed foraging within the survey area that would be subject to direct impacts from Project construction and include the federally endangered LBV. Four LBV territories (5 individuals; 4 males and 1 female) were mapped within the vicinity of the survey area of the SAR and the confluence of the Mission Zanja Channel with the SAR (Appendix A, Figures 4g and 5g [Preferred and Reduced Project, respectively]). Of these, one breeding pair of LBV were observed within the Mission Zanja Channel, approximately 110 feet from the project centerline but outside of the direct impact footprint (Appendix A, Figures 4g and 5g [Preferred and Reduced Project, respectively]). The potential to directly impact these individuals occurs within both the Preferred and Reduced Project, although less suitable habitat would be directly impacted under the Reduced Project Footprint. Given that Project construction in the vicinity of the SAR and Mission Zanja Channel could occur year round, construction activities would coincide with the LBV breeding season (March 15-September 15). These direct impacts to LVB habitat are considered significant prior to mitigation. Implementation of

Mitigation Measures A, B, C, and E would reduce direct impacts to less than significant levels and minimize the potential for direct take.

Operations

The Project would result in minimal physical disturbance to adjacent suitable habitat for LBV. The potential for direct impact is considered a less than significant.

Southwestern Willow Flycatcher

Construction

No SWIFL were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that SWIFL could occur within the Project area and be significantly impacted by construction. As a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for SWIFL. The potential for direct impact is considered less than significant.

San Bernardino Kangaroo Rat

Construction

Based on the completion of focused surveys for SBKR, no evidence of their presence was documented (see Appendix K). However, the survey area at the SAR overlaps with Unit 1 of designated SBKR critical habitat. Temporary impacts to 2.15 acres and permanent impacts to 0.70 acres of the 8,935 acres of the total designated SBKR critical habitat within Unit 1 would not result in an adverse modification to critical habitat as designated within this Unit 1. Furthermore, this Project will not change the hydrologic processes in any way that will contribute to further loss of primary constituent elements (PCEs) identified for SBKR within the SAR. However, given the duration of time prior to Project construction (2015) and the presence of marginally suitable habitat, it is possible that SBKR could take residence within the Project area and be impacted by Project construction. Direct impacts to the SBKR are considered significant and, as a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would not require additional direct impacts to the SAR, which is considered critical habitat for SBKR. Furthermore, this Project will not change the hydrologic processes within the Project area that could contribute to further loss of PCEs elements identified for SBKR within the SAR. For these reasons, long term operational direct impacts would be less than significant.

Santa Ana Sucker

Construction

Due to a number of barriers that occur downstream of the Project area in the vicinity of the SAR, there is no risk of direct take of individual SAS in conjunction with implementing the Project. Although the Project will not likely result in the loss of a federally listed species it would affect critical habitat through the disruption of the channel bed and banks. This would include the temporary placement of both the proposed bridge supports along side of the existing bridge supports until they can be removed. These effects would be temporary and are not expected to result in direct take of SAS and, therefore, the potential for direct impact is less than significant.

Operations

Based on hydraulic modeling, the proposed bridge supports at Bridge 3.4 are not anticipated to substantially alter sediment and water transport downstream (HDR 2012). Each bridge pile would be the same width as the existing piles but approximately 20 feet longer and, thus, oriented parallel to flow. The river channel under the new bridge would be widened, particularly on the north side, so that the five new piles would be in the channel. Hydraulic modeling shows that, relative to the existing bridge, the new bridge would result in a slightly lower water surface elevation and velocity during a 100-year flow event (HDR 2012). Thus, the new bridge supports would not impede water transport under the bridge nor would it change water surface elevations downstream of the bridge. Based on these considerations, the proposed design for both the Preferred Project and Reduced Project Footprint would not affect water or sediment transport downstream. Therefore, the potential for direct impact to SAS is less than significant.

Proposed for Federal Listing

Yellow billed cuckoo

Construction

No Yellow billed cuckoo were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Yellow billed cuckoo could take residence within the Project area and be significantly impacted by Project construction. As a result, Mitigation Measure B is proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for Yellow billed cuckoo. The potential for direct impacts to Yellow billed cuckoo are considered less than significant.

State Designated Species of Special Concern

Western Burrowing Owl

Construction

One individual wintering burrowing owl was observed onsite in January 2013, however, no evidence of breeding burrowing owl was detected within the survey area during 2012 focused protocol surveys. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that breeding and/or wintering BUOW could take residence within the Project area and be significantly impacted by Project construction. As a result, Mitigation Measures B and D are proposed to reduce this direct impact to a less than significant level.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the BUOW. For this reason, the potential for direct impact to BUOW is considered less than significant.

Yellow warbler

Construction

Yellow warbler was observed during surveys and is known to occur in the vicinity of the Project area. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that yellow warbler breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint. If construction occurs during the breeding season (February 15-August 31), there is a potential for direct impacts (e.g., nest abandonment) to occur as a

result of construction activities in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, the potential for direct impacts to yellow warbler are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Yellow warbler is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the yellow warbler. The potential for direct impact is considered less than significant.

Loggerhead shrike

Construction

Loggerhead shrike is known to occur in the vicinity of the Project area. Given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Loggerhead shrike breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint and construction occurs during the breeding season (February 15-August 31), there is potential direct impacts (e.g., nest abandonment) to occur as a result of construction activities; especially in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, direct impacts to Loggerhead shrike are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Loggerhead shrike is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for the Loggerhead shrike. The potential for direct impact is considered less than significant.

Yellow breasted chat

Construction

No Yellow breasted chat were observed within the survey area, therefore, direct impacts to this species are not likely. However, given the presence of suitable habitat and the duration of time prior to Project construction (2015), it is possible that Yellow breasted chat breeding sites could be located within or adjacent to the footprint for either the Preferred Project or Reduced Project Footprint and construction occurs during the breeding season (February 15-August 31), there is potential direct impacts (e.g., nest abandonment) to occur as a result of construction activities; especially in the vicinity of the SAR and Mission Zanja Channel. Activities that may result in other impacts include, disturbing habitat adjacent to the impact footprint that supports sensitive avian species (i.e., SWS, SCWRF, etc.) to the extent that it does not recover and/or significantly decreases its value to wildlife, or destruction of an occupied nest (eggs or birds present). There is a high potential for nests to occur within these areas and, therefore, the potential for direct impacts to Yellow breasted chat are considered significant prior to mitigation. Implementation of Mitigation Measures A and E would reduce impacts to less than significant levels. Yellow breasted chat is covered by the MTBA.

Operations

Once operational, the Project would result in minimal physical disturbance to adjacent suitable habitat for Yellow breasted chat. The potential for direct impact to is considered less than significant.

Western Spadefoot Toad

Construction

Presence of western spadefoot toad is assumed in the Mission Zanja Channel, Twin Creek, and some non-jurisdictional ditches. Both the Preferred and Reduced Project Alternatives could directly permanently impact individuals through physical interaction with construction equipment and potential sedimentary fill into breeding habitat. Pursuant to Appendix G IV (a) of the 2012 State CEQA Guidelines, impacts to western spadefoot toads are considered significant prior to mitigation. Implementation of Mitigation Measure B would reduce impacts to less than significant levels.

Operations

Once constructed, the Project would not require additional direct impacts to the SAR and the Mission Zanja Channel. For this reason, operational direct impacts would be less than significant.

5.3.4 USACE AND CDFW JURISDICTIONAL AREAS

The Project has the potential to result in substantial adverse effects to federal and state-protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to vernal pools and seasonal wetlands) through direct fill or excavation, hydrological interruption, or other indirect impacts (Appendix A, Figures 6 and 7 (Preferred and Reduced Projects, respectively). Implementation of the Project would result in direct and indirect impacts to waters of the U.S. (and State) as result of the placement of fill materials or excavation within jurisdictional waters of the U.S., including wetlands within the railroad corridor. A majority of the direct effects would occur in areas where the railroad ROW intersects with wetlands or other waters of the U.S. (e.g., SAR, Mission Zanja Channel, Mill Creek Zanja, etc.). Although SANBAG would to the maximum extent practical, route the track alignment and supporting subgrade improvements within portions of the ROW not containing wetlands, the possibility for the construction to temporarily or permanently impact wetlands or waters directly or indirectly is high given the number and frequency of potentially jurisdictional features. These impacts would be the most pronounced at the SAR (Bridge 3.4) and for track improvements that would parallel the Mission Zanja Channel. Pursuant to Appendix G IV (c) of the 2012 State CEQA Guidelines, impacts to USACE and CDFW jurisdictional areas are considered significant prior to mitigation. Implementation of Mitigation Measure G would reduce impacts to less than significant levels.

Construction

USACE Jurisdiction

Based on the physical footprint of the Preferred Project, total impacts to waters of the U.S., including wetlands, is estimated at 6.49 acres. Of this total, permanent impacts to USACE jurisdiction for the Preferred Project are 0.31 acres with the remaining 6.49 acres subject to temporary impacts, of which 0.03 acres consists of disturbed wetlands (see Tables 6 and 7, Appendix A, Figure 6). Areas subject to temporary impacts would be revegetated consistent with USACE permit requirements. Areas permanently impacted would experience a permanent loss habitat, and therefore, compensatory mitigation would be required (see Tables 6 and 7). Total impacts to waters of the U.S., including wetlands, under the Reduced Project Footprint are estimated at 5.10 acres with up to 0.21 acres being permanently impacted and the remaining 4.89 acres being subject to temporary impacts (see Tables 6 and 7, Appendix A, Figure 7). All temporary impacts to USACE jurisdiction would be restored to existing contours and revegetated with appropriate native species ensuring no net loss of USACE jurisdiction. However, direct impacts to

wetlands and waters of the U.S. that would be permanent are considered significant and implementation of Mitigation Measure F would be required to reduce the impact to a less than significant level.

Table 6. Permanent and Temporary Impacts to USACE Jurisdictional Areas within the Survey Area

Jurisdictional Resource	Existing (acres)	Temporary Impacts (acres)		Permanent Impacts (acres)		Total Impacts (acres)	
		Preferred Project*	Reduced Project	Preferred Project*	Reduced Project	Preferred Project	Reduced Project
Waters**	16.70	6.46	4.86	0.29	0.19	6.75	5.05
Wetlands	0.05	0.03	0.03	0.02	0.02	0.05	0.05
Total	**16.75**	**6.49**	**4.89**	**0.31**	**0.21**	**6.80**	**5.10**

*Permanent and temporary impacts identified for the Preferred Project would be identical to Design Options 1, 2, and 3.
**Waters includes Waters of the U.S. and Wetlands.

Table 7. Impacts to USACE and CDFW Jurisdictional Areas

Vegetation Type	USACE					CDFW				
	Existing (acres)	Preferred Project (acres)[1]		Reduced Project (acres)		Existing (acres)	Preferred Project (acres)[1]		Reduced Project (acres)	
		T	P	T	P		T	P	T	P
Disturbed Habitat	0.01	0.00	0.00	0.00	0.00	0.70	0.27	0.06	0.13	0.06
Disturbed Wetland	0.02	0.02	0.00	0.02	0.00	0.02	0.02	0.00	0.02	0.00
Eucalyptus Woodland	0.00	0.00	0.00	0.00	0.00	0.19	0.03	0.00	0.03	0.00
Non-vegetated Channel	14.86	5.73	0.26	4.67	0.16	29.14	12.33	0.56	10.32	0.43
Southern Cottonwood Willow Riparian Forest	1.60	0.68	0.03	0.14	0.03	7.92	2.72	0.28	0.61	0.28
Southern Willow Scrub	0.34	0.06	0.02	0.06	0.02	0.64	0.10	0.02	0.10	0.02
Total	**16.75**	***6.49***	***0.31***	***4.89***	***0.21***	**38.61**	***15.47***	***0.92***	***11.21***	***0.79***
Combined Total[3]		**6.80**		**5.10**			**16.39**		**12.01**	

[1]Permanent and temporary impacts identified for the Preferred Project would be identical to Design Options 1, 2, and 3.
[2]Temporary impacts to disturbed habitat are 0.002 ac for both the preferred and reduced project.
[3]The total does not add up to the sum of the above acreage because of rounding estimates

CDFW Jurisdiction

Construction of the Project would result in impacts to a total 16.39 acres of CDFW jurisdiction with permanent impacts occurring to up to 0.92 acres under the Preferred Project of which includes 0.56 acres of non-vegetated channel (Table 7). Temporary impacts to CDFW jurisdiction would occur on the remaining 15.47 acres of which includes 12.33 acres of non-vegetated channel (Table 7). Under the Reduced Project Footprint, up to 12.01 total acres of CDFW jurisdiction would be impacted with permanent impacts of up to 0.79 acres, which include 0.43 acres of non-vegetated channel (Table 7). Temporary impacts would occur within the remaining 11.21 acres, which includes 10.32 acres of non-vegetated channel (Table 7). These direct impacts would be significant and require the implementation of Mitigation Measure F to reduce the impact to a less than significant level.

Operational Impacts

Based on hydrologic analysis of the proposed improvements, including new bridge structures, no substantial changes in hydrology would occur that could otherwise impede water transport to existing

wetlands or change water surface elevations in existing waterways (e.g., SAR). Over the longer term, vegetation clearing/trimming would be generally restricted to ROW. Although these activities could extend into adjacent jurisdictional areas that overlap with SANBAG's ROW (i.e., the SAR, Twin Creek, Mission Zanja Channel), permit conditions adopted by USACE and CDFW in conjunction with Mitigation Measure F prior to construction would minimize the potential for significant direct impacts to jurisdictional areas over the long-term operation of the project. With the implementation of Mitigation Measure F, direct impacts would be reduced to less than significant levels.

5.3.5 LOCAL ORDINANCES

Construction

Implementation of the Preferred and Reduced Project could result in the removal or disturbance of several species of trees including: willow, cottonwood, walnut, citrus, and palm as a result of grading, mitigation planting, road and trail development, and creation of impervious surfaces within and immediately adjacent to open space areas. The pruning and removal of protected trees within the Cities of San Bernardino and Redlands is permitted with appropriate authorization. The proposed project would include the preparation of a tree replacement plan for native and ornamental trees affected outside SANBAG's ROW consistent with local tree ordinances. Therefore, this direct impact is considered less than significant.

Operations

Once constructed, the Project would generally not require the removal of any additional trees. However, future maintenance activities would be required throughout the duration of Project operation and, therefore, limited pruning or vegetation clearing would be required to keep the railroad corridor free of debris. Vegetation maintenance activities would be limited to SANBAG's ROW and would not extend into adjacent sensitive habitats and, therefore, a less than significant impact would occur.

5.3.6 CORRIDORS AND LINKAGES

Construction

Construction activities are not likely to prohibit natural water and substrate transport or the ability of species to move upstream or downstream in the SAR or other waterways functioning as wildlife corridors and linkages. Construction activities will not interfere substantially within the movement of any resident or migratory fish or wildlife species or within established native, resident, or migratory wildlife corridors. As a result, impacts to fish and macroinvertebrate species would be less than significant.

Operations

The proposed bridge structures would continue to facilitate wildlife movement. Once operational, the Project would involve passenger train movement within the existing railroad ROW. Routine maintenance activities along the corridor could result in repeated disturbance over the life of the project. However, given the urbanized setting and narrow width of the railroad ROW, direct impacts would be unlikely to act as a barrier to wildlife movements. As a result, the Project is unlikely to cause habitat shifts (toward nonnative and/or disturbed type communities) or substantially degrade linkages, which may no longer provide food, cover, or ease of travel for many species. Based on these considerations, a less than significant impact would result.

5.3.7 HABITAT CONSERVATION PLANS

The survey area is not contained within an established HCP, Natural Communities Conservation Planning (NCCP), or other approved local, regional, or state habitat conservation plan. For this reason, a no conflict with an adopted HCP or NCCP would occur and, therefore, no impact would result.

5.4 INDIRECT IMPACTS

5.4.1 SENSITIVE VEGETATION COMMUNITIES

The type of indirect impacts on sensitive vegetation communities that could result in an impact to sensitive vegetation communities include sedimentation, changes in vegetation as a result of changes in land use and management practices, altered hydrology, habitat fragmentation, and the introduction of invasive species or noxious weeds from surrounding development. Any disturbance of adjacent sensitive vegetation to the extent that the habitat cannot recover and/or transitions to a non-sensitive habitat type would be considered a significant impact. Additionally, construction activities occurring adjacent to sensitive vegetation communities may result in temporary indirect impacts such as dust, erosion/sediment, and ground disturbance from the intrusion of workers and equipment. These indirect impacts to sensitive vegetation communities are considered significant. Implementation of Mitigation Measure A would reduce impacts to less than significant levels.

5.4.2 SENSITIVE BOTANICAL SPECIES

Based on springtime rare plant surveys within the Survey area, no additional special status plant species were observed within the Project area beyond the SAR individual woolly star that will be directly impacted by Project-related construction. Although no other populations were observed during the rare plant survey, given that Project construction would not start until 2015, there is a potential for one or more special status plants to inhabit the Project area, thereby, being subject to construction-related direct and indirect impacts. This impact is considered significant and Mitigation Measures A and B are proposed.

5.4.3 SENSITIVE ZOOLOGICAL SPECIES AND MIGRATORY BIRDS

Construction

As discussed above, protocol-level surveys only identified the presence of LBV. No other listed bird species were identified within suitable habitat. During construction of the Project, construction activities could produce noise levels that would adversely affect breeding LBV. USFWS typically applies a noise level criterion of 60 dBA Leq for assessing project-related noise effects to listed bird species. Therefore, depending on the type of equipment utilized near active LBV nests an indirect impact associated with construction-related noise could result. Implementation of Mitigation Measure C would minimize this indirect impact to a less than significant level.

Other indirect impacts to sensitive zoological species and migratory birds would generally be attributed to temporary construction-related dust and water quality effects. For example, hazardous materials leaks, such as fuel, hydraulic fluid, and/or lubricants, from equipment working in or above the river channel, although unlikely, have a potential to contaminate dry or moist river bed sediments when no flow is present. This contamination, if not cleaned up immediately, could be transported downstream during higher flow events to critical habitat occupied by SBKR and SAS. Degradation of existing critical habitat functions and values would be considered a significant impact. However, implementation of project design features and BMPs identified in the Project SWPPP and National Pollutant Discharge Elimination System (NPDES) permit prepared for the Project would reduce impacts to water quality during construction to less than significant. Therefore, a less than significant impact is identified for this issue and no mitigation is proposed.

Construction of the new bridge at Bridge 3.4 would result in disturbances within the river channel and on the banks related to access, installation of temporary cofferdam(s) or CISS piles (or similar bridge structure type), dredging in the river bed and/or excavation along the banks, and removal of the cofferdam(s) or CISS piles (or similar bridge structure type) when construction is completed. Dredging and/or excavation of the river banks under the bridge to widen the channel would have the potential to

cause suspension of fine sediments if the work occurs in flowing water or the disturbed soils later are exposed to flowing water before those soils are stabilize. Installation and removal of temporary cofferdam(s), CISS piles (or similar bridge structure type), and bridge support structures may result in temporary indirect impacts to downstream SAS critical habitat. However, eerosion and sedimentation into suitable habitat would be minimized through implementation of the SWPPP, such that temporary indirect impacts would be less than significant.

Operations

As discussed under project-related direct impacts, during operations the Project would result in minimal physical disturbance to adjacent suitable habitat and the potential for indirect impacts to sensitive zoological or bird species is considered low. For example, the potential for noise from passing trains to adversely affect breeding birds is very remote given the limited presence of suitable breeding habitat within the urbanized rail corridor and the infrequent and transient train movements past a given point. The potential for indirect impacts to sensitive zoological or bird species is considered less than significant.

5.4.4 USACE AND CDFW JURISDICTIONAL AREAS

USACE and CDFW jurisdictional areas occur within and adjacent to the Project area for the Preferred Project and Reduced Project Footprint Alternatives. Indirect impacts to these areas would mainly come in the form of indirect water quality impacts resulting from various construction activities. Pollutants of concern for jurisdictional areas include increases in sedimentation and the discharge of hazardous materials or debris during construction activities. To minimize falling debris during the construction of bridges across Warm Creek, Twin Creek, SAR, Mission Zanja Channel, and Mill Creek Zanja, a debris containment system would be installed under the bridges to prevent falling debris from entering jurisdictional areas.

Erosion and sedimentation and hazardous materials spill or leakage from construction vehicles is also considered a potential impact to jurisdictional areas. The use of petroleum products (e.g., fuels, oils, and lubricants) and erosion of cleared land during construction could potentially contaminate surface water. These activities would be required to adhere to the project SWPPP per the NPDES Construction Permit and the water quality certification issued by the Regional Water Quality Board (RWQCB, Santa Ana Region) per Mitigation Measure F. Mitigation Measure F reduces these potential impacts to a less than significant level.

Over the long-term, vegetation clearing/trimming is the primary operational activity that would occur within jurisdictional areas located within the ROW. Vegetation management would generally be confined to SANBAG's ROW and would not extend into adjacent sensitive habitat areas, which include jurisdictional features (i.e., the SAR, Twin Creek, Mission Zanja Channel). Maintenance activities over the long term would generally be infrequent and limited in extent and, therefore, would be unlikely to result in indirect impacts to jurisdictional areas, such as changes in habitat due to clearing, disruption of sediments, and introduction of pollutants (i.e., oil, gas, lubricants, etc.). Indirect impacts to federal and state jurisdictional areas would be less than significant.

5.4.5 LOCAL ORDINANCES

The Project could result in the removal or disturbance of several species as a result of grading mitigation planting, road and trail development, and creation of impervious surfaces within and immediately adjacent to open space areas. These activities could result in indirect effects affecting the root systems of adjacent native and ornamental trees. Trenching, grading, soil compaction, placement of fill, impervious surfaces, irrigation, and landscaping within the drip lines of trees could lead to root damage ultimately resulting in death of the tree. Additional indirect impacts could result from the introduction of invasive species or noxious weeds, which could increase completion with existing native and ornamental species.

The pruning and removal of protected trees within the Cities of San Bernardino and Redlands is permitted with appropriate authorization. The proposed project would include the preparation of a tree replacement plan for areas affected outside SANBAG's ROW consistent with local tree ordinances. Therefore, this indirect impact is considered less than significant.

5.4.6 CORRIDORS AND LINKAGES

Construction and operational activities would not prohibit the movement of native resident or migratory fish or wildlife species through existing wildlife corridors such as the SAR and Twin Creek. Project-related improvements would not result in permanent or temporary indirect impacts such as substantial blockage or significant change in existing habitat or type within the SAR or Twin Creek and a less than significant impact would result.

5.4.7 HABITAT CONSERVATION PLANS

The proposed project does not occur within an established HCP, NCCP, or other approved local, regional, or state habitat conservation plan and, therefore, no impact would result.

5.5 CUMULATIVE IMPACTS

Numerous other projects, independent of the RPRP, would occur within an approximately five mile radius of the Project area. The projects range from private development to road improvements, to Flood Control Facility improvements. Different portions of the Project Alternatives and Design Options would be developed on, and affect, different geographical areas within the RPRP Survey area. These effects could combine with other projects adjacent to and outside the RPRP Survey area. For this reason, the cumulative analysis considers a broader geographic context for each resource considered (e.g., Santa Ana Watershed for wetlands). The following is a discussion of cumulative impacts to biological resources potentially resulting from implementation of the Project and other projects within the defined geographical area.

Although implementation of the Project (Preferred or Reduced) would not result in significant impacts to biological resources, it would result in impacts that would be mitigated to below a level of significance. From a cumulative perspective, a majority of the projects considered would occur entirely within upland urban areas and would not result in impacts to biological resources. Rather, there are three main projects in the vicinity of the Project area that are anticipated to potentially impact biological resources based on their location: (1) Long-Term Maintenance of Flood Control and Transportation Facilities throughout San Bernardino County; (2) Mountain View Bridge over Santa Ana River; and (3) Mountain View Ave. Bridge at Mission Creek Channel. The potential for cumulative impacts is discussed further below under each of the following resource headings.

Sensitive Vegetation Communities

Implementation of the Project (Preferred Project and Reduced Project Footprint Alternative) would result in impacts to sensitive vegetation communities such as SWS, SCWRF, and NVC as a result of bridge replacements, track improvements, and reinforcement of adjacent flood control channels within Mission Zanja Channel. Implementation of other cumulative projects are anticipated to result in similar impacts to sensitive vegetation communities associated with the SAR and local flood control facilities (i.e., Twin Creek, Warm Creek, etc.). Absent mitigation, cumulative impacts to sensitive vegetation communities resulting from implementation of the Proposed Project and several local projects would be considered a significant loss to valuable habitat for biological resources. However, the Project would mitigate for impacts to sensitive vegetation communities through the implementation of Mitigation Measures A, C, and F, which would result in a no net loss to these resources. As a result, no cumulatively considerable impact would occur.

Sensitive Botanical Species

Implementation of the Project (Preferred Project and Reduced Project Footprint Alternative) would result in an impact to one individual of the federally endangered Santa Ana River woolly star located south of the existing Bridge 3.4 located in the SAR. This individual is the only sensitive plant observed within the Project area and is not part of a larger population. The nearest population of Santa Ana River woolly star is located approximately 0.7 miles upstream of the survey area in the SAR. Impacts to the one individual of woolly star would not be considered a cumulatively considerable effect as it is not part of a larger population.

Sensitive Zoological Species

Implementation of the Proposed Project (Preferred Project and Reduced Project Footprint Alternative) would result in impacts to SWS and SCWARF, which are habitats that support the federally endangered LBV, SWIFL and other sensitive avian species such as yellow warbler and those protected under MBTA. In addition, the Proposed Project could potentially impact suitable habitat for State Species of Concern, western spadefoot toad and burrowing owl.

Degradation of wildlife habitat caused by the Project, when combined with other habitat impacts occurring from other water resource, infrastructure, and development within the region, could result in significant cumulative impacts. However, the implementation of Project-specific measures identified in the project-level analysis to mitigate impacts on biological resources. As a result, implementation of Mitigation Measures A, B, C, D, and E are required to reduce impacts to less than significant levels and to minimize the potential for cumulatively considerable impact to special status species.

State and Federal Jurisdictional Areas

As summarized in Tables 6 through 8, Project implementation would permanently and temporarily impact state and federal jurisdictional areas. Permanent impacts to USACE (Preferred-0.39 ac; Reduced-0.29 ac) and CDFW jurisdictional areas (Preferred-0.92 ac; Reduced-0.79 ac) would occur primarily within the SAR, Mission Zanja Channel, Twin Creek and Warm Creek as a result of bridge replacement and bank stabilization/armoring. Direct and indirect impacts to jurisdictional areas would be mitigated to less than significant levels through the implementation of Mitigation Measures F along with any additional measures established during the permitting process. However, the Proposed Project would not result in a net-loss of jurisdictional areas and through project design features and mitigation measures, would not significantly impact these resources. In considering that other cumulative projects would be subject to similar mitigation and regional enforcement by USACE's "no-net-loss" standard, the long-term viability of these resources would not be substantially diminished and, therefore, no cumulative considerable impacts would occur.

Local Ordinances

The Proposed Project would comply with local ordinances tree ordinances. Although other projects may result in cumulative impacts to native and ornamental trees, implementation of these projects would be required to adhere to local tree ordinances and, therefore, would not add to a cumulatively considerable impact to local native and ornamental tree resources.

6.0 MITIGATION MEASURES

Measure A. Protection of Sensitive Plants and Habitats. SANBAG's shall require the construction contractor to implement the following measures to protect sensitive plants and habitats during project-related construction.

1. SANBAG shall designate an approved biologist (project biologist) who will be responsible for overseeing compliance with protective measures for the biological resources during clearing and work activities within and adjacent to areas of native habitat. The project biologist will be familiar with the local habitats, plants, and wildlife and maintain communications with the contractor to ensure that issues relating to biological resources are appropriately and lawfully managed. The project biologist will review final plans, designate areas that need temporary fencing, and monitor construction. The biologist will monitor activities within designated areas during critical times such as vegetation removal, the installation of Best Management Practices (BMPs) and fencing to protect native species, and ensure that all avoidance and minimization measures are properly constructed and followed.
2. Project employees and contractors that will be on-site shall complete environmental worker-awareness training conducted by the project biologist. The training will advise workers of potential impacts to the sensitive habitat and listed species and the potential penalties for impacts to such habitat and species. At a minimum, the program will include the following topics: occurrences of the listed species and sensitive vegetation communities in the area, a physical description and their general ecology, sensitivity of the species to human activities, legal protection afforded these species, penalties for violations of Federal and State laws, reporting requirements, and work features designed to reduce the impacts to these species; and to the extent practicable, promote continued successful occupation of areas adjacent to the work footprint. Included in this program will be color photos of the listed species, which will be shown to the employees. Following the education program, the photos will be posted in the contractor and resident engineer's office, where they will remain through the duration of the work. Photos of the habitat in which sensitive species are found will also be posted on-site. The contractor will be required to provide SANBAG with evidence of the employee training (e.g., sign in sheet or stickers) upon request. Employees and contractors will be instructed to immediately notify the project biologist of any incidents, such as construction vehicles that move outside of the work area boundary. The project biologist will be responsible for notifying the USFWS within 72 hours of any similar incident.
3. Prior to construction, SANBAG shall delineate the construction area (including staging and laydown areas) between Mile Posts 3.3 and 4.0 and erect exclusionary construction fencing along the perimeter of the identified construction area to protect adjacent sensitive habitats (SWS, SCWRF and Santa Ana woolly star). Limits of the exclusionary fencing shall be confirmed by the project biologist prior to habitat clearing. Exclusionary fencing shall be maintained throughout the duration of construction work from Mile Posts 3.3 to 4.0. Exclusionary fencing can be removed at the conclusion of construction work as approved by the project biologist.

   All construction-related vehicles and equipment storage shall occur in the construction area and/or previously disturbed areas as approved by the project biologist. Project-related vehicle traffic shall be restricted to established roads, construction areas, storage areas, and staging and parking areas.

   If construction activity extends beyond the exclusionary fencing into sensitive vegetation communities, areas of disturbance shall be quantified and an appropriate restoration approach shall developed in consultation with USFWS and CDFW. For example, if construction extends

beyond the limits of the exclusionary fencing, temporarily disturbed areas shall be restored to the natural (preconstruction) conditions, which may include the following: salvage and stockpiling of topsoil, re-grading of disturbed sites with salvaged topsoil, and re-vegetation with native locally available species.

Measure B. Pre-Construction Survey. Prior to construction, a qualified biologist retained by SANBAG shall conduct pre-construction surveys for special status plant species including Santa Ana River woolly star, slender-horned spineflower, smooth tarplant, and salt spring checkerbloom. Pre-construction surveys will also be required for special status wildlife species including least Bell's vireo, southwestern willow flycatcher, San Bernardino kangaroo rat, yellow-billed cuckoo, burrowing owl, and western spadefoot toad to verify presence or absence in the Project area. If one or more species are detected, then SANBAG shall consult with the USFWS (and/or CDFW if appropriate) to develop additional minimization measures prior to project construction (if necessary). These additional measures may include construction timing restrictions and/or construction monitoring.

Measure C. Least Bells Vireo (LBV). The following measures will be implemented to minimize direct impacts to LBV during construction:

1. Clearing and grubbing will be timed to avoid the breeding season of the least Bell's vireo (March 15 to September 15), unless SANBAG provides survey documentation to USFWS that confirms the riparian habitat in not occupied by LBV.
2. If active LBV nests are identified during pre-construction surveys and noise levels at the nest exceed 60 dBA Leq, noise attenuation structures will be placed or other noise attenuation measures (e.g., reducing the number of construction vehicles or using different types of construction vehicles) will be implemented to reduce noise levels at the nest to 60 dBA Leq (or ambient noise level if greater than 60 dBA Leq). During construction adjacent to these areas, noise monitoring shall occur during the LBV breeding season and be reported daily to USFWS. Construction activities that create noise in excess of the aforementioned levels will cease operation until effective noise attenuation measures are in place to the extent practicable.
3. Permanent impacts associated with clearing Southern Cottonwood Willow Riparian Forest (SCWRF) and Southern Willow Scrub (SWS) will be completed outside of the LBV and general avian breeding season to avoid direct impacts to these species.
    a. Temporary direct impacts to LBV habitat (SCWRF and SWS) shall be satisfied through in-kind habitat restoration, where appropriate, at a ratio of 1:1.
    b. Permanent impacts to LBV habitat (SCWRF and SWS), shall occur at a ratio of 3:1 through the purchase of mitigation credits from an approved habitat bank and/or habitat creation and restoration at a location to be determined on- and/or off-site.

Measure D. Burrowing Owl. SANBAG will conduct take avoidance (pre-construction) surveys for burrowing owl no more than 30 days and no less than 14 days prior to initiating ground disturbance activities.

1. If burrowing owl is identified during the breeding season (February 1 through August 31) then an appropriate buffer will be established by the biological monitor in accordance with the 2012 *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Construction within the buffer will be avoided until a qualified biologist determines that burrowing owl is no longer present or until young have fledged and a CDFW-approved exclusion plan has been implemented. In addition to avoidance of the occupied habitat, off-site mitigation will be provided as described below:
    a. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.

b. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.

c. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird.

2. If burrowing owl is identified during the non-breeding season (September 1 through January 31), then a 50 meter buffer will be established by the biological monitor. Construction within the buffer will be avoided until a qualified biologist determines that burrowing owl is no longer present or until a CDFW-approved exclusion plan has been implemented.

Measure E. MBTA Covered Species. Prior to habitat removal during the avian breeding season (February 15-August 31), a qualified biologist shall conduct a pre-construction nest survey (in suitable areas) for migratory birds within 10 days of construction. Should an active nest of any MBTA covered species occur within or adjacent to the project impact area, a 100-foot buffer (300 feet for raptors) shall be established around the nest and no construction shall occur within this area until a qualified biologist determines the nest is no longer active or the young have fledged.

Measure F. Clean Water Act Section 401 and 404 Permits and CDFW 1602 Streambed Alteration Agreement. Before the approval of grading or other ground disturbing activities within 50 feet of jurisdictional areas, SANBAG shall obtain a CWA Section 404 permit, Section 401 water quality certification, and CDFW 1602 Streambed Alteration Agreement.

As part of the Section 404 permitting process, if the USACE (and/or CDFW) requires compensatory mitigation, a draft wetland mitigation and monitoring plan (MMP) shall be developed for the selected Build Alternative. The MMP shall be consistent with USACE's and EPA's April 10, 2008 Final Rule for Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332 and 40 CFR Part 230).

Potential mitigation for impacts to federal and state jurisdictional areas may occur at the following ratios:

1. USACE Wetland
   - Permanent: 3:1
   - Temporary: restoration (in-kind)
2. USACE Waters
   - Permanent: 1:1
   - Temporary: restoration (in-kind)
3. CDFW Riparian
   - Permanent: 3:1 (SWS and SCWRF)
   - Permanent: 1:1 (unvegetated stream bank)
   - Temporary: restoration (in-kind)

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7.0 REFERENCES

American Ornithologists' Union (AOU). 1983. Check-list of North American Birds, 6th edition. Allen Press, Inc., Lawrence, Kansas. 877 pp.

American Ornithologists' Union. 2009. Fiftieth supplement to the American Ornithologists' Union *Check-list of North American Birds.* Auk 126:705–714.

Bent, A.C. 1960. Life histories of North American flycatchers, larks, swallows and their allies. Dover Press, New York, New York. 555 pp.

Calflora. 2010. Information on California plants for education, research and conservation, based on data contributed by the Consortium of Calif. Herbaria and dozens of other public and private institutions and individuals. 2010. Berkeley, California: The Calflora Database [a non-profit organization]. Available: http://www.calflora.org/ (Accessed: February 8, 2012).

California Department of Fish and Game (CDFG) 2012a. 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency, Sacramento. March 7, 2012.

_____.2012b. Natural Diversity Database. Rare Find Version 4.0. Website: https://nrmsecure.dfg.ca.gov/myaccount/login.aspx?ReturnUrl=%2fcnddb%2fview%2fquery.aspx. Viewed January 6, 2012.

_____.2011. State and Federally Listed Endangered & Threatened Animals of California. January 2011. Website: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf. Viewed January 6, 2012.

_____. 2004. Fish and Game Code Sections 1600-1616 (Effective January 1, 2004). http://www.leginfo.ca.gov/cgi-bin/displaycode?section=fgc&group=01001-02000&file=1600-1616. Viewed February 6, 2012.

_____. 1994. A Field Guide to Lake and Streambed Alteration Agreements.

California Native Plant Society (CNPS). 2010a. *The CNPS Ranking System*. http://www.cnps.org/cnps/rareplants/ranking.php. Viewed March, 2012.

_____. 2010b. Online Inventory of Rare and Endangered Plants. http://www.rareplants.cnps.org/

California Environmental Quality Act (CEQA). 2012. California Natural Resources Agency. "California Environmental Quality Act."[http://ceres.ca.gov/ceqa/]. Viewed December 2012.

California Wetland Information System. 2007. "Summary of Clean Water Act, Section 404." Available online <http://ceres.ca.gov/wetlands/permitting/sec404_descrip.html >. Webpage last modified on July 23, 2007. Accessed February 6, 2012.

County of Riverside. 2000. Western Riverside County Multiple Species Habitat Conservation Plan. Volume 2: Reference Documents

Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, P. A. Rabie, and B. R. Euliss. 1999. Effects of management practices on grassland birds: Burrowing Owl. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/grasbird/buow/buow.htm

DeSante, D. F., Ruhlen, E. D., and Rosenberg, D. K. 2004. Density and abundance of Burrowing Owls in the agricultural matrix of the Imperial Valley, California. Studies Avian Biol. 27:116–119.

Dundas, H., and J. Jensen. 1994/95. Burrowing Owl status and conservation. Bird Trends 4:21-22.

Eckerle, K. P., and C. F. Thompson. 2001. Yellow-breasted Chat (*Icteria virens*), in The Birds of North America (A. Poole and F. Gill, eds.), no. 575. Birds N. Am., Philadelphia.

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1992. Birds in Jeopardy: the Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico. Stanford University Press, Stanford, California. 259 pp.

Emmel, T.C. and J.F. Emmel. 1973. The Butterflies of Southern California. Los Angeles County Natural History Museum.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterways Experimental Station, Vicksburg, Mississippi.

Franzreb, K. 1987. Perspectives on managing riparian ecosystems for endangered bird species. Western Birds 18:10-13.

_____. 1989. Ecology and conservation of the endangered least Bell's vireo. U.S. Fish and Wildlife Service, Biol. Rep. 89(1). 17 pp.

Fraser, J.D., and D.R. Luukkonen. 1986. The loggerhead shrike. Pages 933-941 in R.L. DiSilvestro, editor. Audubon Wildlife Report 1986. Academic Press, New York.

Gaines, D., and S. A. Laymon. 1984. Decline, status, and preservation of the Yellow-billed Cuckoo in California. Western Birds 15: 49-80.

Garrett, K., and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Gervais, J. A., and Anthony, R. G. 2003. Chronic organochlorine contaminants, environmental variability, and demographics of a Burrowing Owl population. Ecol. Applications 13:1250–1262.

Grant, R. A. 1965. The Burrowing Owl in Minnesota. Loon 37:2-17.

Green, G. A., and Anthony, R. G. 1989. Nesting success and habitat relationships of Burrowing Owls in the Columbia basin, Oregon. Condor 91:347–354.

Greenberg, R., and J. Salgado Ortiz. 1994. Interspecific defense of pasture trees by wintering yellow warblers. Auk 111:672-682.

Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

HDR Engineering, Inc. (HDR). 2012. Redlands Passenger Rail Project Hydraulic Impact Analysis – Santa Ana River Bridge 3.4. Prepared for SANBAG. August.

Halterman, M.D. 1991. Distribution and habitat use of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90. Masters' Thesis California State University, Chico 49 pp.

Haug, E. A., B. A. Millsap and M. S. Martell. 1993. Burrowing Owl (*Athene cunicularia*), the Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/061/articles/introduction

_____Hickman, J.C., ed. 1993. The Jepson Manual, Higher Plants of California. University of California Press, Berkeley. 1400 pp.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, Nongame-Heritage Program. 156p (amended).

Hughes, J.M. 1999. Yellow-billed cuckoo (*Coccyzus americanus*). *In* The Birds of North America, No. 418 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

ICF International. 2012. Redlands Passenger Rail Project. Noise Technical Memorandum in the Cities of San Bernardino, Loma Linda, and Redlands, San Bernardino County, California. DRAFT December 2012. Prepared for: Federal Transit Administration and San Bernardino Associated Governments.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report submitted to the California Department of Fish and Game, Inland Fisheries Division. Contract No. 8023. 255 pp.

Justia US Laws (Justia). 2010. *California Fish and Game Code*. http://law.justia.com/california/codes/fgc.html. Viewed January 6, 2012.

Klute, D. S., L. W. Ayers, M. T. Green, W. H. Howe, S. L. Jones, J. A. Shaffer, S. R. Sheffield, and T. S. Zimmerman. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Konrad, P. M., and D. S. Gilmer. 1984. Observations on the nesting ecology of Burrowing Owls in Central North Dakota. Prairie Naturalist 16:129-130.

Lack, D. 1976. Island biology illustrated by the land birds of Jamaica. Studies in Ecology, Vol. 3. Univ. California Press, Berkeley. 445 pp.

Laymon, S.A. and M.D. Halterman. 1987. Can the western subspecies of the yellow-billed cuckoo be saved from extinction. Western Birds 18:19-25.

Lidicker, W.Z. 1960. An analysis of intraspecific variation in the kangaroo rat *Dipodomys merriami*. Univ. Calif. Publ. Zoology 67: 125-218.

Matthews, J.R. and C.J. Moseley (eds.). 1990. The Official World Wildlife Fund Guide to Endangered Species of North America. Volume 1. Plants, Mammals. xxiii + pp 1-560 + 33 pp. appendix + 6 pp. glossary + 16 pp. index. Volume 2. Birds, Reptiles, Amphibians, Fishes, Mussels, Crustaceans, Snails, Insects, and Arachnids. xiii + pp. 561-1180. Beacham Publications, Inc., Washington, D.C.

McKernan, R.L. 1997. The status and known distribution of the San Bernardino kangaroo rat (*Dipodomys merriami parvus*): Field surveys conducted between 1987 and 1996. Report prepared for the U.S. Fish and Wildlife Service, Carlsbad Field Office.

Munz, P.A. 1974. A Flora of Southern California. University of California Press. Berkeley. 1086p.

National Geographic Society (NGS). 1983. Field guide to the birds of North America. National Geographic Society, Washington, DC.

NatureServe. 2009. NatureServe Explore: An online 2008 encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available online<http://www.natureserve.org/explorer>

NatureServe Explorer: Species Name Criteria - All Species - Scientific or Informal Taxonomy, Species - Informal Names. *NatureServe Homepage: A Network Connecting Science with Conservation.* NatureServe, 2 Feb. 2009. Web. 26 Jan. 2012. <http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt>

Ratcliff, B. D. 1986. The Manitoba Burrowing Owl survey, 1982-1984. Blue Jay 44:31-37.

Regents of the University of California.2000. Consortium of California Herbaria. Accessed electronically via http://ucjeps.berkeley.edu/cgi-bin/get_consort.pl?taxon_name=Centromadia%20pungens subsp. laevison 10/23/12.

Reid, F.A. 2006. A Field Guide to Mammals of North America. Houghton-Mifflin Company, Boston. 579p.

Roberts, F. M., Jr., S. D. White, A. C. Sanders, D. E. Bramlet, and S. Boyd. 2004. The Vascular Plants of Western Riverside County, California: An Annotated Checklist. F. M. Roberts Publications, San Luis Rey, CA.

Rodriguez-Estrella, R., F. Chavez Ramirez, and G.L. Holroyd. 1998. Current knowledge of the Burrowing Owl in Mexico: what is needed for a conservation plan? Abstract and notes. Second International Burrowing Owl Symposium, Ogden, Utah.

Rosenberg, D. K., and Haley, K. L. 2004. The ecology of Burrowing Owls in the Agroecosystem of the Imperial Valley, California. Studies Avian Biol. 27:120–135.

Rosenberg, D.K., B.R. Noon, and E.C. Meslow. 1997. Biological Corridors: Form, Function, and Efficacy. BioScience 47:677-687.

Ruibal, R., L. Tevis Jr. and V. Roig. 1969. The terrestrial ecology of the spadefoot toad *Scaphiopus hammondii*. Copeia 1969:571–584.

Schweiger, E.W., J.E. Diffendorfer, R.D. Holt, R. Pierotti, and M.S. Gaines. 2000. The interaction of habitat fragmentation, plant, and small mammal succession in an old field. Ecological Monographs 70:383-400.

Sheffield, S. R. and M. Howery. 2001. Current status, distribution, and conservation of the Burrowing Owl in Oklahoma. Journal of Raptor Research 35:351-356.

Shuford, W., and T. Gardali, ed. 2008. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Smith, G.R. 1966. Distribution and evolution of the North American catostomid fishes of the subgenus *Pantosteus*, Genus *Catostomus*. Number 129, Miscellaneous Publications, Museum of Zoology, University of Michigan, Ann Arbor, Michigan.

Stebbins, R. C. 1972. California amphibians and reptiles. Univ. California Press, Berkeley. 152pp.

_____. 2003. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston. 336p.

Stiles, F.G. and A.F. Skutch. 1989. A guide to the birds of Costa Rica. Cornel University Press, Ithaca, New York, USA. 511pp.

Terres, J.K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.

Thomsen, L. 1971. Behavior and ecology of Burrowing Owls on the Oakland Municipal Airport. Condor 73:177–192.

U.S. Army Corps of Engineers (USACE). 1994. Reconnaissance Study, Mission Zanja Creek. February.

_____. 2008a. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0),ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://www.usace.army.mil/CECW/Documents/cecwo/reg/trel08-28.pdf. Viewed June 2012.

_____. 2008b. Regulatory Program CWA Guidance to Implement the U.S. Supreme Court Decision for the *Rapanos* and *Carabell* Cases. http://www.usace.army.mil/CECW/Documents/cecwo/reg/cwa_guide/cwa_juris_2dec08.pdf. Viewed July 8, 2011.

_____. 2008c. A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States. August. Viewed June 2012. http://www.crrel.usace.army.mil/library/technicalreports/ERDC-CRREL-TR-08-12.pdf

United States Department of Agriculture, Natural Resources Conservation Service (USDA). 2008. Soil Survey Geographic (SSURGO) database for San Bernardino County, Southwestern Part, California. Publication date January 03, 2008. Accessed 2012.

_____.2002. *Final recovery plan southwestern willow flycatcher (empidonax traillii extimus).* Retrieved from website: http://ecos.fws.gov/docs/recovery_plans/2002/020830c.pdf

_____. 2001. *Least Bell's Vireo Survey Guidelines*. January 19, 2001. Retrieved from website: http://www.fws.gov/ventura/species_information/protocols_guidelines/docs/lbv/leastbellsvireo_survey-guidelines.pdf

_____. 2011. *Federal Endangered Species Act*. http://www.fws.gov/endangered/laws-policies/esa.html. Website last updated December 08, 2011. Viewed February 6, 2012.

_____. 2000. 65 FR 19686. Endangered and Threatened Wildlife and Plants; Threatened Status for the Santa Ana Sucker. Federal Register 65: 19686–19698

United States Environmental Protection Agency (USEPA). 2011. Clean Water Act, Section 401 Certification and Wetlands. Available online <http://water.epa.gov/type/wetlands/outreach/fact24.cfm >Webpage last updated September 2011. Viewed February 6, 2012.

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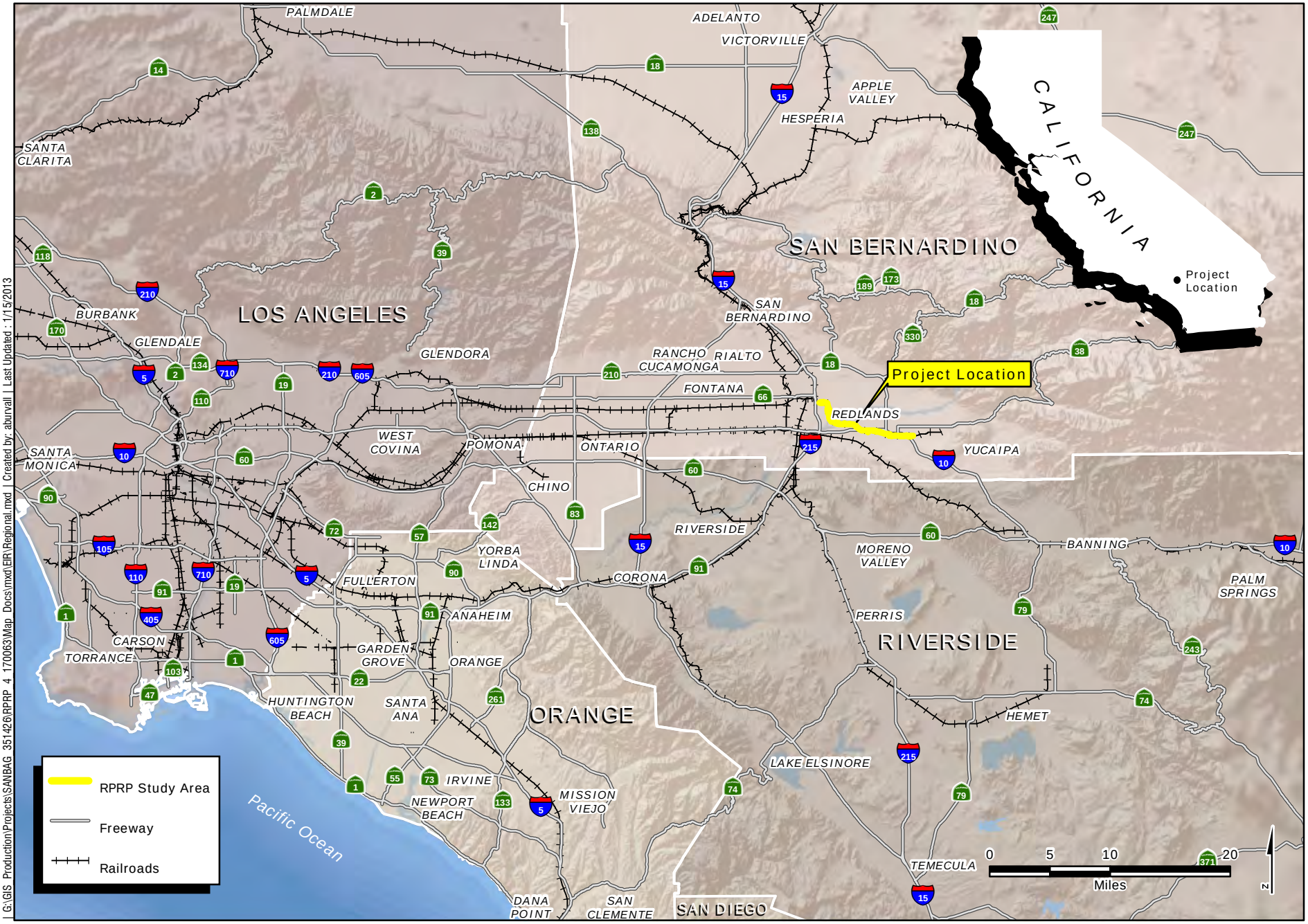
APPENDIX A

Project Figures



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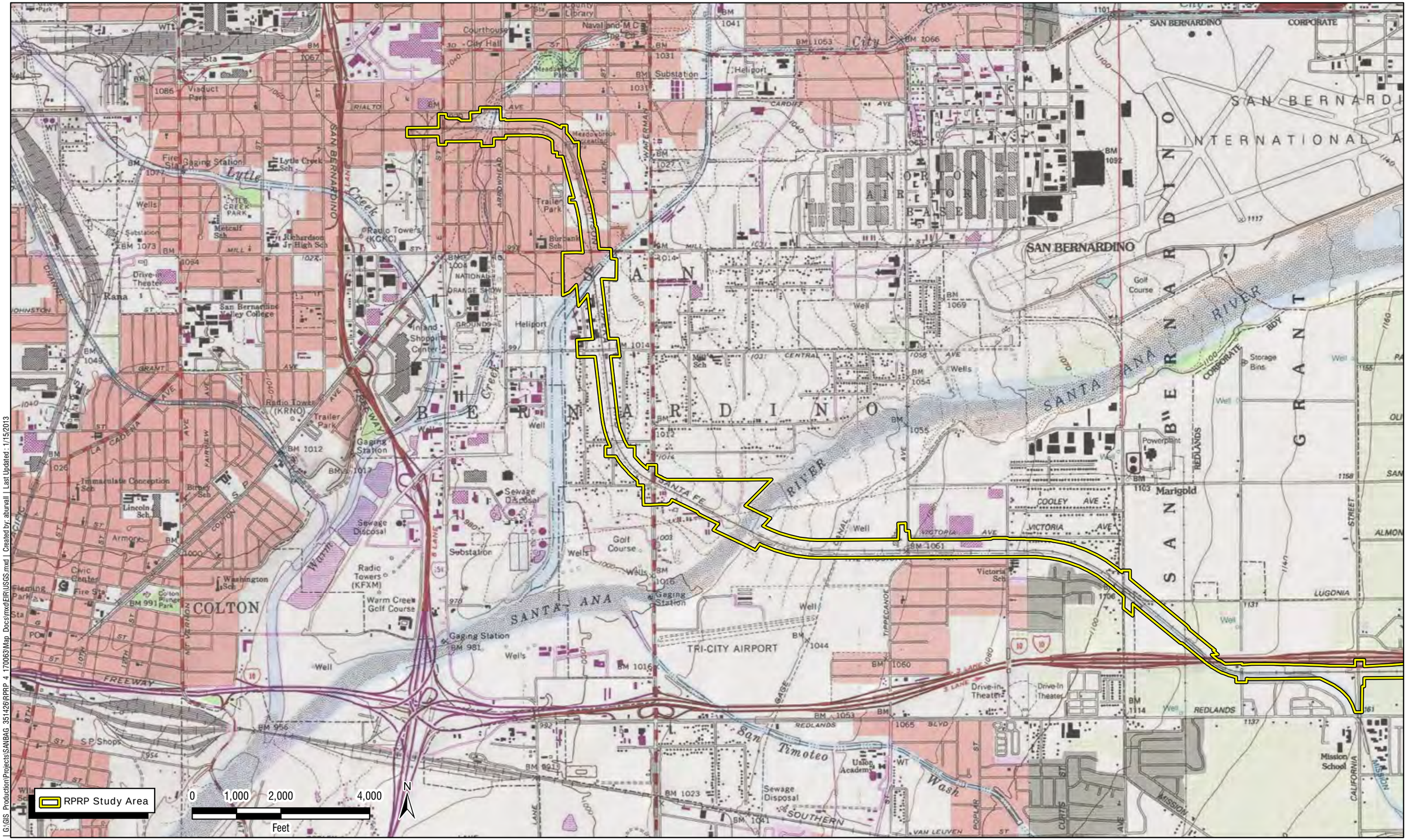
Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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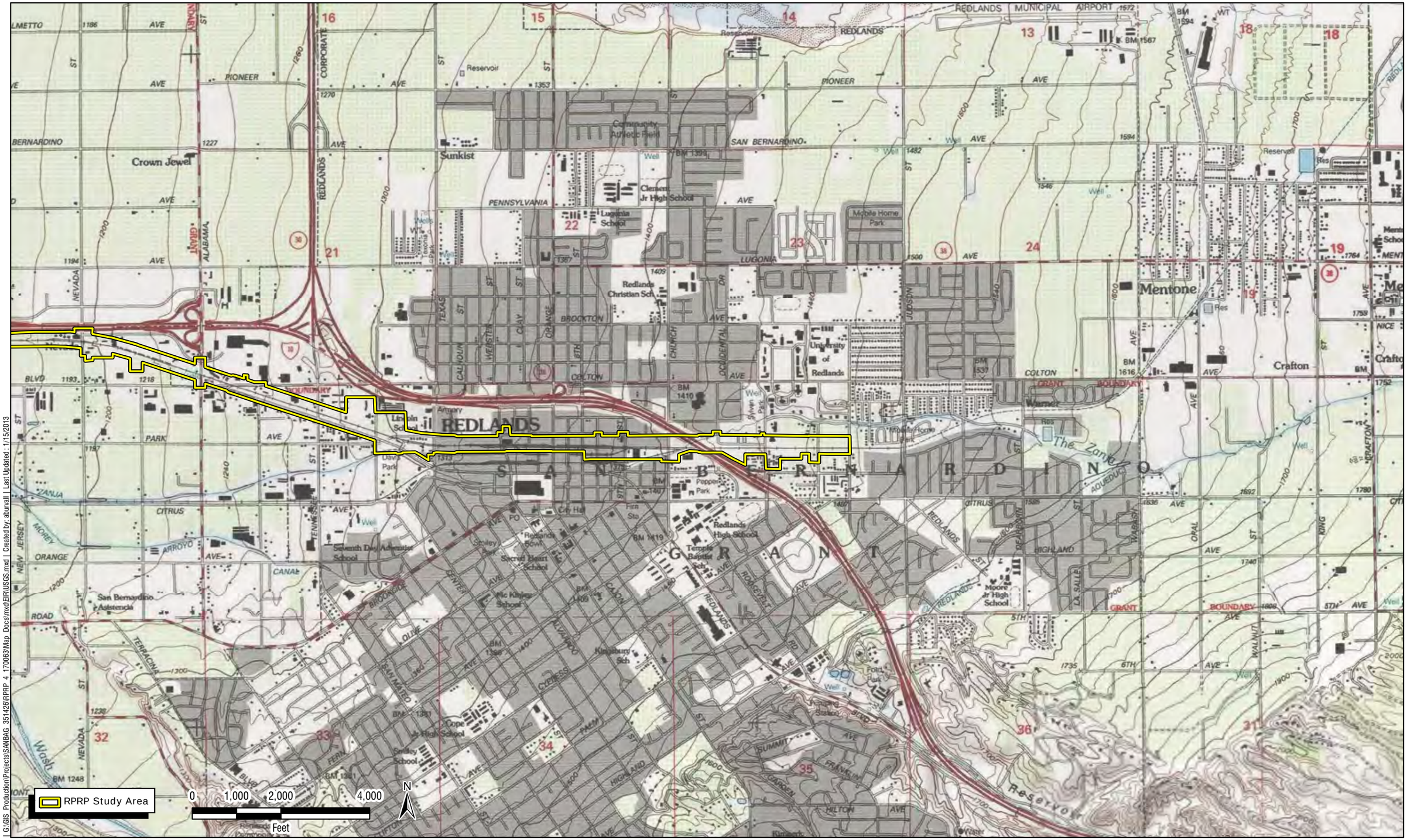
USGS Topographic Map

Figure 2a

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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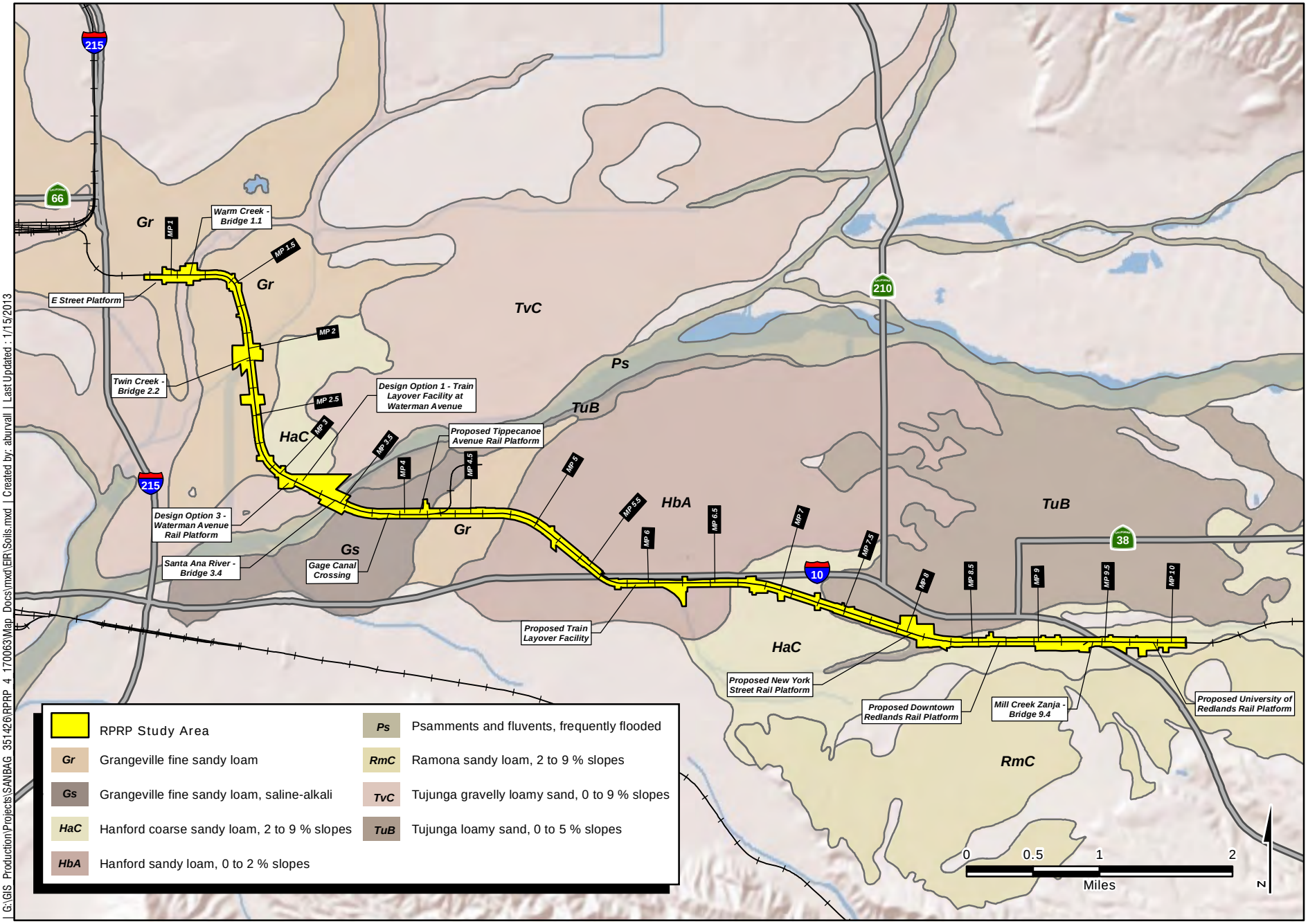
USGS Topographic Map

Figure 2b

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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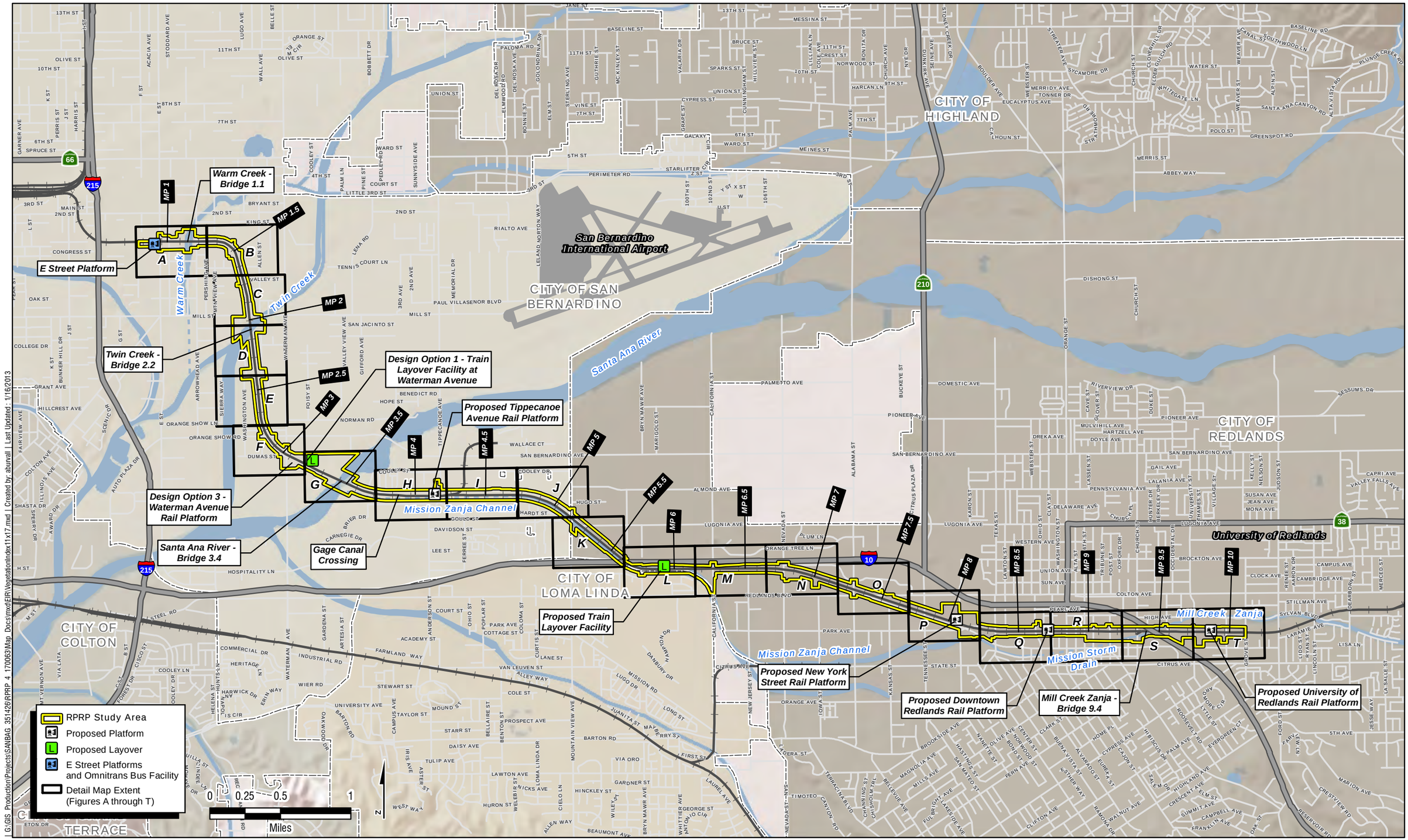
Soils

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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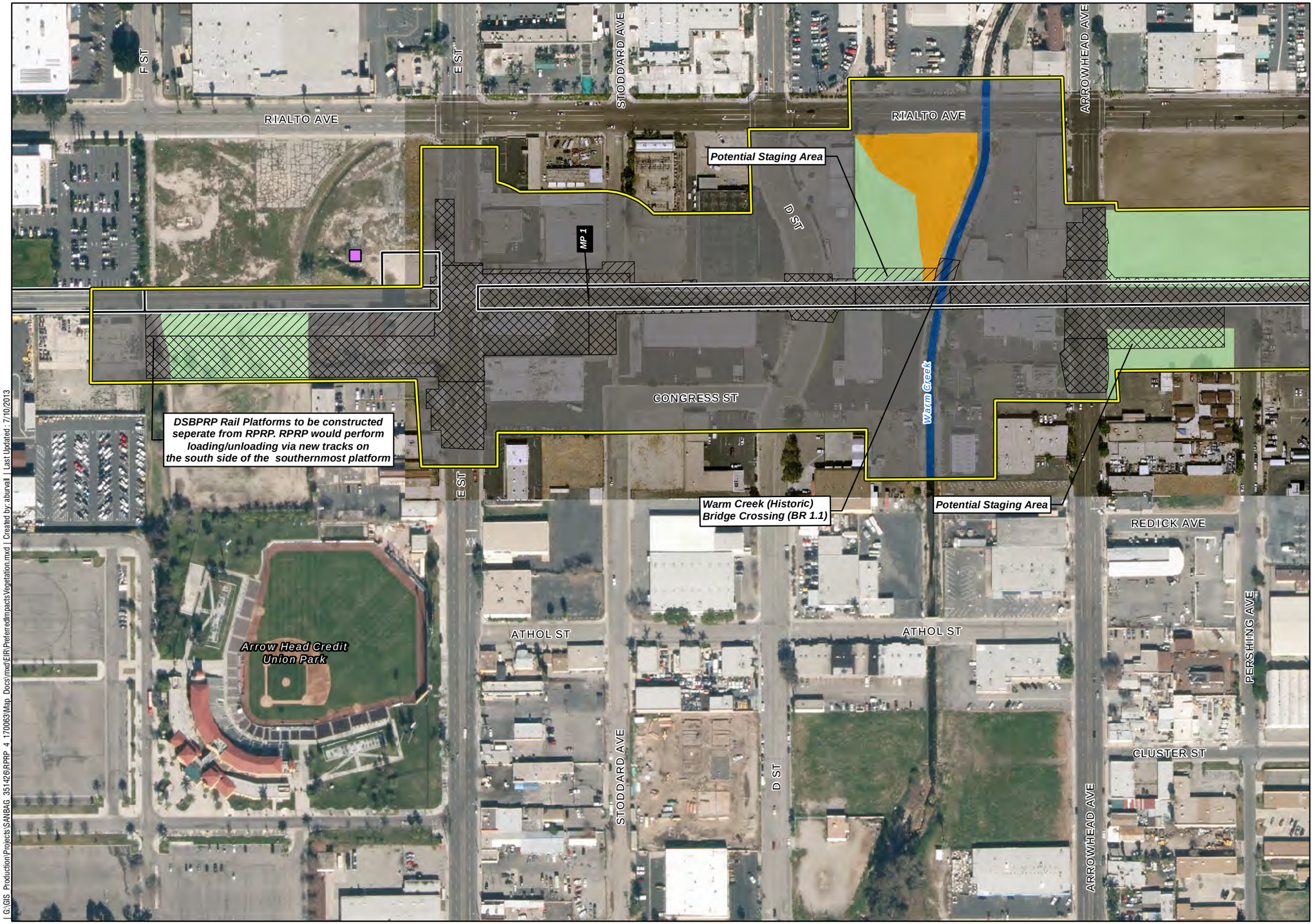
Impacts on Vegetation Communities Overview (Preferred Project)

Figure 4

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Footprint

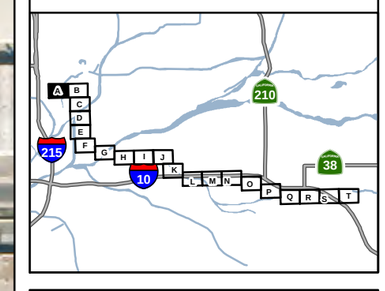
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 A

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

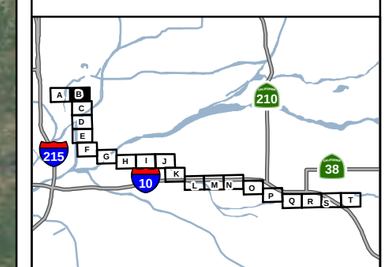
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 B

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

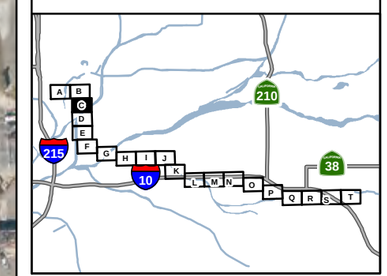
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 C

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

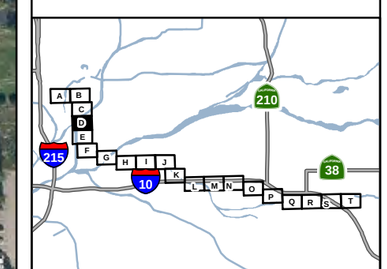
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

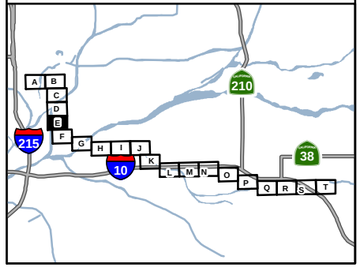
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 E

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RPRP Study Area

Footprint

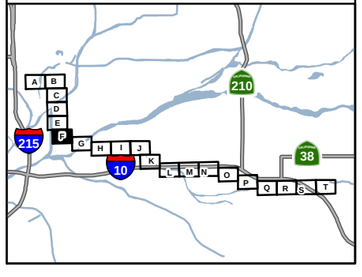
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 F

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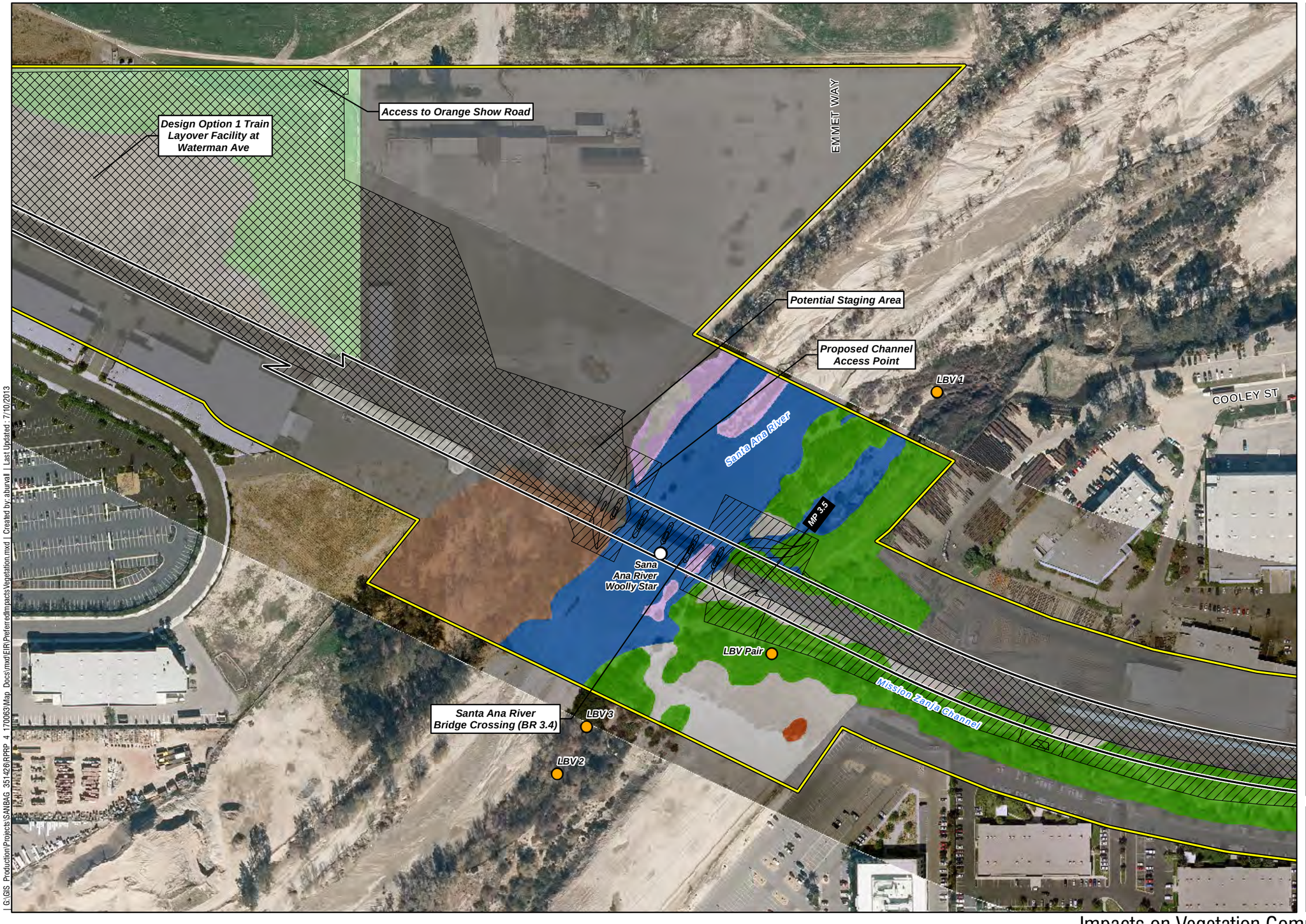


RPRP Study Area

Footprint

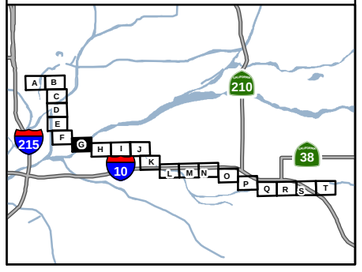
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

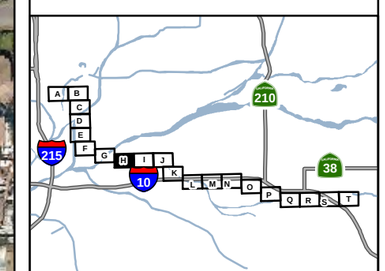
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

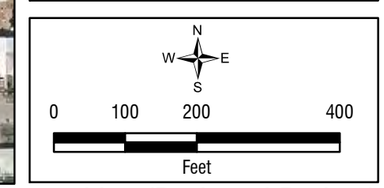
Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star





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Impacts on Vegetation Communities (Preferred Project)

Figure 4 H

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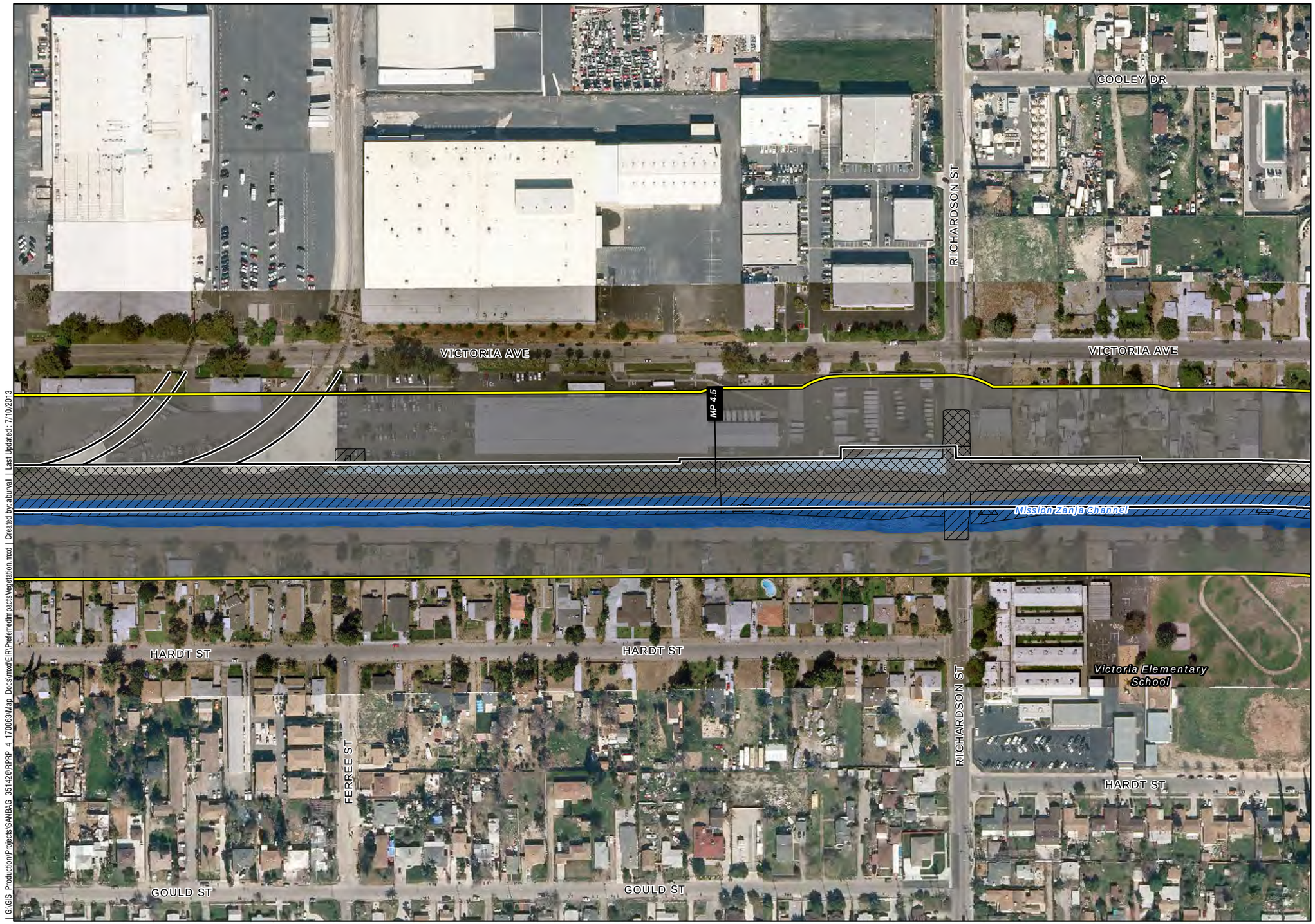

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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- NonVegetated Channel
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- Orchard and Vineyards
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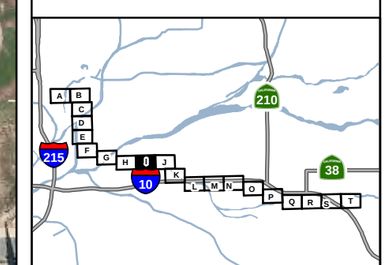
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 I

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RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
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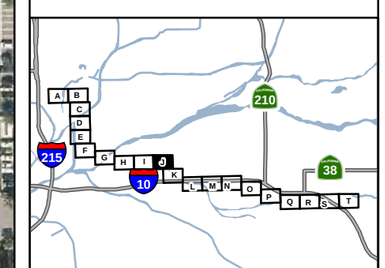
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 J

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RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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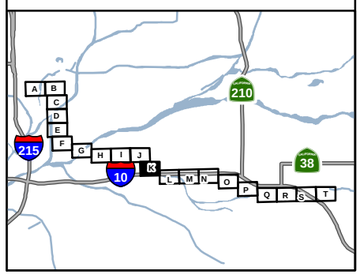
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 K

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RPRP Study Area

Footprint

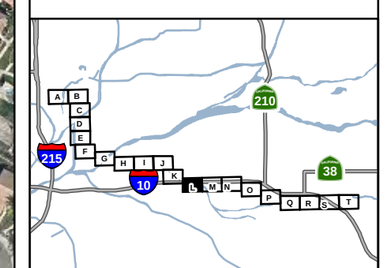
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 L

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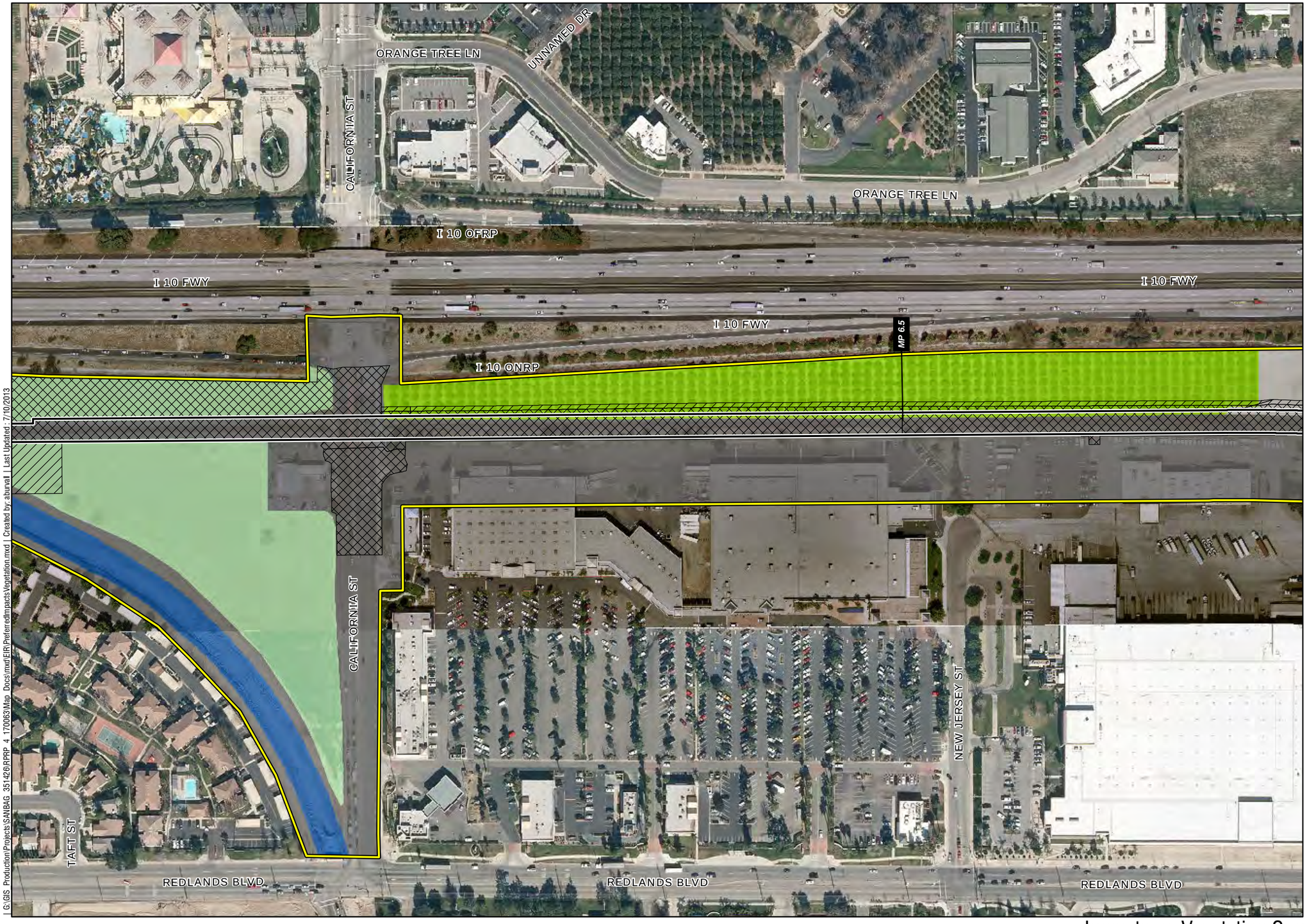


RPRP Study Area

Footprint

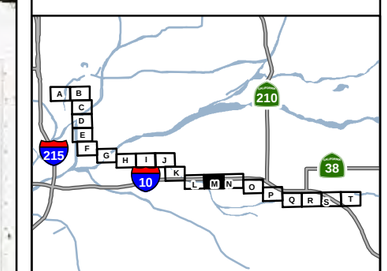
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 M

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RPRP Study Area

Footprint

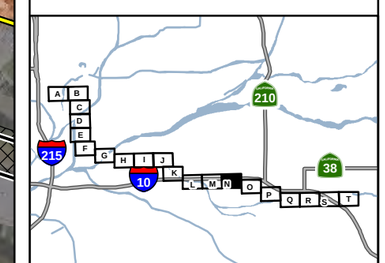
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 N

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

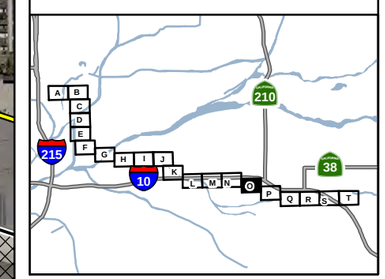
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 O

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
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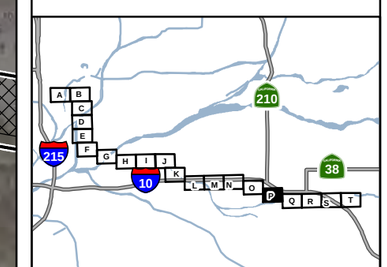
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 P

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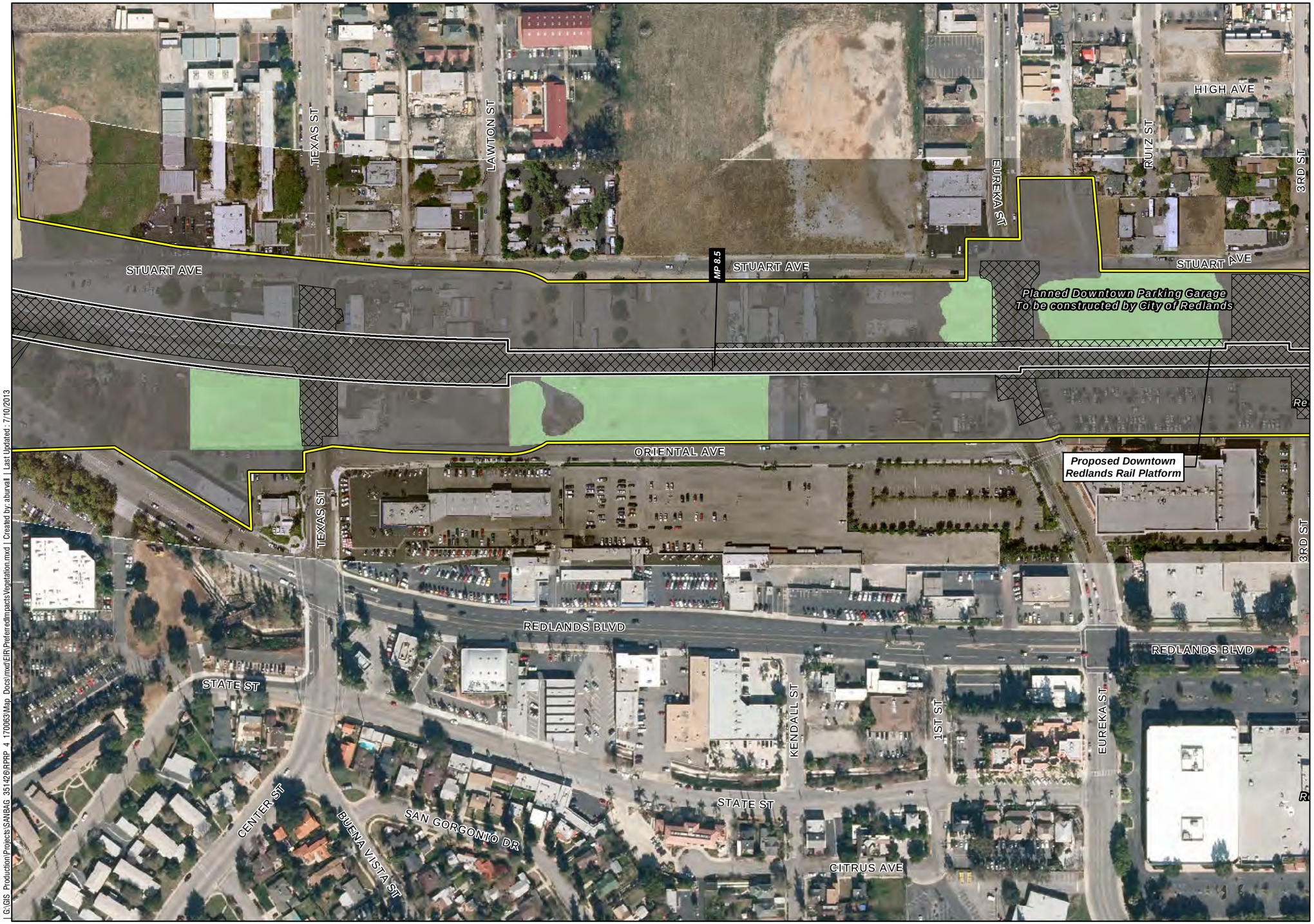

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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- Orchard and Vineyards
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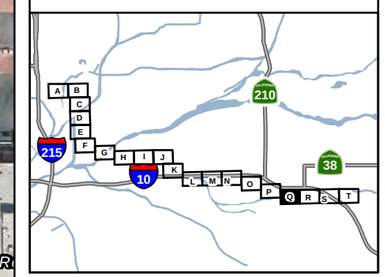
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 Q

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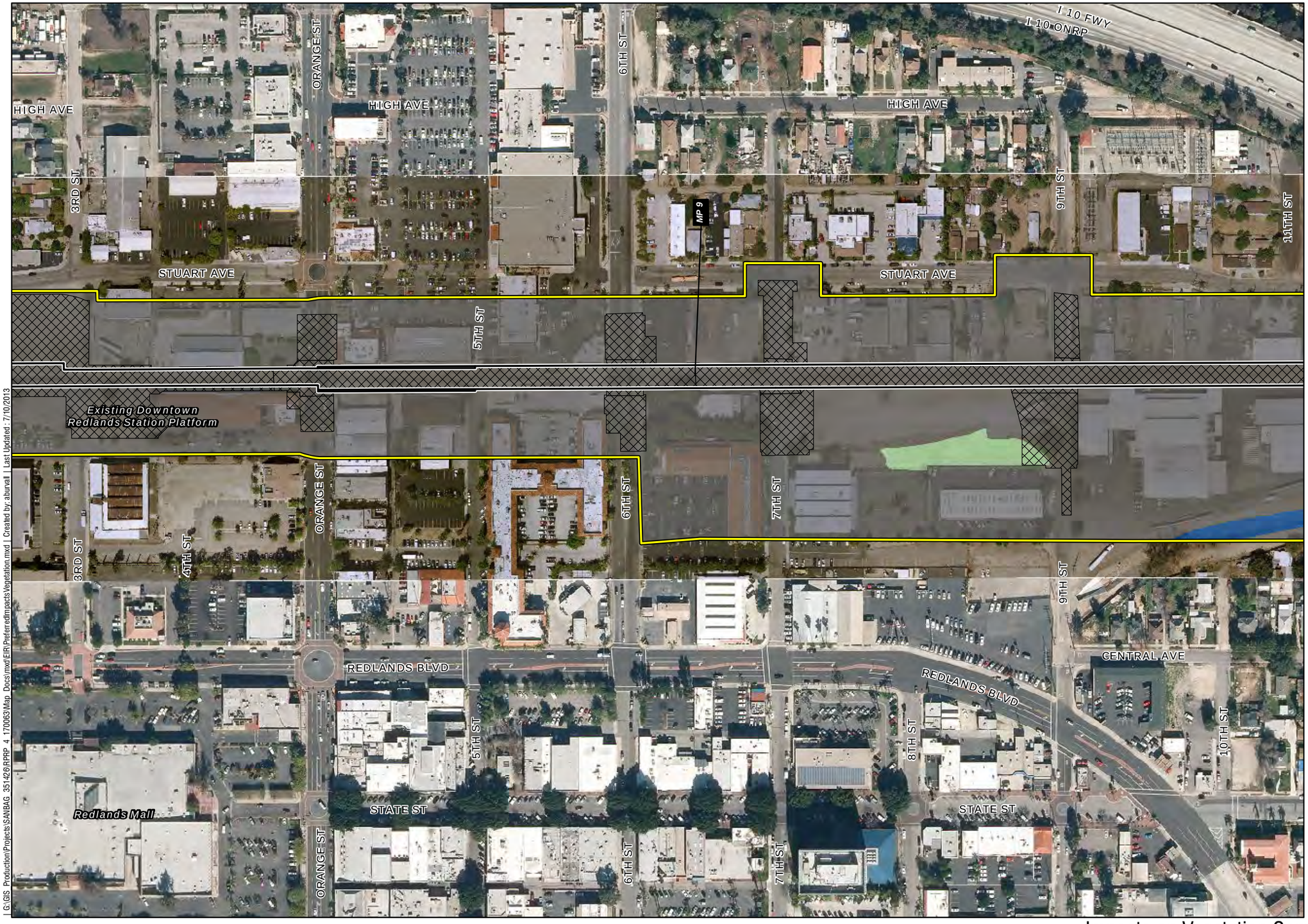

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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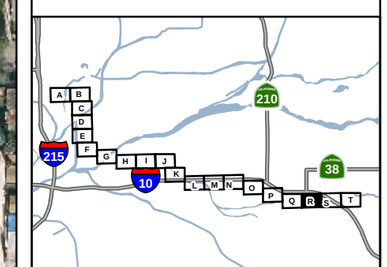
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 R

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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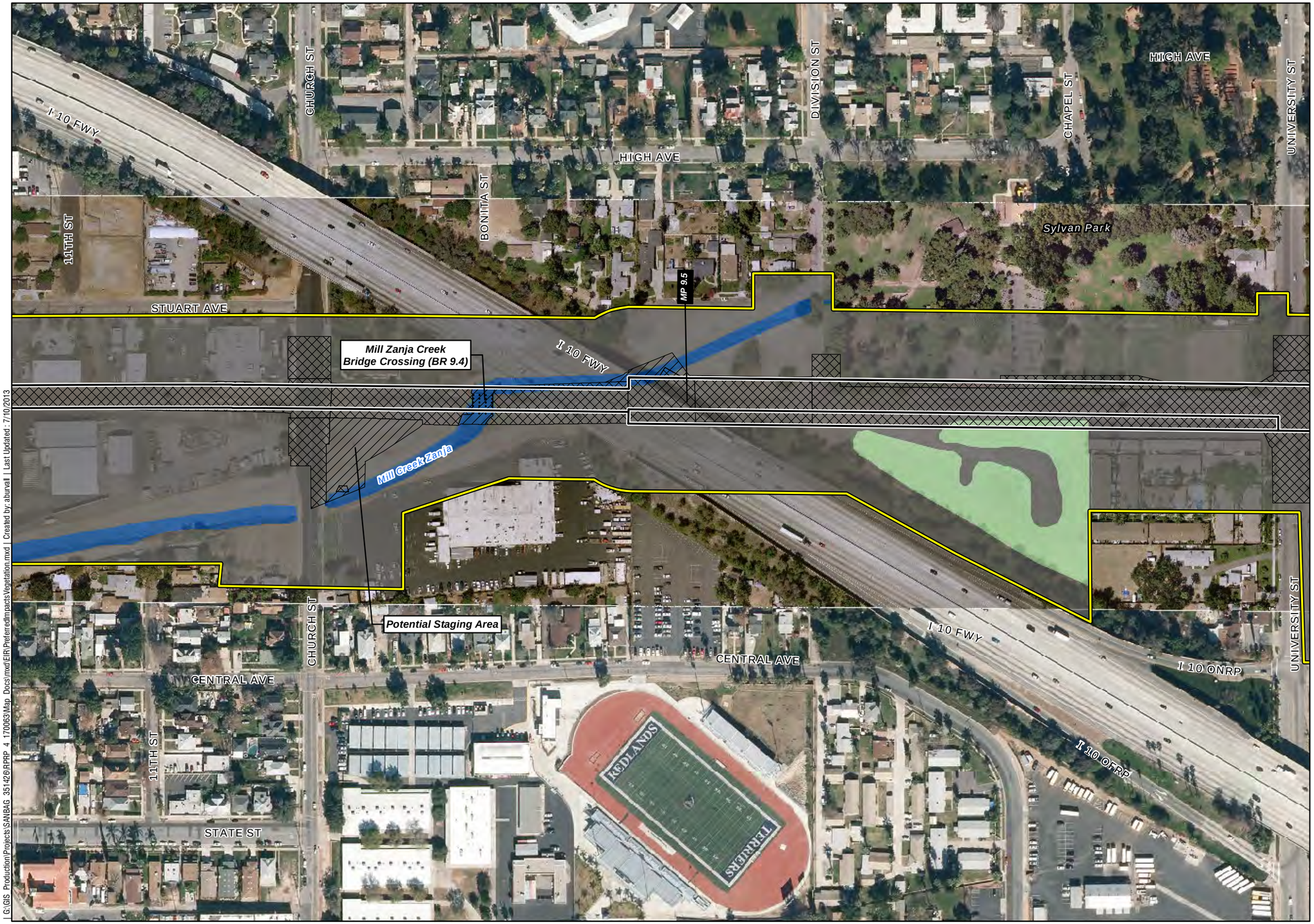


RPRP Study Area

Footprint

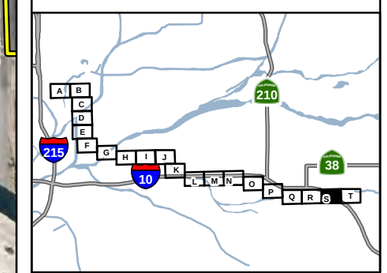
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Preferred Project)

Figure 4 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
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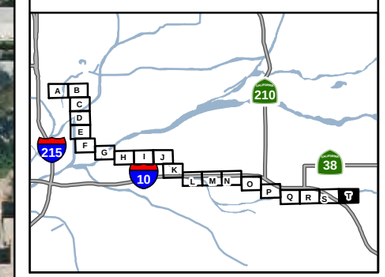
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Non-Breeding Season BUOW Observation
- Least Bell's Vireo
- Sana Ana River Woolly Star



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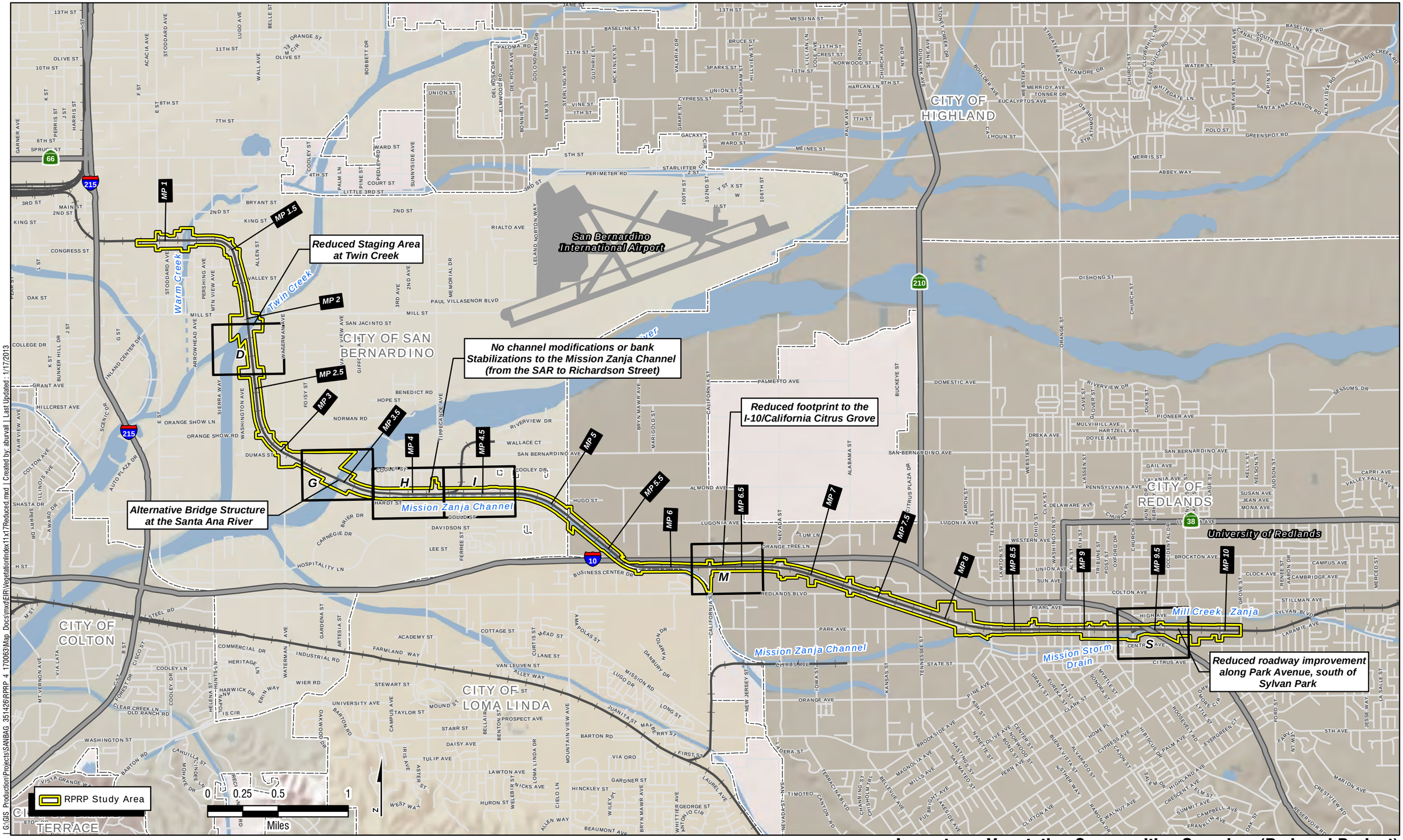
Impacts on Vegetation Communities (Preferred Project)

Figure 4 T

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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Impacts on Vegetation Communities Overview (Reduced Project)

Figure 5

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Vegetation Community

Disturbed Habitat

Disturbed Wetland

Eucalyptus Woodland

Flat-top Buckwheat Scrub

Mulefat Scrub

Non Jurisdictional Ditch

Non-native Grassland

NonVegetated Channel

Oak Woodland

Orchard and Vineyards

Southern Willow Scrub

Southern Cottonwood Willow Riparian Forest

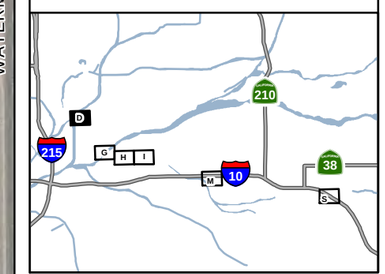
Tamarisk Scrub

Urban/Developed

Species Observation

Least Bell's Vireo

Sana Ana River Woolly Star



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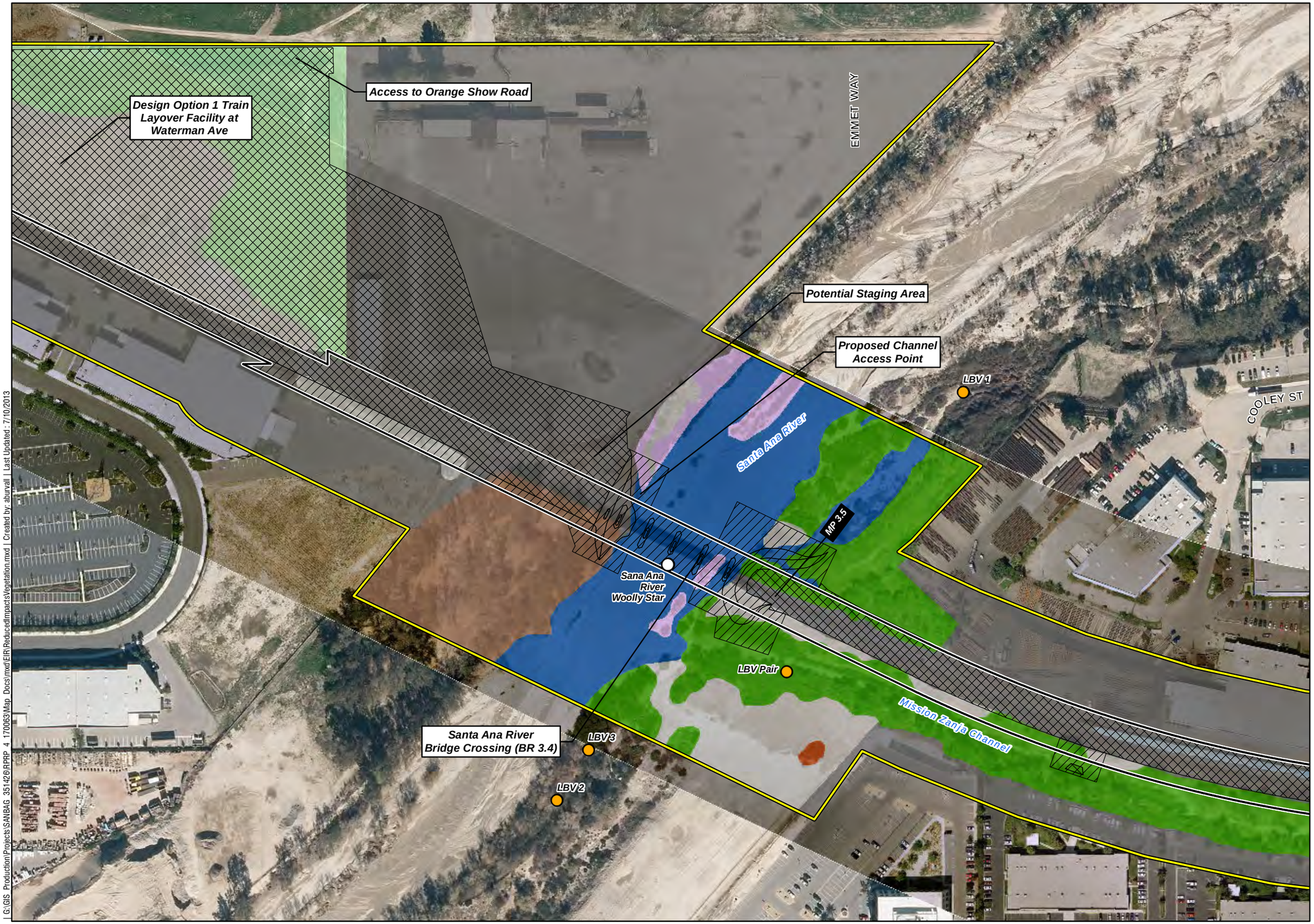
Impacts on Vegetation Communities (Reduced Project)

Figure 5 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

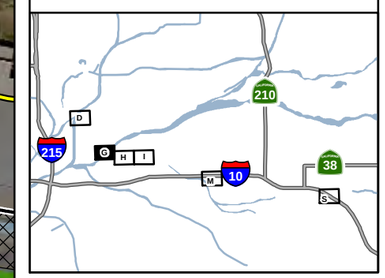
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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Impacts on Vegetation Communities (Reduced Project)

Figure 5 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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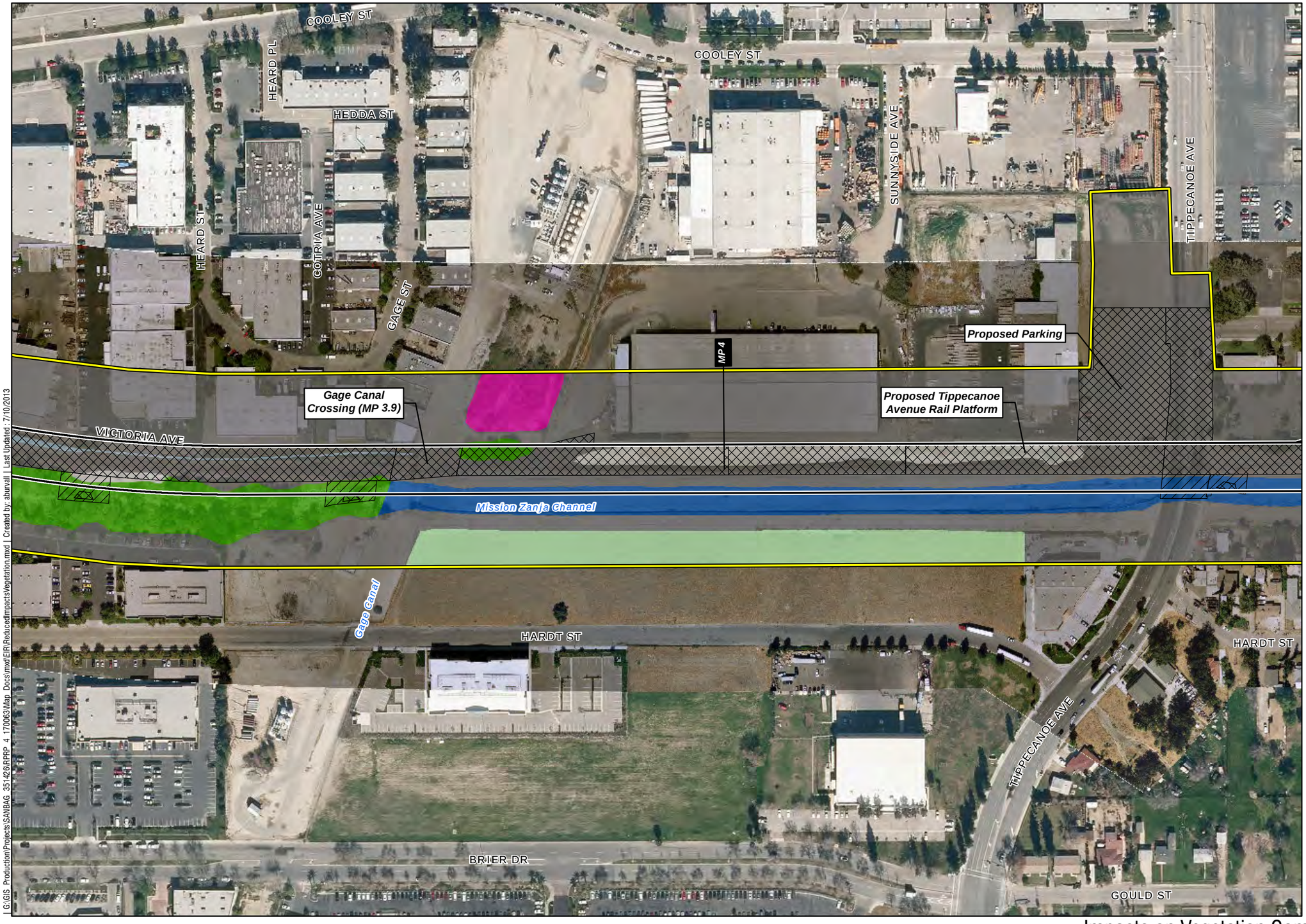

RPRP Study Area

Reduced

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
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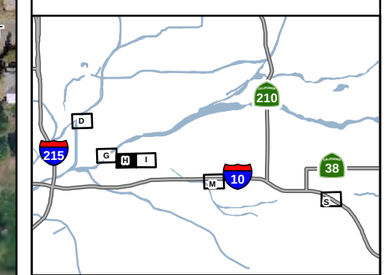
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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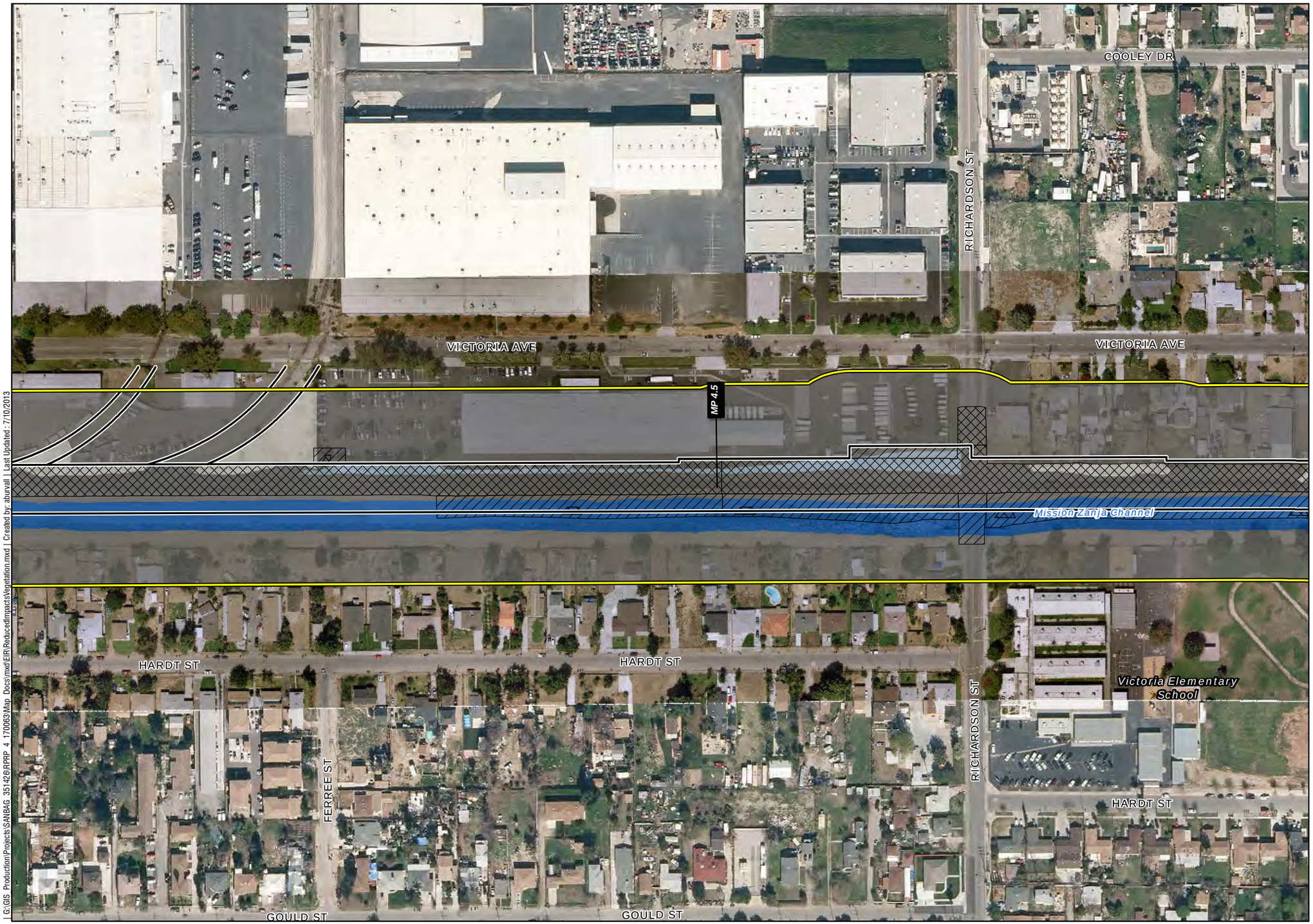
Impacts on Vegetation Communities (Reduced Project)

Figure 5 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Vegetation Community

Disturbed Habitat

Disturbed Wetland

Eucalyptus Woodland

Flat-top Buckwheat Scrub

Mulefat Scrub

Non Jurisdictional Ditch

Non-native Grassland

NonVegetated Channel

Oak Woodland

Orchard and Vineyards

Southern Willow Scrub

Southern Cottonwood Willow Riparian Forest

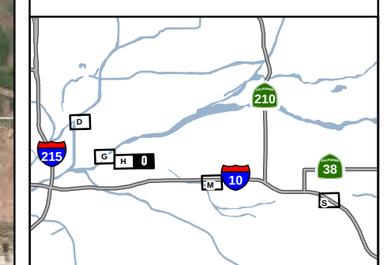
Tamarisk Scrub

Urban/Developed

Species Observation

Least Bell's Vireo

Sana Ana River Woolly Star



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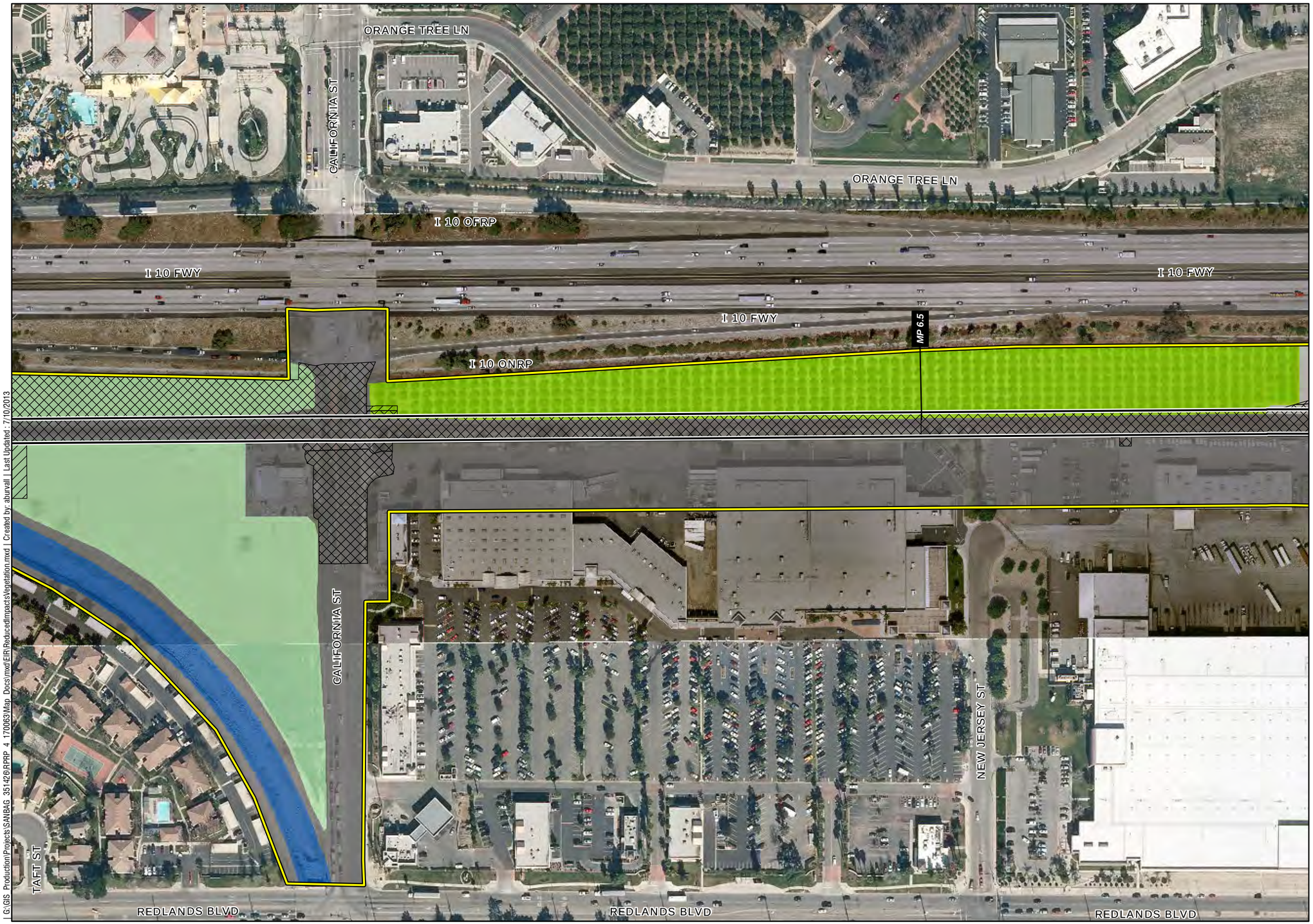
Impacts on Vegetation Communities (Reduced Project)

Figure 5 I

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

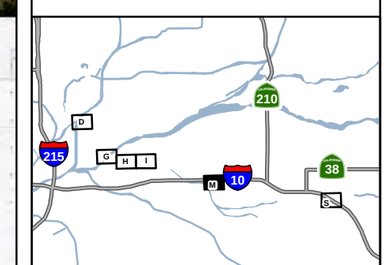
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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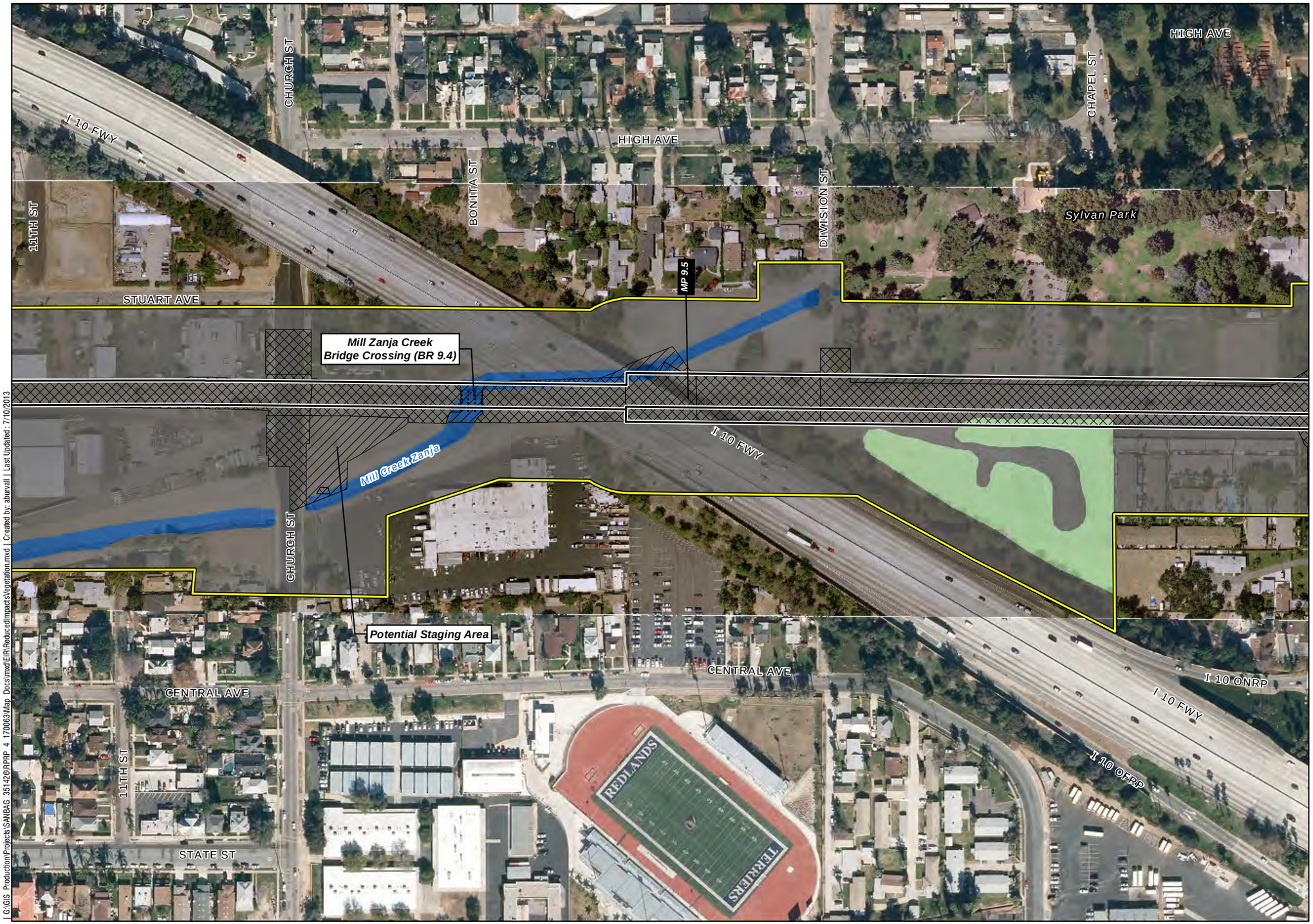
Impacts on Vegetation Communities (Reduced Project)

Figure 5 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

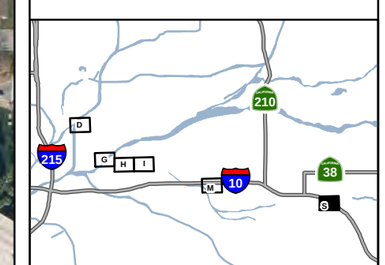
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed

Species Observation

- Least Bell's Vireo
- Sana Ana River Woolly Star



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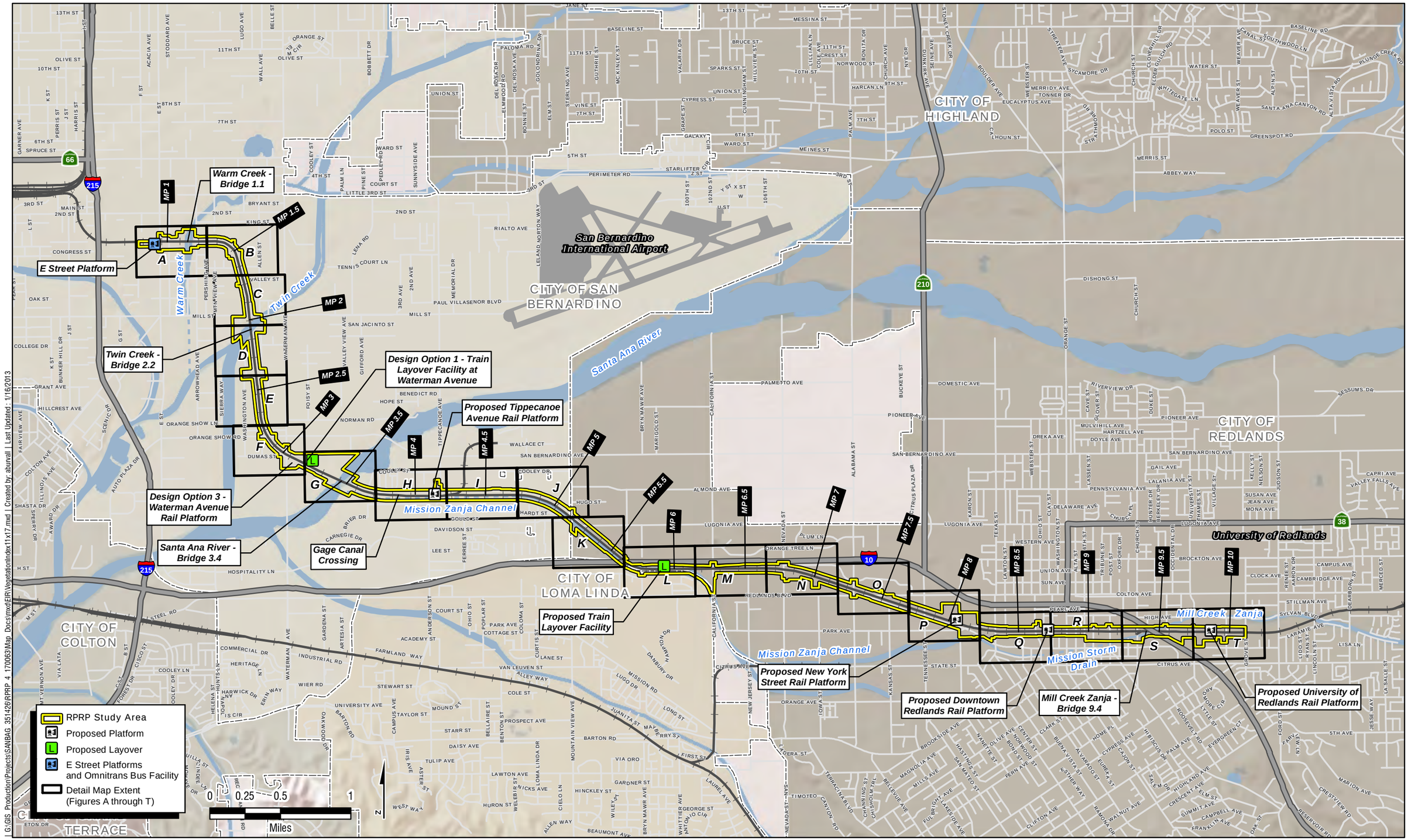
Impacts on Vegetation Communities (Reduced Project)

Figure 5 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR



Impacts on Wetland and Waters of the U.S Overview (Preferred Project)

Figure 6

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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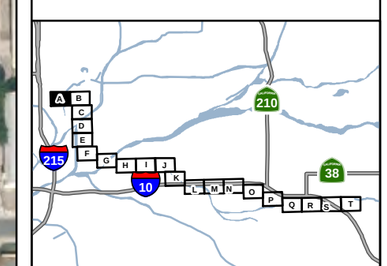
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

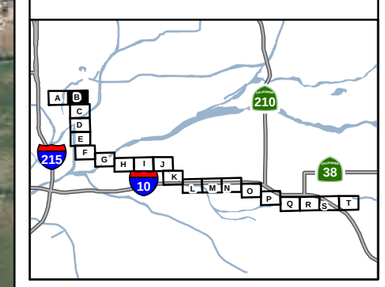
Figure 6 A

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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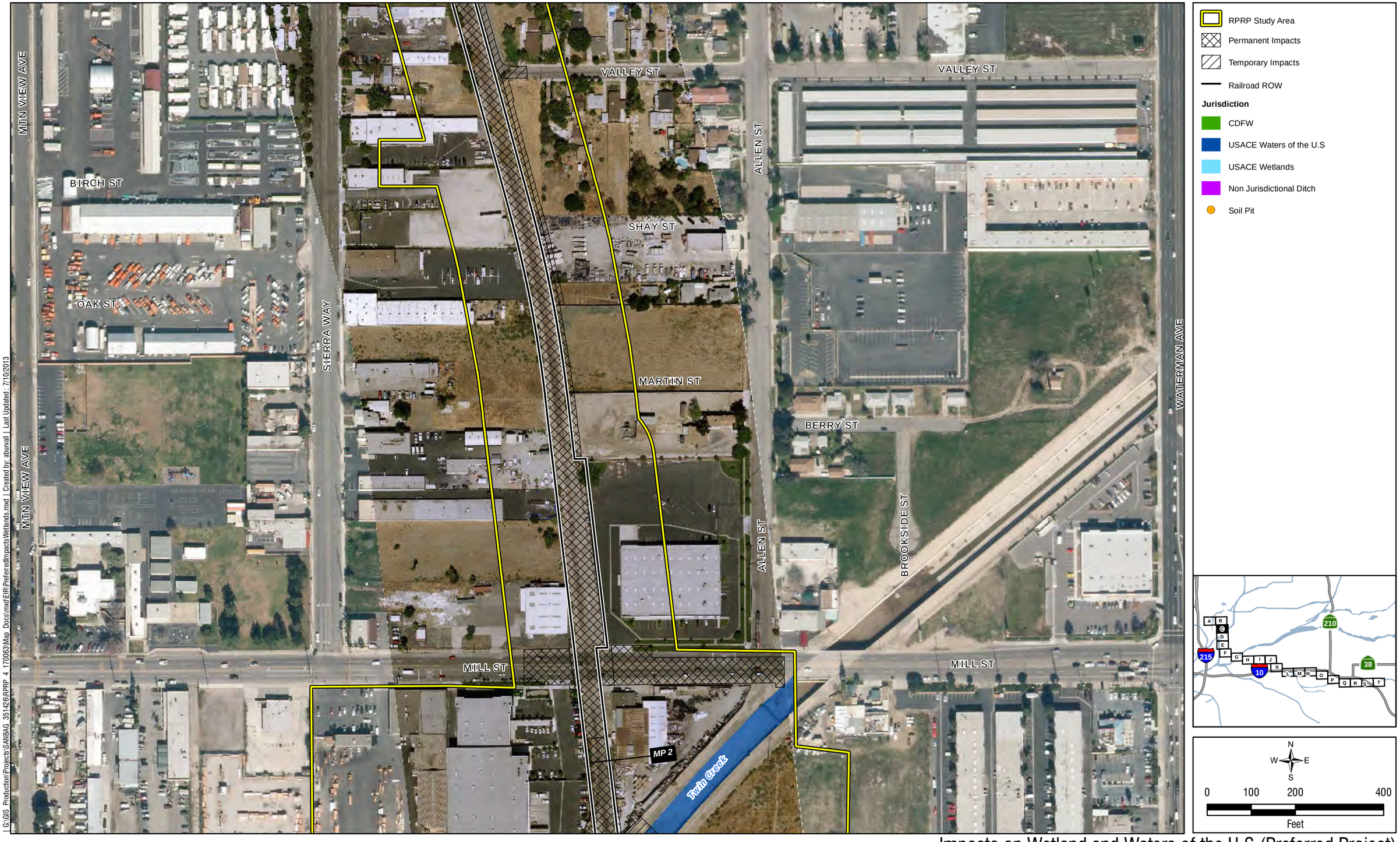
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 B

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 C

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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Impacts on Wetland and Waters of the U.S (Preferred Project)

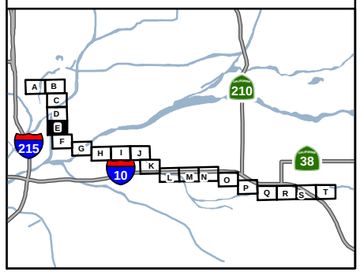
Figure 6 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 E

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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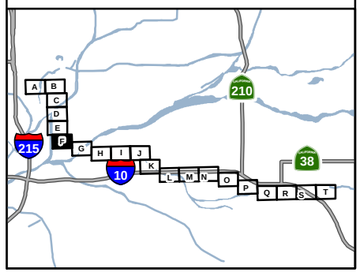
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

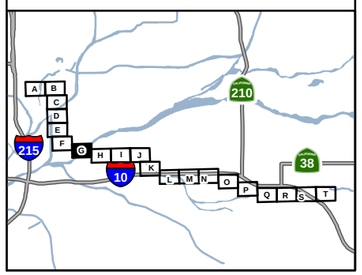
Figure 6 F

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

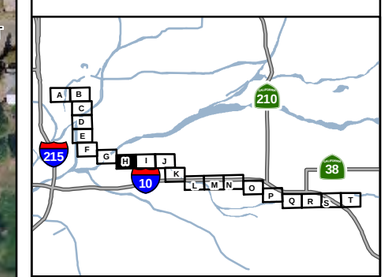
Figure 6 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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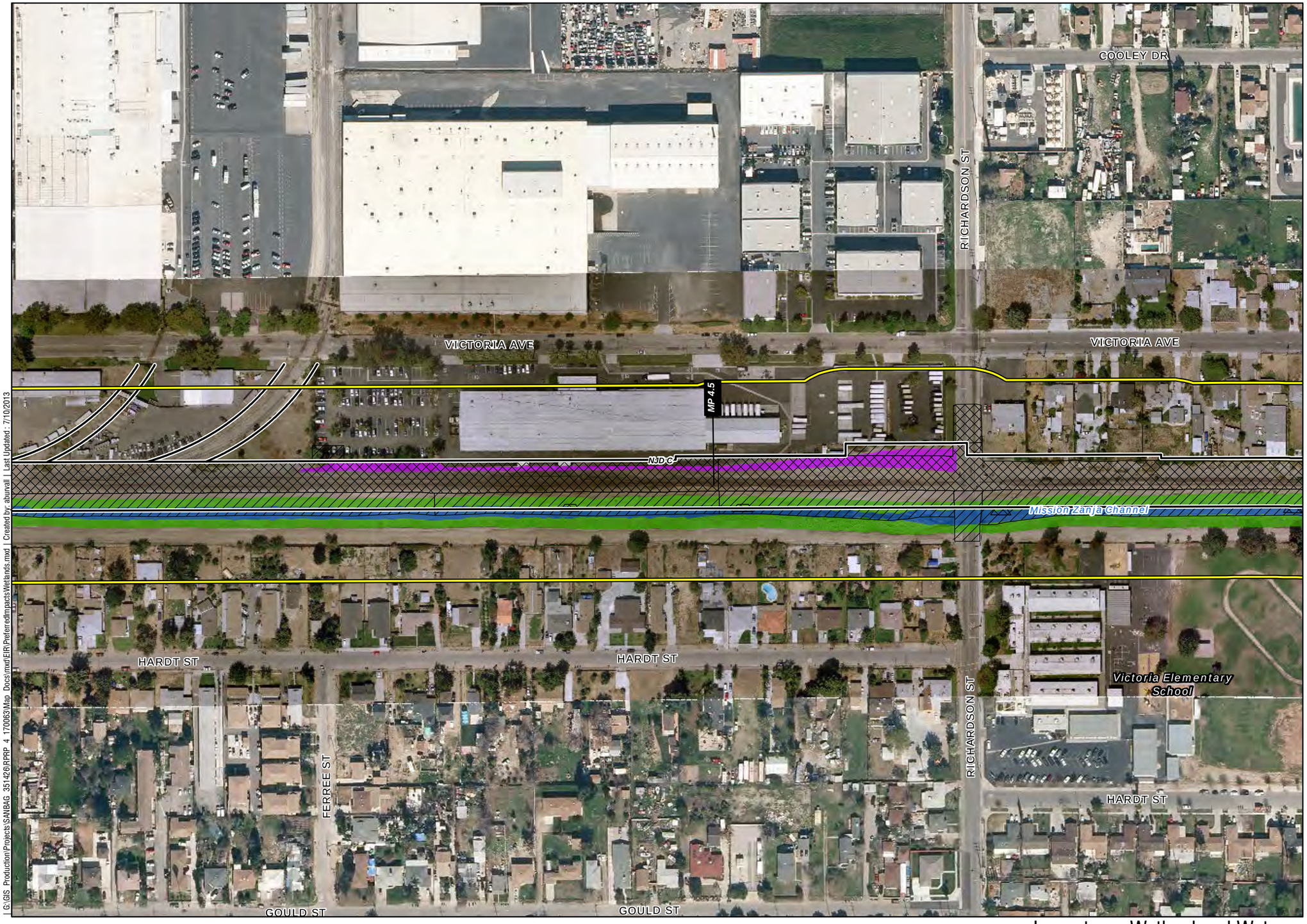
Impacts on Wetland and Waters of the U.S (Preferred Project)

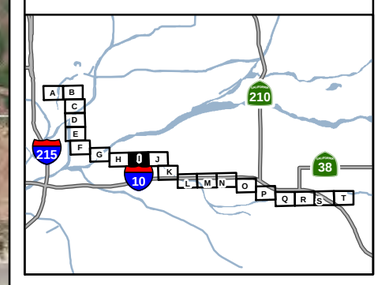
Figure 6 H



RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

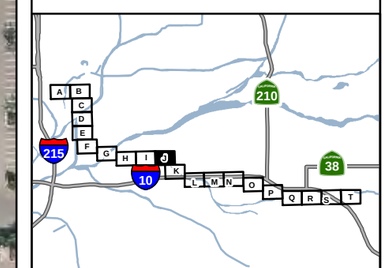
Figure 6 I

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 J

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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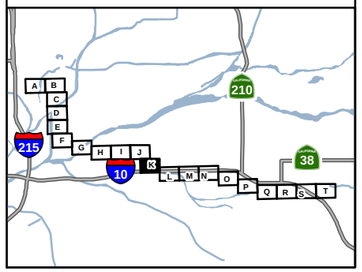
RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

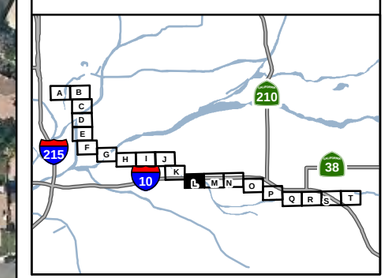
Figure 6 K

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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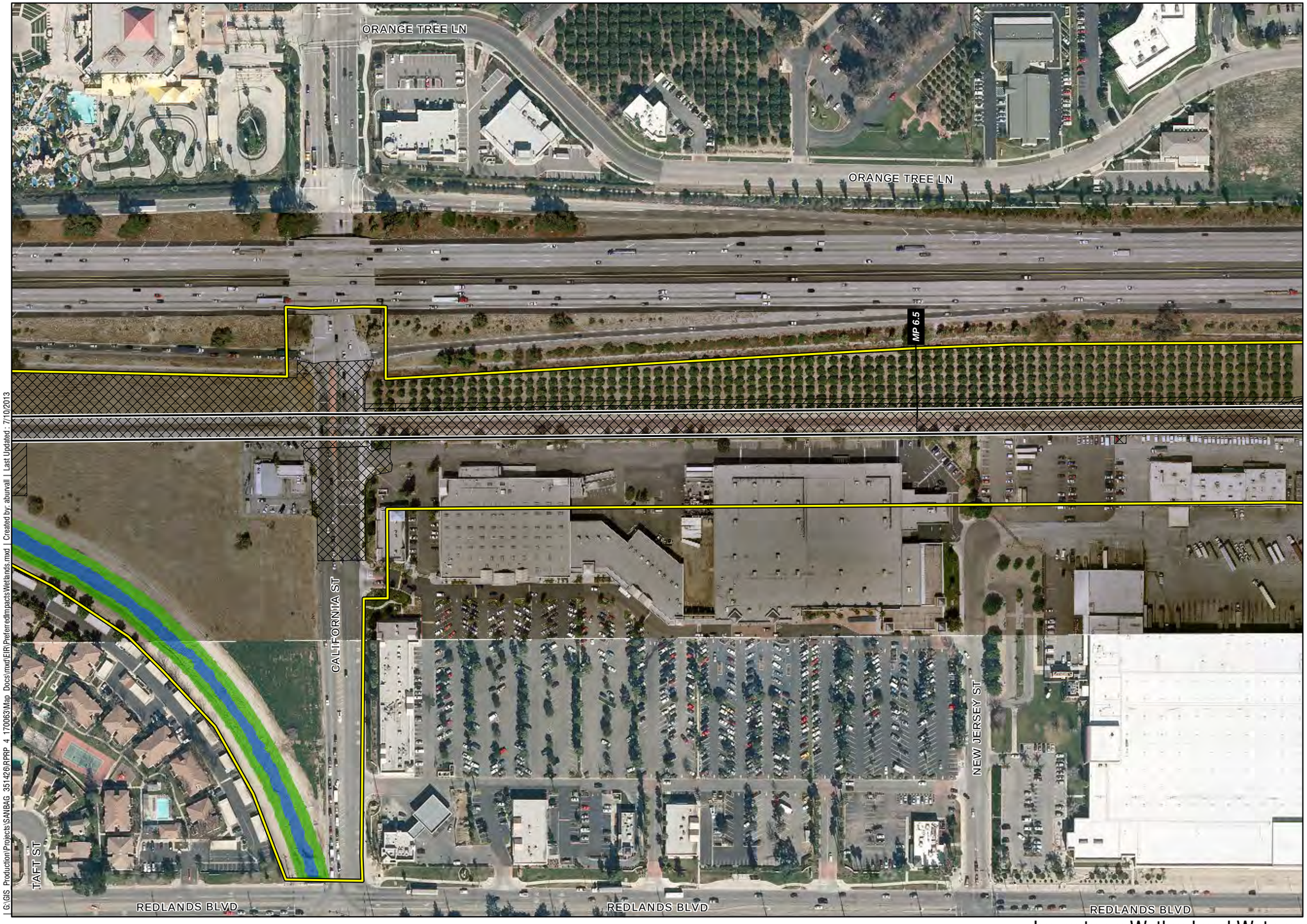
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 L

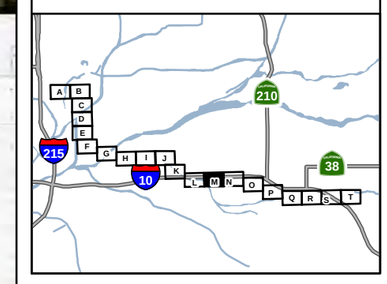
FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

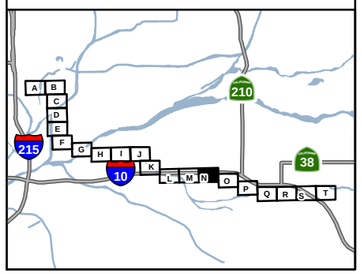
Figure 6 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 N

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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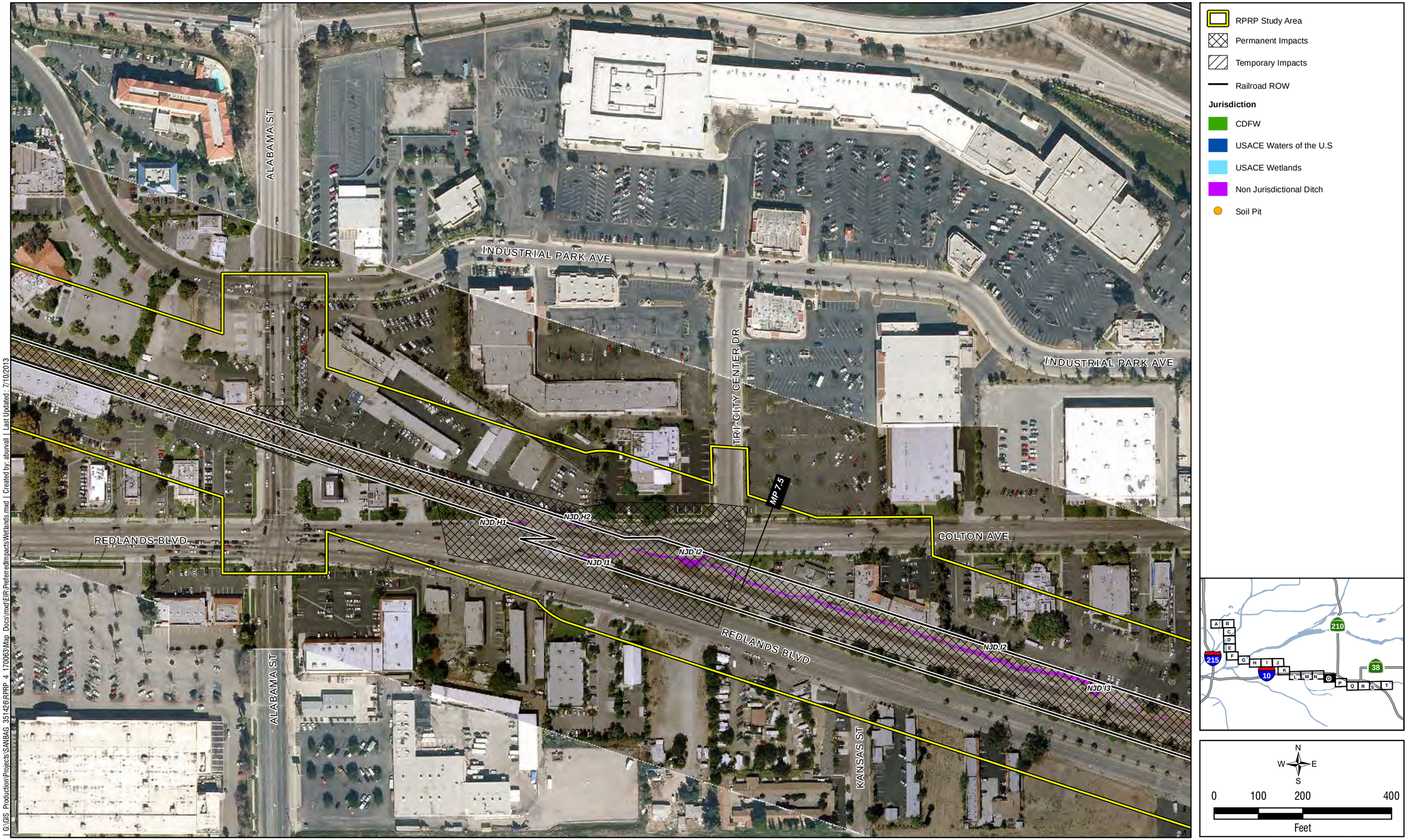

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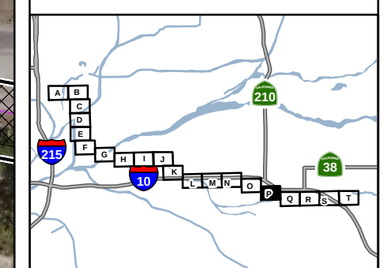
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 O

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

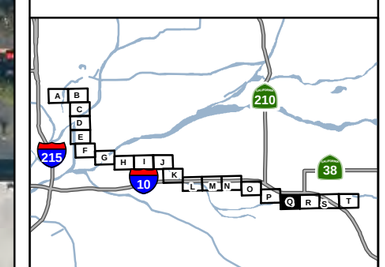
Figure 6 P

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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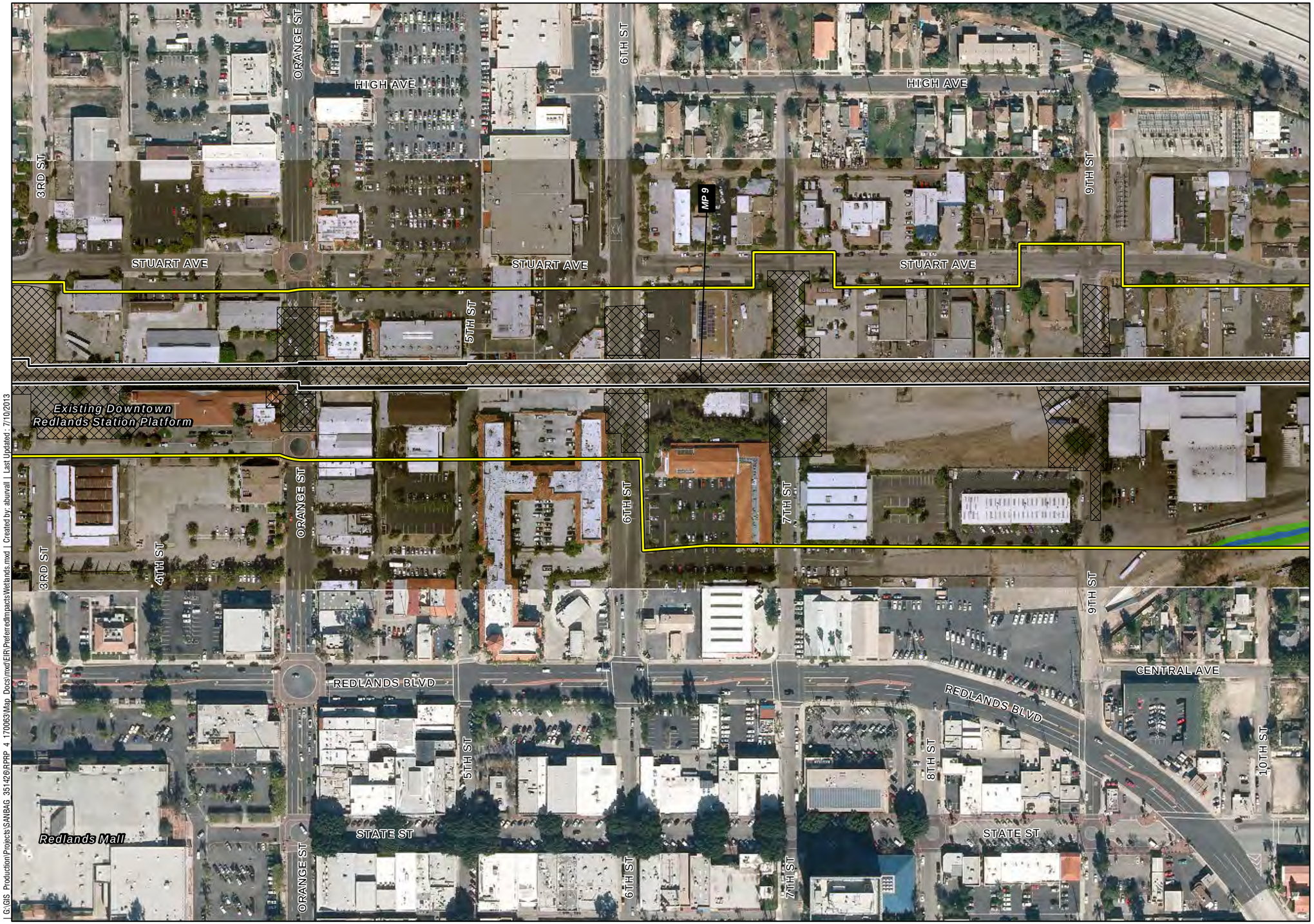
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 Q

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

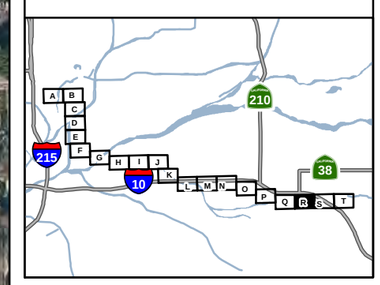
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

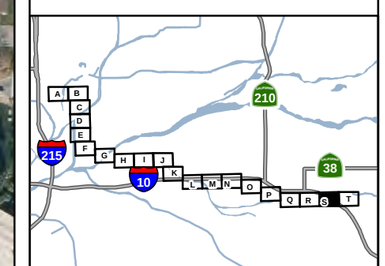
Figure 6 R

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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Impacts on Wetland and Waters of the U.S (Preferred Project)

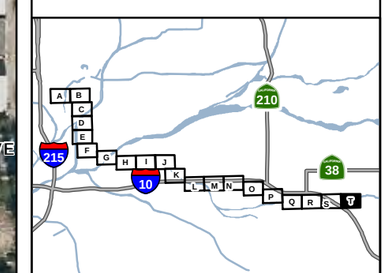
Figure 6 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area
Permanent Impacts
Temporary Impacts
Railroad ROW

Jurisdiction

CDFW
USACE Waters of the U.S
USACE Wetlands
Non Jurisdictional Ditch
Soil Pit



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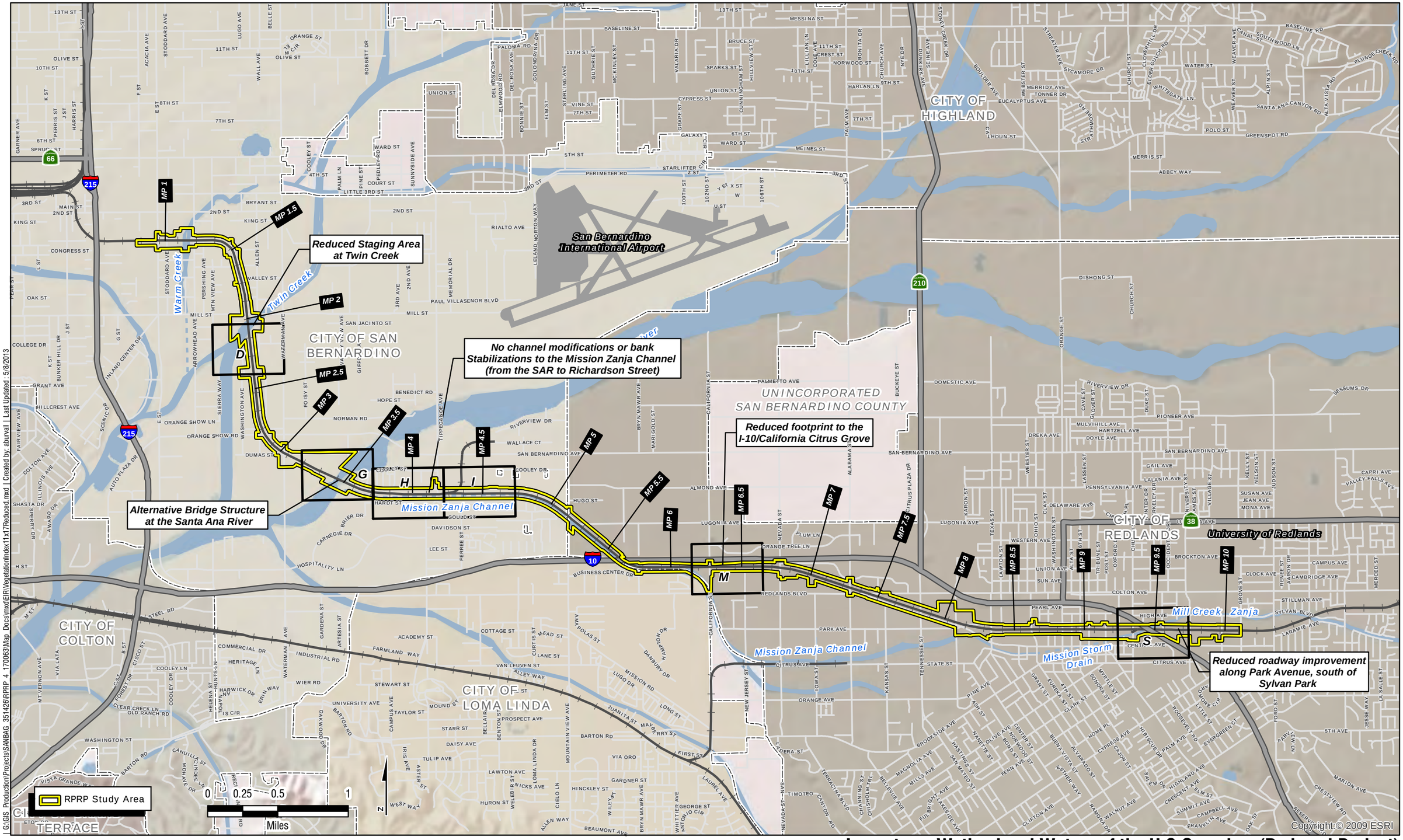
Impacts on Wetland and Waters of the U.S (Preferred Project)

Figure 6 T

FTA/SANBAG | Redlands Passenger Rail Project | BTR



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Impacts on Wetland and Waters of the U.S Overview (Reduced Project)

Figure 7

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

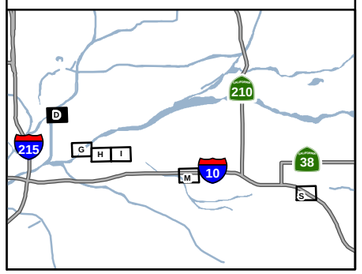
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 D

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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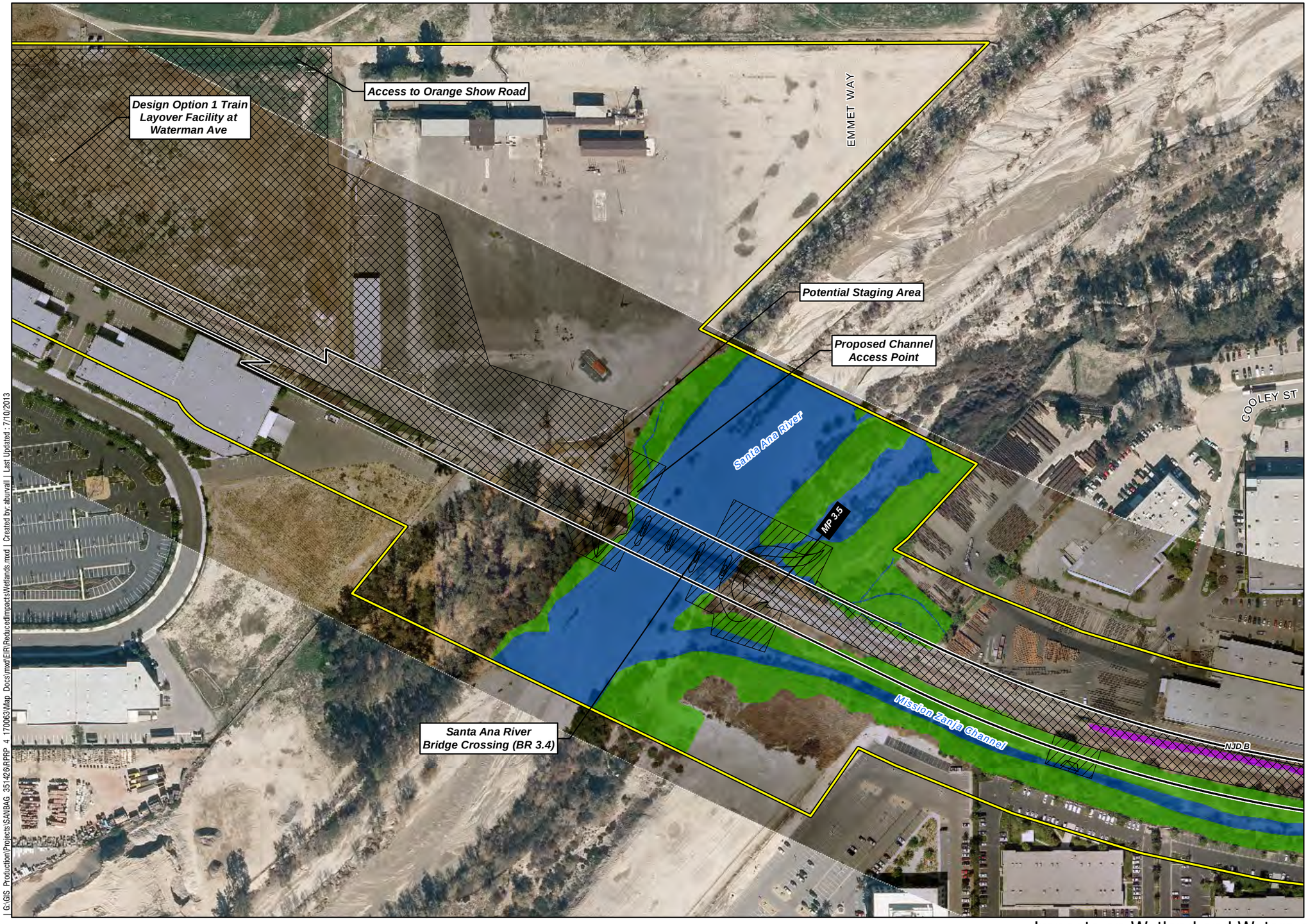


RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

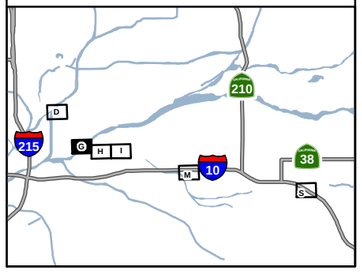
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Feet

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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 G

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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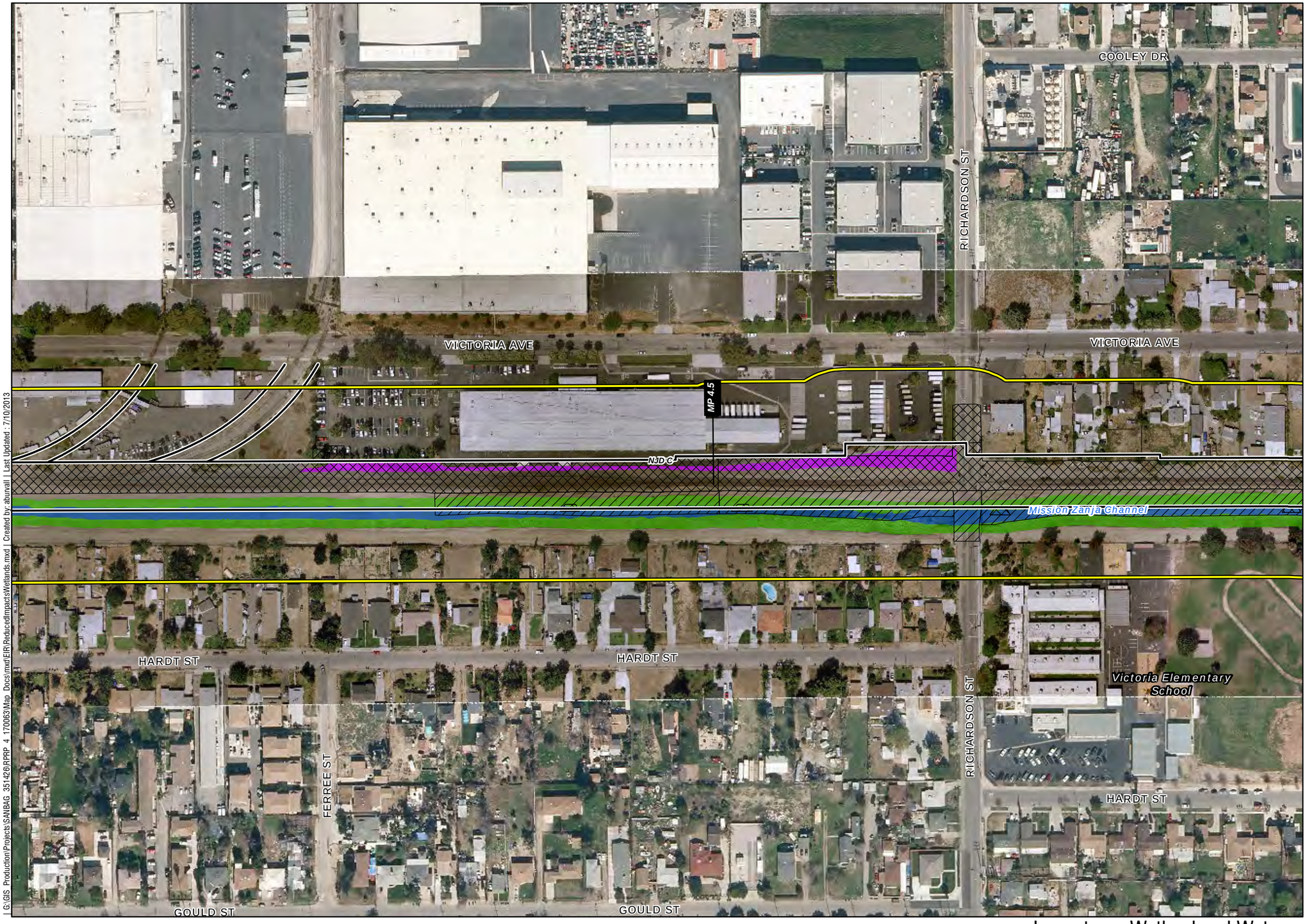
Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 H

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

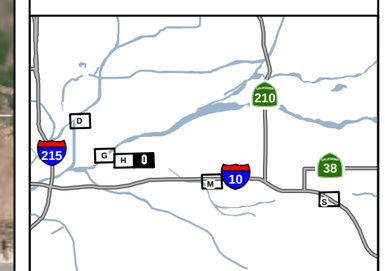
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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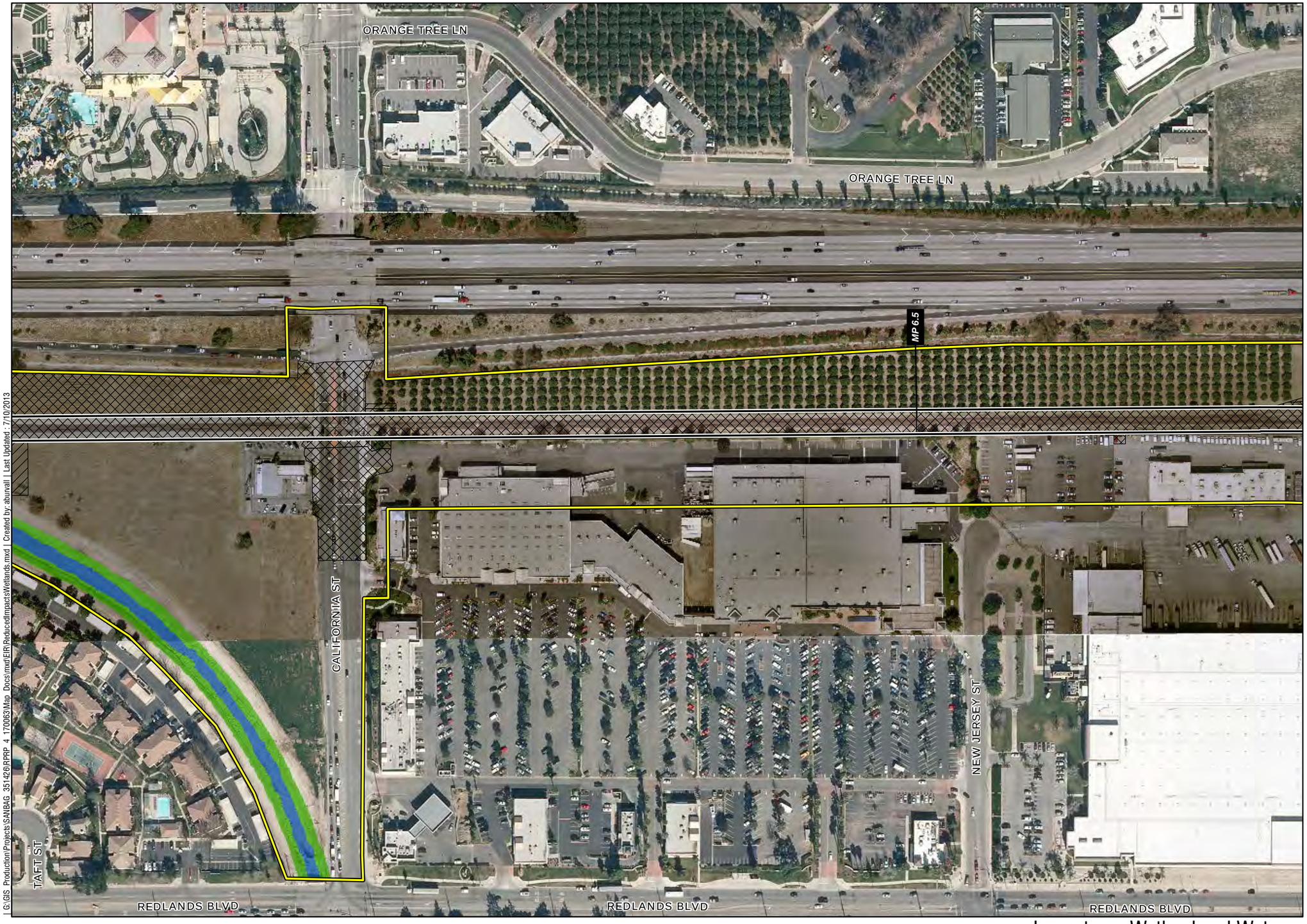
Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 |

FTA/SANBAG | Redlands Passenger Rail Project | BTR



RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

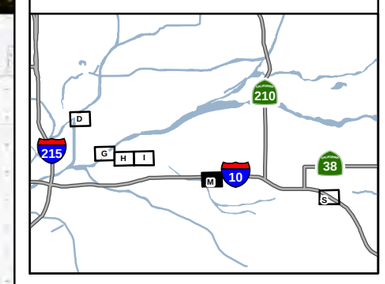
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 M

FTA/SANBAG | Redlands Passenger Rail Project | BTR

RPRP Study Area

Reduced

Permanent Impacts

Temporary Impacts

Railroad ROW

Jurisdiction

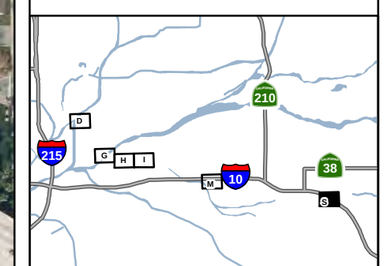
CDFW

USACE Waters of the U.S

USACE Wetlands

Non Jurisdictional Ditch

Soil Pit



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Impacts on Wetland and Waters of the U.S (Reduced Project)

Figure 7 S

FTA/SANBAG | Redlands Passenger Rail Project | BTR

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APPENDIX B

Survey Summary Table

APPENDIX B

Survey Summary Table

Survey Type	Surveyors	Date	Time	Percent Cloud Cover		Temperature		Winds
				Start	End	Start	End	(mph)
Wetland Delineation	AS/SH	2/7/2012	0900-1615	0	0	64	68	0 - 1
Wetland Delineation	AS/SH	2/8/2012	0800-1445	ND	ND	ND	ND	ND
Wetland Delineation	AS/SH	2/22/2012	1000-1600	<10	<10	82	86	2 -5
Wetland Delineation/General Bio	AS/SH	2/23/2012	0830-1700	ND	ND	ND	ND	ND
General Biology/Vegetation Mapping	AN/SA	2/23/2012	0830-1700	ND	ND	ND	ND	ND
LBV #1	AS/AN	4/16/2012	0820-1115	0	0	63	75	1 - 2
LBV #2	AS/AN	4/27/2012	0730-1023	80	10	59	77	0-2
LBV #3	AS/AN	5/8/2012	0756-1050	0	0	65	87	0-4
LBV #4	JA	5/21/2012	0615-0950	0	0	65	82	1-1
LBV #5	JA	6/1/2012	0600-0925	0	0	63	73	1-1
LBV #6	JA	6/11/2012	0620-0945	0	0	63	70	2-1
LBV #7	JA	6/25/2012	0530-0855	0	0	53	62	1-3
LBV #8	JA	7/5/2012	0555-0900	20	20	59	70	2-2
BUOW burrow mapping	AS/AN	4/4/2012	1000-1700	70	0	76	80	0 - 2
BUOW burrow mapping	AS/AN	4/5/2012	0800-1145	20	<10	56	73	1 - 3
BUOW #1a	AS/AN	4/10/2012	0715-0900	0	10	68	62	0 - 1
BUOW #1b	AS/AN	4/10/2012	1730-1911	0	0	ND	86	0-3
BUOW #2a	AS/AN	5/7/2012	1720-1930	0	0	86	84	3 - 10
BUOW #2b	AS/AN/SA/JS	5/8/2012	1730-1815	0	0	91	86	0 - 4
BUOW #3a	AS/AN	6/4/2012	1747-1930	0	0	ND	76	1-6
BUOW #3b	AS/AN	6/5/2012	0745-0957	0	0	ND	66	0-3
BUOW #4a	SH	7/9/2012	1800-2000	0	0	ND	100	3-4
BUOW #4b	SH	7/10/2012	0546-0746	15	15	ND	70	0
BUOW #4c	SH	7/10/2012	1803-1943	15	15	ND	107	2-4
BUOW #4d	SH	7/11/2012	0625-0745	10	10	ND	73	3-6

Survey Type	Surveyors	Date	Time	Percent Cloud Cover		Temperature		Winds
				Start	End	Start	End	(mph)
Rare Plant	AS/AN/JS/SA	5/8/2012	1000-1700	0	0	ND	75	1-2
Rare Plant	AS/AN/JS/SA	5/9/2012	0800-1300	0	0	ND	75	1-2
Rare Plant	AS/AN	6/4/2012	1747-1930	0	0	ND	76	1-6
Rare Plant	AS/AN	6/5/2012	0745-0957	0	0	ND	66	0-3
Rare Plant	AS/DJ	6/12/2012	0830/1200	0	0	ND	80	0-3
Rare Plant	SH	7/9/2012	1800-2000	0	0	ND	100	3-4
Rare Plant	SH	7/10/2012	0546-0746	15	15	ND	70	0
Rare Plant	SH	7/10/2012	1803-1943	15	15	ND	107	2-4
Rare Plant	SH	7/11/2012	0625-0745	10	10	ND	73	3-6
SWIFL	JA	5/21/2012	0615-0950	0	0	65	82	1-1
SWIFL	JA	6/1/2012	0600-0925	0	0	63	73	1-1
SWIFL	JA	6/11/2012	0620-0945	0	0	63	70	2-1
SWIFL	JA	6/25/2012	0530-0855	0	0	53	62	1-3
SWIFL	JA	7/5/2012	0555-0900	20	20	59	70	2-2
SBKR	SL	5/18/2012	ND	50	ND	57	ND	0-2
SBKR	SL	5/19/2012	ND	50	ND	58	ND	0-2
SBKR	SL	20-May	ND	20	ND	57	ND	0-2
SBKR	SL	5/21/2012	ND	10	ND	60	ND	0-1
SBKR	SL	5/22/2012	ND	0	ND	63	ND	0-2
SBKR	SL	5/23/2012	ND	0	ND	60	ND	0-1

Surveyor Legend:

AN Aaron Newton
AS Allegra Simmons
DJ Dustin Janeke
JA Jeff Ahrens
JS Joseph Schroeder
SA Summer Adleberg
SH Sean Harris
SL Shay Lawrey
ND No Data

APPENDIX C

Botanical Species Observed

APPENDIX C
Observed Botanical Species

Family	Scientific Name	Common Name
Vascular Plants		
Asteraceae		**Sunflower Family**
	Ambrosia psilostachya	Western ragweed
	Artemisia californica	California sagebrush
	Artemisia douglasiana	Mugwort
	Artemisia dracunculus	Tarragon
	Baccharis salicifolia	mulefat
	Baccharis sarothroides	Broom baccharis
	Bidens pilosa	Common beggar's tick
	Carduus pycnocephalus	Italian thistle
	Centaurea benedicta	Blessed thistle
	Centaurea melitensis	tocalote
	Chamomilla suaveolens	common pineapple weed
	Cirsium arvense	Canada thistle
	Cirsium sp.	thistle
	Conyza bonariensis	Flax leaved horseweed
	Conyza canadensis	common horseweed
	Conyza sp.	Horseweed species
	Encelia farinosa	brittlebush
	Gazania linearis	Gazania
	Gnaphalium canescens ssp. beneolens	fragrant everlasting
	Helianthus sp.	sunflower
	Helianthus annuus	common sunflower
	Heterotheca grandiflora	Telegraph weed
	Heterotheca sp.	Telegraph weed
	Heterotheca villosa	Hairy false goldenaster
	Lactuca serriola	prickly lettuce
	Lepidospartum squamatum	Scale broom
	Solidago occidentalis	western goldenrod
	Sonchus asper	Prickly sow-thistle
	Xanthium strumarium	cocklebur
Brassicaceae		**Mustard Family**
	Brassica geniculata	shortpod mustard
	Brassica nigra	Black Mustard
	Sisymbrium altissimum	Tumble mustard
	Sisymbrium irio	London rocket

Family	Scientific Name	Common Name
Chenopodiaceae		**Goosefoot Family**
	Chenopodium album	Lamb's Quarters
	Kochia sp.	Red sage species
	Salsola iberica	Russian thistle
	Salsola tragus	Russian thistle
Euphorbiaceae		**Spurge Family**
	Croton californicus	California croton
	Ricinus communis	castor bean
Fabaceae		**Legume Family**
	Acacia redolans	bank catclaw
	Acacia sp.	Acacia species
	Cercidium microphyllum	palo verde
	Lotus heermannii	Woolly Lotus
	Lotus scoparius	Deer weed
	Lotus strigosus	Strigose lotus
	Lupinus hirsutissimus	Stinging Lupine
	Lupinus truncates	Collar Lupine
	Medicago sativa	alfalfa
	Melilotus sp.	Clover species
	Melilotus indicus	sourclover
	Parkinsonia aculeate	Mexican palo verde
	Spartium junceum	Spanish broom
	Vicia villosa	Winter vetch
Geraniaceae		**Geranium Family**
	Erodium sp.	filaree
Malvaceae		**Mallow Family**
	Malva parviflora	cheeseweed
Myrtaceae		**Myrtle Family**
	Eucalyptus sp.	eucalyptus
Oleaceae		**Olive Family**
	Fraxinus sp.	ash
	Fraxinus uhdei	Shamel ash
	Olea sp.	Olive species
Tamaricaceae		**Tamarisk Family**
	Tamarix ramosissima	Mediterranean tamarisk
	Tamarix sp.	tamarisk

Family	Scientific Name	Common Name
Solanaceae		**Nightshade Family**
	Datura wrightii	jimson weed
	Nicotiana glauca	tree tobacco
	Solanum douglasii	Douglas' nightshade
Vitaceae		**Grape Family**
	Parthenocissus inserta	Virginia creeper
	Vitis girdiana	desert wild grape
Zygophyllaceae		**Caltrop Family**
	Tribulus terrestris	puncture vine
Arecaceae		**Palm Family**
	Washingtonia sp.	fan palm
	Washingtonia robusta	Mexican fan palm
Poaceae		**Grass Family**
	Agrostis viridis	Water bentgrass
	Arundo donax	Giant reed
	Avena sp.	Oat species
	Bromus diandrus	ripgut brome
	Bromus hordeaceus	soft chess
	Bromus madritensis ssp. *rubens*	red brome
	Cynodon dactylon	Bermuda grass
	Digitaria sanguinalis	crab grass
	Distichlis spicata	salt grass
	Eragrostis sp.	Lovegrass species
	Festuca arundinacea	Tall fescue
	Hordeum murinum	false barley
	Leptochloa uninervia	mexican sprangletop
	Lolium perenne	Perennial ryegrass
	Lolium sp.	Ryegrass Species
	Muhlenbergia asperifolia	Scratch grass
	Paspalum dilatatum	Dallis grass
	Pennisetum ciliare	Buffelgrass
	Phalaris arundinacea	Reed canary grass
	Polypogon interruptus	Beard grass
	Polypogon monspeliensis	Rabbitsfoot grass
	Schismus barbatus	Mediterranean schismus
	Setaria gracilis	Knotroot bristlegrass
	Sorghum halepense	Johnsongrass
	Sporobolus indicus	smutgrass
	Vulpia octoflora	Six weeks fescue

Family	Scientific Name	Common Name
Plantaginaceae		**Plantain Family**
	Plantago lanceolata	english plantain
	Plantago major	Common plantain
Cyperaceae		**Sedge Family**
	Cyperus eragrostis	Tall umbrella-sedge
	Cyperus involucratus	Umbrella-sedge
Polygonaceae		**Buckwheat Family**
	Eriogonum fasciculatum	California buckwheat
	Eriogonum thurberi	Thurber's Buckwheat
	Rumex crispus	Curly Dock
	Polygonum arenastrum	Common knotweed
	Polygonum lapathifolium	Willow weed
Scrophulariaceae		**Figwort Family**
	Mimulus guttatus	spotted monkey flower
	Verbascum thapsus	Woolly mullein
	Verbascum virgatum	Wand mullein
	Veronica anagallis-aquatica	great water speedwell
Moraceae		**Mulberry and Fig Family**
	Ficus carica	Edible Fig
	Morus	Mulberry
	Morus alba	White mulberry
Rosaceae		**Rose Family**
	Heteromeles arbutifolia	toyon
	Rubus discolor	Himalayan blackberry
Polemoniaceae		**Woolly Stars**
	Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woolly star
	Eriastrum sapphirinum	Sapphire woolly star
Convolvulaceae		**Morning Glory**
	Calystegia macrostegia	California bindweed
	Convolvulus arvensis	Bindweed
	Cuscuta subinclusa	Canyon dodder
Boraginaceae		**Borage Family**
	Amsinckia menziesii var. *intermedia*	common fiddleneck
	Cryptantha intermedia	Common Cryptantha
	Cryptantha sp.	Cat's eye
	Eriodictyon trichocalyx	Yerba santa
	Heliotropium curassavicum	Chinese purslane

Family	Scientific Name	Common Name
Cucurbitaceae		**Gourd Family**
	Cucurbita foetidissima	Wild gourd
Simaroubaceae		**Quassia Family**
	Ailanthus altissima	tree of heaven
Apocynaceae		**Dogbane Family**
	Apocynum cannabinum	Dogbane hemp
Hydrophyllaceae		**Waterleaf Family**
	Phacelia distans	Common phacelia
	Phacelia minor	California bluebells
	Phacelia ramosissima	Branching Phacelia
	Phacelia sp.	bluebells
Salicaceae		**Willow Family**
	Populus fremontii	Fremont cottonwood
	Populus fremontii subsp. fremontii	western cottonwood
	Salix exigua	Sandbar willow
	Salix gooddingii	black willow
	Salix laevigata	Red willow
	Salix lasiolepis var. *lasiolepis*	Arroyo willow
	Salix lucida spp. lasiandra	Pacific willow
Apiaceae		**Carrot Family**
	Anthriscus caucalis	Burr chervil
	Conium maculatum	common poison-hemlock
Rubiaceae		**Madder Family**
	Galium aparine	common bedstraw
Lamiaceae		**Mint Family**
	Marrubium vulgare	Horehound
	Mentha sp.	Mint
	Salvia columbariae	Chia
	Salvia mellifera	Black sage
Urticaceae		**Nettle Family**
	Urtica urens	Orchard nettle
Cactaceae		**Cactus Family**
	Opuntia littoralis	coastal prickly pear
Rhamnaceae		**Buckthorn Family**
	Rhamnus californica	California coffeeberry
Primulaceae		**Primrose Family**
	Anagallis arvensis	Scarlet pimpernel
	Ceanothus leucodermis	Chaparral whitethorn

Family	Scientific Name	Common Name
Verbenaceae		**Vervain Family**
	Lantan sp.	Lantana
Viscaceae		**Mistletoe Family**
	Phoradendron macrophyllum	Big leaf mistletoe
	Phoradendron sp.	Mistletoe
Agavaceae		**Agave Family**
	Spanish bayonet	Yucca whipplei
	Yucca	Ornamental yucca
Simaroubaceae		**Quassia Family**
	Ailanthus altissima	tree of heaven
Typhaceae		**Cattail Family**
	Typha domingensis	Southern cattail
	Typha latifolia	Common or broad-leaved cattail
	Typha sp.	Cattail species
Onagraceae		**Evening Primrose Family**
	Camissonia bistorta	California sun cup
	Epilobium ciliatum	Green willow herb
	Oenothera elata	Great marsh evening primrose
Platanaceae		**Sycamore Family**
	Platanus racemosa	Western sycamore
Adoxaceae		**Muskroot Family**
	Sambucus mexicana	Mexican elderberry
Anacardiaceae		**Sumac or Cashew Family**
	Schinus terebinthifolius	Brazilian pepper tree
Lythraceae		**Loosestrife Family**
	Lythrum californicum	California loosestrife

APPENDIX D

Zoological Species Observed

APPENDIX D

Zoological Species Observed

Family	Scientific Name	Common Name
Birds		
Accipitridae		**Hawks and Eagles**
	Accipiter cooperii	Cooper's hawk
	Buteo jamaicensis	red-tailed hawk
Aegithalidae		**Bushtit**
	Psaltriparus minimus	bushtit
Anatidae		**Ducks, Geese and Swans**
	Anas platyrhynchos	mallard
	Branta canadensis	Canadian goose
Ardeidae		**Herons and Bitterns**
	Bubulcus ibis	cattle egret
	Butorides virescens	green heron
Cardinalidae		**Cardinals, Grosbeaks, and Allies**
	Pheucticus melanocephalus	black-headed grosbeak
	Piranga ludoviciana	western tanager
Cathartidae		**New World Vultures**
	Cathartes aura	turkey vulture
Charadriidae		**Plover and Relatives**
	Charadrius vociferus	killdeer
Columbidae		**Pigeons and Doves**
	Columba livia	rock pigeon
	Streptopelia decaocto	Eurasian collared dove
	Zenaida macroura	mourning dove
Corvidae		**Jays, Magpies and Crows**
	Aphelocoma californica	western scrub jay
	Corvus brachyrhynchos	American crow
	Corvus corax	common raven
Emberizidae		**Emberizines**
	Amphispiza bilineata	Black-throated Sparrow
	Melospiza melodia	Song Sparrow
	Melozone crissalis	California towhee
	Pipilo maculates	spotted towhee
	Zonotrichia leucophrys	white-crowned sparrow

Family	Scientific Name	Common Name
Falconidae		**Falcons**
	Falco sparverius	American kestrel
Fringillidae		**Finches**
	Carpodacus mexicanus	house finch
	Spinus psaltria	lesser goldfinch
Hirundinidae		**Swallows**
	Stelgidopteryx serripennis	northern rough-winged swallow
	Hirundo rustica	barn swallow
Icteridae		**Blackbirds, Orioles, and Allies**
	Euphagus cyanocephalus	Brewer's blackbird
	Icterus bullockii	Bullock's oriole
	Icterus cucullatus	hooded oriole
	Sturnella neglecta	western meadowlark
Laniidae		**Shrikes**
	Lanius ludovicianus	loggerhead shrike
Mimidae		**Mockingbirds and Thrashers**
	Mimus polyglottos	Northern Mockingbird
	Toxostoma redivivum	California thrasher
Odontophoridae		**New World Quails**
	Callipepla californica	California quail
Parulidae		**Wood Warblers and Relatives**
	Cardellina pusilla	Wilson's warbler
	Geothlypis trichas	common yellowthroat
	Oreothlypis celata	orange-crowned warbler
	Setophaga coronata	yellow-rumped warbler
	Setophaga petechia	yellow warbler
Passeridae		**Old World Sparrows**
	Passer domesticus	house sparrow
Picidae		**Woodpeckers and Wrynecks**
	Colaptes auratus	northern flicker
	Picoides nuttallii	Nuttal's woodpecker
Ptilogonatidae		**Silky Flycatchers**
	Phainopepla nitens	phainopepla
Rallidae		**Rails**
	Fulica americana	American coot
Regulidae		**Kinglets and Firecrests**
	Regulus calendula	ruby-crowned kinglet

Family	Scientific Name	Common Name
Sturnidae		**Starlings and Allies**
	Sturnus vulgaris	European starling
Timaliidae		**Tree Babblers**
	Chamaea fasciata	wrentit
Trochilidae		**Hummingbirds**
	Archilochus alexandri	black-chinned hummingbird
	Calypte anna	Anna's hummingbird
	Selasphorus sasin	Allen's hummingbird
Troglodytidae		**Wrens**
	Thryomanes bewickii	Bewick's wren
	Troglodytes aedon	house wren
Turdidae		**Thrushers**
	Turdus migratorius	American robin
Tyrannidae		**Tyrant Flycatchers**
	Empidonax difficilis	Pacific-slope flycatcher
	Myiarchus cinerascens	ash-throated flycatcher
	Sayornis nigricans	black phoebe
	Tyrannus verticalis	western kingbird
	Sayornis saya	Say's phoebe
	Tyrannus vociferans	Cassin's kingbird
Vireonidae		**Vireos**
	Vireo bellii pusillus	least Bell's vireo
	Vireo gilvus	warbling vireo
Mammals		
Rodentia		**Rodents**
	Chaetodipus fallax fallax	San Diego pocket mouse
	Dipodomys simulans	Dulzura kangaroo rat
	Neotoma lepida	desert wood rat
	Peromyscus eremicus	cactus mouse
	Peromyscus maniculatus	deer mouse
	Spermophilus beecheyi	California ground squirrel
Leporidae		**Rabbits and Hares**
	Sylvilagus audubonii	desert cottontail
Felidae		**Cats**
	Felis domesticus	domestic cat
Canidae		**Dog**
	Canis latrans	coyote
	Canis lupis familiaris	domestic dog

Family	Scientific Name	Common Name
Procyonidae		**Raccoon Family**
	Procyon lotor	raccoon
Reptiles		
	Sceloporus occidentalis	western fence lizard
	Uta stansburiana	side-blotched lizard
Amphibians		
	Pseudacris regilla	Pacific tree frog
Insects		
	Junonia coenia	common buckeye
	Nymphalis antiopa	mourning cloak
	Papilio rutulus	western tiger swallowtail
	Pieris rapae	cabbage white
	Pontia protodice	checkered white

APPENDIX E

Potential Sensitive Botanical Species

APPENDIX E

Potential Sensitive Botanical Species

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Asteraceae			
smooth tarplant *Centromadia pungens* ssp. *laevis*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in valley and foothill grasslands, particularly near alkaline locales. Sites with minimal shrub cover. From 0 to 1,600 feet in elevation	High – suitable habitat occurs throughout the project area. An individual plant was observed within the ROW in 2009. The species was not observed within the survey area during 2012 rare plant surveys.
Brassicaceae			
Robinson's pepper-grass *Lepidium virginicum var. robinsonii*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in chaparral and sage scrub below 2,000 feet in elevation	None – project area does not support suitable habitat CNDDB data identifies the survey area within the species' occurrence territory along the Historic Warm Creek. However the most recent record of an elemental occurrence in the Survey Area was 1889.
Gambel's water cress *Nasturtium gambelii*	Federal: FE State: ST CNPS: 1B.1	Perennial herb. Occurs in marshes, streambanks, and lake margins below 4,800 feet in elevation	Low– project area supports potentially suitable habitat, however, there is a low occurrence of ponded or marshy areas within the project area. CNDDB data identifies the survey areas as within the species' occurrence territory. However, only three known populations occur in the state. The most recent record of an elemental occurrence in the survey area was 1935. The species was not observed within the survey area during 2012 rare plant surveys.
Cuscutaceae			
Peruvian dodder *Cuscuta obtusiflora*	Federal: None State: None CNPS: 2.2	Annual vine. Occurs in freshwater marshes and swamps below 900 feet in elevation.	None – project area does not support suitable habitat. CNDDB data identifies the survey area within the species' occurrence territory along the Historic Warm Creek. However the most recent record of an elemental occurrence in the survey area was 1890.

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Caryophyllaceae			
Marsh sandwort *Arenaria paludicola*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in boggy marshes and meadows below 1,200 feet in elevation	None – project area does not support suitable habitat. CNDDB data identifies the survey area within the species' occurrence territory. However the most recent record of an elemental occurrence in the survey area was 1899.
Fabaceae			
Horn's milk-vetch *Astragalus hornii* var. *hornii*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in salty flats, lake shores, alkali sink, wetland-riparian. From 190 to 500 feet in elevation.	Low– project area supports potentially suitable habitat. CNDDB data identifies the survey areas as within the species' occurrence territory. However the most recent record of an elemental occurrence in the survey area was 1898. The species was not observed within the survey area during 2012 rare plant surveys.
Grossulariaceae			
Parish's gooseberry *Ribes divaricatum var. parishii*	Federal: None State: None CNPS: 1A	Deciduous shrub. Occurs in riparian woodland. From 200 to 1,000 feet in elevation. (Presumed extinct).	None– project area supports potentially suitable habitat. However, the species is presumed extinct in California. CNDDB data identifies the survey area as within the species' occurrence territory. The most recent record of an elemental occurrence in the survey area was 1917.
Malvaceae			
Salt Spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in creosote bush scrub, chaparral, sage scrub, yellow pine forest, alkali sink, and wetland riparian. From below 5,700 feet in elevation.	Moderate – project area supports potentially suitable habitat. CNDDB data identifies the survey area as within the species' occurrence territory. The species was not observed within the survey area during 2012 rare plant surveys.
Polygonaceae			
Santa Ana River woolly star *Eriastrum densifolium* ssp. *sanctorum*	Federal: Endangered State: Endangered CNPS List: 1B.1	Occurs in sandy or gravelly chaparral and coastal scrub (alluvial fan).	High – An individual plant was observed within a portion of the survey area located within the SAR during 2012 rare plant surveys.

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Slender-horned spineflower *Dodecahema leptoceras*	Federal: FE State: SE CNPS: 1B.1	Annual herb. Occurs in alluvial sand and coastal scrub. From 700 to 2,700 feet in elevation.	Moderate – project area supports potentially suitable habitat. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1983. The species was not observed within the survey area during 2012 rare plant surveys.
Poaceae			
California satintail *Imperata brevifolia*	Federal: None State: None CNPS: 2.1	Perennial herb. Occurs in wet springs, meadows, streamsides, and flood plains. Will also occur in non-wetlands. From below 1,900 feet in elevation.	Low – the project area supports potentially suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1904. The species was not observed within the survey area during 2012 rare plant surveys.
Prairie wedge grass *Sphenopholis obtusata*	Federal: None State: None CNPS:2.2	Perennial herb. Occurs in Cismontane woodland, meadows and seeps. From 6,500 feet in elevation.	None – project area does not support suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory along the SAR. However the most recent record of an elemental occurrence in the Survey Area was 1904.
Scrophulariaceae			
salt marsh bird's-beak *Cordylanthus maritimus ssp. maritimus*	Federal: FE State: SE CNPS: 1B.2	Annual herb (hemiparasitic). Occurs in coastal salt-marsh, dunes, and wetlands. From below 38 feet in elevation.	None – project area does not support suitable habitat CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1888.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
CNPS = California Native Plant Society listing.
List 1B.2 = List 1b: Rare, threatened, or endangered in California and elsewhere. 0.2: Fairly endangered in California.
List 2.3 = List 2: Rare, threatened, or endangered in California, but more common elsewhere. O.3: Not very endangered in California.
List 4.2 = Limited distribution (Watch list). 0.2: Fairly endangered in California.
List 4.3 = Limited distribution (Watch list). 0.3: Not very endangered in California.
List A = Plants rare, threatened or endangered in California and elsewhere.
List B = Plants rare, threatened or endangered in California but more common elsewhere.

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APPENDIX F

Potential Sensitive Zoological Species

APPENDIX F

Potential Sensitive Zoological Species

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
Invertebrates				
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	FE	Fine, sandy soils, often with wholly or partly consolidated dunes. Restricted to a particular soil type classified as the 'Delhi' series.	No	None- The project site lacks appropriate soils. CNDDB data identifies the survey area as within the species' occurrence territory.
Fish				
Santa Ana Sucker *Catostomus santaanae*	FT, SSC	Slight to swift flowing perennial streams with water depths ranging from a few inches to several feet.	No	Moderate – the project area supports suitable habitat.
Amphibians				
Western spadefoot toad *Spea hammondii*	SSC	Open areas with sandy or gravelly soils, often found in woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, floodplains, alluvial fans, playas, alkali flats, foothills and in mountain areas.	No	Moderate –Suitable habitat occurs within the project area.
Reptiles				
Coast horned lizard *Phrynosoma blainvillii*	SSC	Coastal sage scrub, grasslands, chaparral, oak woodland, riparian woodland and coniferous forest.	No	Low- marginal, fragmented habitat exists within the project area. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1935.
Birds				
Western Burrowing Owl *Athene cunicularis hypugaea*	SSC	Open, dry annual or perennial grasslands, deserts and scrubland characterized by low-growing vegetation.	Yes	Moderate-breeding habitat occurs throughout the project area ranging in suitability from low to moderate. One transitory/wintering individual was observed within the Survey Area in January 2013.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal candidate for listing, SE	Deciduous riparian woodland, especially including dense stands of cottonwood and willow, but also including mesquite and tamarisk in some	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. CNDDB

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
		areas.		data identifies the survey area as within the species' occurrence territory along Twin Creek and the SAR. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE, ST	Dense riparian habitat along streams, rivers, lakesides, and other wetland habitats.	No	Moderate – The riparian forest habitat associated with the SAR and Mission Zanja Channel provides suitable breeding habitat. The species was not observed during 2012 southwestern willow flycatcher and least Bell's vireo protocol surveys.
Least Bell's vireo *Vireo bellii pusillus*	FE, SE	Dense brush and mesquite associated with riparian systems, willow-cottonwood forest, and streamside thickets.	Yes	High– several individuals were observed within the survey area.
Loggerhead shrike (*Lanius ludovicianus)*	SSC	Inhabits open brushy areas, meadows, pastures, orchards, thickets along roads, and hedges.	Yes	High – the species was observed within the survey area.
Yellow breasted chat (*Icteria virens*)	SSC-Breeding	Breeding habitat includes early successional riparian habitats with well-developed shrub layer and open canopy.	No	High – Suitable habitat occurs within the survey area.
Yellow warbler (*Dendroica petechia*)	SSC	Inhabits riparian areas, or strips of riparian habitat in foothills.	Yes	High – the species was observed within the survey area.
Mammals				
San Bernardino kangaroo rat *Dipodomys merriami parvus*	FE, SSC	Alluvial sage scrub on alluvial fans, flood plains, along washes, and in adjacent upland areas.	No	Moderate –Suitable habitat occurs within the project area. CNDDB data identifies the survey area as within the species' occurrence territory. The most recent record of an elemental occurrence in the Survey Area was 1993.
Stephens' kangaroo rat *Dipodomys stephensi*	FE,ST	Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	No	None –Suitable habitat occurs within the project area but the project is not within the range of the species.

Species	Sensitivity Status	Preferred Habitat	Observed On-Site	Potential for Occurrence
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	SSC	Open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub.	No	None – The project site lacks suitable habitat for this species. CNDDB data identifies the survey area as within the species' occurrence territory.
Western yellow bat *Lasiurus xanthinus*	SSC	Roosts and feeds in, and near, palm oases and riparian habitats. Known to occur in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Generally roost in palms.	No	Low – Appropriate roosting habitat on-site. Not detected during biological surveys. CNDDB data identifies the survey area as within the species' occurrence territory.
Pallid bat *Antrozous pallidus*	SSC	Abandoned buildings for roosting and arid habitat types for foraging.	No	Low – Appropriate roosting habitat on-site. However, the species is not typically found in heavily developed areas. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1929.
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	Prominent on cliffs and cliff faces.	No	None – lack of appropriate habitat. CNDDB data identifies the survey area as within the species' occurrence territory. However the most recent record of an elemental occurrence in the Survey Area was 1985.
American badger *Taxidea taxus*	SSC	Arid, open habitats, grasslands, savannahs, mountain meadows, and desert scrub openings; needs friable soils for digging and open, uncultivated ground.	No	None - marginal, fragmented habitat exists within the project area. Not detected during general biological survey. CNDDB data identifies the survey area as within the species' occurrence territory.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SSC = State Species of Concern
CFP = California Department of Fish and Game Fully Protected
BCC = USFWS Birds of Conservation Concern

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APPENDIX G

Least Bell's Vireo Report

SANBAG
Redlands Passenger Rail Project
Least Bell's Vireo Survey Report

October 2012

Prepared for

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1.0 EXECUTIVE SUMMARY

This report details the results of a focused least Bell's vireo (*Vireo bellii pusillus;* LBV) survey for the proposed Redlands Passenger Rail Project (project). The project would include the development of new railroad infrastructure along an approximate nine mile section rail corridor owned by SANBAG and would include the development of five stations consisting of boarding platforms with supporting amenities, parking and pedestrian access improvements, train layover/storage facilities with storage tracks, a vehicle wash, ancillary facilities, grading and drainage improvements, railroad signal improvements, replacement or improvements to five existing bridge structures and approximately two dozen at-grade highway-rail crossings.

2.0 SURVEY AND SITE DESCRIPTION

The survey area is located in the City of San Bernardino and within the San Bernardino South U.S. Geological Survey 7.5-minute quadrangle (Figures 1 and 2). The RPRP would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. Figure 1 depicts the project location. A portion of the project area occurs within the Santa Ana River (SAR), which supports suitable nesting and foraging habitat for the federally endangered LBV. In summary, three non-mated males and one nested pair of LBV were observed within the survey area from April 16, 2012-July 5, 2012 (Figure 3).

3.0 PURPOSE OF STUDY

The purpose of the study is to determine if suitable habitat for LBV exists within the survey area, and if so, to conduct a presence/absence survey for the state and federally endangered LBV per the United States Fish and Wildlife Service (USFWS) protocol (USFWS 2001).

4.0 LEAST BELL'S VIREO STATUS AND BIOLOGY

The LBV is a federally and state of California listed endangered species. The species is small, averaging about 4.75 inches in length, with faint wing bars, an eye-ring or stripe, and is typically grey to light olive in color. A distinguishing characteristic of LBV is the flicking and bobbing of their relatively long tails (Sibley 2000). The species has a life span of up to seven years (USFWS 1998).

Historically the species was known to breed from as far south as San Fernando, Baja California to as far north as Tehama County in northern California (CDFG 2006). Currently, the LBV breeding range has been restricted to Southern California, with large breeding populations in Riverside and San Diego Counties. Small breeding populations are found in Santa Barbara and Ventura counties, and in northern Baja California, Mexico (CDFG 2006).

LBV generally occur in southern arroyo willow riparian forest and southern willow scrub habitats during the breeding season. Plant species associated with these habitats are Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), willow shrubs (*Salix spp*.), and mulefat (*Baccharis salicifolia*). LBV winter in southern Baja California, Mexico, where they will occupy a variety of habitats including: mesquite scrub within arroyos, palm groves, and hedgerows bordering agricultural and residential areas (Kus 2002).

LBV generally conceal their nests in dense foliage and within one meter of the ground. Early to mid-successional riparian habitat is typically used for nesting by LBV because it supports the dense shrub cover required for nest concealment as well as a structurally diverse canopy for foraging (Kus 2002). LBV nests are typically constructed out of small pieces of bark, leaf fragments, pieces of soft plants, spider webs and other materials. LBV prefer to forage in lower to mid level canopy heights for bugs, beetles, moths, grasshoppers, and caterpillars.

The major threat to LBV populations has been nest parasitism by the brown-headed cowbird (BHC) (*Molothrus ater*) and loss of habitat due to animal grazing and human development. Due to aggressive conservation efforts, the status of the LBV is stable to increasing (CDFG 2006).

5.0 SURVEY METHODS AND LIMITATIONS

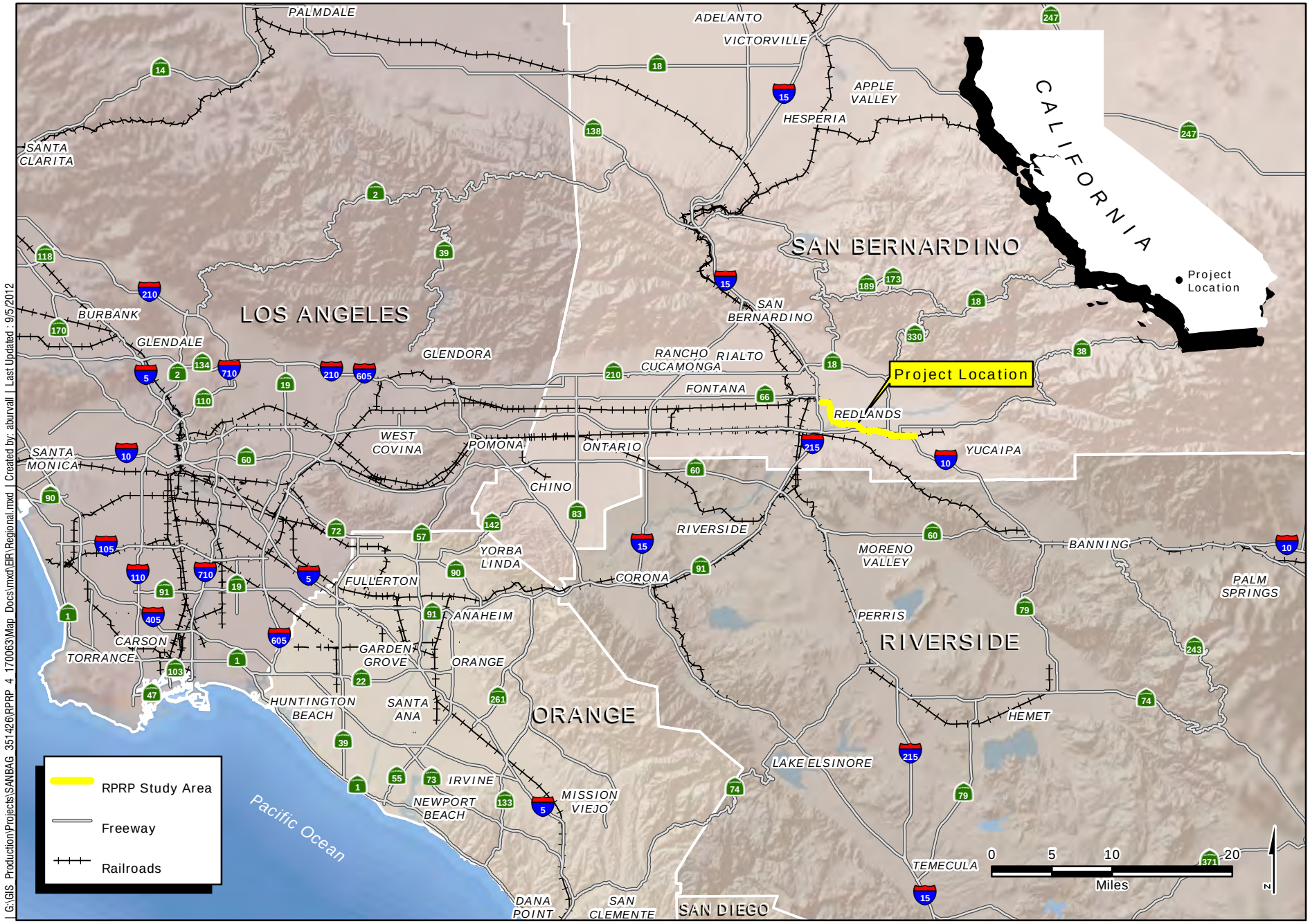
5.1 HABITAT ASSESSMENT

Prior to initiating protocol presence/absence surveys, vegetation communities within the survey area were assessed for suitability for LBV. Fourteen distinct vegetation communities occur within the 533.88-acre survey area (Figure 3, Table 1). Of the 14, two communities support habitat suitable for LBV nesting and foraging (Southern Cottonwood Willow Riparian Forest [SCWRF], Southern Willow Scrub [SWS]).

Table 1. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	533.88

Southern Cottonwood Willow Riparian Forest (SCWRF) is generally a tall, open, broadleafed winter-deciduous riparian forests dominated by Fremont cottonwood (*Populus fremontii)* and several willow species (*Salix* spp). This habitat occurs in sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. The understory is generally vegetated by herbaceous and viney species such as sedges (*Carex* sp.), grape (*Vitis* sp.), and introduced wetland species. Within the survey area, southern cotton wood riparian (SCWRF) occurs primarily within the western portion of Mission Zanja Channel and within the SAR.



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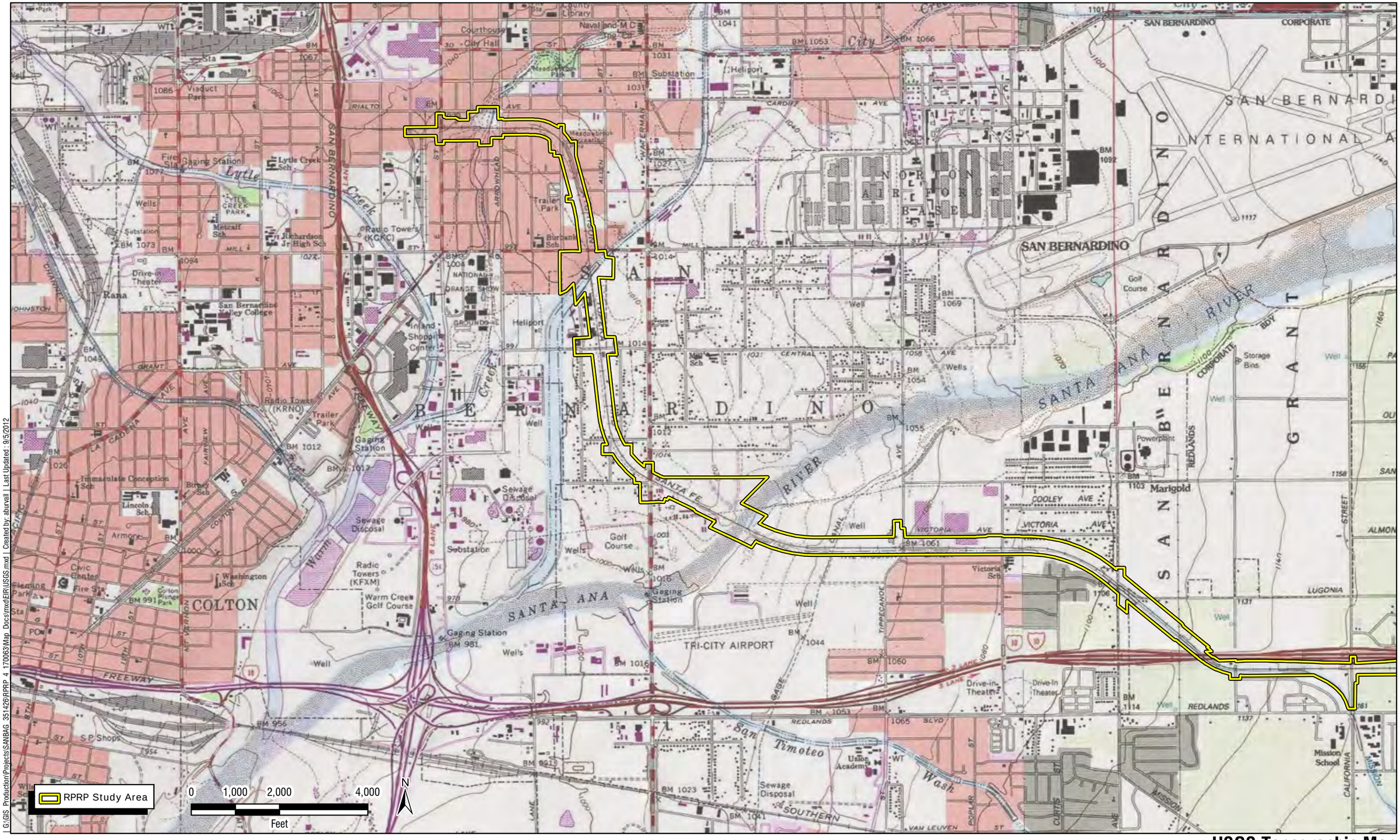
Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | LBV



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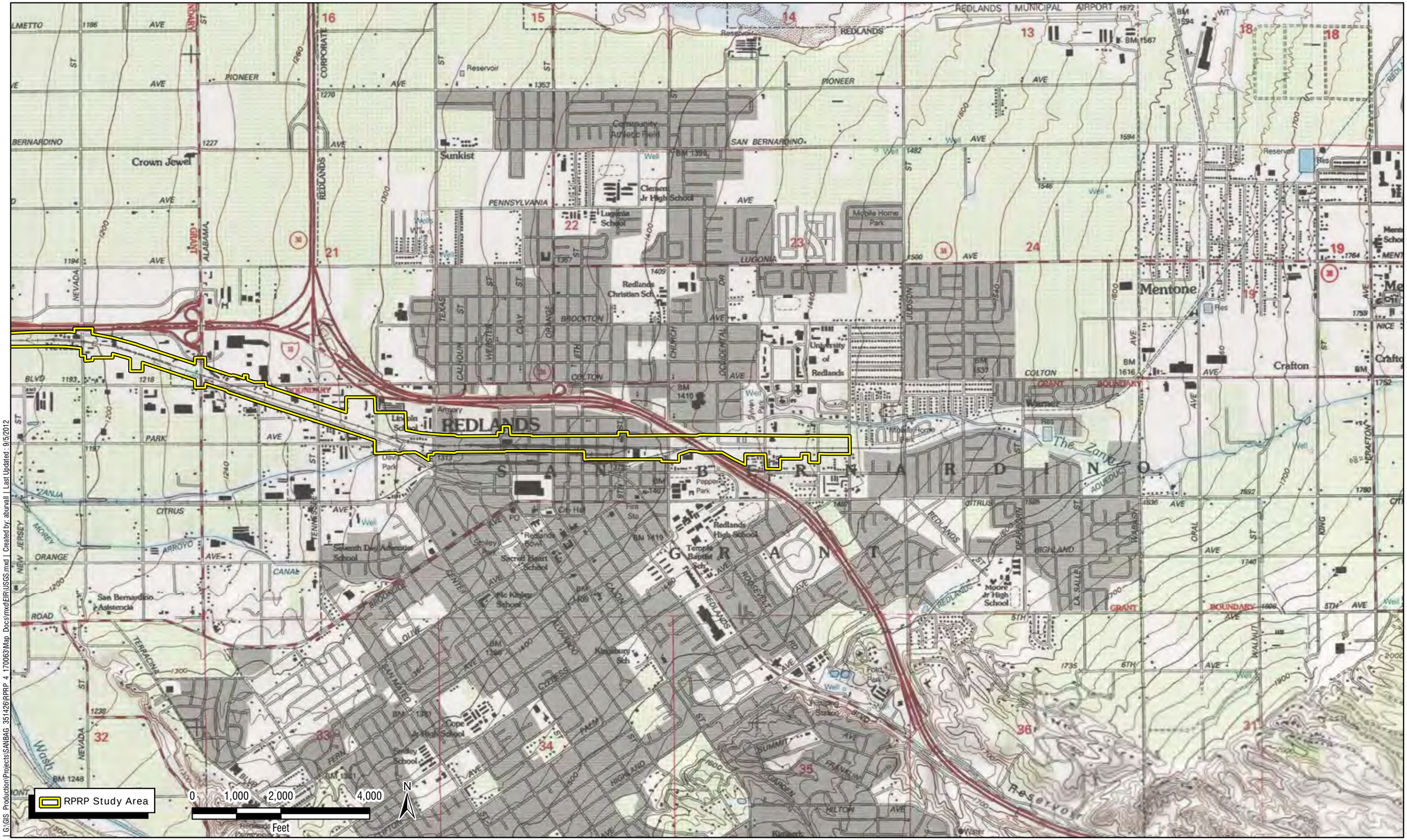
USGS Topographic Map
Figure 2a
FTA/SANBAG | Redlands Passenger Rail Project | LBV



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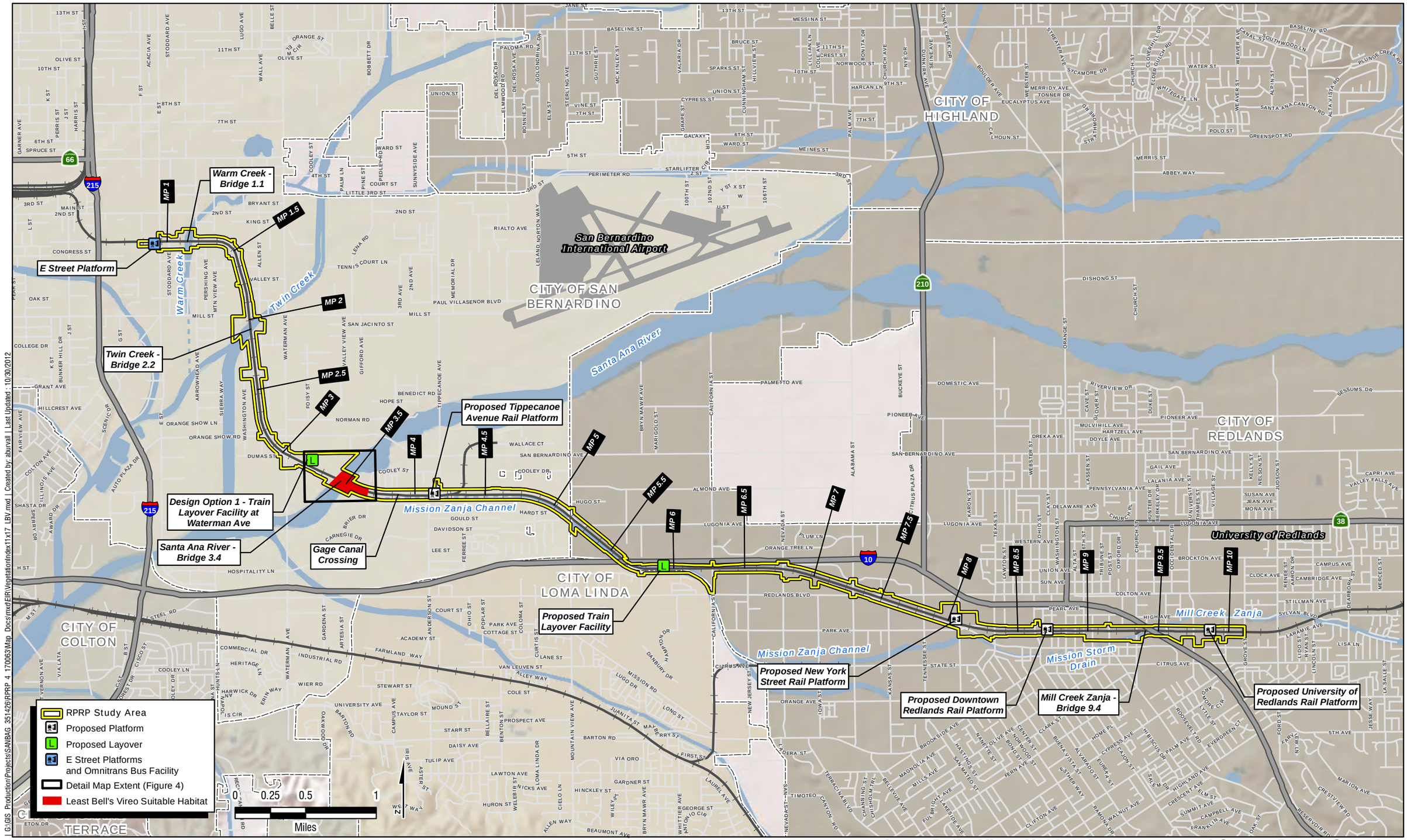
USGS Topographic Map
Figure 2b
FTA/SANBAG | Redlands Passenger Rail Project | LBV



Least Bell's Vireo Habitat Assessment and Survey Result Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | LBV

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Southern willow scrub (SWS) generally consists of a dense thicket of various willow species (*Salix* spp.). This habitat occurs in loose, sandy alluvium near stream channels and is frequently flooded. The habitat is limited by the dense thicket of willows and frequent flooding which impacts the development of an understory. Within the survey area, SWS occurs as small patches within the SAR.

5.3 SURVEY METHODOLOGY

In accordance with the USFWS presence/absence survey protocols for the LBV (USFWS 2001), all appropriate riparian habitat located within the survey area was surveyed during each site visit. Within the nine-mile alignment, suitable habitat only occurs within the Santa Ana River (SAR) portion of the project. The survey was conducted by HDR biologists Allegra Simmons, Aaron Newton, and Glenn Lukos Associates (GLA) biologist Jeff Ahrens. Each of the eight focused survey visits were conducted at an interval of no less than 10 calendar days and between April10 and July 31. LBV were identified through visual and audible observations. Locations, activity, and number of individuals were noted during the site visits. In addition, all avian species observed were noted (Appendix A). All accessible portions of the survey area with appropriate habitat were surveyed on foot to allow for direct visual observation the habitat (Figure 3). Surveyors walked slowly and methodically during normal weather conditions conductive to bird activity (winds less then 15 mph, no rain and temperatures less then 95 F).

The protocol presence/absence surveys were conducted during morning hours (between 0530 and 1100 hours) under clear to morning overcast skies (0-80% cloud cover), with air temperatures between 59 and 87 degrees Fahrenheit, and with winds between 0 and 4 miles per hour (Table 2).

Table 2. Survey Dates, Times and Climatic Conditions

Surveyors	Survey Date	Times	Skies (% cloud cover)		Temperature		Winds (mph)
			Start	End	Start	End	
Allegra Simmons, Aaron Newton	4/16/2012	0820-1100	0	0	63°F	75°F	1-2
Allegra Simmons, Aaron Newton	4/27/2012	0730-1023	80	10	59°F	77°F	0-2
Allegra Simmons, Aaron Newton	5/08/2012	0756-1050	0	0	65°F	87°F	0-4
Jeff Ahrens	5/21/2012	0615-0950	0	0	65	82	0-1
Jeff Ahrens	6/01/2012	0600-0925	0	0	63	73	0-1
Jeff Ahrens	6/11/2012	0620-0945	0	0	63	70	1-2
Jeff Ahrens	6/25/2012	0530-0855	0	0	53	62	1-3
Jeff Ahrens	7/05/2012	0555-0900	20	20	59	70	1-2

6.0 SURVEY RESULTS

A diverse assemblage of 48 avian species was observed during the survey (Appendix A). These species are expected to occur within the urban and riparian habitat in the survey area. A common threat to LBV, brown-headed cowbirds (BHC) was not observed on site during the surveys. Other sensitive species observed during the surveys include the yellow warbler (*Setophaga petechia*), a California

Species of Concern, and an individual of Santa Ana River woolly-star (*Eriastrum densifolium spp. sanctorum*), which is federally endangered (Figure 3).

The USFWS protocol surveys included eight survey sessions conducted between April 16, 2011 and July 5, 2012 (Table 2). During the surveys, three individual male LBV and one pair were detected. Of these, Table 3 is a summary of each survey session.

Table 3. LBV Observations

Survey Date	LBV Observed
4/16/2012	1
4/27/2012	2
5/08/2012	1
5/21/2012	0
6/01/2012	4
6/11/2012	3
6/25/2012	3
7/05/2012	3

The following is a summary of each survey session. LBV locations referenced below can be found on Figure 3b.

On **April 16, 2012**, a single male LBV (LBV 1) was detected vocalizing in the SCWARF along the northeastern portion of the SAR; the location of the vocalization was approximately 600 feet northeast of Bridge 3.4.

On **April 27, 2012**, two separate males were detected vocalizing repeatedly in different locations. The first single male LBV (LBV 1) was heard calling/observed at 0843 hours, approximately 800 feet north of Bridge 3.4, along the east side of the SAR in the SWS. The male was followed south for approximately 200 feet as he continued calling. It is likely this is the same male (LBV 1) observed on April 16, 2012.

The second single male LBV (LBV2) was detected vocalizing repeatedly approximately 500 feet south of Bridge 3.4 along the east bank of the SAR around 0930 hours. LBV 2 was observed using the SCWARF along the river banks and the upper floodplain area up to adjacent parking lot.

On **May 8, 2012**, one male LBV (LBV 1) was detected vocalizing approximately 800 feet north of Bridge 3.4 in the SAR along the northeast bank within the SWS. He was observed for a short period of time before he flew off and ceased calling. This is likely the same male that was observed on April 16 and 27, 2012.

On **May 21, 2012** no LBV were observed during the survey effort.

On **June 1, 2012**, four LBV were detected during surveying activities. The first LBV (LBV 1) was observed approximately 500 feet to the northeast of the project site and is in the same location/territory as initially observed on April 16, 2012. The second LBV (LBV 3) was observed approximately 400 feet to the southeast of the Bridge 3.4 within the SCWARF (Figure 3). The third

and fourth LBV detected was a pair (LBV Pair) exhibiting nesting behavior and was observed approximately 150 feet south of the railroad in the lower portion of Mission Zanja Creek and within the limits of the survey area.

On **June 11, 2012**, three LBV were detected. A male LBV (LBV 2) was detected approximately 600 feet south of the project site. The male arrived from the south and was noted as countering singing with another LBV (LBV 3), then returned to the south out of the LBV survey area. The other two observed LBV were in the same locations as previously observed LBV, one to the north in the SCWRF (LBV 1) and one to the south in the willow riparian forest (LBV 3).

On **June 25, 2012**, three LBV were observed separately in previously detected locations. The pair that was first detected on June 1, 2012 (LBV pair) was spotted in the same location/territory. The other LBV (LBV 3) was detected to the south in the same willow riparian forest.

On **July 5, 2012**, three LBV were detected in previously observed and documented locations. The first LBV (LBV 3) was observed 400 to the south of Bridge 3.4 and the second and third LBV observed was the breeding pair (LBV Pair) that was first observed on June 1, 2012.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Breeding and non-breeding LBV were documented within the portion of the survey area located in the SAR. Implementation of the proposed project would temporarily and permanently impact nesting and foraging habitat (SWS and SCWARF) for LBV. HDR recommends the following measures to minimize and/or avoid impacts to nesting and foraging LBV:

(1) Construction activities within or immediately adjacent to LBV habitat should occur outside of the breeding season for the species (February 15 – September 15).

(2) Should construction within the breeding season be unavoidable, a pre-construction nesting survey may be required.

(3) The federal Endangered Species Act (ESA) defines and lists *species* as "endangered" or "threatened" and provides regulatory protection for the listed species. The federal ESA provides a program for conservation and recovery of threatened and endangered species. It also ensures the conservation of designated critical habitat that the USFWS has determined is required for the survival and recovery of these listed species. Section 9 of the federal ESA prohibits the "Take" of species listed by USFWS as threatened or endangered. *Take* is defined as: "…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that *Take* cannot always be avoided, Section 10(a) of the federal ESA includes provisions for *Take* that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (incidental take permits) may be issued if *Take* is incidental and does not jeopardize the survival and recovery of the species.

    Should *Take* of LBV be unavoidable as a result of project implementation, Section 10 consultation with USFWS may be required.

(4) The results identified in the survey report are generally considered valid for one year. Should implementation of the proposed project occur beyond this period, additional protocol-level surveys may be required by the wildlife agencies.

(5) Please note that mitigation would be established during consultation with the wildlife agencies.

8.0 REFERENCES

California Department of Fish and Game. 2006. *California's Plants and Animal: Least Bell's Vireo.* Habitat Conservation Planning Branch.

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/species/riparian/least_bell_vireo.htm. Viewed August 24, 2012.

Sibley, A. 2000. National Audubon Society *The Sibley Guide to Birds*. Alfred A. Knopf, New York.

U.S. Fish and Wildlife Service. 1998. Draft recovery plan for the least Bell's vireo. U.S. Fish and Wildlife Service, Portland, OR. 139p.

U.S. Fish and Wildlife Service. 2001. Least Bell's Vireo Survey Guidelines.

APPENDIX A

Observed Avian Species

Appendix A
Inventory of Avian Species Observed

Common Name	Scientific Name	Status
Ciconiiformes		
Ardeidae		
Green Heron	*Butorides virescens*	-
Galliformes		
Odontophoridae		
California Quail	*Callipepla californica*	-
Falconiformes		
Cathartidae		
Turkey Vulture	*Cathartes aura*	-
Accipitrinae		
Cooper's Hawk	*Accipiter cooperii*	-
Red-tailed Hawk	*Buteo jamaicensis*	-
Charadriiformes		
Charadriiae		
Killdeer	*Charadrius vociferus*	-
Columbiformes		
Columbidae		
Rock pigeon	*Columbia livia*	-
Eurasian collared dove	*Streptopelia decaocto*	-
Mourning Dove	*Zenaida macroura*	-
Apodiformes		
Trochilidae		
Allen's hummingbird	*Selasphorus sasin*	-
Anna's Hummingbird	*Calypte anna*	-
Black-chinned hummingbird	*Archilochus alexandri*	-
Piciformes		
Picidae		
Northern Flicker	*Colaptes auratus*	-
Nuttall's Woodpecker	*Picoides nuttallii*	-
Passeriformes		
Ptilogonatidae		
Phainopepla	*Phainopepla nitens*	-
Tyrannidae		
Pacific-slope Flycatcher	*Empidonax difficili*	-
Ash-throated Flycatcher	*Myiarchus cinerascens*	-
Black Phoebe	*Sayornis nigricans*	-
Say's phoebe	*Sayornis saya*	-
Western Kingbird	*Tyrannus verticalis*	-
Cassin's kingbird	*Tyrannus vociferans*	-

Common Name	Scientific Name	Status
Vireonidae		
Least Bell's Vireo	*Vireo bellii pusillus*	FE
Warbling Vireo	*Vireo gilvus*	-
Corvidae		
American crow	*Corvus brachyrhynchos*	-
Common Raven	*Corvus corax*	-
Hirundinidae		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	-
Barn swallow	*Hirundo rustica*	-
Aegithalidae		
Bushtit	*Psaltriparus minimus*	-
Troglodytidae		
Bewick's Wren	*Thryomanes bewickii*	-
House Wren	*Troglodytes aedon*	-
Regulidae		
Ruby-crowned Kinglet	*Regulus calendula*	-
Timaliidae		
Wrentit	*Chamaea fasciata*	-
Mimidae		
Northern mockingbird	*Mimus polyglottos*	-
Sturnidae		
European Starling	*Sturnus vulgaris*	-
Parulidae		
Yellow Warbler	*Dendroica petechia*	SSC
Yellow-rumped Warbler	*Dendroica coronata*	-
Common Yellowthroat	*Geothlypis trichas*	-
Orange-crowned Warbler	*Oreothlypis celata*	-
Wilson's Warbler	*Wilsonia pusilla*	-
Emberizidae		
Song Sparrow	*Melospiza melodia*	-
California Towhee	*Melozone crissalis*	-
Spotted Towhee	*Pipilo maculatus*	-
Cardinalidae		
Black-headed Grosbeak	*Pheucticus melanocephalus*	-
Western tanager	*Piranga ludoviciana*	-
Icteridae		
Bullock's oriole	*Icterus bullockii*	-
Hooded Oriole	*Icterus cucullatus*	-
Fringillidae		
Carduelinae		
House Finch	*Carpodacus mexicanus*	-
Lesser goldfinch	*Spinus psaltria*	-

SSC = State Species of Concern, FE = Federally Endangered, FT = Federally Threatened

APPENDIX B
Site Photographs

APPENDIX B
Site Photographs

Photograph 1. View of SWS within the Mission Zanja Creek.
View looking east.

Photograph 2. View looking north of the project site at the SWS along the eastern side of the Santa Ana River.

Photograph 3. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the east.

Photograph 4. The SCWRF in the Mission Zanja Creek from the ROW. View looking to the southwest towards the Santa Ana River.

APPENDIX H

Southwest Willow Flycatcher Report

APPENDIX H

Southwest Willow Flycatcher Report

GLENN LUKOS ASSOCIATES

Regulatory Services

August 13, 2012

Susie Tharratt
U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, California 92011

SUBJECT: Submittal of Report for the Southwestern Willow Flycatcher at the Redlands Passenger Rail Project Located in the City of Redlands; San Bernardino County, California

Dear Ms. Tharratt:

This letter report summarizes the methodology and findings of surveys conducted for the federally-listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*) ("SWIFL") conducted by Glenn Lukos Associates, Inc. (GLA) for the above-mentioned site in San Bernardino County, California. GLA was retained by HDR Engineering, Inc.to determine the presence or absence of the southwestern willow flycatcher at the property (hereinafter referred to as the "Project Site").

INTRODUCTION

The SWIFL is a small, migratory songbird, which inhabits riparian habitats throughout southern California and is one of four subspecies of willow flycatcher (WIFL) currently recognized. It was officially designated as a state-endangered species on January 2, 1991 and federally designated as endangered on March 29, 1995. The SWIFL measures about 5.75 inches (15 cm) in length, and weighs only about 0.4 ounces (12 g). Overall, it is roughly the size of a small sparrow. Both sexes look alike. Its appearance is overall greenish or brownish gray above, with a white throat that contrasts with a pale olive breast. The belly is pale yellow. Two white wing bars are visible, but the eye ring is faint or absent. The upper mandible is dark, and the lower mandible light (USGS). It closely resembles the other races of willow flycatcher, and several other species of the *Empidonax* genus, particularly the closely related Alder flycatcher (*Empidonax alnorum*). The SWIFL is generally the palest in coloration of the WIFL subspecies (Unitt 1987), but this difference in color is extremely subtle and is not recommended as a reliable way to distinguish between the subspecies in the field (Hubbard 1999).

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The SWIFL breeds in relatively dense riparian habitats in all or parts of seven southwestern states, from near sea level to over 2,000 m (6,100 ft). More specifically, the SWIFL breeds in riparian habitats along rivers, streams, or other wetlands, where relatively dense growths of trees and shrubs are established, near or adjacent to surface water or underlain by saturated soil (McCabe 1991). Common tree and shrub species comprising nesting habitat include willow (*Salix* sp.), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), and Russian olive (*Eleagnus angustifolia*) (USFWS 2002).

Habitat characteristics such as plant species composition, size and shape of habitat patch, canopy structure, vegetation height, and vegetation density vary across the subspecies range. However, regardless of the plant species composition or height, occupied sites usually consist of dense vegetation in the patch interior, or an aggregate of dense patches interspersed with openings. In most cases this dense vegetation occurs within the first 3-4 m (10-13 ft) above ground. These dense patches are often interspersed with small openings, open water or marsh, or shorter/sparser vegetation creating a mosaic that is not uniformly dense (USFWS 2002). The SWIFL winters in Mexico and Central America and northern South America (Phillips 1948, Gorsiki 1969, McCabe 1991, Koronkiewicz et al. 1998, Unitt 1999).

SITE LOCATION AND DESCRIPTION

The Project Site is located in the City of Redlands, San Bernardino County, California and can be found on the U.S. Geological Survey 7.5' San Bernardino South quadrangle [dated 1967 and photorevised in 1980]) in unsectioned areas of Township 1 South, Range 4 West [Exhibits 1 and 2 – Regional and Vicinity Map]. The WIFL surveys were conducted within a portion of the Project Site located north of South Waterman Avenue and south of East Orange Show Road.

The survey area included the Santa Ana River, approximately 91 meters (300 feet) on both sides of the railroad bridge crossing and also included Zanja Channel, which parallels the railroad corridor from the confluence of the Santa Ana River east approximately 0.65 kilometers (0.4 miles) to where the riparian vegetation terminates at a concrete spillway [Exhibit 3 – Survey Area Map]. The Santa Ana River within the survey area is approximately 170 meters wide (558 feet) and consists primarily of fine sandy substrate and includes areas supporting vegetated sandy terraces and islands. Zanja Channel is an un-improved trapezoidal earthen channel that is approximately 36 meters (118 feet) in width. Elevation of the Project Site is approximately 314 meters (1030 feet) above mean sea level. A detailed description of the riparian habitat surveyed is provided below.

VEGETATION

The riparian habitat surveyed within the Santa Ana River and Zanja Channel is comprised primarily of southern cottonwood willow riparian forest and southern willow scrub. In general, the riparian habitat is mature and consists of a sandy substrate. Portions of the Santa Ana River are unvegetated or support newer growth caused by seasonal scouring. Surface water or saturated soils were not detected within the Santa Ana River. The western half of Zanja channel supported dense riparian willow vegetation within a narrow sandy streambed. The eastern half of the channel was more open, supporting more cottonwoods than willows. A small central portion of Zanja channel exhibited surface water. The height of the riparian vegetation within the survey area ranged between 4.6 meters (15 feet) to 16.7 meters (55 feet), but averaged between 10.7 meters (30 feet) to 12.2 meters (40 feet).

Dominant riparian vegetation within the survey area includes arroyo willow (*Salix lasiolepis*), Freemont's cottonwood (*Populus fremontii* ssp. *fremontii*), red willow (*Salix laevigta*), Gooding's willow (*Salix goodingii*), sandbar willow (*Salix exigua*), yellow willow (*Salix lasiandra* ssp. *lasiandra*), and mule fat (*Baccharis salicifolia*).

Additional plants detected on site include western ragweed (*Ambrosia psilostachya*), mugwart (*Artemisia douglasiana*), common sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*), prickly lettuce (*Lactuca serriola*), cocklebur (*Xanthium strumarium*), salt cedar (*Tamarix ramosissima*), wild grape (*Vitis girdiana*), California rose (*Rosa californica*), wild radish (*Raphanus sativus)*, annual yellow sweetclover (*Melilotus indicus*), white sweetclover (*Melilotus albus*), common sow-thistle (*Sonchus oleraceus*), Lamb's quarters (*Chenopodium album*), alkali heliotrope (*Heliotropium curassavicum*), Canadian horseweed (*Conyza canadensis*), black mustard (*Brassica nigra*), California buckwheat (*Eriogonum fasciculatum*), dwarf nettle (*Urtica urens*), cheeseweed (*Malva parviflorus*), Russian thistle (*Salsola tragus*), tocolote (*Centaurea melitensis*), blue gum (*Eucalyptus globulus*), shortpod mustard (*Hirschfeldia geniculata*), London rocket (*Sisymbrium irio*), chia (*Salvia coumbariae*), yerba santa (*Eriodictyon californicum*) and horehound (*Marrubium vulgare*).

METHODOLOGY

Protocol surveys for the SWIFL were performed in all areas of suitable habitat on site. Surveys were conducted in accordance with the 2010 U.S. Fish and Wildlife Service (USFWS) guidelines[1], which stipulate that for Projects, five surveys (divided into three survey periods)

[1] *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher*, prepared by the USGS.

shall be conducted in all areas of suitable habitat. One survey was conducted during the first survey period (May 15 to May 31). Two surveys were conducted during the second survey period (June 1 to June 24), and two surveys were conducted during the third survey period (June 25 to July 17).

GLA biologist Jeff Ahrens (TE052159-3) conducted the protocol surveys on May 21, June 1, June 11, June 25, and July 5, 2012. All surveys were conducted during the morning hours and were completed before 10:30 A.M. No surveys were conducted during extreme weather conditions (i.e., winds exceeding 15 miles per hour, rain, or temperatures in excess of 95°F). All areas of suitable habitat were surveyed on foot by walking slowly and methodically. Taped vocalizations primarily using the willow flycatcher's main contact call "fitz-bew" was used to elicit responses from WIFLs that might be present on site. The detection of WIFLs on site was based on both sight and call.

Weather conditions during the surveys were conducive to a high level of bird activity. Temperatures ranged from approximately 53 ° to 82° Fahrenheit. Wind speeds ranged from one to three miles per hour (mph) during the surveys. Table 1 summarizes the survey dates and weather conditions recorded at the Project site.

Table 1. Summary of Survey Dates and Weather Conditions for the Redlands Passenger Rail Project

Date	Start Time	End Time	Permitted Surveyor	Temp °F, (start/end)	Wind Speed (MPH) (start/end)	% Cloud Cover (start/end)
5/21/12	0615	0950	JA	65 - 82	1 - 1	Clear
6/01/12	0600	0925	JA	63 - 73	1 - 1	Clear
6/11/12	0620	0945	JA	63 - 70	2 - 1	Clear
6/25/12	0530	0855	JA	53 - 62	1 - 3	Clear
7/5/12	0555	0900	JA	59 - 70	2 - 2	20 - 20

JA – Jeff Ahrens

RESULTS

No WIFLs were detected within the Project Site during the focused surveys. One least Bell's vireo (*Vireo bellii pusillus*) (LBV) pair exhibiting nesting behavior was detected within Zanja Channel near the confluence with the Santa Ana River. In addition, three unmated LBVs were detected outside of the survey area. LBV 1 was an unmated male that was detected on June 1, 11, 25, and July 5, 2012) approximately 132 meters (433 feet) south of the railroad crossing. LBV 2 was presumed to be an unmated male that was detected on June 1 and June 11, 2012

approximately 162 meters (531 feet) north of the railroad crossing. LBV 3 was a male that was observed briefly counter singing with LBV 1 on June 11, 2012 and proceeded to fly south and was not detected again. LBV 3 was approximately 170 meters (559 feet) south of the railroad crossing.

One individual Santa Ana River wooly star (*Eriastrum densifolium sanctorum*) was detected on June 11, 2012 within the Santa Ana River, immediately south of the railroad crossing. Other sensitive species detected within or close proximity to the Project Site include the yellow warbler (*Setophaga petechia*). Brown-headed cowbirds (*Molothrus ater*) were not detected during the focused surveys.

Exhibits 3 and 4 depict the survey area, LBV (and dates detected) and Santa Ana River wooly star locations on aerial and topographic maps, respectively. Data sheets are included at the end of the report. A compendium listing all avian species detected during the focused surveys is included at the end of the report.

If you have any questions regarding the methodology or findings of this report, please contact me at (949) 837-0404, ext 40.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

GLENN LUKOS ASSOCIATES, INC.

Jeff Ahrens	TE 052159-3	8/13/12
Jeff Ahrens Biologist	Permit #	Date

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REFERENCES

Gorski, L. J. 1969. Traill's Flycatchers of the "fitz-bew" songform wintering in Panama. Auk 86:745-747.

Hubbard, J.P. 1999. A critique of Wang Yong and Finch's field identifications of Willow Flycatcher subspecies in New Mexico. Wilson Bulletin 111(4): 585-588.

Koronkiewicz, T., M.K. Sogge, and C.A. Drost. 1998. A preliminary survey for wintering willow flycatchers in Costa Rica. USFS Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station, Northern Arizona University, Flagstaff. 47 pp.

McCabe, R. A. 1991. The little green bird: ecology of the willow flycatcher. Palmer publications, Inc., Amherst, Wisconsin. 171 pp.

Phillips, A. R. 1948. Geographic variation in *Empidonax traillii*. Auk 65:507-514.

Unitt, P. 1987. *Empidonax traillii extimus*: an endangered subspecies. Western Birds 18: 137-162.

Unitt, P. 1999. Winter Range and discriminant function analysis of the Willow Flycatcher. Final report submitted to the Bureau of Reclamation Phoenix Area Office (Federal Grant No. 98-FG-32-0200), Phoenix, AZ.

U.S.G.S. 2010. *A natural history summary and survey protocol for the southewestern willow flycatcher*. U.S. Department of the Interior. U.S. Geological Survey. 38 pp.

U.S. Fish and Wildlife Service. 2000. Southwestern Willow Flycatcher Protocol Revision 2000. 3 pp.

_____. 2002. Final Recovery Plan Southwestern Willow Flycatcher (*Empidonax traillii extimus*). 229 pp.

_____. 2010. Southwestern Willow Flycatcher Protocol Revision 2010. 3 pp.

APPENDIX A

AVIAN COMPENDIUM

The avian compendium lists bird species identified on the Site.

* = non-native species

ODONTOPHORIDAE	**Quails and Bobwhites**
Callipepla californica	California Quail
ARDEIDADE	**Herons and Egrets**
Butorides virescens	green heron
CATHARTIDAE	**New World Vultures**
Cathartes aura	turkey vulture
ACCIPITERIDAE	**Hawks, Old World Vultures and Harriers**
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
CHARADRIIDAE	**Plovers And Relatives**
Charadrius vociferus	killdeer
COLUMBIDAE	**Pigeons and Doves**
* *Columbia livia*	rock pigeon
* *Streptopelia decaocto*	Eurasian collared dove
Zenaida macroura	mourning dove
TROCHILIDAE	**Hummingbirds**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
PICIDAE	**Woodpeckers and Wrynecks**
Colaptes auratus	northern flicker
Picoides nuttallii	Nuttall's woodpecker
TYRANNIDAE	**Tyrant Flycatchers**
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird

VIREONIDAE	**Vireos**
Vireo bellii puusillus	least Bell's vireo
CORVIDAE	**Jays, Magpies and Crows**
Corvus brachyrhynchos	American crow
Corvus corax	common raven
HIRUNDINIDAE	**Swallows**
Stelgidopteryx serripennis	northern rough-winged swallow
Hirundo rustica	barn swallow
AEGITHALIDAE	**Bushtit**
Psaltriparus minimus	bushtit
TROGLODYTIDAE	**Wrens**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
MIMIDAE	**Mockingbirds and Thrashers**
Mimus polyglottos	northern mockingbird
PTILOGONATIDAE	**Silky-flycatchers**
Phainopepla nitens	phainopepla
STURNIDAE	**Starlings and Allies**
* *Sturnus vulgaris*	European starling
PARULIDAE	**Wood Warblers and Relatives**
Geothlypis trichas	common yellowthroat
Oreothlypis celata	orange-crowned warbler
Setophaga petechia	yellow warbler
EMBERIZIDA	**Emberizines**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculates	spotted towhee
CARDINALIDAE	**Cardinals, Grosbeaks, and Allies**
Pheucticus melanocephalus	black-headed grosbeak
Piranga ludoviciana	western tanager
ICTERIDAE	**Blackbirds, Orioles, and Allies**
Icterus bullockii	Bullock's oriole

Icterus cucullatus	hooded oriole
FRINGILLIDAE	**Finches**
Spinus psaltria	lesser goldfinch
Carpodacus mexicanus	house finch

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Redlands Passenger Rail Project State: CA County: San Bernardino

USGS Quad Name: San Bernardino South Elevation: ~308 (meters)

Creek, River, or Lake Name: Santa Ana River & Zanja Channel

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* X *No* ____

Survey Coordinates: Start: E 474843.36 N 3770435.32 UTM Datum: 83 (See instructions)

Stop: E 475531.89 N 3770325.68 UTM Zone: 11

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

*****Fill in additional site information on back of this page*****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Jeff Ahrens	Date: 5/21/12 Start: 0615 Stop: 0950 Total hrs: 3hr, 35m	–	–	–	–	No WIFL Detected				
Survey # 2 Observer(s): Jeff Ahrens Jason Fitzgibbon	Date: 6/1/12 Start: 0600 Stop: 0925 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 3 Observer(s): Jeff Ahrens	Date: 6/11/12 Start: 0620 Stop: 0945 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 4 Observer(s): Jeff Ahrens	Date: 6/25/12 Start: 0530 Stop: 0855 Total hrs: 3hr, 25m	–	–	–	–	" "				
Survey # 5 Observer(s): Jeff Ahrens	Date: 7/5/12 Start: 0555 Stop: 0900 Total hrs: 3hr, 5m	–	–	–	–	" "				

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 16hr, 55m	0	0	0	0

Were any WIFLs color-banded? Yes ____ No ____

If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: Jeff Ahrens Date Report Completed: 8/13/12

US Fish & Wildlife Service Permit #: TE 052159-3 State Wildlife Agency Permit #: SCP 5820/MOU

***Submit** form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.*

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Jeff Ahrens Phone #(949) 837-0404 ext 40

Affiliation Glenn Lukos Associates E-mail wildlife-biologist@yahoo.com

Site Name Redlands Passenger Rail Project Date report Completed 8/13/12

Was this site surveyed in a previous year? Yes____ No X Unknown____

Did you verify that this site name is consistent with that used in previous yrs? Yes X No _____ Not Applicable _____

If name is different, what name(s) was used in the past? —

If site was surveyed last year, did you survey the same general area this year? Yes N/A No _____ If no, summarize below.

Did you survey the same general area during each visit to this site this year? Yes X No _____ If no, summarize below.

Management Authority for Survey Area: Federal _____ Municipal/County X State _____ Tribal _____ Private _____

Name of Management Entity or Owner (e.g., Tonto National Forest) San Bernardino County Flood Control District / SANBAG

Length of area surveyed: ~ 0.85 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)

_____ Mixed native and exotic plants (mostly native, 50 - 90% native)

_____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

_____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix lasiolepis, Salix laevigata, Populus fremontii, Baccharis Salicifolia, Salix exigua

Average height of canopy (Do not include a range): 30 feet (9.1) meters (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Source: ESRI World Street Map

N

0 2 4 8 Miles

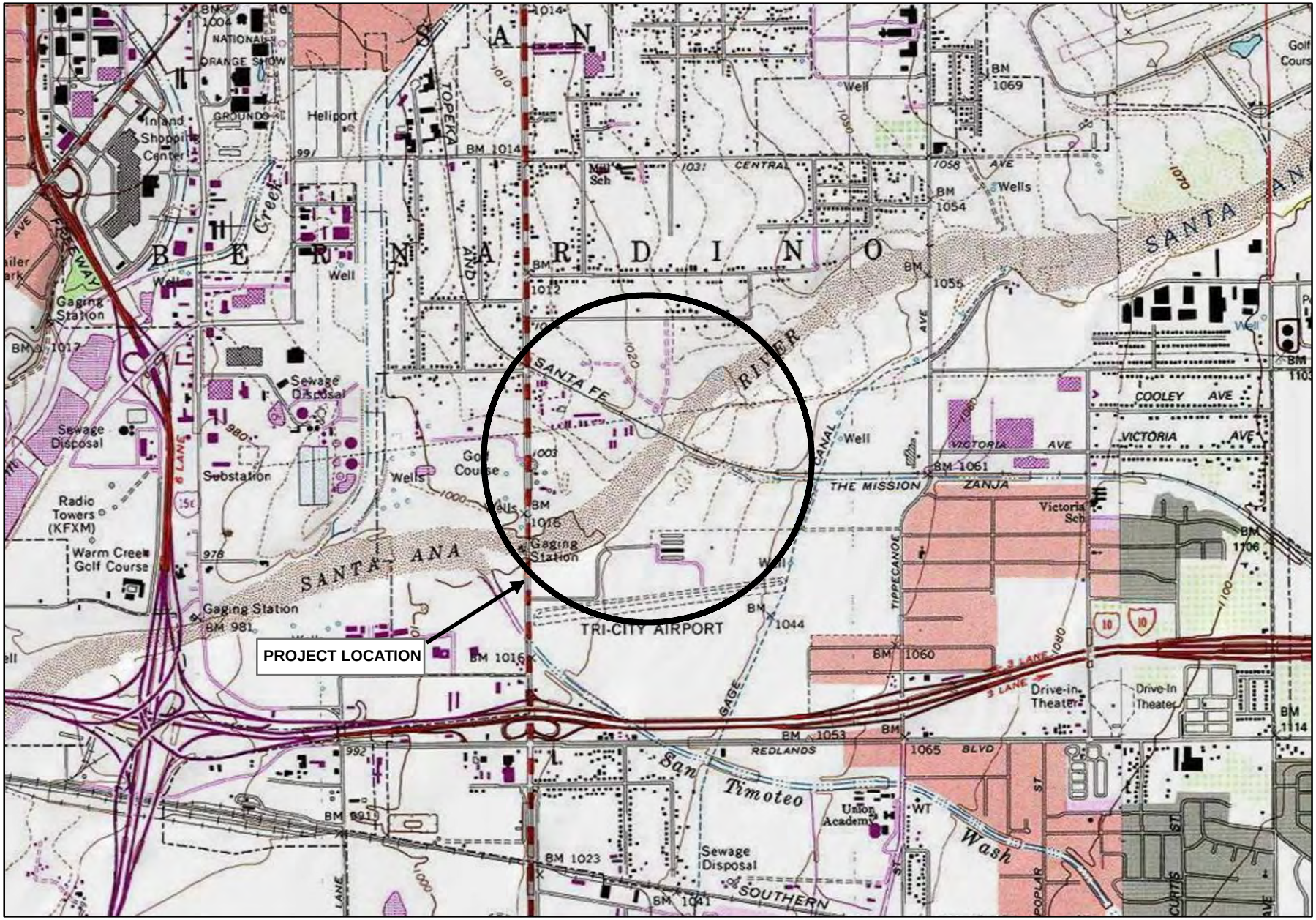
REDLANDS PASSENGER RAIL PROJECT

Regional Map

GLENN LUKOS ASSOCIATES

Exhibit 1

Adapted from USGS San Bernardino South, CA quadrangle



N

0 1,000 2,000 4,000 Feet

REDLANDS PASSENGER RAIL PROJECT

Vicinity Map

GLENN LUKOS ASSOCIATES

Exhibit 2

Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 100 200 400
Feet

REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area Aerial Map

GLENN LUKOS ASSOCIATES

Exhibit 3

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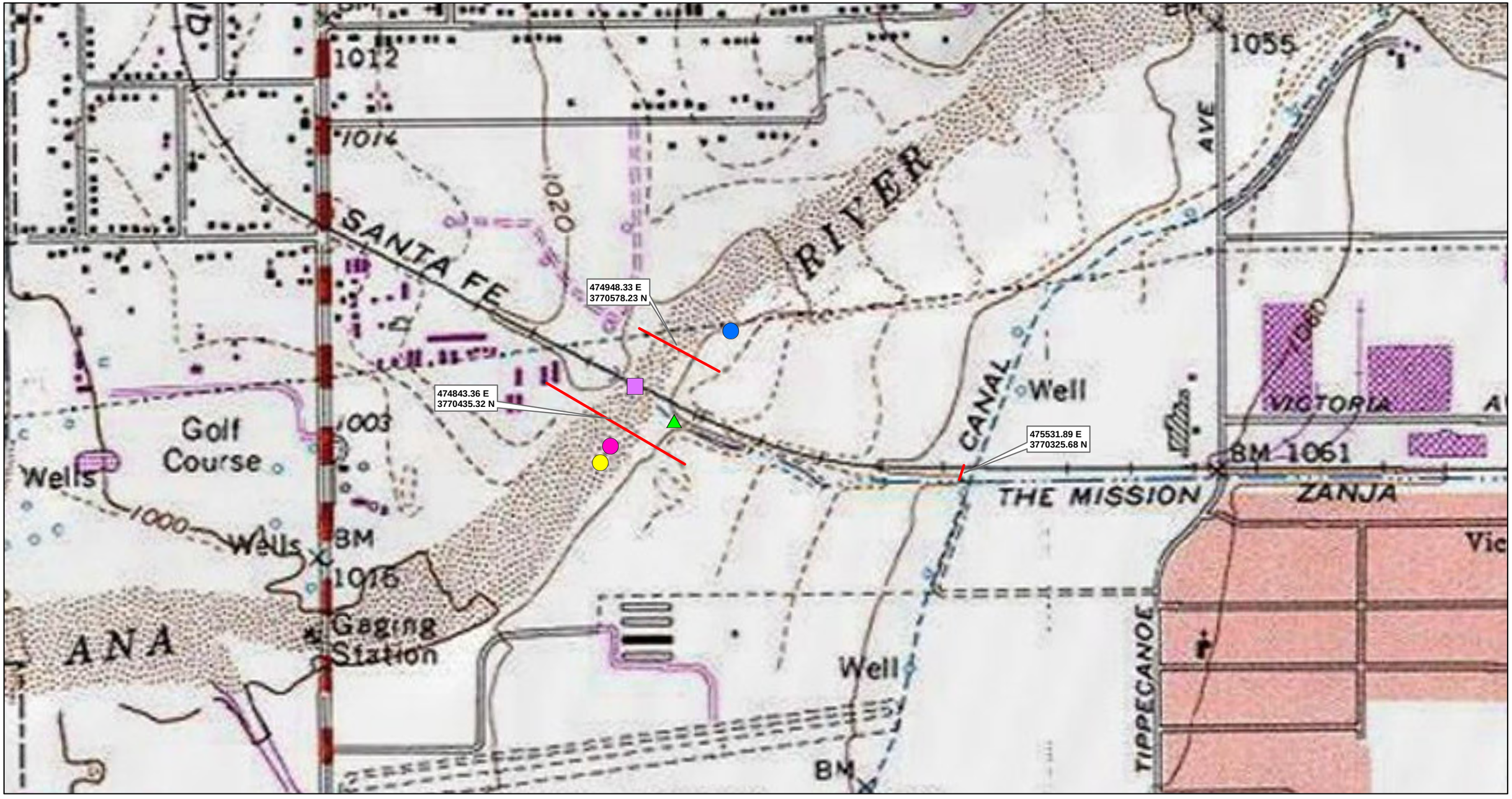
July 20,2012



Legend

- Limits of Survey Area
- Unmated LBV 1 (June 1, 11, 25 & July 5)
- Unmated LBV 2 (June 1 & 11)
- Unmated LBV 3 (June 11)
- LBV Pair (June 1, 25 & July 5)
- Santa Ana River Wooly Star

N

0 300 600 1,200
Feet

REDLANDS PASSENGER RAIL PROJECT

Southwestern Willow Flycatcher Survey Area USGS Map

GLENN LUKOS ASSOCIATES

Exhibit 4

X:\0363-THE REST\1038-1WIFL\1038-1GIS\1038-1WIFL USGS.mxd
July 20,2012

Photograph 1: View looking south at the southern bank of the Santa Ana River at the confluence with Zanja Channel, from beneath the railroad bridge crossing.

Photograph 2: View looking southwest at the Santa Ana River, north (upstream) of the railroad bridge crossing.

Photograph 3: View looking east within Zanja Channel, near the confluence with the Santa Ana River.

Photograph 4: View looking east within Zanja Channel, approximately 300 meters east of the confluence with the Santa Ana River.

GLENN LUKOS ASSOCIATES

Exhibit 5

REDLANDS PASSENGER RAIL PROJECT

Site Photographs

APPENDIX I

Burrowing Owl Report

Redlands Passenger Rail Project

Western Burrowing Owl Survey Report

October 2012

Prepared for

San Bernardino Associated Governments
1170 W. Third Street, 2nd Floor
San Bernardino, California 92410

Prepared by

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, California 92123

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1.0 INTRODUCTION

This report details the results of a focused western burrowing owl (*Athene cunicularia hypugaea*; BUOW) habitat assessment and breeding season owl survey for the Redlands Passenger Rail Project (Project or RPRP), located within the County of San Bernardino, California (Figure 1). The Project would include the development of new railroad infrastructure along an approximate nine-mile section of rail corridor owned by the San Bernardino Associated Governments (SANBAG). The Project would include the development of five stations consisting of boarding platforms with supporting amenities, parking and pedestrian access improvements, train layover/storage facilities with storage tracks, a vehicle wash, ancillary facilities, grading and drainage improvements, railroad signal improvements, replacement or improvements to five existing bridge structures, and approximately two dozen at-grade highway-rail crossings. In summary, no BUOW were observed within the survey area during focused 2012 BUOW surveys.

2.0 PROJECT AND SITE DESCRIPTION

The Project occurs along a nine-mile corridor between the cities of San Bernardino and Redlands, located within the County of San Bernardino, California (Figure 1). The survey area (which includes the entire Project alignment) occurs within the San Bernardino South and Redlands U.S. Geologic Survey 7.5-minute quadrangles (Figures 2a and 2b). The RPRP would involve the implementation rail improvements along the Redlands Corridor to facilitate commuter rail service between the City of San Bernardino and the University of Redlands in the City of Redlands. The five station stops proposed in conjunction with the RPRP would be located at E Street and Tippecanoe Avenue within the City of San Bernardino and New York Street, Orange Street, and University Street within the City of Redlands. Maintenance activities would be performed at a new layover facility proposed west of California Street and south of Interstate 10 (I-10) in the City of Redlands, just north of the Loma Linda city limits. The overall RPRP and major components are generally illustrated in Figure 3.

Construction of the Project would occur within an existing railroad right-of-way (ROW) owned by SANBAG. SANBAG's ROW averages 50 to 100 feet in width, with the exception of portions of downtown Redlands where the ROW measures less than 40 feet. Additional details regarding each of the components comprising the Project and associated operations are described under the following subheadings.

Track Improvements

The Project would include the construction of track improvements to facilitate train movements along a single track through the rail corridor with an approximately 10,000-foot-long section of passing track or siding, from just west of Richardson Street to just east of California Street (MP 5.5 to MP 7.4). The proposed track ballast and sub-grade along the nine-mile Project corridor would be constructed to 50 feet in width, sufficient to support a parallel maintenance road. In downtown Redlands, this width would be reduced to less than 40 feet in recognition of the constrained ROW. This would require demolition and replacement of the existing track. These improvements would adhere to standards established by Burlington Northern Santa Fe (BNSF) and Southern California Regional Railroad Authority (SCRRA) for the rail, rail ties, ballast and subballast materials, grade crossing panels, placement of drainage structures and retaining walls, and horizontal and vertical clearances. The rail improvements would also include the construction of a new train signaling and communications system.

Structural Crossings and Bridges

The Project would require the replacement or retrofitting of up to six structural crossings to facilitate the loading requirements of the Metrolink trains and track foundation. Five of the six structural crossings consist of existing bridge structures. The location of each of these proposed structural replacements is illustrated in Figure 3.

Roadway Grade Crossings

The Study Area traverses 32 existing roadway grade crossings including two I-10 underpasses. Roadway grade crossing not subject to closure would be redesigned in accordance with the latest Grade Crossing Design Guidelines that in certain cases require raised medians, widened sidewalks, traffic striping, flashing lights, pedestrian gate arms where requested by the CPUC, and swing gates.

Proposed Rail Platforms

There are currently five station stops proposed for the Project with new rail platforms proposed at four locations. Two station stops (E Street and Tippecanoe Avenue) would be located in the City of San Bernardino, while the other three (New York Street, Downtown Redlands, and the University of Redlands) would be located in the City of Redlands. The E Street Rail Platform would be constructed in conjunction with the already approved Downtown San Bernardino Passenger Rail Project (DSBPRP) and, therefore, only track improvements would be required west of E Street to align the Project tracks with the planned rail platforms.

Rail platforms would, in most instances, be less than 200 feet long[1] and would be designed to provide access consistent with American Disability Act (ADA) requirements[2]. Pedestrian crossovers[3] would be provided for each platform with accessible parking provided adjacent to pedestrian crossovers. Ticket vending machines would be located adjacent to crossovers. Shade structures (or canopies) would be provided to individually distinguish each rail platform and to compliment the contextual surroundings. Landscape planters would be used to separate platforms from open areas, adjacent uses, and walkways.

Train Layover Facility

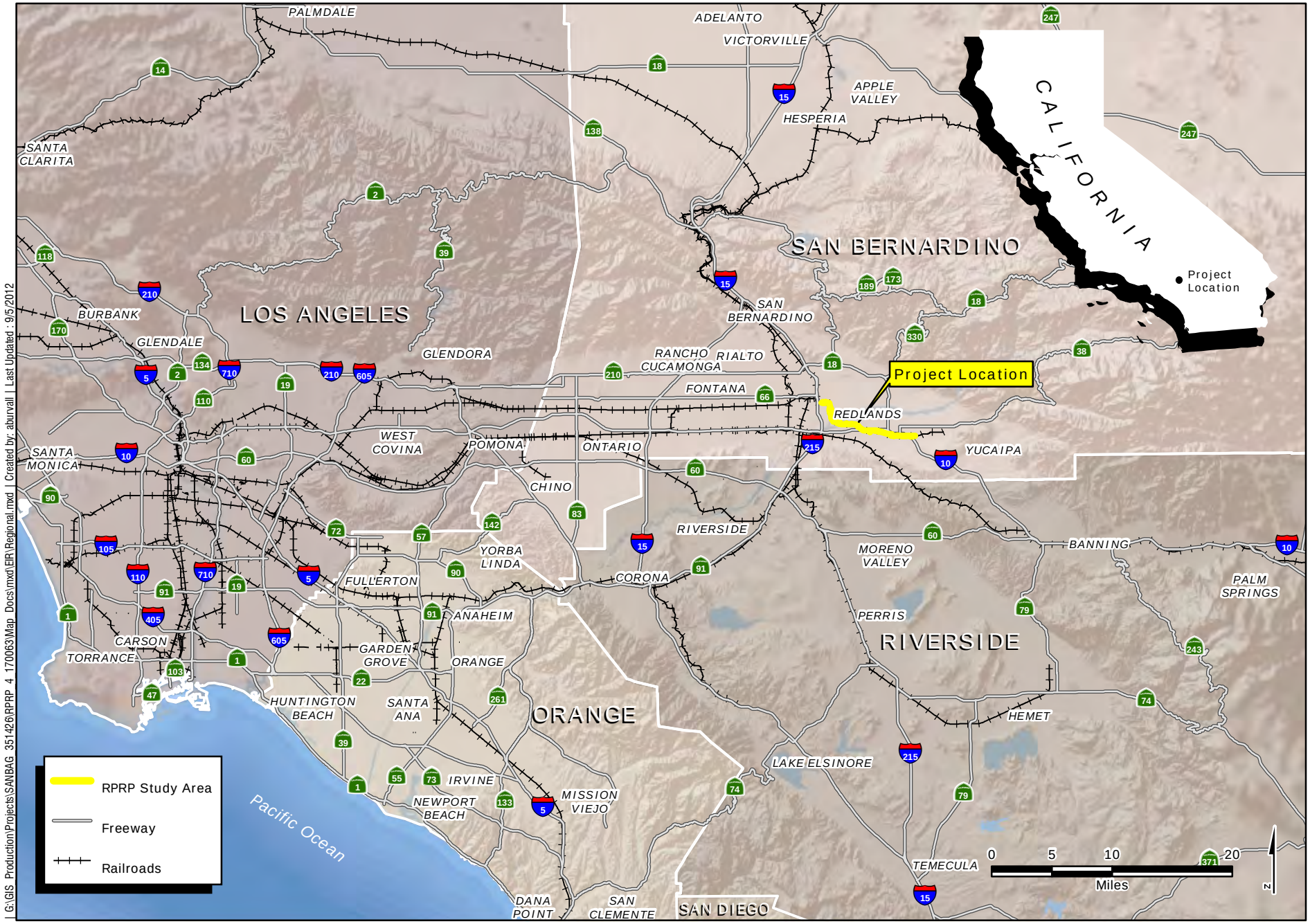
The Project would require the development of a new Train Layover Facility to include sufficient storage tracks for maintenance activities and operational activities including offices, training rooms, and a crew break room. The Train Layover Facility would be constructed on a long narrow site immediately south of I-10 and west of California Street (see Figure 3) and would contain up to seven spur tracks.

---

[1] A minimum of 170 feet is required to accommodate two 85-foot Bombardier passenger coaches.

[2] Access to commuter rail trains for riders with mobility limitations would be provided through the use of a mini-high platform at each station consistent with ADA requirements.

[3] Pedestrian crossovers may consist of at-grade, below grade (e.g., underpass), or above grade crossings (e.g., overpass) pending final design.



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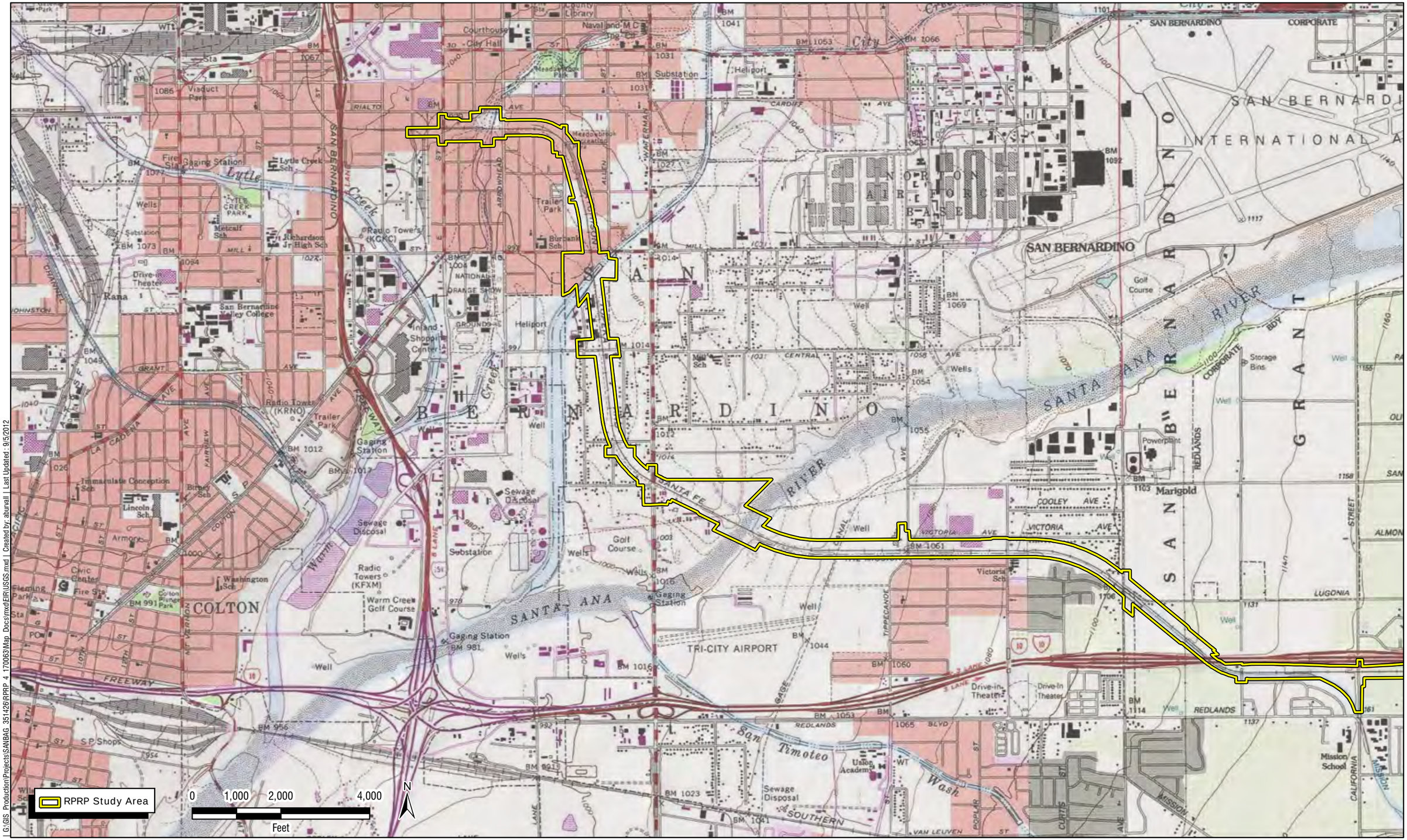
Regional Location Map

Figure 1

FTA/SANBAG | Redlands Passenger Rail Project | BUOW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2,000
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COLTON
TRI-CITY AIRPORT
NORTON AIR FORCE BASE
SAN BERNARDINO INTERNATIONAL A
SANTA ANA RIVER
Lytle Creek
Warm Creek
San Timoteo Wash
Marigold
REDLANDS
COOLEY AVE
VICTORIA AVE
LUGONIA
FREEWAY
SOUTHERN
SANTA FE
Golf Course
Sewage Disposal
Substation
Heliport
Trailer Park
Radio Towers (KFXM)
Radio Towers (KGKC)
Radio Tower (KRNO)
Gaging Station
Drive-in Theater
Powerplant
Storage Bins
Mission School
Union Academy
Victoria Sch
Immaculate Conception Sch
Lincoln Sch
Washington Sch
Richardson Jr High Sch
San Bernardino Valley College
Inland Shopping Center
Civic Center
Fire Sta
Courthouse
City Hall
Viaduct Park
Meadowbrook Park
Burbank Sch
Lytle Creek Sch
Metcalf Sch
Golf Course
Well
Wells
Rana
S P Shops
Armory
Colton Pioneer Park
Fleming Park
Drive-In Theater
Meadowbrook Swimming Pool
Naval and M C Res Cntr
Library
Substation
Heliport
Powerplant
Storage Bins
Golf Course
Sewage Disposal
Gaging Station
Trailer Park
Radio Towers (KFXM)
Warm Creek Golf Course
Gaging Station BM 981
Gaging Station BM 1016
Gaging Station BM 1014
Gaging Station BM 1017
Gaging Station BM 991
Gaging Station BM 1073
Gaging Station BM 1077
Gaging Station BM 1086
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Gaging Station BM 1103
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Gaging Station BM 1131
Gaging Station BM 1137
Gaging Station BM 1158
Gaging Station BM 1161
Gaging Station BM 1155
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Gaging Station BM 1100
Gaging Station BM 1070
Gaging Station BM 1040
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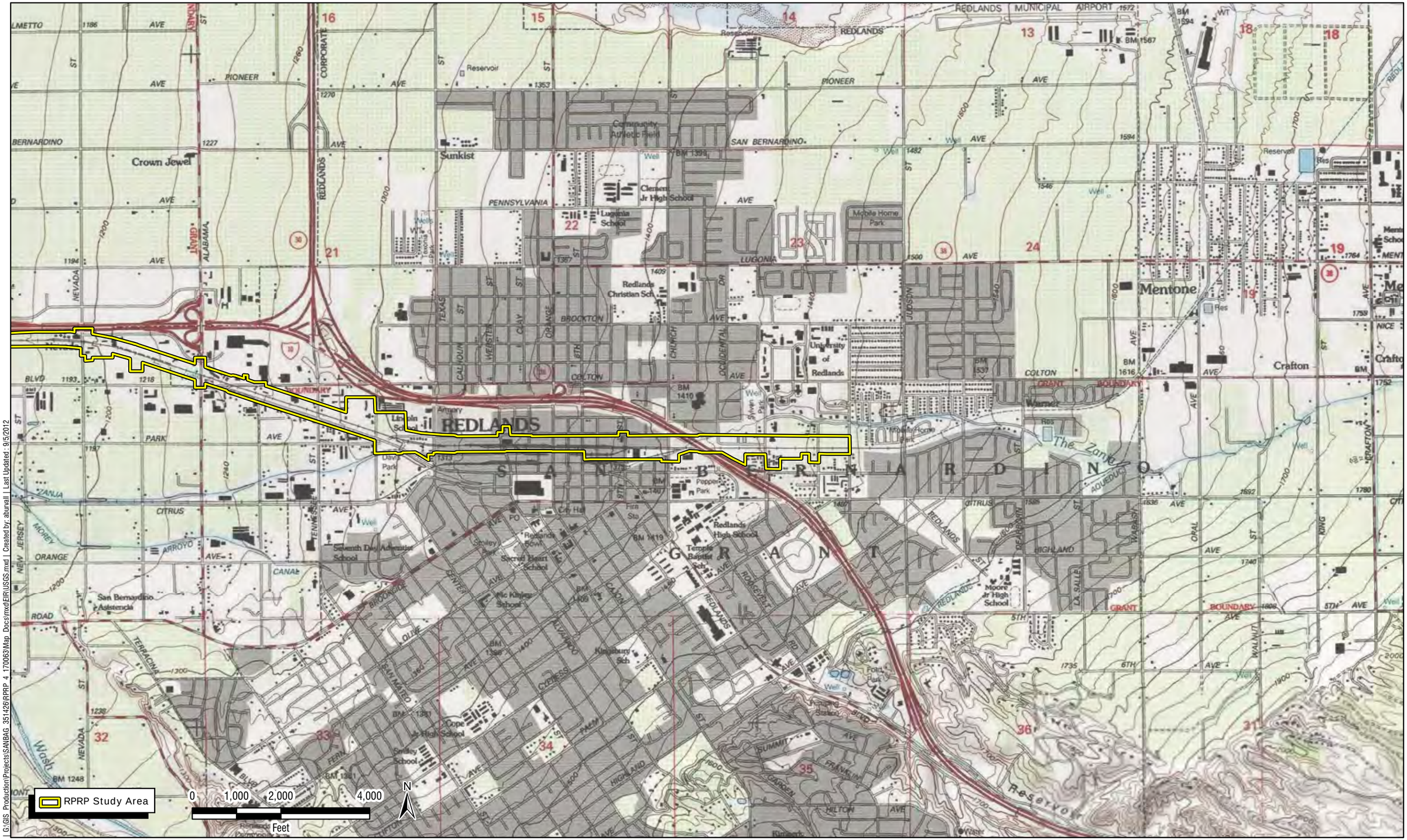

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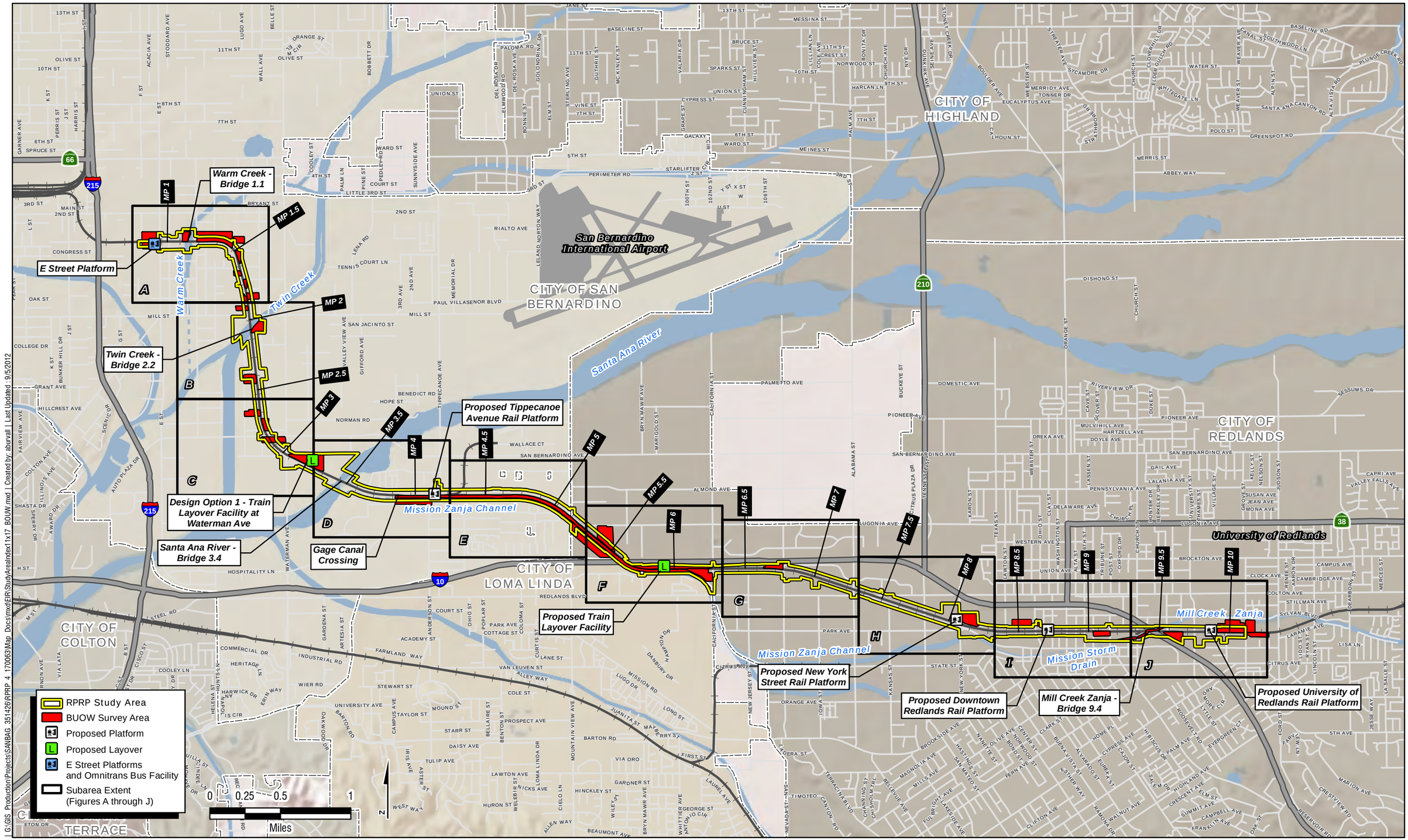
USGS Topographic Map
Figure 2b
FTA/SANBAG | Redlands Passenger Rail Project | BUOW



Burrowing Owl Survey Results Overview

Figure 3

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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Utility Replacement and Relocation

The Project would likely necessitate the relocation of existing subsurface and overhead crossing utilities (i.e., water, sewer, storm drain, power, gas, fiber optic, and telephone lines) in accordance with applicable utility accommodation design criteria and engineering standards.

Specific utilities known to cross the Study Area are identified below. The exact method of improvement, if required, would be determined in coordination with the affected utility provider in conjunction with the Project's final design.

Drainage

Several drainage facility improvements would be necessary to accommodate the track improvements, bridge replacements, platform improvements, and layover facility. It is anticipated that a majority of the storm drain facilities would be protected in place and would not need to be lowered to meet minimum depth requirements. However, it is likely that the majority of the storm drain casings within the rail ROW would need to be extended to span the entire width of the rail ROW. These improvements would be coordinated with the cities of San Bernardino and Redlands along with the San Bernardino County Flood Control District (SBCFCD). In addition, longitudinal storm drain lines located within the rail corridor would need to be relocated further from the proposed track centerlines to comply with BNSF engineering standards.

***Mission Zanja Creek Improvements*.** Mission Zanja Creek runs parallel to the rail line from the Santa Ana River (SAR) to approximately 900 feet west of California Street for a distance of approximately 2.6 miles, where it diverges from the study area to the south. At approximately milepost 9.4 (Bridge 9.4), the creek rejoins the railroad further east, as Mill Creek Zanja where it passes under the railroad just west of the I-10 overcrossing. Mission Zanja Creek is characterized as an improved, trapezoidal earthen channel with some segments including wire revetment (USACE, 1994). The capacity of the open channel ranges from 3,500 cubic feet per second (cfs); however, several the roadway bridges limit the flow carrying capacity to less than 1,500 cfs along portions that border the rail corridor (HDR 2012). To ensure the structural integrity of the track improvements along sections of Mission Zanja Creek, the Project would require bank stabilization improvements (e.g., armoring) to the northern bank of the Mission Zanja Creek, from MP 3.6 to MP 7.2, to ensure that the bank is able to support the additional loading requirements and withstand scour during high flow events. At this time, SANBAG is proposing the use of articulated concrete block (ACB) to support the armoring of the northern bank, which would allow for the growth of limited vegetation. This improvement would be coordinated and constructed with the SBCFCD, which owns and maintains the Mission Zanja Creek.

Description of Passenger Rail Operations

The Project would incorporate the use of previously owned rail commuter rail vehicles and would start operations in early 2018. Project rail service would operate between the E Street and University of Redlands rail platforms with stops at each of the station stops along the route. Trains would operate every 30 minutes in the peak periods and every hour in the off-peak period. This would translate to 25 average daily round trips along the alignment during weekdays.

The Project does not propose any corresponding increase in freight service. All freight movements are assumed to occur during the nighttime hours to allow for spatial separation of freight and passenger trains.

Maintenance

Maintenance of the rail ROW is currently the responsibility of BNSF, which is the current operator of the rail line. This includes routine maintenance of the track and track ties, grade crossings, and communication system. Vegetation management and weed abatement would also be required along the ROW. Each platform would also require routine landscaping and facility maintenance (e.g., replacement of lighting fixtures).

The maintenance of the SCRRA commuter rail system is governed by the Federal Railroad Administration (FRA) regulations and by the California Public Utilities Commission (CPUC) General Orders. SCRRA owns a fleet of locomotives and coaches that are maintained at the Central Maintenance Facility (CMF) in Los Angeles and at the Eastern Maintenance Facility (EMF) in Colton. Routine vehicle inspection and light repair are also performed at various layover sites throughout the SCRRA commuter rail system, including the Inland Empire Maintenance Facility (IEMF) located approximately one mile west of E Street in San Bernardino. Typical railroad maintenance and inspections would be conducted by a contractor hired by SANBAG throughout the operational phase of the Project in accordance with SCRRA/Metrolink and BNSF standard practices.

Construction

Construction of the proposed Project would begin in 2015 and take up to 36 months to complete. Construction would proceed generally from west of E Street to the SAR, and similarly from the SAR east to Cook Street. Construction scheduling and phasing would ultimately be at the discretion of SANBAG's contractor. In total, the anticipated construction disturbance area is estimated at 151.51 acres; however, actual physical disturbance would generally be limited to 5 acres or less on any given day. Of this total disturbance area, approximately 19.84 acres would be limited to temporary construction-related impacts associated with the bridge structures and staging areas, while approximately 131.67 acres would be permanently impacted by the placement of one or more Project facilities.

A description of anticipated construction activities over the course of Project construction is provided as follows:

- Construction easement acquisition, clearing and grubbing, and removal of existing track;
- Relocate, extend, or encase utilities, as appropriate, to remove conflicts;
- Construct embankments, culvert extensions, and retaining walls for the proposed rail corridor, as necessary;
- Re-grade, install drainage, and construct bridge crossings, including as appropriate, new standard height parapets on both sides of each bridge, construct in-fill walls, plug deck drains, construct new spread footings at each pile, and seal parapet joints;
- Construct new rail platforms at proposed rail platform locations and layover facility; and

- Construct new continuous welded rail track, roadway grade crossings, and install pedestrian access improvements and landscaping, where appropriate.

These activities would likely overlap at times. Staging areas for construction equipment and materials would be located primarily within the SANBAG ROW to the extent feasible. Other staging areas would be acquired, as necessary, by the construction contractor and, to the extent feasible, would include vacated roadway ROW. The location of the staging areas would depend on the rail segment, bridge, and platform locations being constructed. In addition, a part of the proposed layover facility would be used as a centralized construction staging area for heavy equipment due to its centralized location along the rail corridor.

Structural Improvements at Water Crossings

Construction of the structural crossings at local waterways, including the SAR, may require the isolation of the work zone through the installation of a cofferdam and/or construction work pads within the wet area. Construction could also cause debris to fall into the local waterways; however, a debris containment system will be installed under the bridge to catch any falling debris. Erosion, sedimentation, and hazardous materials spill or leakage from construction vehicles is also considered a potential impact to water quality. To address these issues, the Project will require the contractor to conduct vehicle refueling within the staging/assembly area, a minimum of 50 feet from wetland areas.

The Project will include preparation of a Storm Water Pollution Prevention Plan (SWPPP), as well as other Permit Registration Documents (PRDs) by the project engineer or contractor. The SWPPP will identify Best Management Practices (BMPs) to address potential short-term impacts and post-construction (long-term) measures to be implemented for the Project. Stormwater pollution prevention BMPs included as a part of the SWPPP would be implemented in accordance with the California Stormwater Construction Handbook (latest edition) and the Construction General Permit Order No. 2009-0009-DWQ. Construction could also involve limited dredging of material from the channel bed and/or excavation along the adjacent banks. These activities could also include the placement of fill including concrete and riprap. To minimize construction activity in the channel, the structural improvements would be constructed in two or more increments to the minimize disturbance to the channel bottom and allow for the safe passage of water flow. A similar approach would be employed for the removal of any existing structures. To minimize the mobilization of sediment, in-channel construction activities would be limited to the period between April 15 and October 15 to the extent feasible.

New structural supports would be constructed behind an encircling temporary cofferdam constructed of sheet piling or similar method, such as the use of kiss piles. The foundation would consist of a reinforced concrete supported by piling, with conventional reinforced concrete piers extending up to the bridge decks. To minimize the potential for falling debris into local waterways during bridge construction, a debris containment system would be installed under the bridge to catch any falling debris. If flow is present and as an additional precaution, a boom would be strung across the water feature to keep any material that escapes the containment system from being carried down stream.

Diversion of Water

If flow is present during construction, a temporary diversion of water may be required. The diversion may consist of a temporary bypass using a pipe, flume, excavated channel, or alternative method that temporarily reroutes water around the construction area. The method would ultimately be at the discretion of the construction contractor. Surface water diversion BMPs would be required to prevent or reduce mingling of construction-related runoff with upstream non-construction-related runoff so as to prevent the introduction of sediment, nutrients, pesticides, and/or other pollutants to local waterways during construction.

3.0 PURPOSE OF STUDY

The purpose of the focused BUOW study is threefold: (1) to determine if suitable burrowing owl habitat occurs within the Project area; (2) characterize suitable BUOW habitat; and (3) characterize any BUOW that are detected within suitable habitat. These data were used in the assessment of biological resource values with an analysis that allows for a determination of Project-related direct and indirect impacts, as required by California Environmental Quality Act (CEQA). By assessing impacts to biological resources it is also possible to propose mitigation and mitigation measures, if appropriate.

4.0 WESTERN BURROWING OWL STATUS AND BIOLOGY

Burrowing owl has a broad distribution that includes open country throughout the Midwest, western United States, Texas, southern Florida, parts of central Canada, Mexico, and the drier regions of Central and South America. In southern California, the species is known from lowlands over much of the region, particularly in agricultural areas. In California, the BUOW has been extirpated as a breeding species during the last 10-15 years from approximately 8 percent of its former range (Klute 2003). Primary threats across the North American range of the BUOW are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986, Haug et al. 1993, Dundas and Jensen 1994/95, Rodriguez- Estrella et al. 1998, Dechant et al. 1999).

BUOW is primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity (Shuford and Gardali 2008, references found therein). The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting, and relatively short vegetation with only sparse shrubs and taller vegetation (Green and Anthony 1989, Haug et al. 1993). Owls in agricultural environments nest along roadsides and water conveyance structures (open canals, ditches, drains) surrounded by crops (DeSante et al. 2004, Rosenberg and Haley 2004). BUOW often nest near and under runways and associated structures (Thomsen 1971, Gervais et al. 2003). Individual BUOWs have moderate to high site fidelity to general breeding areas, prairie dog colonies, and even to particular nest burrows (Klute 2003). Burrow fidelity has been reported in some areas; however, more frequently, BUOWs reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Occupancy of suitable habitat can be verified at a site by observing owls during the spring and summer months or, alternatively, the presence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow entrance.

Burrowing owls follow a crepuscular habit, being most active during the early morning and evening hours. Their diet is predominantly large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey. They are often observed perched on fence posts or utility wires or in close association with their burrow. They typically live eight years or more.

Migratory individuals arrive on the breeding areas either singly or paired. Non-migratory owls retain pair bonds throughout the year (Haug et al. 1993). The breeding season for BUOW generally begins in the month of April.

5.0 WESTERN BURROWING OWL SURVEY METHODOLOGY

A BUOW habitat assessment was conducted by HDR biologists Aaron Newton and Allegra Simmons on April 4 and 5, 2012. Per the guidelines presented in the Staff Report on Burrowing Owl Mitigation (2012), the habitat assessment included 100 percent cover of a 150-meter (500-foot) buffer around the proposed Project footprint. The biologists assessed all habitat within the BUOW survey area (footprint plus 500-foot buffer) for the presence of burrows, burrow surrogates, fossorial mammal dens, well drained soils, available prey, and short or sparse vegetation. Where access was prohibited (i.e., gated, private property, etc.), biologists used binoculars and aerial photography to determine suitability. During the initial site visit, locations of suitable habitat were identified and delineated as either having high or low potential based on the friability of the soil, whether the land was in agricultural production or had native soils, and the presence of burrows. Areas with suitable habitat were the focus of the protocol surveys (Figures 3a-3t). A survey route was established through the suitable habitat and was followed during each survey session.

Breeding season focused surveys were conducted for the Project by HDR Biologists Allegra Simmons (AS), Sean Harris (SH), Joe Schroeder (JS), Summer Adleberg (SA), and Aaron Newton (AN). Per guidelines presented in the 2012 Staff Report, four separate surveys were conducted within suitable habitat. The surveys were spaced no less than three weeks apart, with the first survey occurring between February 15 and April 15. Surveys were conducted during either morning civil twilight and 10 am or two hours before sunset until evening civil twilight. Given the large size of the Project, it took 2-4 visits to cover the entire site for each of the four surveys.

Focused surveys were conducted by either walking transects (primarily in the large vacant lot areas) or by walking along the center of the flood control channel or along the banks. In areas with good visibility along the straight flood control channel, biologists would drive along the channel and enter the channel every 50-100 meters to scan the banks. Survey dates, times, and weather conditions are summarized in Table 1.

Wildlife observations in addition to those of BUOWs were made opportunistically (Appendix B). Zoological nomenclature used in this report is taken from Stebbins (2003) for reptiles and amphibians, American Ornithologists Union (2005) for birds, and Burt/Grossenheider (1980) for mammals.

Table 1. Survey Dates, Times, and Environmental Conditions

Date	Surveyor	Start Time	End Time	Temp (°F)	Wind (mph)	Cloud Cover
04/10/12	AS/AN	0715	0900	68	0–1	0%
04/10/12	AS/AN	1730	1911	62	3-10	10%
05/07/12	AS/AN	1720	1930	86	0-3	0%
05/08/12	AS/AN/SA/JS	1730	1815	91	0-4	0%
06/04/12	AS/AN	1747	1930	76	1-6	0%
06/05/12	AS/AN	0745	0957	66	0-3	0%
07/09/12	SH	1800	2000	100	3-4	0%
07/10/12	SH	0546	0746	70	0	15%
07/10/12	SH	1803	1943	107	2-4	15%
07/11/12	SH	0625	0745	73	3-6	10%

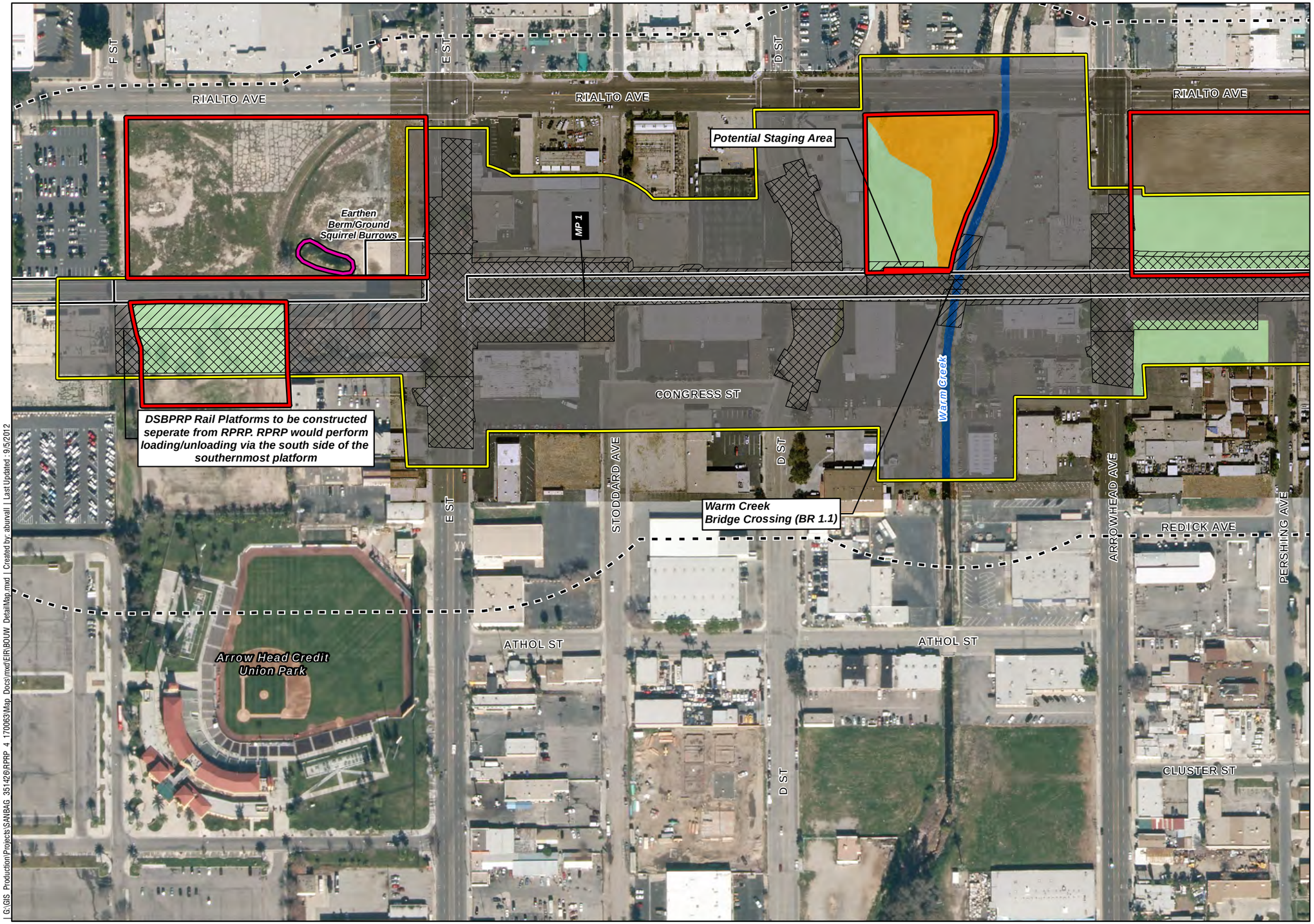
6.0 RESULTS

6.1 HABITAT ASSESSMENT

The survey area supports 14 distinct vegetation communities (Table 2); however, the predominant land cover was indentified as being urban/developed. Vegetation was classified using the R.F. Holland system of natural communities as described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004). The majority of the survey area is made up of paved roadways, man-made structures, adjacent lands that are unvegetated and landscaped parcels. A biological resources map depicting the location of these communities is included as Figures 3a-3t. Of the 14 vegetation communities, seven were identified as supporting suitable habitat for BUOW nesting and foraging within the BUOW survey area: disturbed habitat, flat-top buckwheat scrub, non-native grassland, non-vegetated channel, oak woodland, orchard and vineyards, and urban developed. A description of surveyed habitats is provided below.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat (DH) is primarily used to identify areas of severe impacts to natural communities to the extent where it is no longer sustaining or functioning naturally. These areas have been previously physically disturbed, but continue to retain a soil substrate. Disturbed areas consist of predominantly non-native weedy and ruderal exotic species. This is not a natural community and generally does not provide habitat for wildlife or sensitive species. Examples of disturbed habitat include areas that have been graded, cleared areas for fuel management, staging areas, off-road vehicle trails, and abandoned home sites.



RPRP Study Area

Footprint

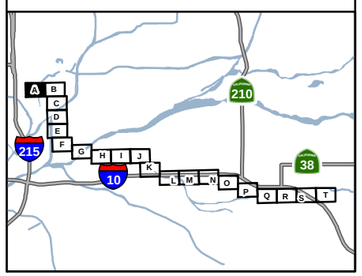
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 A

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RPRP Study Area

Footprint

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- Tamarisk Scrub
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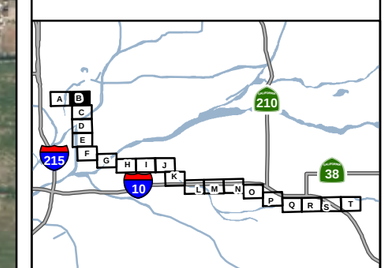

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Burrowing Owl Survey Results

Figure 3 B

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

RPRP Study Area

Footprint

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- Railroad ROW

Burrowing Owl Survey

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- BUOW 150m Buffer

Vegetation Community

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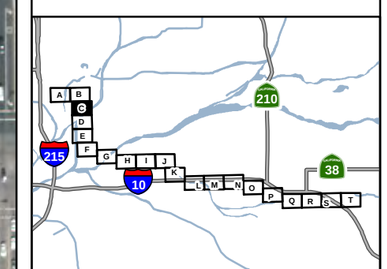

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Burrowing Owl Survey Results

Figure 3 C

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RPRP Study Area

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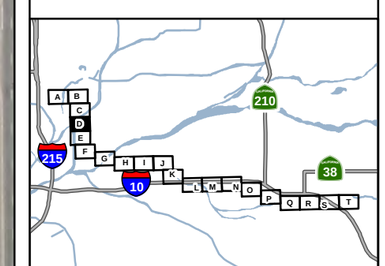

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Burrowing Owl Survey Results

Figure 3 D

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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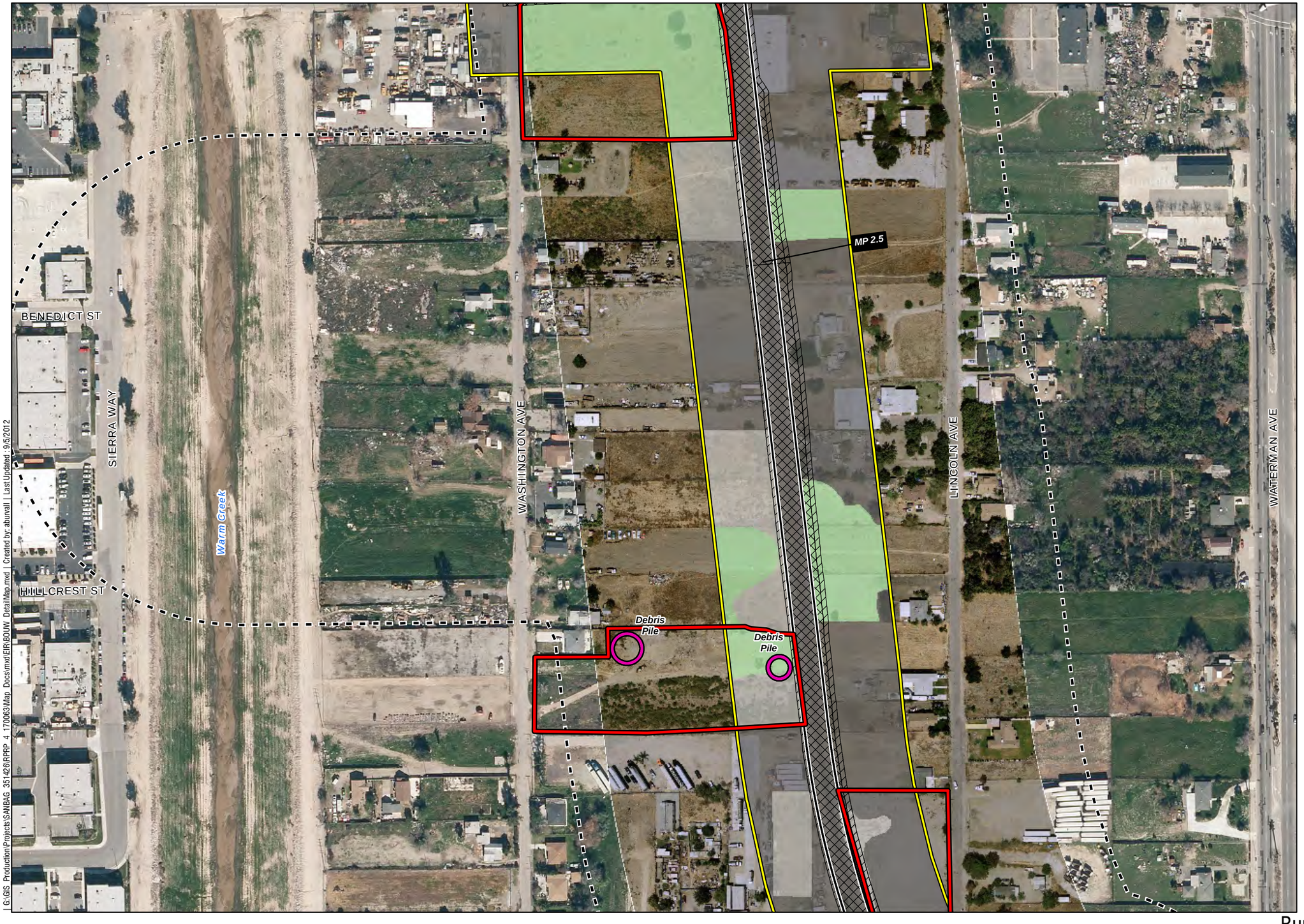

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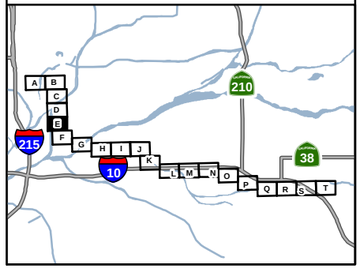

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Burrowing Owl Survey Results

Figure 3 E

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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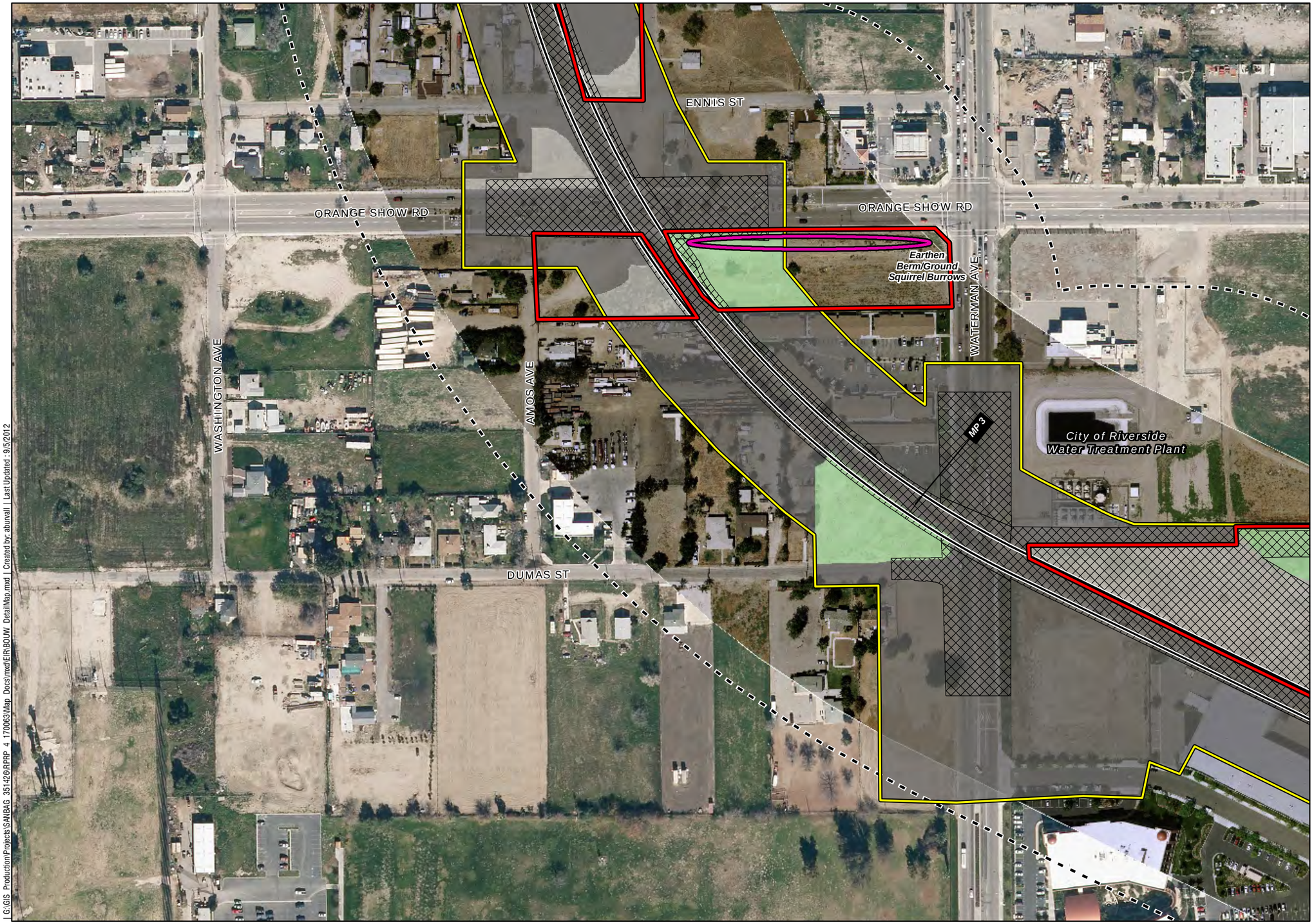

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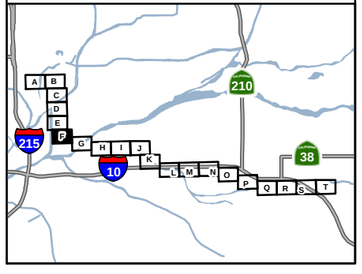

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Burrowing Owl Survey Results

Figure 3 F

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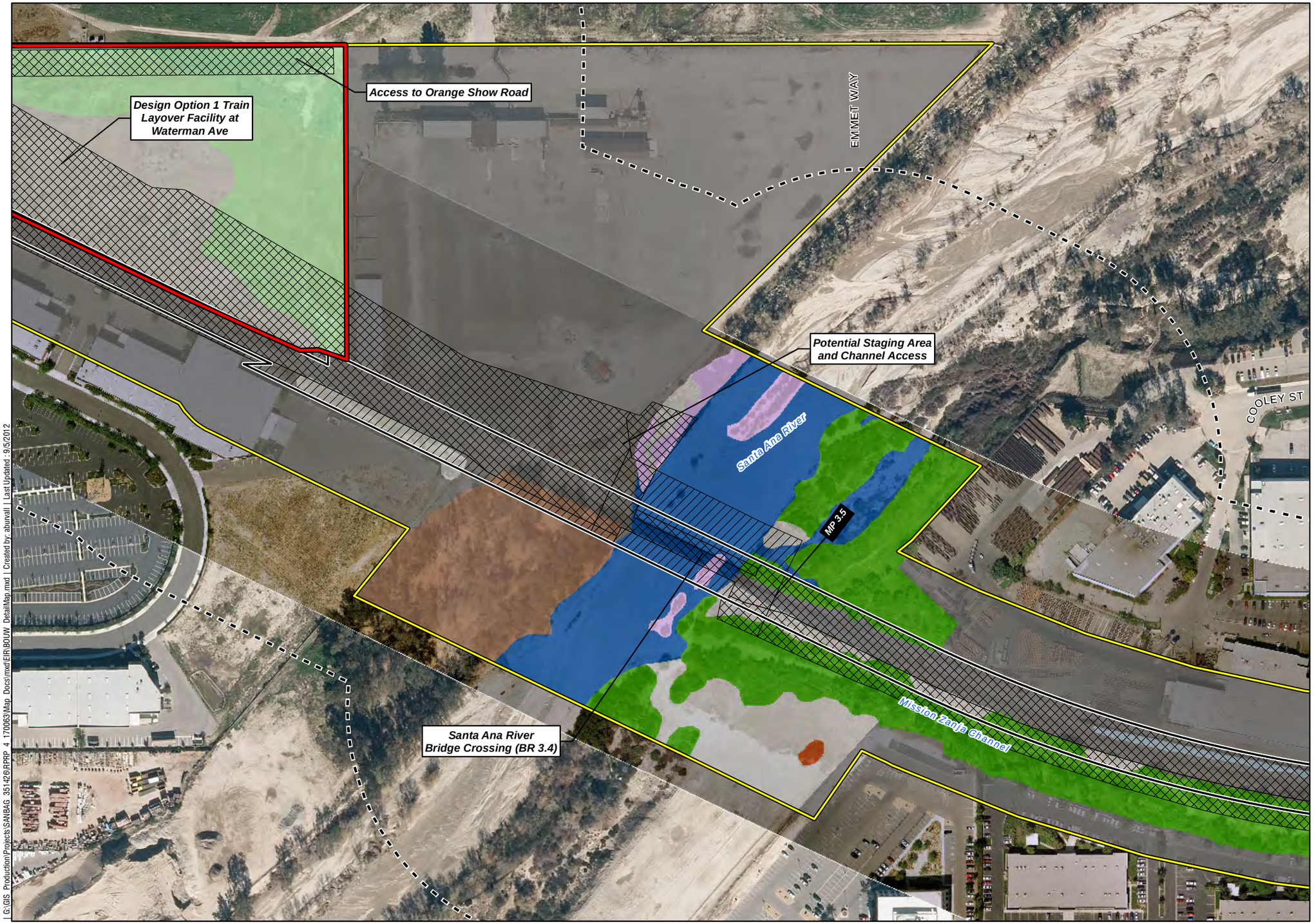

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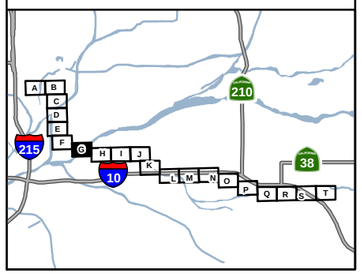

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Burrowing Owl Survey Results

Figure 3 G

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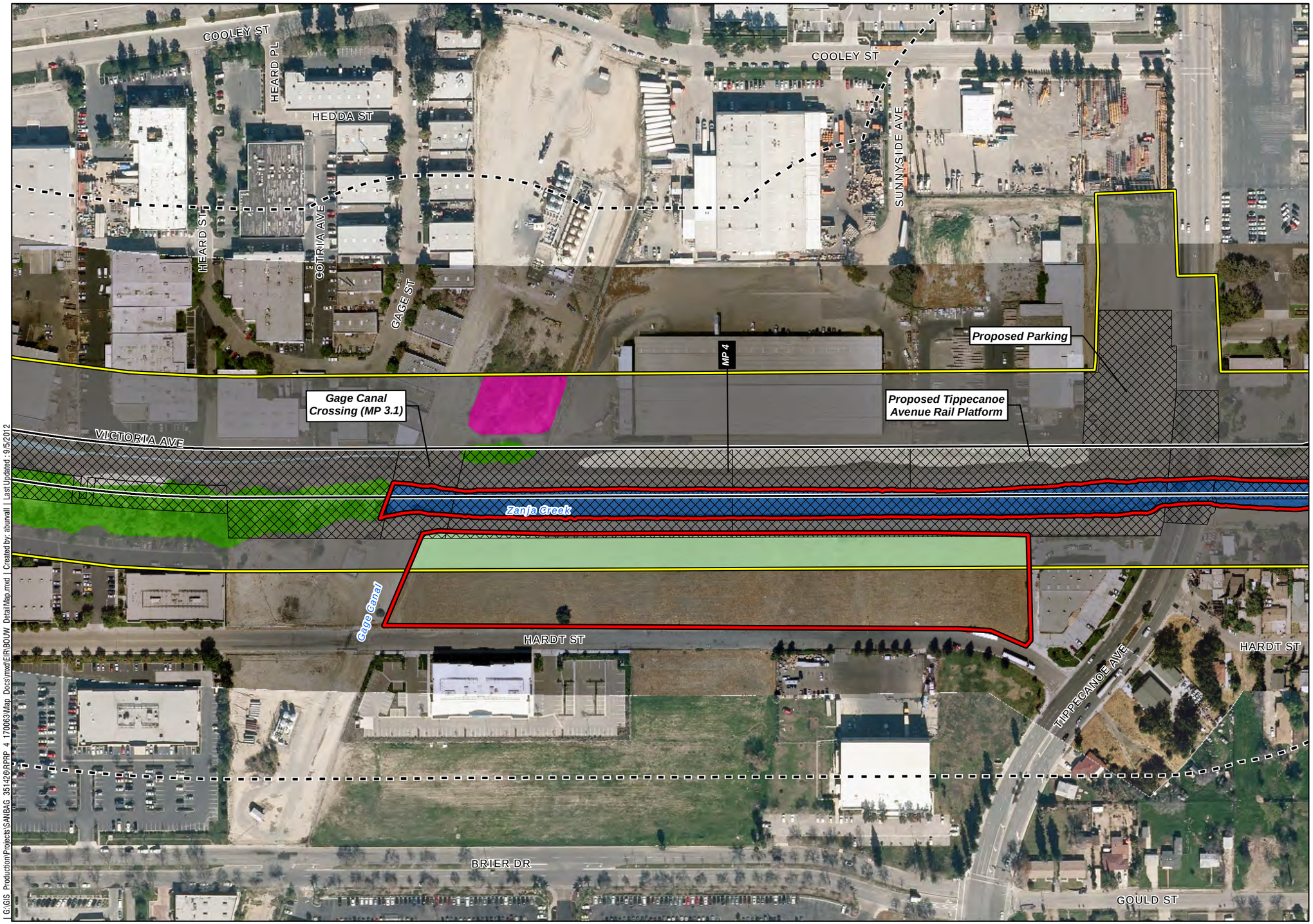


RPRP Study Area

Footprint

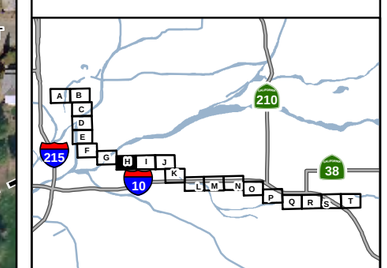
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 H

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

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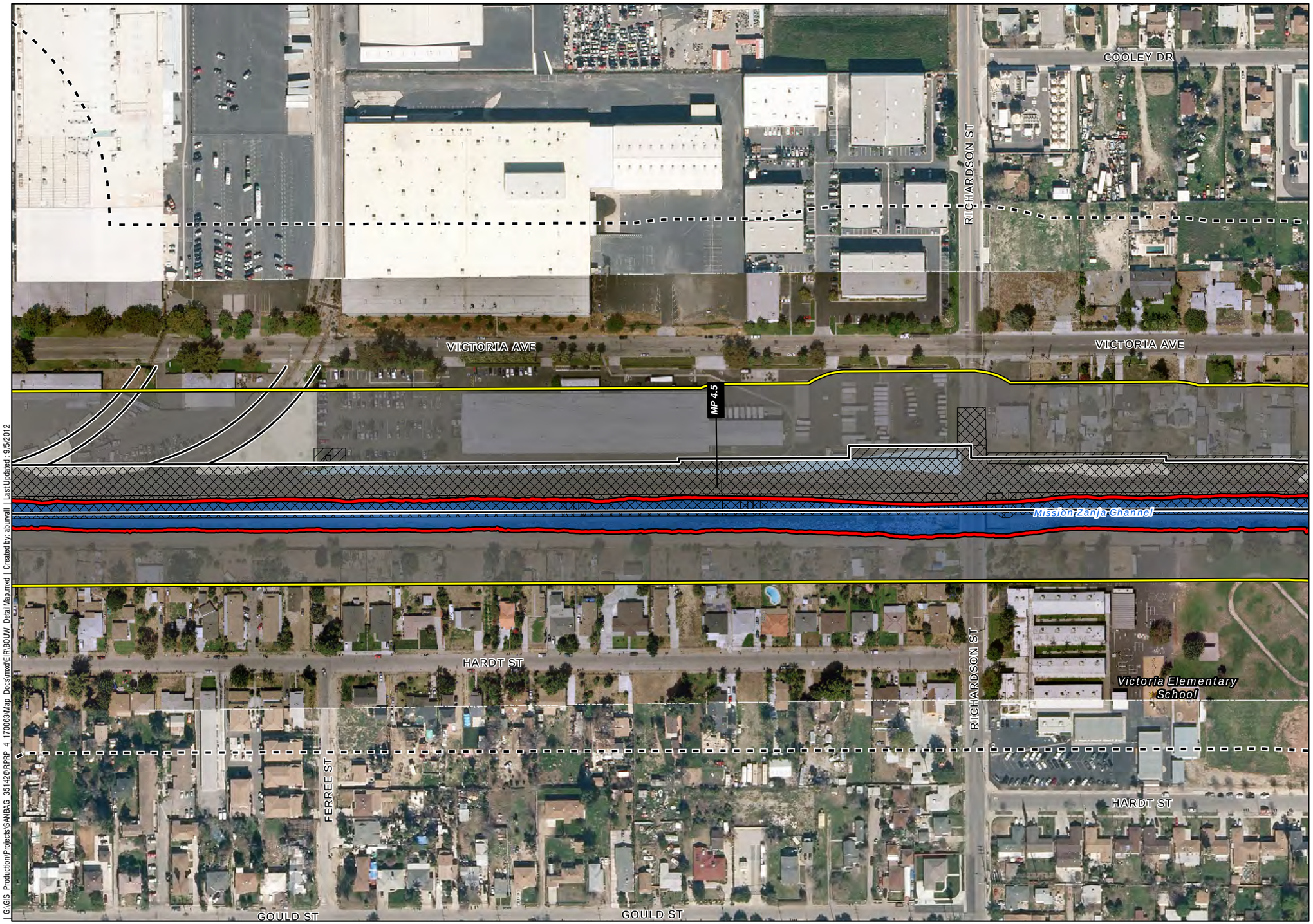

RPRP Study Area

Footprint

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- Railroad ROW

Burrowing Owl Survey

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- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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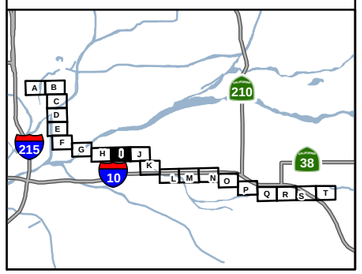

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Burrowing Owl Survey Results

Figure 3 I

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RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
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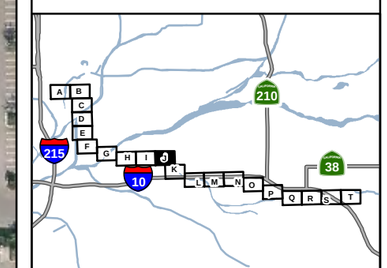
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 J

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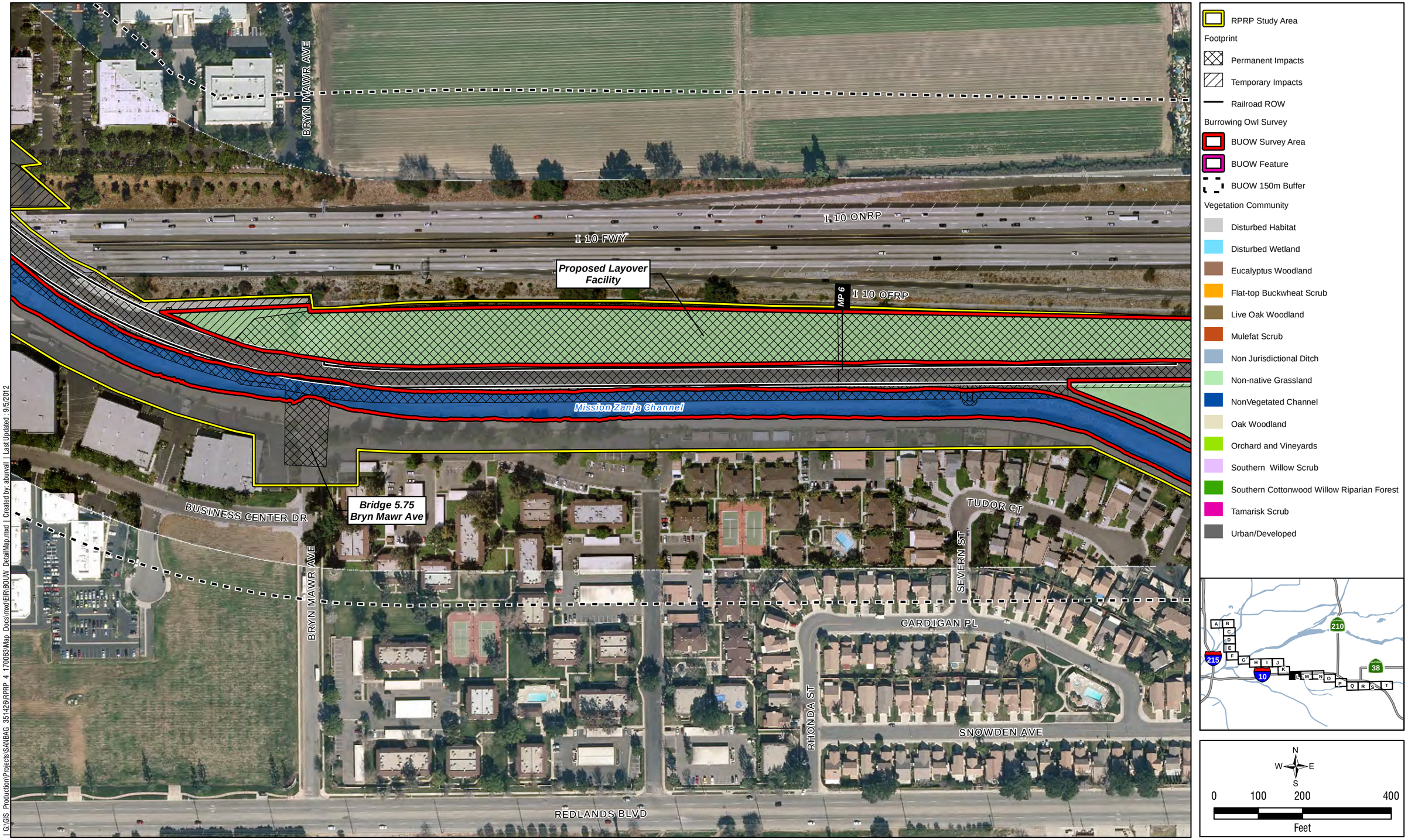

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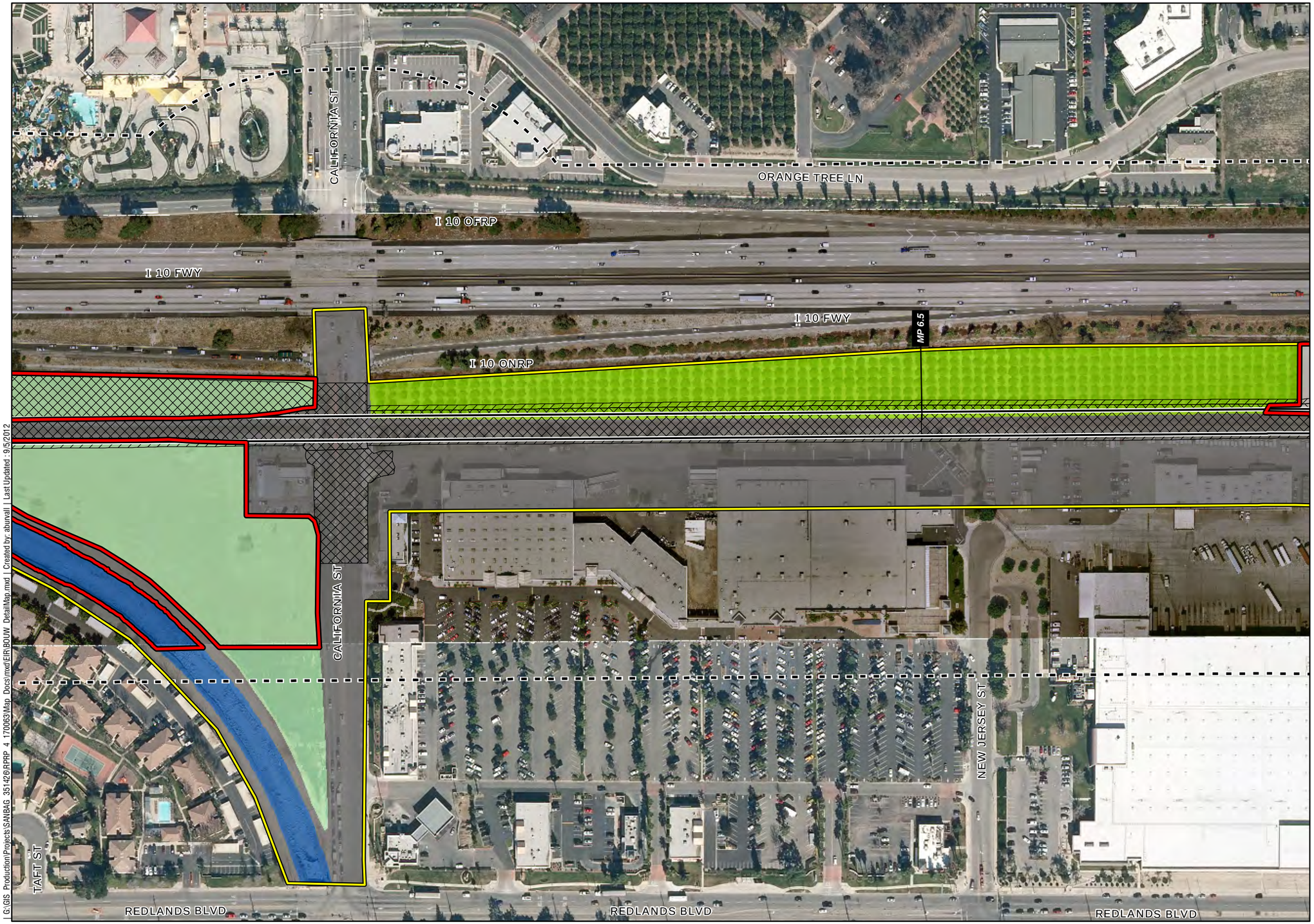
Burrowing Owl Survey Results

Figure 3 L

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

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- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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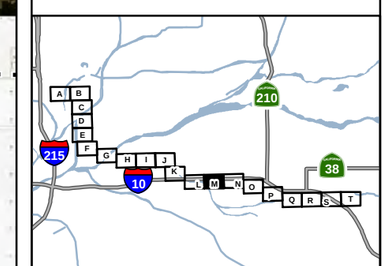
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 M

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RPRP Study Area

Footprint

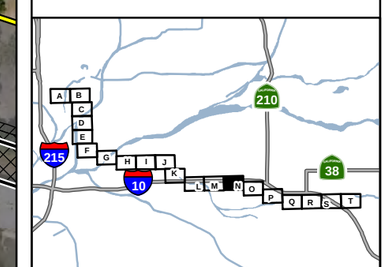
- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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Burrowing Owl Survey Results

Figure 3 N

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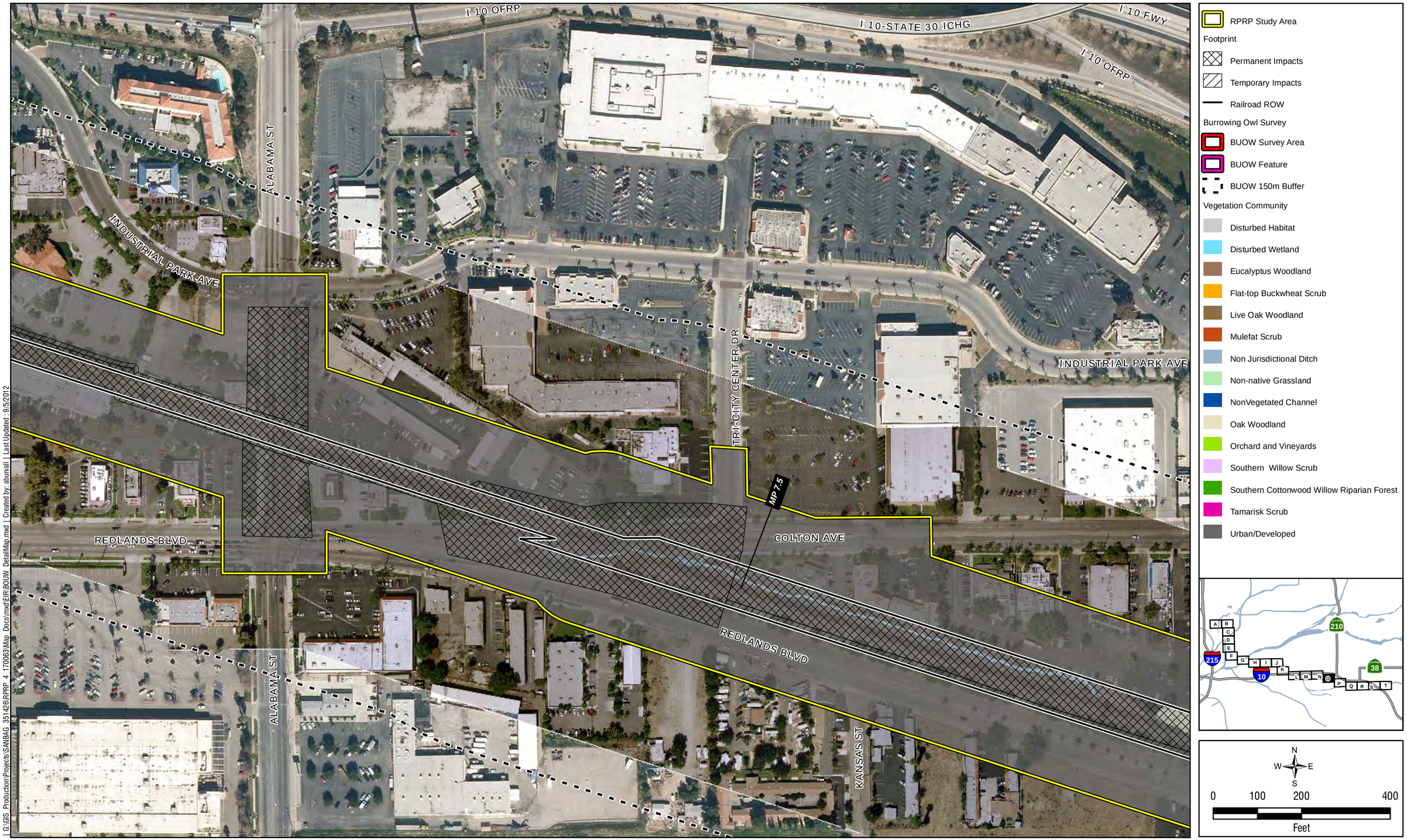

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Burrowing Owl Survey Results

Figure 3 0

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
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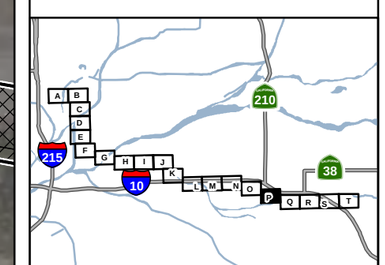
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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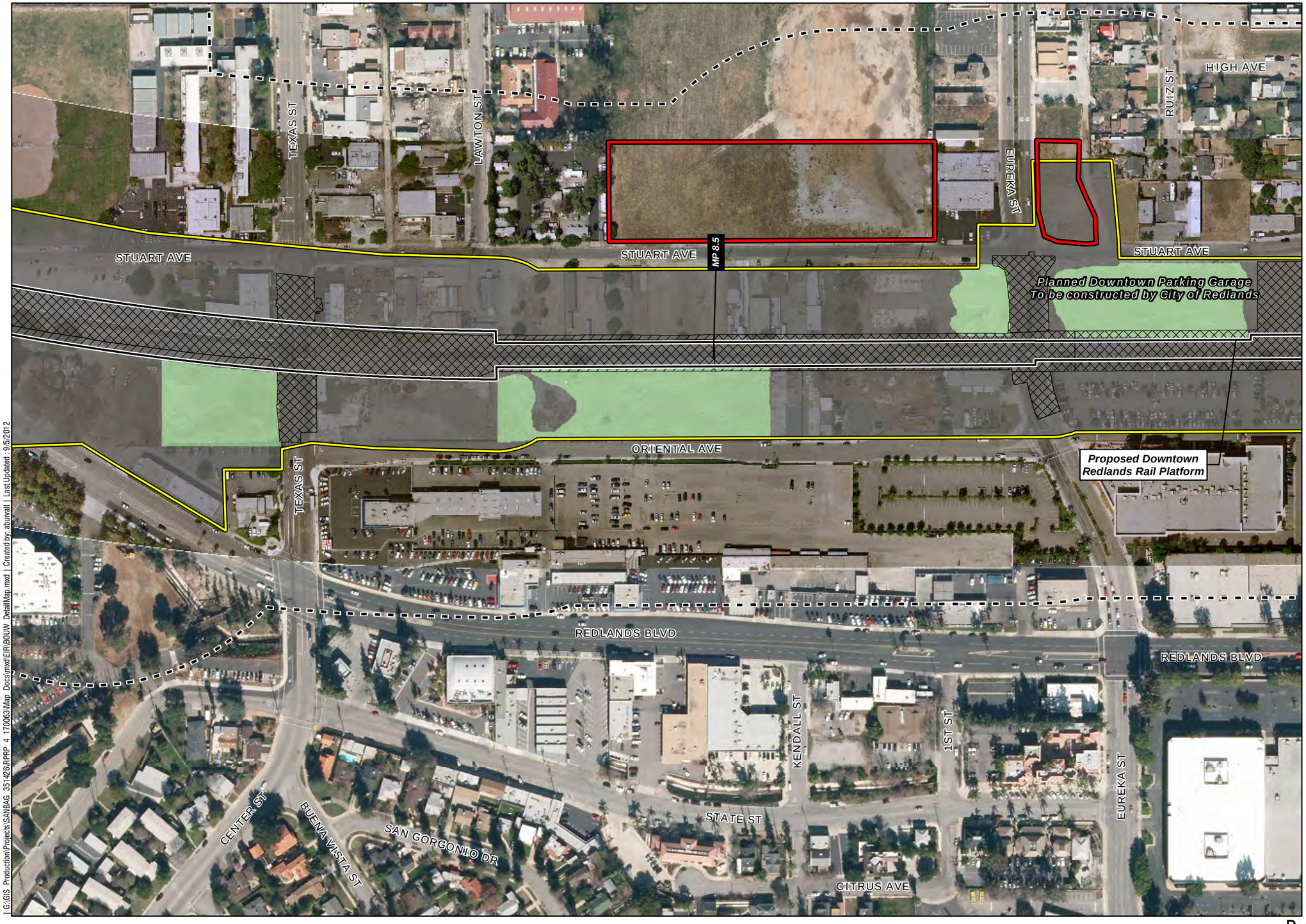
Burrowing Owl Survey Results

Figure 3 P

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
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- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
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- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
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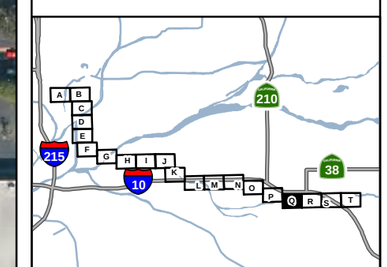

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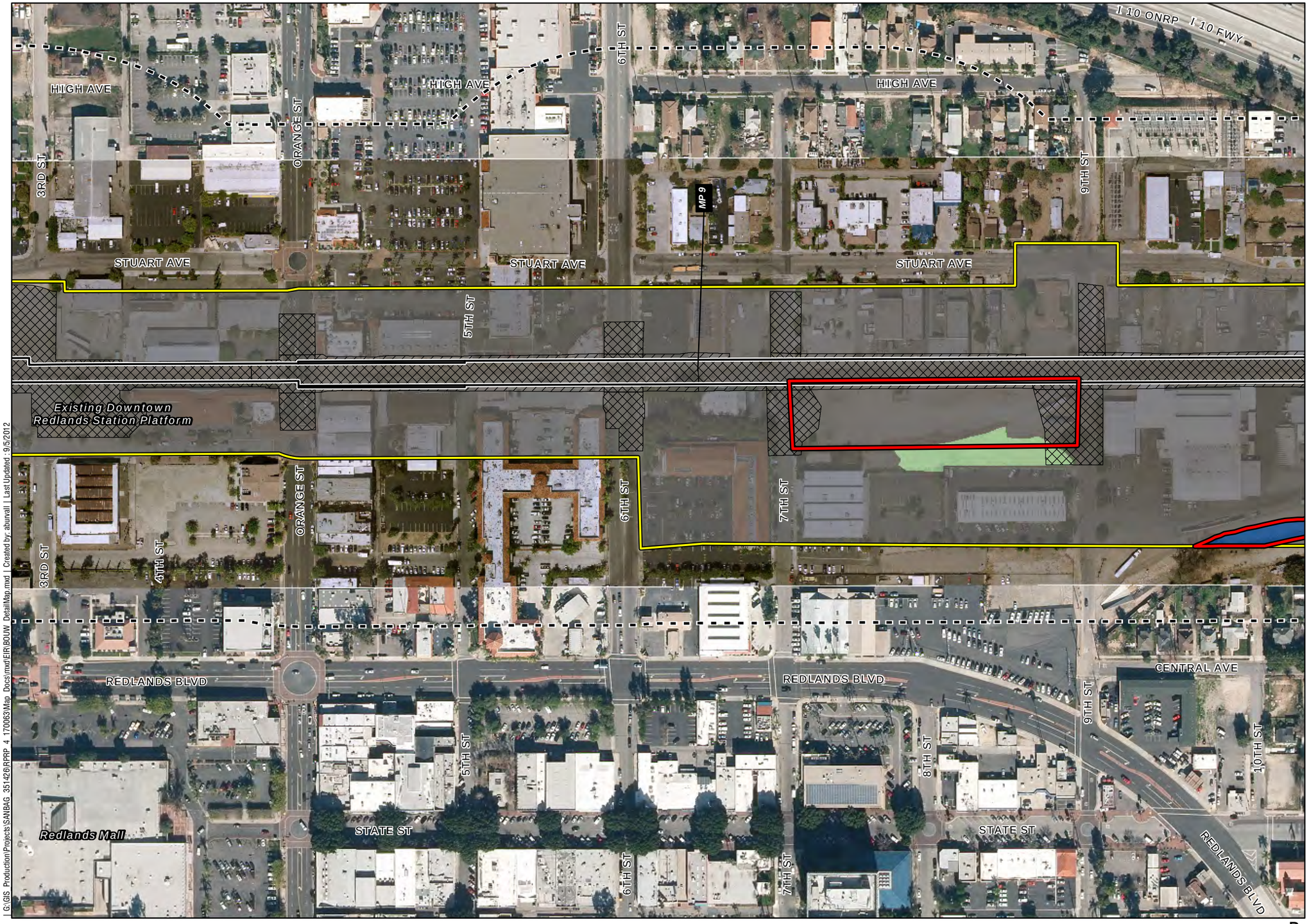
Burrowing Owl Survey Results

Figure 3 Q

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
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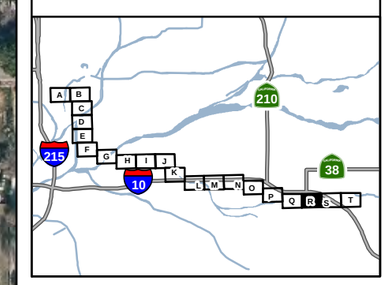
- Live Oak Woodland
- Mulefat Scrub
- Non Jurisdictional Ditch
- Non-native Grassland
- NonVegetated Channel
- Oak Woodland
- Orchard and Vineyards
- Southern Willow Scrub
- Southern Cottonwood Willow Riparian Forest
- Tamarisk Scrub
- Urban/Developed



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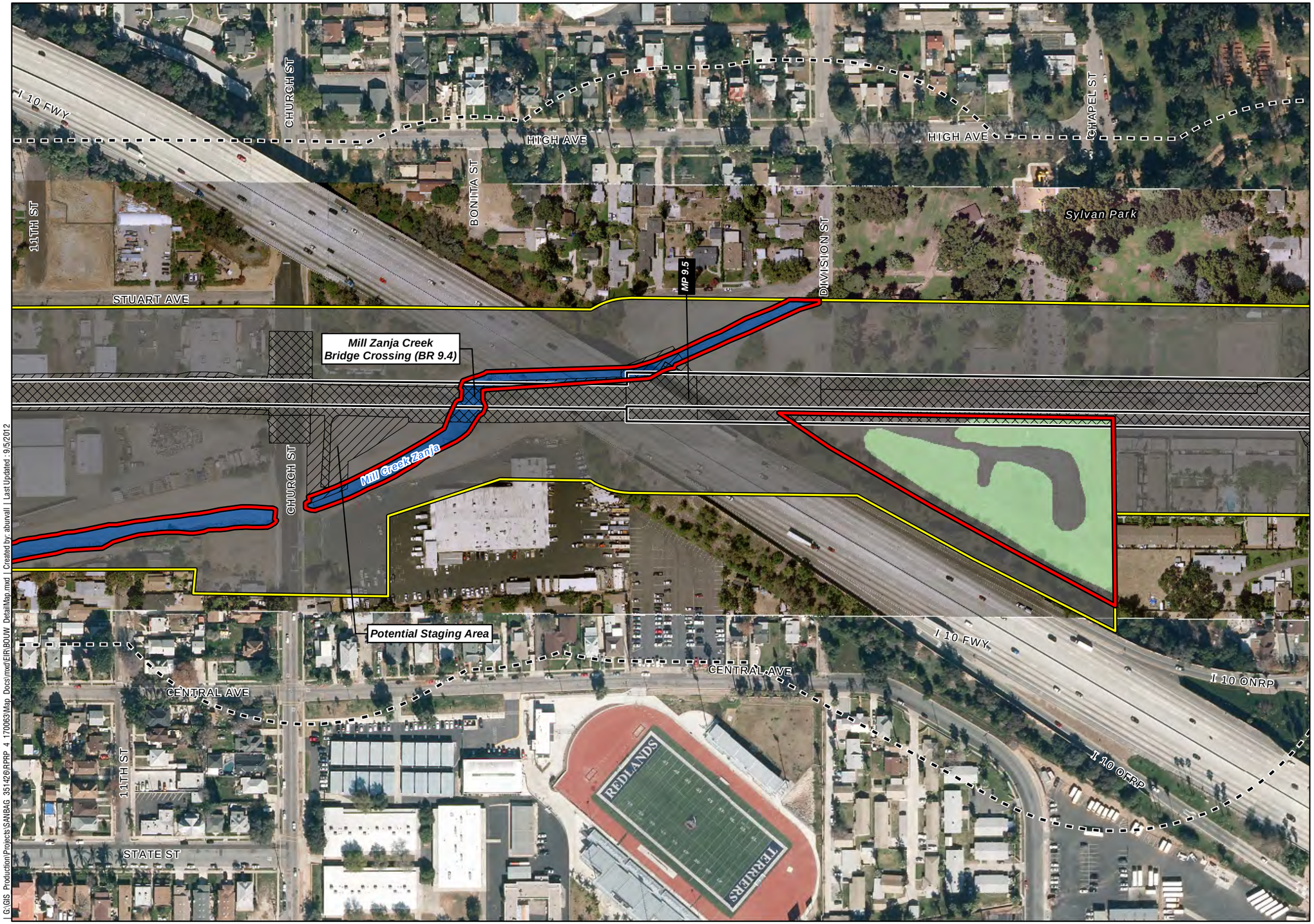
Burrowing Owl Survey Results

Figure 3 R

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



RPRP Study Area

Footprint

- Permanent Impacts
- Temporary Impacts
- Railroad ROW

Burrowing Owl Survey

- BUOW Survey Area
- BUOW Feature
- BUOW 150m Buffer

Vegetation Community

- Disturbed Habitat
- Disturbed Wetland
- Eucalyptus Woodland
- Flat-top Buckwheat Scrub
- Live Oak Woodland
- Mulefat Scrub
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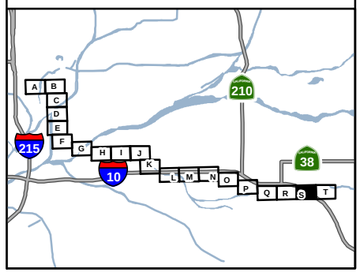

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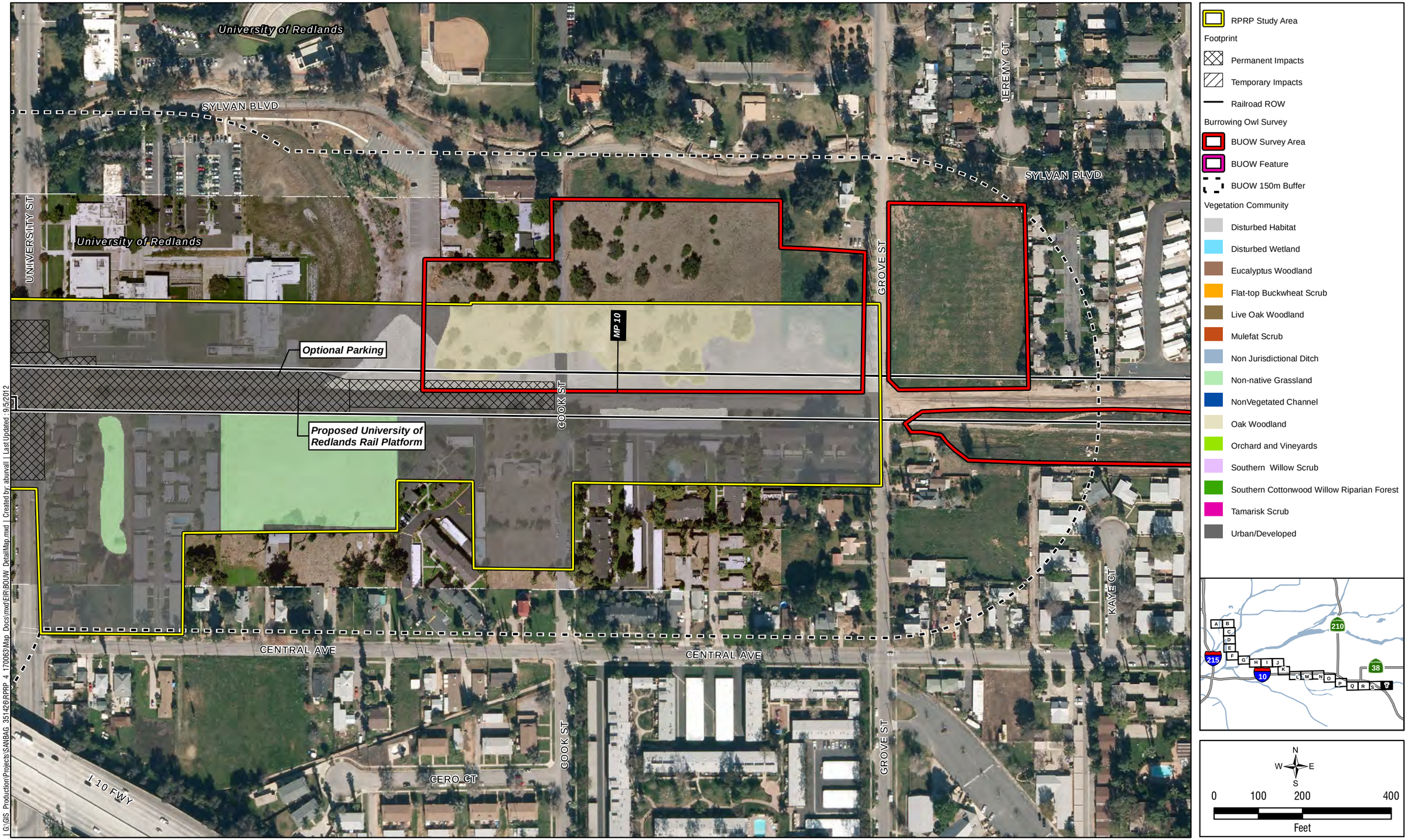
Burrowing Owl Survey Results

Figure 3 S

FTA/SANBAG | Redlands Passenger Rail Project | BUOW



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Burrowing Owl Survey Results

Figure 3 T

FTA/SANBAG | Redlands Passenger Rail Project | BUOW

Table 2. Existing Vegetation within the Project Survey Area

Vegetation Communities	Survey Area Acreage
Disturbed Habitat	24.54
Disturbed Wetland	0.02
Eucalyptus Woodland	2.78
Flat-top Buckwheat Scrub (disturbed)	0.91
Mulefat Scrub	0.04
Non-Jurisdictional Ditch	1.31
Non-Native Grassland	61.90
Non-Vegetated Channel	29.22
Oak Woodland	9.62
Orchard and Vineyards	5.28
Southern Cottonwood Willow Riparian Forest	8.27
Southern Willow Scrub	0.64
Tamarisk Scrub	0.47
Urban/Developed	388.88
Total	**533.88**

*Vegetation was mapped within the Project Area only. These numbers do not include the 500 foot buffer.
**Indicates vegetation community supporting suitable BUOW habitat within the BUOW survey area.

Disturbed habitat in the survey corridor consists of abandoned staging areas, home sites, parking areas, unpaved roads, and areas that have been graded, repeatedly cleared, and/or experienced repeated use that prevents natural revegetation (Appendix A, Photograph 1). Characteristic species include invasive, non-native forbs, such as prickly Russian-thistle/tumbleweed (*Salsola tragus*), London rocket (*Sisymbrium irio*), fennel (*Foeniculum vulgare*). In addition, a limited amount of annual grasses typical of non-native grassland (Holland Code 42200) occur but do not dominate DH. The limited amount of non-native grassland within the DH provides potential habitat for BUOW.

Flat-top Buckwheat Scrub (Holland Code 37000)

Flat-top buckwheat scrub (FBS) consists of a monoculture of successional vegetation that formally supported coastal sage scrub and chaparral in areas that experience continued disturbances. In the survey corridor this community is disturbed, however, it is dominated by flat-topped buckwheat (*Eriogonum fasciculatum*) and Wright's buckwheat (*Eriogonum wrightii)*, with the presence of other species. Other species that were present include annual brome grasses, fescue (*Vulpia* spp.), filaree (*Erodium* spp.), deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), and ranchers fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Within the survey area, FBS occurs within a vacant lot located north of the railroad tracks adjacent to Warm Creek and east of D Street. This habitat is disturbed due to frequent mowing. FBS is potential habitat for BUOW, but the frequent mowing decreases the likelihood that BUOWs will utilize this habitat.

Non-native Grassland (Holland Code 42200)

Non-native grasslands (NNG) are often associated with numerous species of wildflowers and a dense to sparse cover of annual grasses. Characteristic plant species of NNG include oat (*Avena* sp.), rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), foxtail brome *(Bromus madritensis* ssp. *rubens),* four-spot clarkia *(Clarkia purpurea),* sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*).

NNG within the survey area is often disturbed and appears to have been previously irrigated and/or cultivated for agricultural purposes. Characteristics that comprise this attribute include the occurrence of previously open space between rows and these areas appear to be currently maintained. These areas are indicated with a "d" before the vegetation community acronym (e.g., d-NNG).

A ground squirrel population constructed a large cluster of burrows within non-native grassland habitat near Twin Creek (Figure 3d, Appendix A, Photograph 2). Throughout the alignment during surveying in this habitat, biologists noticed the presence of several feral cats and makeshift homeless camps. The empty non-native grass fields appear to be regularly mowed and disked of vegetation, which could negatively impact any BUOW population (Appendix A, Photograph 3). These areas, along with the other areas within the Project, have a low potential for BUOW activity.

Non-Vegetated Channel (Holland Code 13200)

Non-vegetated channel (NVC) consists primarily of engineered/leveed channels maintained by the San Bernardino County Flood Control District or local municipality. The channels are either concrete-lined or consist of a fine to coarse sandy or sandy cobbly substrate and are sparsely vegetated or unvegetated. Leveed banks consist of either concrete, concrete-covered cobble, or rock rip rap.

Within the survey area, FVC occurs primarily in Twin Creek, Warm Creek, the Santa Ana River, Mission Zanja Creek (Appendix A, Photographs 4 and 5). Portions of this vegetation community have rodent burrows and provide potential habitat for BUOW (Figures 3a-3t; Appendix A, Photograph 3).

Oak Woodland (Holland Code 71100)

Oak woodland (OW) consists primarily of monotypic stands or various species of oak (*Quercus* sp.) with a poorly developed shrub layer, and well developed herbaceous layer generally dominated by grasses (*Bromes* spp.).

In the survey area this vegetation community consists of uniformly distributed scrub oak (*Quercus berberidifolia*) with an occasional live oak (*Quercus agrifolia*) and a disturbed understory made up of non-native grasses that appear to be maintained. The area provides little habitat value due to the amount of disturbance and the surrounding land uses.

Orchard and Vineyards (Holland Code 18100)

Orchard and vineyards (OV) occurs as an active orange grove located north of the ROW between California and Nevada Streets.

Urban/Developed (Holland Code 12000)

Urban/developed (UD) land is comprised of areas of intensive use with much of the land constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is highly modified and characterized by permanent or semi-permanent structures, pavement, unvegetated areas and landscaped areas that require irrigation. Small areas of UD have the potential to support BUOW.

Within the survey corridor, developed areas are comprised of paved roadways, man-made structures, adjacent lands that are unvegetated, or landscapes with a variety of ornamental (typically non-native/ exotic) plants.

6.2 FOCUSED BURROWING OWL SURVEY RESULTS

No BUOW, sign, or active/inactive burrows were observed during 2012 BUOW focused surveys. The few suitable burrows throughout the alignment were extensively surveyed and no sign of owls including pellets, tracks, or feathers were observed. The areas that qualified as low potential were also surveyed and no sign of owls were observed (Figures 3a-3t).

7.0 CONCLUSIONS AND RECOMMENDATIONS

During focused surveys, no BUOW were detected within the Project area and the 500-foot buffer. Throughout the surveys, no evidence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement near burrow entrances were observed. While the Project area does have open habitat, the lack of large burrows, presence of other birds of prey, regularly mowed and disked fields, makeshift homeless camps, surrounding commercial/urban development and large population of feral cats have created less than ideal conditions to support high populations of BUOW and nesting/foraging habitat.

However, given that burrowing mammals have the potential to excavate burrows over time making the unvegetated areas with exposed soil more suitable, a pre-construction survey is recommended prior to the initiation of construction.

8.0 BIBLIOGRAPHY

American Ornithologist's Union. 2005. Forty-sixth Supplement to the American Ornithologist's Union Check-List of North American Birds. *The Auk* 122(3):1026-1031.

Burt, W. H. and R. P. Grossenheider. 1980. A Field Guide to the Mammals. Houghton-Mifflin Company, 289p.

Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, P. A. Rabie, and B. R. Euliss. 1999. Effects of management practices on grassland birds: Burrowing Owl. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/grasbird/buow/buow.htm

DeSante, D. F., Ruhlen, E. D., and Rosenberg, D. K. 2004. Density and abundance of Burrowing Owls in the agricultural matrix of the Imperial Valley, California. Studies Avian Biol. 27:116–119.

Dundas, H., and J. Jensen. 1994/95. Burrowing Owl status and conservation. Bird Trends 4:21-22.

Gervais, J. A., and Anthony, R. G. 2003. Chronic organochlorine contaminants, environmental variability, and demographics of a Burrowing Owl population. Ecol. Applications 13:1250–1262.

Grant, R. A. 1965. The Burrowing Owl in Minnesota. Loon 37:2-17.

Green, G. A., and Anthony, R. G. 1989. Nesting success and habitat relationships of Burrowing Owls in the Columbia basin, Oregon. Condor 91:347–354.

Haug, E. A., B. A. Millsap and M. S. Martell. 1993. Burrowing Owl (*Athene cunicularia*), the Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/061/articles/introduction

Haug, E. A., B. A. Millsap, and M. S. Martell. 1993. Burrowing Owl (*Speotyto cunicularia*). *In* A. Poole and F. Gill, editors. The Birds of North America, No. 61. The Academy of Natural Sciences, Philadelphia, Pennsylvania; The American Ornithologists' Union, Washington, DC.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, Nongame-Heritage Program. 156p (amended).

Hickman, J.C., ed. 1993. The Jepson Manual, Higher Plants of California. University of California Press, Berkeley. 1400 pp.

Klute, D. S., L. W. Ayers, M. T. Green, W. H. Howe, S. L. Jones, J. A. Shaffer, S. R. Sheffield, and T. S. Zimmerman. 2003. Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

Konrad, P. M., and D. S. Gilmer. 1984. Observations on the nesting ecology of Burrowing Owls in Central North Dakota. Prairie Naturalist 16:129-130.

Ratcliff, B. D. 1986. The Manitoba Burrowing Owl survey, 1982-1984. Blue Jay 44:31-37.

Roberts, F. M., Jr., S. D. White, A. C. Sanders, D. E. Bramlet, and S. Boyd. 2004. The Vascular Plants of Western Riverside County, California: An Annotated Checklist. F. M. Roberts Publications, San Luis Rey, CA.

Rodriguez-Estrella, R., F. Chavez Ramirez, and G.L. Holroyd. 1998. Current knowledge of the Burrowing Owl in Mexico: what is needed for a conservation plan? Abstract and notes. Second International Burrowing Owl Symposium, Ogden, Utah.

Rosenberg, D. K., and Haley, K. L. 2004. The ecology of Burrowing Owls in the Agroecosystem of the Imperial Valley, California. Studies Avian Biol. 27:120–135.

Shuford, W., and T. Gardali, ed. 2008. California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

"Staff Report on Burrowing Owl Mitigation." *State of California Natural Resource Agency*. Department of Fish and Game, 7 Mar. 2012. Web. Viewed 30 March. 2012. <http://www.dfg.ca.gov/wildlife/nongame/docs/BUOWStaffReport.pdf>.

Stebbins, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. Houghton Mifflin Company, Boston. 336p.

Thomsen, L. 1971. Behavior and ecology of Burrowing Owls on the Oakland Municipal Airport. Condor 73:177–192.

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