

Appendix 4.0

Determination of Biologically Equivalent or Superior Preservation Analysis

Palomar Street Improvement Project

Determination of Biologically Equivalent or Superior Preservation Analysis

Prepared for:

Daniel A. York
City of Wildomar
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595

Prepared by:

HELIX Environmental Planning, Inc.
16485 Laguna Canyon Road, Suite 150
Irvine, CA 92618

June 24, 2020 | PLW-01

This page intentionally left blank

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Study Area Location	1
1.2 Project Description	1
2.0 RIPARIAN/RIVERINE (SECTION 6.1.2)	2
2.1 Methods	2
2.1.1 Habitat Assessment	2
2.1.2 Jurisdictional Delineation.....	3
2.1.3 MSHCP Consistency Analysis	3
2.2 Existing Conditions.....	3
2.2.1 Study Area Description	3
2.2.2 Riparian Areas	4
2.2.3 Species Associated with Riparian/Riverine Areas.....	4
3.0 PROJECT IMPACTS.....	10
3.1 Impacts to Riparian Areas	10
3.2 Impacts to Species Associated with Riparian/Riverine Areas.....	10
4.0 AVOIDANCE	10
5.0 MITIGATION AND EQUIVALENCY	12
5.1 Direct Effects	12
5.2 Indirect Effects	13
6.0 CONCLUSION.....	16
7.0 CERTIFICATION/QUALIFICATION.....	17
8.0 REFERENCES	18

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

- A Drainage Photographs

LIST OF FIGURES

<u>No.</u>	<u>Title</u>	<u>Follows Page</u>
1	Regional Location.....	1
2	Project Vicinity (USGS Topography).....	1
3	Project Vicinity (Aerial Photograph)	1
4	Site Plan	1
5	MSHCP Criteria Cell.....	2
6	MSHCP Riparian Areas	4
7	Impacts to MSHCP Riparian Areas	11

LIST OF TABLES

<u>No.</u>	<u>Title</u>	<u>Page</u>
Table 1	MSHCP RIPARIAN AREAS	4
Table 2	MSHCP RIPARIAN/RIVERINE AND VERNAL POOL PLANT SPECIES.....	5
Table 3	MSHCP RIPARIAN/RIVERINE AND VERNAL POOL ANIMAL SPECIES	7
Table 4	IMPACTS TO MSHCP RIPARIAN AREAS.....	10
Table 5	MITIGATION FOR IMPACTS TO RIPARIAN AREAS	12

ACRONYMS AND ABBREVIATIONS

AMSL	Above Mean Sea Level
APN	Assessor's Parcel Number
BMP	Best Management Practices
BUOW	Burrowing Owl
CDFW	California Department of Fish and Wildlife
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
City	City of Wildomar
DBESP	Determination of Biologically Equivalent or Superior Preservation
Dudek	Dudek & Associates
GBRA	General Biological Resources Assessment
HELIX	HELIX Environmental Planning, Inc.
LBVI	Least Bell's Vireo
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
Project	Palomar Street Improvement Project
Project Proponent	City of Wildomar
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey

Report Date:	June 24, 2020
Title:	Determination of Biologically Equivalent or Superior Preservation for The Palomar Phase I Road Improvements Project
Project Location:	The approximately 36.96-acre study area consists of the right-of-way for Palomar Street Clinton Keith Road from McVicar Street to the north, to Laura Drive to the south, and along both sides of Clinton Keith Road extending a short distance east and west from the intersection with Palomar Street in the City of Wildomar, Riverside County, California. The site is located within the U.S. Geological Survey (USGS) 7.5-minute Wildomar and Murrieta quadrangle maps in an unsectioned area of Township 7 South, Range 4 West and also includes a portion in Range 3 West.
Assessor's Parcel Numbers:	The majority of the project occurs in road right-of-way that do not have Assessor's Parcel Numbers (APN). Adjacent APN with Riparian/Riverine resources include: 380-130-003, 380-130-013, 380-140-004, 380-140-005, 380-170-021, and 380-200-008.
Owner/Applicant:	Mr. Daniel A. York City of Wildomar 23873 Clinton Keith Road, Suite 201 Wildomar, CA 92595
Principal Investigator:	HELIX Environmental Planning, Inc. 16485 Laguna Canyon Road, Suite 150 Irvine, CA 92618 (949) 234-8770
Report Summary:	The approximately 36.96-acre study area was surveyed for burrowing owl (<i>Athene cunicularia</i> ; BUOW) habitat, MSHCP Riparian/Riverine and Vernal Pool resources, and jurisdictional features, along with an assessment for other sensitive species. Least Bell vireo (<i>Vireo bellii pusillus</i>) and BUOW focused surveys are currently being conducted. The study area supports approximately 0.78 acre of MSHCP Riparian Areas. No riparian/riverine species, vernal pools, or sensitive species have been observed on the study area to date. The project proposes impacts to approximately 0.64 acre of Riparian Areas. Mitigation for impact to Riparian Areas are proposed at a 2:1 ratio for native riparian habitat. Non-native vegetation, ornamental, and disturbed habitats are proposed to be mitigated at a 1:1 ratio. The mitigation for these resources are proposed through purchase of credits from an agency-approved mitigation bank or in-lieu fee program. The project also proposes impacts to developed habitat consisting of riprap features within the streambed. Developed habitat will be mitigated on-site at a 1:1 ratio.

Report Preparers:	Robert Hogenauer	(562) 537-2426
	Ezekiel Cooley	(949) 234-8770
	Lauren Singleton	(949) 234-8770

Field Personnel:	Ezekiel Cooley	(949) 234-8770
	Daniel Torres	(949) 234-8770
	Rob Hogenauer	(562) 537-2426

This page intentionally left blank

1.0 INTRODUCTION

At the request of the City of Wildomar (City; Project Proponent), HELIX Environmental Planning, Inc. (HELIX) prepared this Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis to address consistency of the proposed Palomar Phase I Road Improvements Project (project) with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP; Dudek and Associates [Dudek] 2003), specifically with MSHCP Section 6.1.2. Consistency. Project consistency with other sections of the MSHCP is addressed in the General Biological Resources Assessment (GBRA; HELIX Environmental Planning [HELIX] 2020). The study area is located within the Elsinore Area Plan of the MSHCP and is not located within any Criteria Cell or Group Cell targeted for conservation by the MSHCP.

This DBESP analysis provides information necessary for the City as the MSHCP Permittee to find that the project, with mitigation and conservation measures incorporated, would result in a biologically equivalent or superior MSHCP Conservation Area design and configuration compared to the baseline condition.

This DBESP focuses on demonstrating project consistency and conservation with respect to MSHCP Section 6.1.2 due to unavoidable impacts to Riparian/Riverine Areas. MSHCP Section 6.1.2 states the following:

“The purpose of the procedures described in this section is to ensure that the biological functions and values of these areas throughout the MSHCP Plan Area are maintained such that Habitat values for species inside the MSHCP Conservation Area are maintained.”

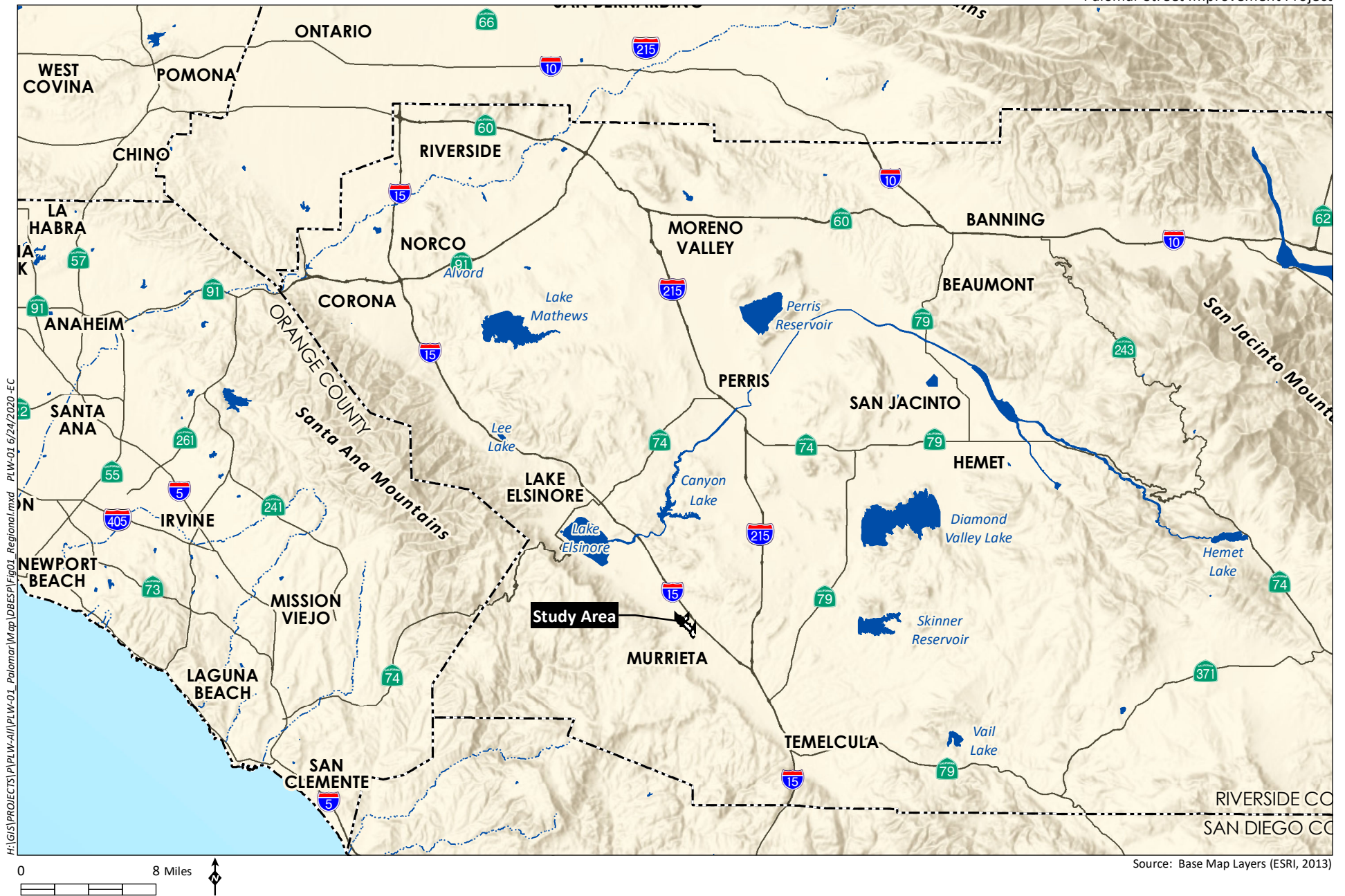
The emphasis is on conservation of habitats capable of supporting MSHCP Covered Species, particularly within an identified MSHCP Conservation Area. For projects that propose impacts to Riparian/Riverine or Vernal Pool resources, a DBESP assessment must be completed to ensure that the proposed alternative provides for “replacement of any lost functions and values of Habitat as it relates to Covered Species.” This DBESP analysis provides information necessary for the City to find that the project meets these objectives.

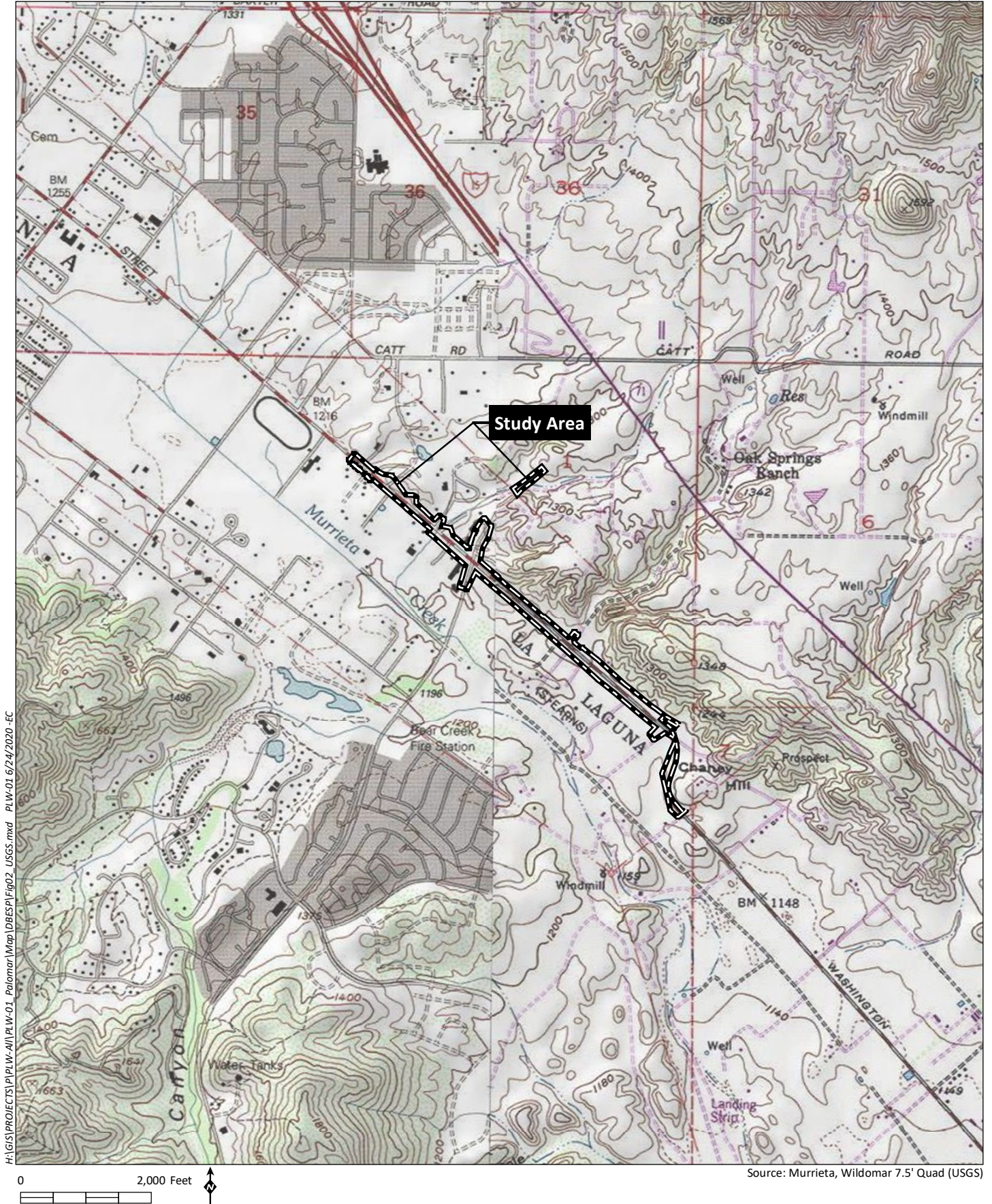
1.1 STUDY AREA LOCATION

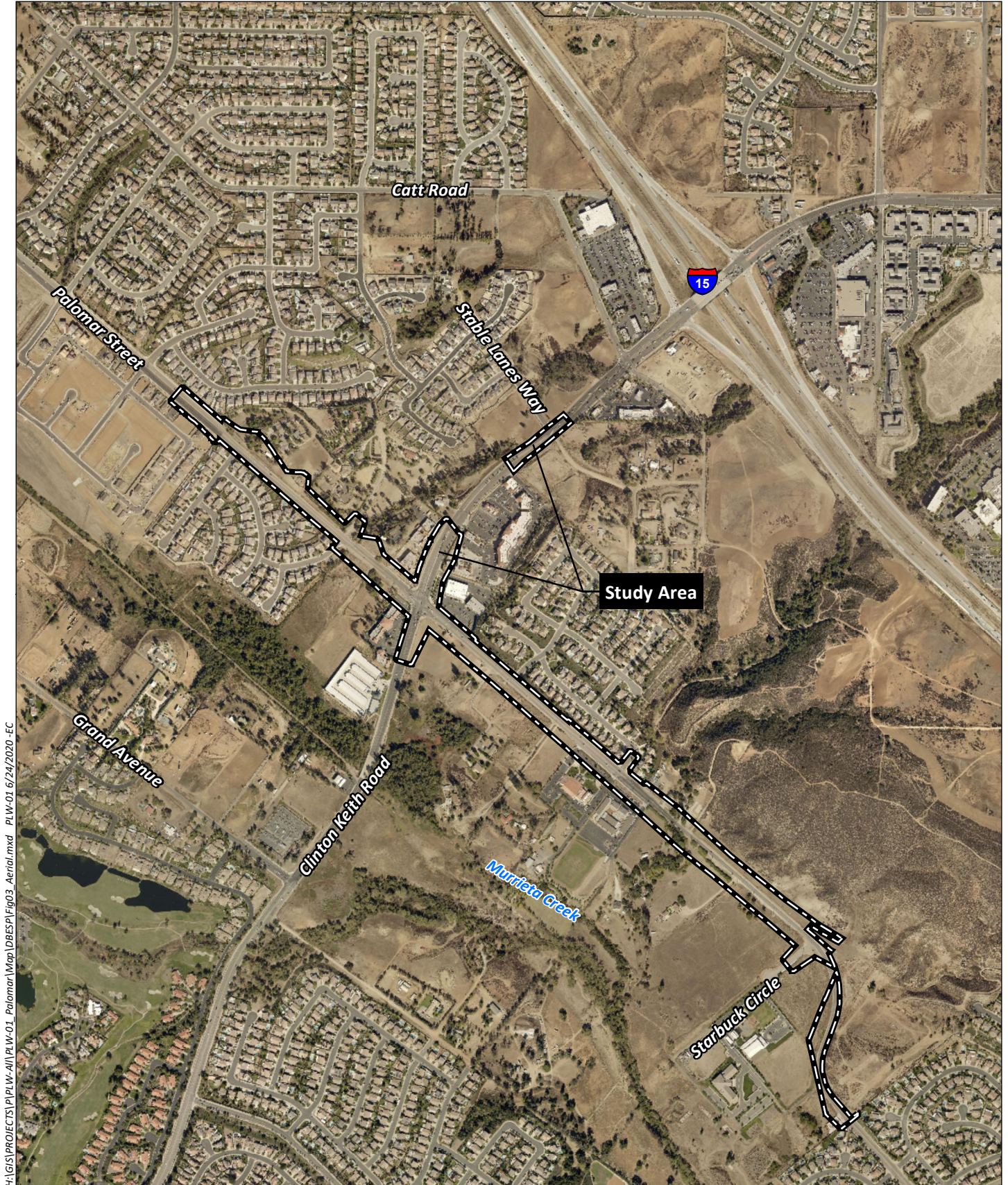
The study area is located in the City of Wildomar and within unincorporated portions of southwestern Riverside County (Figure 1, *Regional Location*). The 36.96-acre study area is located within an unsectioned area of Township 7 South, Range 4 West and a portion in Range 3 West, on the U.S. Geological Survey (USGS) 7.5-minute Murrieta and Wildomar quadrangles (Figure 2, *USGS Topography*). The study area comprises the right-of-way for Palomar Street, Clinton Keith Road from McVicar Street to the north, to Laura Drive to the south, and along both sides of Clinton Keith Road extending short distances east and west from the intersection with Palomar Street (Figure 3, *Aerial Photograph*).

1.2 PROJECT DESCRIPTION

The project proposes to improve connectivity for active transportation users by filling in sidewalk/trail gaps and adding bicycle lanes along portions of two major roadways in the City of Wildomar- Palomar Street and Clinton Keith Road (Figure 4, *Site Plan*). On Palomar Street, 4,100 linear feet of Class II bicycle

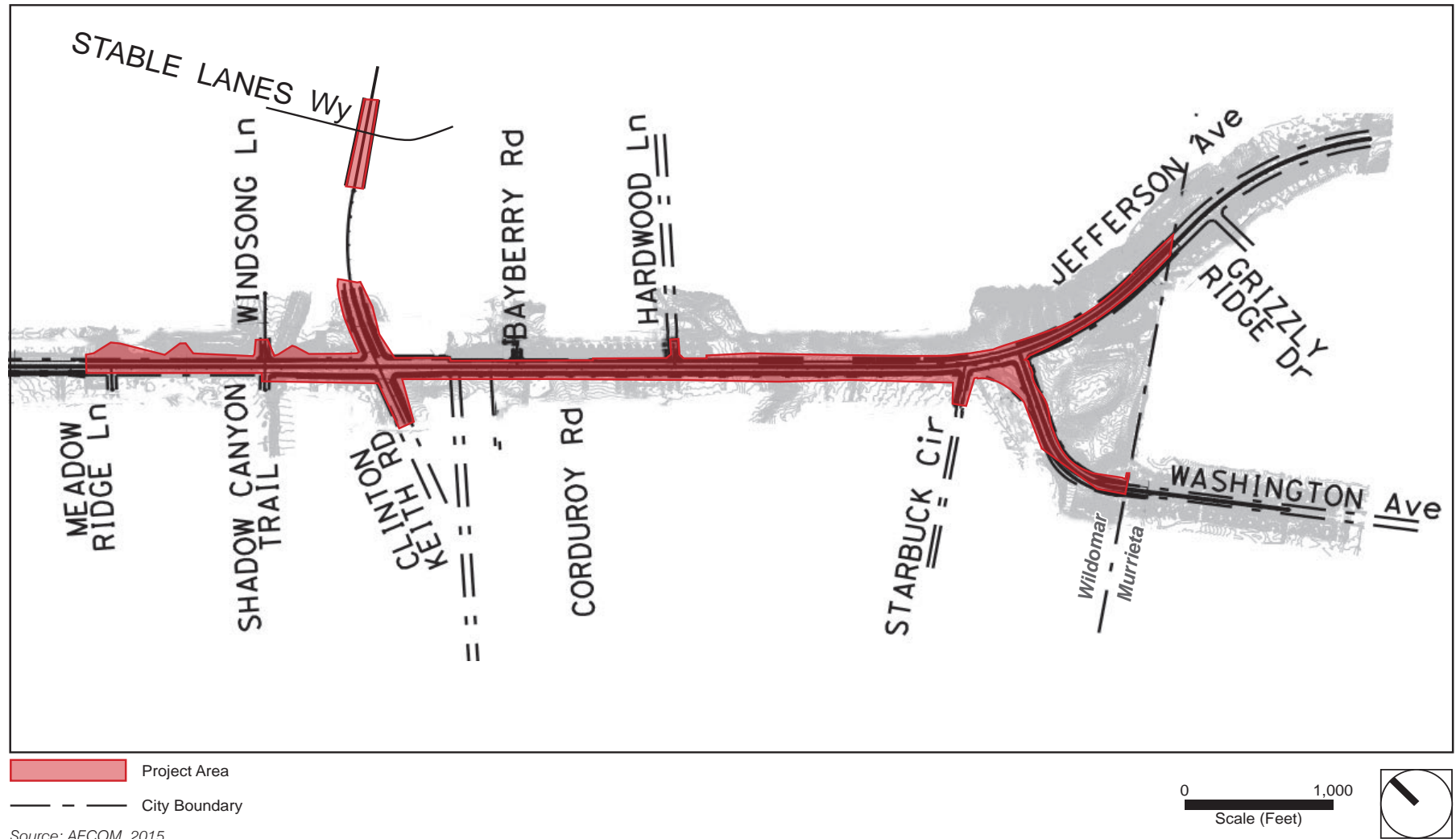






H:\GIS\PROJECTS\PLW-A\PLW-01_Palomar\Map\DBESP\Fig03_Aerial.mxd PLW-01 6/24/2020 - EC

Figure 4 - Site Plan



PlaceWorks
Source: Place Works, 2019

lanes and 2-foot-wide buffers are proposed between McVicar Street and Clinton Keith Road. In addition, approximately 530 linear feet of sidewalks/trails will be filled in along the south side of Palomar Street to create a continuous barrier free path along this segment to connect to newly constructed bike lanes on Clinton Keith Road. On Clinton Keith Road, 630 linear feet of sidewalk is proposed to fill in a sidewalk gap which will increase connectivity for pedestrians accessing the various business and retail stores along Clinton Keith Road. A portion of the proposed improvements that include connecting Jefferson Avenue to Palomar Street fall within the Camelia Project and will be built by the project proponent.

2.0 RIPARIAN/RIVERINE (SECTION 6.1.2)

2.1 METHODS

2.1.1 Habitat Assessment

A Riparian/Riverine and Vernal Pool habitat assessment was conducted by HELIX on December 19, 2019. The habitat assessment was conducted concurrently with the jurisdictional delineation. The identification of Riparian/Riverine habitats was based on potential for the habitat to support, or are tributary to habitat that support, Riparian/Riverine Covered Species identified in MSHCP Section 6.1.2.

Riparian/Riverine Areas are defined in MSHCP Section 6.1.2 as:

“Riparian/riverine areas are lands that contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or depend upon soil moisture from a nearby freshwater source; or areas with freshwater flow during all or a portion of the year.”

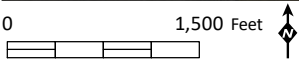
Vernal Pools are defined in MSHCP Section 6.1.2 as:

“Vernal pools are seasonal wetlands that occur in depression areas that have wetland indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics and the definition of the watershed supporting vernal pool hydrology must be made on a case-by-case basis. Such determinations should consider the length of time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area’s wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records.”

Section 6.1.2 of the MSHCP states that “areas demonstrating characteristics [of riparian/riverine habitat] which are artificially created are not included in these definitions” of riparian/riverine habitat. The identification of Riparian/Riverine and Vernal Pool habitats is based on the potential for the habitat to support Riparian/Riverine and Vernal Pool Covered Species, which are identified in Section 6.1.2 of the MSHCP. These species include least Bell’s vireo (*Vireo bellii pusillus*; LBVI) and a suite of other animals and plants outlined in Section 6.1.2 of the MSHCP. During the field survey, the study area was evaluated



H:\GIS\PROJECTS\PLW-A\PLW-01_Palomar\Map\DBESP\Fig05_MSHCP_CriteriaCell.mxd PLW-01 6/24/2020-EC



Source: Aerial (Riverside County, 2016)

for habitat that could support animals and/or plants identified by the MSHCP as Riparian/Riverine and Vernal Pool species.

2.1.2 Jurisdictional Delineation

HELIX conducted the jurisdictional delineation field work on December 19, 2019. Prior to beginning fieldwork, aerial photographs (1-inch = 100-foot scale), topographic maps (1-inch = 100-foot scale), and USGS quadrangle maps were reviewed to assist determining potential jurisdictional waters and wetlands on the study area. Data collection was targeted in areas that were deemed to have the potential to support jurisdictional resources, such as the presence of an ordinary high water mark and/or other surface indications of wetland hydrology.

2.1.3 MSHCP Consistency Analysis

HELIX prepared the GBRA for the study area, which addresses project consistency with the MSHCP (HELIX 2020). HELIX conducted a general biological survey on December 19, 2019, which included vegetation mapping and recording of all plant and wildlife species. Prior to conducting field visits, a literature review and records search were conducted for sensitive species potentially occurring on or within the vicinity of the study area.

As documented in the GBRA, the study area is not located within a Criteria Cell (Figure 5, *MSHCP Criteria Cell*), Narrow Endemic Plant Species Survey Area, Criteria Area Species Survey Area, Mammal Survey Area, or Amphibian Survey Area. The study area is located within a Burrowing Owl (*Athene cunicularia*; BUOW) Survey Area. HELIX is currently conducting focused BUOW surveys on the study area following the MSHCP BUOW survey instructions (County of Riverside 2006). No BUOWs or BUOW signs haven been detected during the surveys completed to date. A mitigation measure related to BUOW is included in project's GBRA. If BUOW are determined to be present in the study area, a separate DBESP will be prepared to address BUOW.

2.2 EXISTING CONDITIONS

2.2.1 Study Area Description

The study area mostly consists of paved roads, including Palomar Street and Clinton Keith Road. The study area also supports undeveloped land and some areas of rural residential use. Palomar Street has existed on the study area since at least 1938 (Historic Aerials 1938) and Clinton Keith Road was built after 1982 (Historical Aerials 1982). The study area supports three drainage features (Drainage A, Drainage B, and Drainage C). Drainage A is an ephemeral drainage feature dominated by coast live oak woodland. Drainage B is an ephemeral drainage feature dominated by southern willow scrub. Drainage C northeast of Palomar Street is dominated by coast live oak woodland and southwest of Palomar Street is dominated by southern cottonwood-willow riparian forest.

The topography of the study area is mostly flat with some gentle slopes throughout. Elevations on the study area range from approximately 1,184 feet (361 meters) above mean sea level (AMSL) near the southern boundary to a high of approximately 1,310 feet (399 meters) AMSL near the southeastern boundary. Surrounding land uses include mostly rural and low-density residential. Commercial development exists adjacent to the intersection of Palomar Street and Clinton Keith Road. The eastern portion of the study area is bounded by developed land to the north.

The MSHCP lists nine sensitive soil types that occur within the Plan Area (Dudek 2003). None of the MSHCP sensitive soils occur on or immediately adjacent to the study area. Soils on the study area are mapped primarily as Arlington and Greenfield fine sandy loams (2 to 8 percent slopes, eroded), Chino silt loam (drained), Chino silt loam (drained, saline-alkali), Greenfield sandy loam (2 to 8 percent slopes, eroded), Gullied land, Hanford coarse sandy loam (2 to 8 percent slopes; NRCS 2019), Hanford coarse sandy loam (8 to 15 percent slopes, eroded), Monserate sandy loam (8 to 15 percent slopes, eroded), Monserate sandy loam (shallow, 15 to 25 percent slopes, severely eroded), Pachappa fine sandy loam (2 to 8 percent slopes, eroded), San Timoteo loam (8 to 25 percent slopes), and Tujunga loamy sand (channeled, 0 to 8 percent slopes). The majority of these soil types consist of well-drained soils and are associated with alluvial fans. The Chino soil component, however, is somewhat poorly drained and is associated with floodplains.

2.2.2 Riparian Areas

The Riparian/Riverine habitat assessment identified a total of approximately 0.78 acre of Riparian habitat within the study area (Figure 6, *MSHCP Riparian Areas*). The habitat is comprised of 0.07 acre of southern cottonwood-willow forest, 0.10 acre of southern willow scrub, 0.45 acre of coast live oak woodland, 0.03 acre non-native vegetation, 0.04 acre ornamental vegetation, 0.06 acre disturbed habitat, and 0.04 acre of developed land (Table 1, *MSHCP Riparian Areas*). The Riparian habitat that meets the MSHCP definition occur along three drainages referred to as Drainages A, B, and C. These drainages connect to Murrieta Creek to the south of the study area. No vernal pools or similar habitat occurs in the study area.

Table 1
MSHCP RIPARIAN AREAS

Habitat	Drainage A (acres) ¹	Drainage B (acres) ¹	Drainage C (acres) ¹	TOTAL (acres) ¹
Southern Cottonwood-Willow Forest	-	-	0.07	0.07
Southern Willow Scrub	-	0.10	-	0.10
Coast Live Oak Woodland ²	0.33	-	0.12	0.45
Streambed – Non-native Vegetation	-	-	0.03	0.03
Streambed – Ornamental Vegetation	0.04	-	-	0.04
Streambed – Disturbed Habitat	-	-	0.06	0.06
Streambed – Developed Land	0.04	-	-	0.04
TOTAL	0.41	0.10	0.28	0.78

¹ Acreage rounded to nearest 0.01 acre.

² A portion of the coast live oak woodland within the study area is not associated with a stream and is, therefore, not included in the Riparian acreage.

2.2.3 Species Associated with Riparian/Riverine Areas

2.2.3.1 Plants

The MSHCP lists 23 plant species that have a potential to occur in Riparian/Riverine and/or Vernal Pool habitats within the MSHCP Plan Area, which are listed below in Table 2, *MSHCP Riparian/Riverine and Vernal Pool Plant Species*.

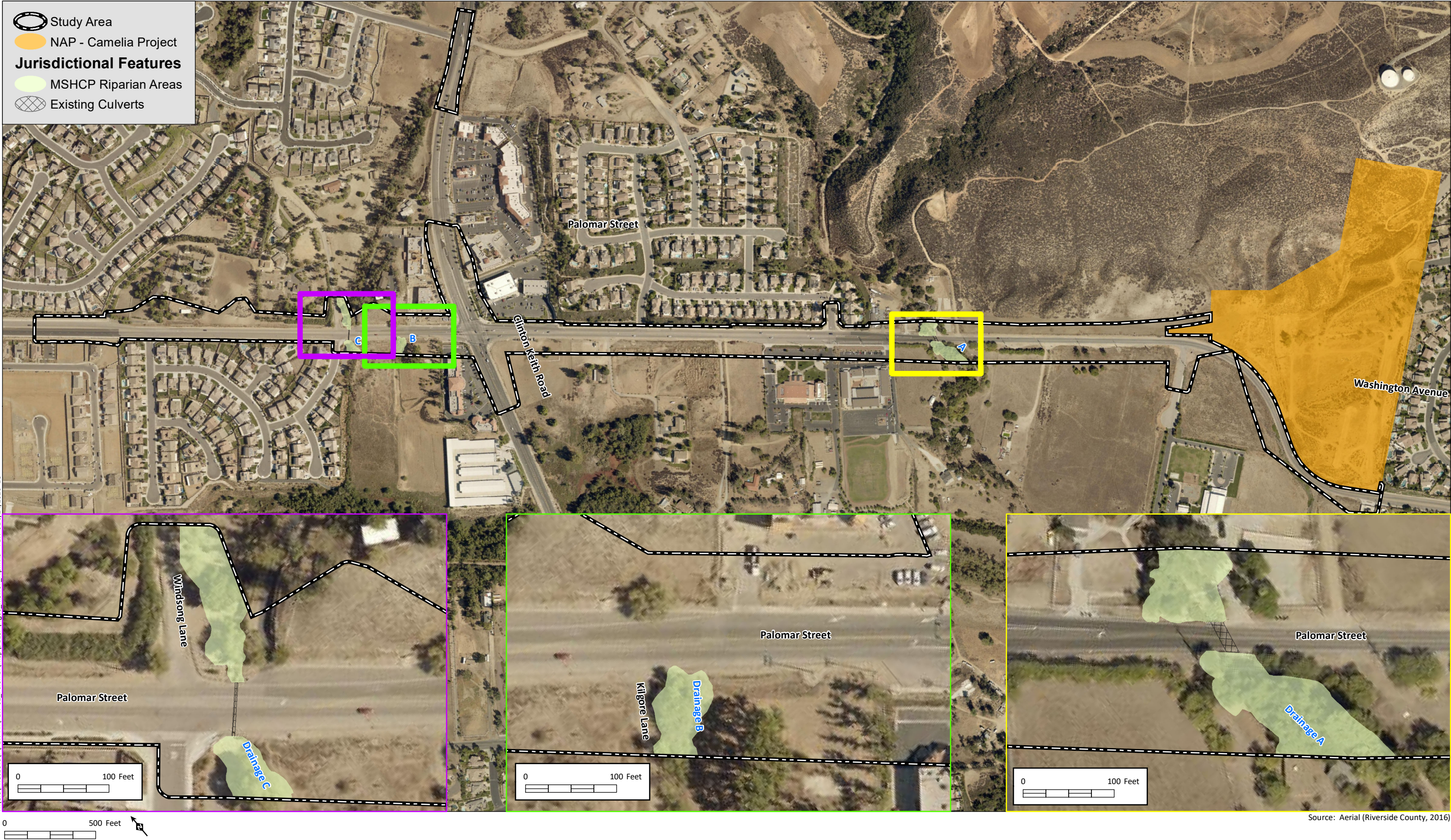


Table 2
MSHCP RIPARIAN/RIVERINE AND VERNAL POOL PLANT SPECIES

Common Name	Scientific Name	Habitat
Brand's phacelia	<i>Phacelia stellaris</i>	Sandy washes and/or benches in alluvial flood plains.
California black walnut	<i>Juglans californica</i>	Open savannahs, creek beds, alluvial terraces, and north-facing slopes.
California Orcutt grass	<i>Orcuttia californica</i>	Vernal pools.
Coulter's matilija poppy	<i>Romneya coulteri</i>	Dry washes and canyons in chaparral and coastal sage scrub communities and disturbed areas.
Engelmann oak	<i>Quercus engelmannii</i>	Woodlands, mixed chaparral, and savannah grasslands.
Fish's milkwort	<i>Polygala cornuta</i> var. <i>fishiae</i>	Shaded, rocky places in canyons associated with woodlands and chaparral.
graceful tarplant	<i>Holocarpha virgata</i> ssp. <i>elongata</i>	Coastal mesas and foothills with grassland habitats.
lemon lily	<i>Lilium parryi</i>	Moist montane meadows.
Mojave tarplant	<i>Deinandra mohavensis</i>	Drainages within arid montane chaparral.
mud nama	<i>Nama stenocarpum</i>	Marshes, swamps, lake margins, and riverbanks along muddy embankments.
ocellated Humboldt lily	<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	Shaded montane canyons.
Orcutt's brodiaea	<i>Brodiaea orcuttii</i>	Vernally moist grasslands and vernal pools; occasionally occurs along stream embankments within clay soils.
Parish's meadowfoam	<i>Limnanthes gracilis</i> var. <i>parishii</i>	Montane meadows with abundant annual and herbaceous perennials and lack of shrubs.
prostrate navarretia	<i>Navarretia prostrata</i>	Coastal sage scrub, valley and foothill grassland, and vernal pools.
San Diego button-celery	<i>Eryngium aristulatum</i> var. <i>parishii</i>	Vernal pools.
San Jacinto Valley crownscale	<i>Atriplex coronata</i> var. <i>notatior</i>	Highly alkaline and silty-clay soils associated with alkali sink scrub, alkali playa, vernal pool, and annual alkali grassland habitats.
San Miguel savory	<i>Clinopodium chandleri</i>	Coastal sage scrub, chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands.
Santa Ana River woolly-star	<i>Eriastrum densifolium</i> spp. <i>sanctorum</i>	Sandy soils on flood plains and terraces within coastal scrub and chaparral communities.

Table 2
MSHCP RIPARIAN/RIVERINE AND VERNAL POOL PLANT SPECIES

Common Name	Scientific Name	Habitat
slender-horned spineflower	<i>Dodecahema leptoceras</i>	Sandy soil associated with alluvial scrub; is often found on stream terraces and banks.
smooth tarplant	<i>Centromadia pungens</i> ssp. <i>laevis</i>	Alkali scrubs, playas, and grasslands; riparian woodland and streams.
spreading navarretia	<i>Navarretia fossalis</i>	Vernal pools, depressions, and ditches.
thread-leaved brodiaea	<i>Brodiaea filifolia</i>	Clay soils in vernal moist grasslands and vernal pool periphery are typical locales.
vernal barley	<i>Hordeum intercedens</i>	Saline flats and depressions in grasslands or vernal pools.

Source: Dudek (2003)

Based on the habitat assessment conducted in December 2019, the plant species associated with Riparian/Riverine and Vernal Pool areas were confirmed to be absent from the study area. A number of the species are associated with habitats that do not occur on the study area (e.g., vernal pools) or have distributions well outside of the study area, including Brand's phacelia (*Phacelia stellaris*), California Orcutt grass (*Orcuttia californica*), Fish's milkwort (*Polygala cornuta* var. *fishiae*), graceful tarplant (*Holocarpha virgata* ssp. *elongata*), lemon lily (*Lilium parryi*), Mojave tarplant (*Deinandra mohavensis*), Orcutt's brodiaea (*Brodiaea orcuttii*), Parish's meadowfoam (*Limnanthes gracilis* var. *parishii*), prostrate navarretia (*Navarretia prostrata*), San Diego button-celery (*Eryngium aristulatum* var. *parishii*), San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*), San Miguel savory (*Clinopodium chandleri*), Santa Ana River woolly-star (*Eriastrum densifolium* ssp. *sanctorum*), spreading navarretia (*Navarretia fossalis*), thread-leaved brodiaea (*Brodiaea filifolia*), and vernal barley (*Hordeum intercedens*). Spreading navarretia was recorded in the California Natural Diversity Database (CNDDB) approximately 1.5 miles north and east of the study area (California Department of Fish and Wildlife [CDFW] 2020). The remaining seven species have a distribution that includes the study area or occur in habitats found on the study area. These species are discussed in detail below.

California black walnut (*Juglans californica*) is a conspicuous tree species associated with open savannahs, creek beds, alluvial terraces, and north-facing slopes. No California black walnuts were observed and this species is presumed to be absent from the study area.

Coulter's Matilija poppy (*Romneya coulteri*) occurs in dry washes and canyons below 3,600 feet. It often occurs within sage scrub and chaparral habitats. Dense shrub cover may limit expansion of this species (Dudek 2003). This species is easily detected year-round when present. It was not observed and is presumed absent from the study area.

Engelmann oak (*Quercus engelmannii*) is a conspicuous tree species associated with alluvial fans and slopes with a mesic aspect. Coast live oak (*Quercus agrifolia*) trees occur on the study area. No Engelmann oaks were observed and this species is presumed to be absent from the study area.

Mud nama (*Nama stenocarpum*) is restricted to muddy embankments of marshes and swamps and within lake margins and riverbanks (California Native Plant Society [CNPS] 2020). Three populations are known from Riverside County, with two occurring along the San Jacinto River (Dudek 2003). This species was not observed and is presumed to be absent from the study area.

Ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*) is associated with riparian corridors in coniferous forest and chaparral habitats. Within Western Riverside County, ocellated Humboldt lily is restricted to canyons along the east slope of the Santa Ana Mountains and the north slope of the Palomar Mountains. The riparian habitat in the study area is not associated with coniferous forest. This species was not observed and is presumed to be absent from the study area.

Slender-horned spineflower (*Dodecahema leptoceras*) is typically found in mature alluvial scrub with sandy soils but is also found in rocky soils and open chamise chaparral. Ideal habitat is thought to be benches or terraces that receive overbank flow every 50 to 100 years. Habitat for this species does not occur on the study area. This species was not observed and is presumed to be absent from the study area.

Smooth tarplant (*Centromadia pungens* ssp. *laevis*) is found in southwestern California and northwestern Baja California, Mexico (Baja), and occurs in San Bernardino, Riverside, and San Diego counties. This species occurs in open spaces within a variety of habitats, including alkali scrub and playas, riparian woodland, watercourses, and grasslands with alkaline affinities (Dudek 2003; CNPS 2020). This species has CNDDDB records located approximately 800 feet south of the study area but was not observed in the study area and is presumed to be absent from the study area.

2.2.3.2 Animals

The MSHCP lists 12 sensitive animal species that have a potential to occur in Riparian/Riverine and/or Vernal Pool habitats within the MSHCP Plan Area, which are provided in Table 3, *MSHCP Riparian/Riverine and Vernal Pool Animal Species*. The MSHCP requires focused surveys to be conducted for projects that propose impacts to three invertebrate and three bird species, as described in detail below.

Table 3
MSHCP RIPARIAN/RIVERINE AND VERNAL POOL ANIMAL SPECIES

Common Name	Scientific Name	Habitat
Riverside fairy shrimp	<i>Streptocephalus woottoni</i>	Deep vernal pools and other ephemeral basins that hold water for typically 30 or more days.
Santa Rosa Plateau fairy shrimp	<i>Linderiella santarosae</i>	Limited to vernal pools within the Santa Rosa Plateau.
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Vernal pools and other ephemeral basins within patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.
arroyo toad	<i>Anaxyrus californicus</i>	Washes and intermittent streams with open-canopy riparian forest.
California red-legged frog	<i>Rana aurora draytonii</i>	Perennial streams with dense, shrubby riparian vegetation.

Table 3
MSHCP RIPARIAN/RIVERINE AND VERNAL POOL ANIMAL SPECIES

Common Name	Scientific Name	Habitat
mountain yellow-legged frog	<i>Rana muscosa</i>	Perennial waterways, often within open riparian vegetation.
Santa Ana sucker	<i>Catostomus santaanae</i>	Clear, cool perennial streams with loose sand, gravel, cobble, and boulders with algae, aquatic emergent vegetation, macroinvertebrates, and riparian vegetation.
bald eagle	<i>Haliaeetus leucocephalus</i>	Within close proximity to lakes or other water bodies.
least Bell's vireo	<i>Vireo bellii pusillus</i>	Well-developed riparian scrub, woodland, or forest.
peregrine falcon	<i>Falco peregrinus</i>	Generally, areas with cliffs or tall buildings near water where prey (shorebirds and ducks) is concentrated.
southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Breeds within thickets of willows or other riparian understory usually along streams, ponds, lakes, or canyons.
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Extensive stands of mature riparian woodland.

Source: Dudek (2003)

Invertebrates

There are three sensitive fairy shrimp species that occur in the MSHCP Plan Area, including Riverside fairy shrimp (*Streptocephalus woottoni*), Santa Rosa Plateau fairy shrimp (*Linderiella santarosae*), and vernal pool fairy shrimp (*Branchinecta lynchi*). Vernal pool fairy shrimp occurs throughout the Central Valley and in several disjunct populations in Riverside County. This species exists in vernal pools and other ephemeral basins often located in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral. Riverside fairy shrimp occurs in Riverside, Orange, and San Diego counties as well as in northern Baja California, Mexico. This species is typically found in deeper vernal pools and other ephemeral basins that hold water for long periods of time (30 or more days). Santa Rosa Plateau fairy shrimp is limited to the Santa Rosa Plateau in Riverside County.

The MSHCP requires focused surveys to be conducted for projects that propose impacts to suitable habitat for the three sensitive fairy shrimp species discussed above. The study area was evaluated for suitable habitat, such as vernal pools or ephemeral ponds. Indicators of potential fairy shrimp habitat include, but are not limited to, mima-mound complexes, depressions, road ruts, algal/biotic crusts, and cracked soils. No suitable habitat occurs within the study area for these species, and no focused surveys were conducted or are required.

Fish

The Santa Ana sucker (*Catostomus santaanae*) is the only fish included on the MSHCP Riparian/Riverine and Vernal Pool animal species list. The Santa Ana sucker is restricted to the Santa Ana River watershed with year-round flows. This species generally lives in small shallow streams less than seven meters wide with various current strengths. They require permanent streams with a gravel bottom preferred and

with cool, clear water but can tolerate turbid waters. Habitat for this species is not present on the study area; thus, this species is not expected to occur.

Amphibians

The MSHCP includes three amphibians on the Riparian/Riverine and Vernal Pool animal species list: arroyo toad (*Anaxyrus californicus*), mountain yellow-legged frog (*Rana muscosa*), and California red-legged frog (*Rana aurora draytonii*). The study area was searched for suitable aquatic habitat (i.e., streams, ponds, reservoirs, etc.) that could support these species.

Arroyo toad occur in streams that have breeding pools that are shallow with minimal current. Requirements also include sandy banks with areas of minimal vegetative cover. A minimal amount of streambed does occur on the study area. However, it is of limited size and of poor quality and is ephemeral. Mountain yellow-legged frog and California red-legged frog are not known to occur on or adjacent to the study area. The mountain yellow-legged frog occurs in mountain streams and is currently only known within Riverside County in the San Jacinto Mountains. The California red-legged frog is only known within Riverside County on the Santa Rosa Plateau. It requires deep water with adjacent uplands to move between breeding sites. Habitat for these species does not occur on the study area; thus, none of the MSHCP sensitive amphibian species are expected to occur.

Additionally, the Study Area is not located within the Amphibian Species Survey Area prescribed in the MSHCP. Therefore, surveys for sensitive amphibian species (arroyo toad, California red-legged frog, and mountain yellow-legged frog) are not required and were not conducted.

Birds

Riparian/Riverine Areas within the MSHCP Plan Area provide suitable habitat for sensitive bird species, such as LBVI, southwestern willow flycatcher (*Empidonax traillii extimus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinus*). Typical habitat for least Bell's vireo consists of well-developed riparian scrub, woodland, or forest dominated by willows, mule fat, and Fremont cottonwood. LBVI will also use small patches of trees adjacent to dense, riparian habitat. Southwestern willow flycatcher and western yellow-billed cuckoo require mature riparian forest with a stratified canopy and nearby water. Both the bald eagle and peregrine falcon occur primarily in and adjacent to open water habitats, with the falcon possibly occurring in riparian areas with nearby cliffs for nesting.

The study area includes 0.10 acre of southern willow scrub and 0.07 acre of southern cottonwood-willow forest. The study area does not support open water or cliffs and therefore does not have potential habitat for bald eagle or peregrine falcon. The riparian habitat on the study area is of limited size and does not have the layered composition that required for southwestern willow flycatcher and western yellow-billed cuckoo. These habitats do have low potential to support LBVI.

Since the study area supports suitable LBVI habitat, the MSHCP requires focused surveys for projects that have a potential to impact LBVI. Focused LBVI surveys are currently being conducted following U.S. Fish and Wildlife Service' (USFWS) survey protocol (USFWS 2001). LBVI have not been detected within 500 feet of the study area during the first four of eight protocol surveys. Based on the size of the habitat and lack of detection of LBVI during the first four LBVI surveys, this species is not expected to occur on the study area.

3.0 Project Impacts

3.1 IMPACTS TO RIPARIAN AREAS

Of the 0.78 acre in the study area, proposed impacts to Riparian Areas total 0.64 acre and comprise 0.04 acre southern cottonwood-willow riparian, 0.09 acre southern willow scrub 0.34 acre coast live oak woodland, 0.03 acre non-native vegetation, 0.04 acre ornamental vegetation, 0.06 acre disturbed habitat, and 0.04 acre developed land (Table 2, *Impacts to MSHCP Riparian Areas*; Figure 7, *Impacts to MSHCP Riparian Areas*).

Table 4
IMPACTS TO MSHCP RIPARIAN AREAS

Habitat	Drainage A (acres) ¹	Drainage B (acres) ¹	Drainage C (acres) ¹	TOTAL (acres) ¹
Southern Cottonwood-Willow Forest	-	-	0.04	0.04
Southern Willow Scrub	-	0.09	-	0.09
Coast Live Oak Woodland	0.27	-	0.07	0.34
Streambed – Non-native Vegetation	-	-	0.03	0.03
Streambed – Ornamental Vegetation	0.04	-	-	0.04
Streambed – Disturbed Habitat	-	-	0.06	0.06
Streambed – Developed Land	0.04	-	-	0.04
TOTAL	0.35	0.09	0.20	0.64

¹ Acreage rounded to nearest hundredth.

3.2 IMPACTS TO SPECIES ASSOCIATED WITH RIPARIAN/RIVERINE AREAS

Plant and animal species associated with Riparian/Riverine and Vernal Pool habitats do not occur in the study area. None of the species covered under Section 6.1.2 are expected to occur in the study area as evident by a lack of potential habitat or where habitat occurs the species have not been observed. The site does have low potential for LBVI, but this species has not been detected during focused surveys completed to date.

Section 6.1.2 Riparian/Riverine species have not been detected with the study area. The small amount of habitat and the proximity of the adjacent developments, and habitat disturbance, limits the potential for LBVI and other Riparian/Riverine species. The functions of the Riparian Areas in the study area are primarily water conveyance, sediment transport, energy dissipation (hydrologic regime and flood attenuation), and habitat for wildlife species. Specifically, the southern cottonwood-willow riparian forest, southern willow scrub, and oak woodland habitats provide cover for wildlife movement and habitat for nesting birds.

4.0 AVOIDANCE

Emphasis of the MSHCP Riparian/Riverine Area and Vernal Pool policy is on conservation of habitats capable of supporting MSHCP Covered Species. Furthermore, the goal of the DBESP process is to determine if the project has in fact provided a project alternative that results in biologically equivalent

or superior preservation. The first priority for Riparian/Riverine Areas that have potential to contribute to the biological values of the MSHCP preserve is avoidance of direct impacts.

MSHCP Section 6.1.2 states:

“The purpose of the procedures described in this section is to ensure that the biological functions and values of these areas throughout the MSHCP Plan Area are maintained such that Habitat values for species inside MSHCP Conservation Areas are maintained.”

The MSHCP also states that:

“[f]or identified and mapped resources not necessary for inclusion in the MSHCP Conservation Area, applicable mitigation under the California Environmental Quality Act (CEQA), which may include federal and state regulatory standards related to wetland functions and values, will be imposed by the Permittees. To ensure that these standards are met, Permittees shall ensure that, through the CEQA process, project applicants develop project alternatives demonstrating efforts that first avoid, and then minimize direct and indirect effects to the mapped wetlands and shall review these alternatives with the Permittee. An avoidance alternative shall be selected, if feasible. If an avoidance alternative is selected, measures shall be incorporated into the project design to ensure the long-term conservation of the areas to be avoided.

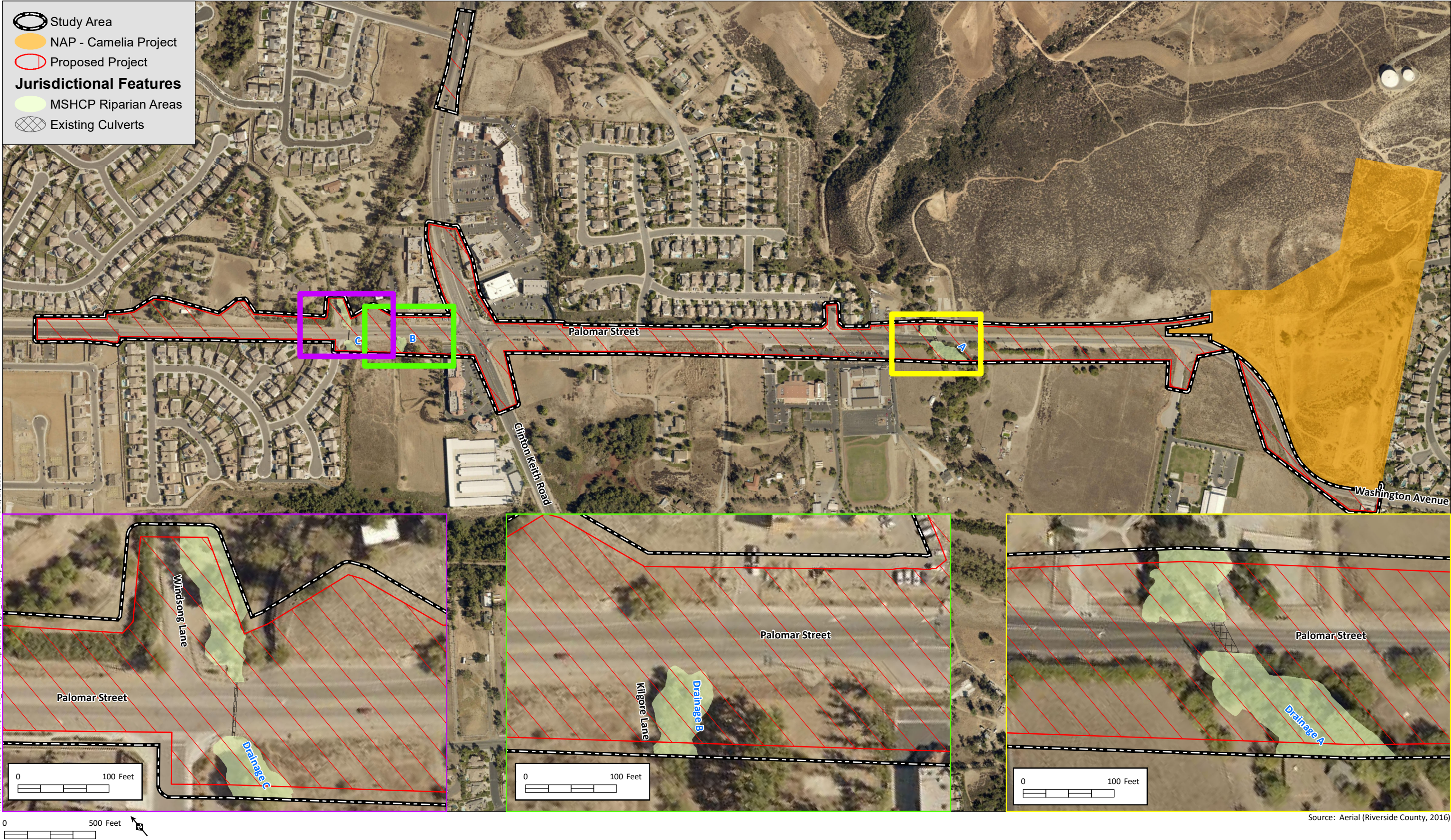
If an avoidance alternative is not feasible, a practicable alternative that minimizes direct and indirect effects to riparian/riverine areas and vernal pools and associated functions and values to the greatest extent possible shall be selected. Those impacts that are unavoidable shall be mitigated such that the lost functions and values as they relate to Covered Species are replaced as set forth below under the Determination of Biologically Equivalent or Superior Preservation.”

As described above, the emphasis of the MSHCP’s Riparian/Riverine and vernal pool policy is on conservation of habitats capable of supporting MSHCP Covered Species. The goal of the DBESP process is to determine if the project has in fact provided for a project alternative that results in biologically equivalent or superior preservation. The priority for Riparian/Riverine habitats that have potential to contribute to the biological values of the MSHCP preserve is avoidance of direct impacts. Due to the projects purpose of widening the existing roads, and alternative location for the project is not possible. The only available options to avoiding impacts would be a no project alternative.

The first priority for Riparian/Riverine habitats that have potential to contribute to MSHCP preserve biological values is avoidance of direct impacts. The study area, and therefore the Riparian Areas, are not within an MSHCP Conservation Area. However, the resources within the study area can contribute to downstream resources that are within the MSHCP Conservation Area. The three drainages each have a separate connection to downstream resources. These drainages connect to Murrieta Creek southwest of the study area.

The Riparian Areas occur within three drainages that are generally perpendicular to the study area. The drainages cross under the existing road. The widening of the road will result in impacts to the drainages and result in a longer reach of the drainage being placed in a culvert (or similar structure) under the road.

Complete avoidance of the Riparian Areas would result in a no-project alternative as the proposed project is the for the widening of the existing roadway and the Riparian habitat occur immediately



adjacent to the road. The locations where streams cross under the roadway require additional impacts to prevent flood-level flows from damaging the roadway and resulting is potential danger to humans. As currently designed the project limits impacts to Riparian resources to 0.64 acre, and most of the impacts are related to culvert and flood protection required by engineering standards.

5.0 MITIGATION AND EQUIVALENCY

5.1 DIRECT EFFECTS

Mitigation for impact to Riparian Areas are proposed at a 2:1 ratio for native riparian habitats (Table 5, *Mitigation for Impacts to Riparian/Riverine Resources*). The non-native vegetation, ornamental, and disturbed habitats are proposed to be mitigated at a 1:1 ratio. The mitigation for these resources are proposed through purchase of credits from an agency-approved mitigation bank or in-lieu fee program. These options will provide for mitigation within a much broader conservation context with resources that will be of an equal or greater conservation value to the impacted southern cottonwood-willow riparian forest, southern willow scrub, coast live oak woodland, and streambed resources. The project proposes purchase credits from the Riverpark Mitigation Bank or other agency-approved mitigation bank. The Riverpark Mitigation Bank offers re-establishment of alkali playa and vernal pool habitat, which are two of the rarest habitat types in the MSHCP. Mitigation for impacts to Riparian Areas will be biologically equivalent to resources being impacted by the proposed project.

The project also proposes impacts to developed habitat consisting of riprap features within the streambed. This habitat will be mitigated at a 1:1 ratio on-site. Riprap will be installed as part of the construction process and will replace the portion of the Riparian impacts consisting of developed habitat. This on-site replacement of riprap will not be monitored following the completion of the project installation.

If LBVI are detected within 500 feet of the study area during the remaining focused surveys, this DBESP will be updated to include mitigation measures related to direct impacts to LBVI.

Table 5
MITIGATION FOR IMPACTS TO RIPARIAN AREAS

Vegetation Type	Impacts (acres)	Mitigation Ratio	Mitigation Required (acres)
Southern Cottonwood-Willow Riparian Forest	0.04	2:1	0.08
Southern Willow Scrub	0.09	2:1	0.18
Coast Live Oak Woodland	0.34	2:1	0.68
Developed	0.04	1:1	0.04 ¹
Disturbed	0.06	1:1	0.06
Non-native Vegetation	0.03	1:1	0.03
Ornamental	0.04	1:1	0.04
TOTAL	0.64	-	1.11
TOTAL OFF-SITE CREDITS			1.07

¹ Impacts to developed areas will be mitigated on-site and is excluded in the total off-site mitigation credit requirement.

5.2 INDIRECT EFFECTS

Riparian Habitat

The project would incorporate the following minimization measures to reduce indirect effects on Riparian Areas to the maximum extent:

- Implementation of standard Best Management Practices (BMPs) to minimize the impacts during construction and post-construction.
 - Construction BMPs may include, but are not limited to, erosion control measures, stabilized construction entrances, silt fencing, and gravel bags. Measures would include those required for construction pursuant to the State Water Resources Control Board General Construction Storm Water Permit and the project Storm Water Pollution Prevention Plan (SWPPP).
 - Post-construction BMPs may include, but are not limited to, prohibiting dumping of oils, paint, or other hazardous waste into streets and storm drains; requiring covered trash containers; and/routine street sweeping. Measures would be implemented in compliance with the National Pollutant Discharge Elimination System and the Municipal Storm Drain Permit requirements.
- Applicable Standard BMPs listed in Appendix C to the MSHCP would be implemented, including, but not limited to, delineating the limits of disturbance to Riparian Areas prior to construction, storing equipment outside of the Riparian Areas, placing staging areas outside of the Riparian Areas, not depositing erodible fill material into the Riparian Areas; and/or disposing all debris and trash items (Dudek 2003).
- Source control and treatment control BMPs would be implemented to minimize the potential contaminants that are generated during and after construction.
 - Source control BMPs may include education/training for residents, irrigation system and landscape maintenance, common area litter control, street sweeping, drainage facility inspection and maintenance, restricting overuse of fertilizations, municipal separate storm sewer systems stenciling and signage, and/or protection of slopes and channels (e.g., vegetation, riprap, etc.).
 - Treatment-control BMPs would be implemented according to the project's SWPPP. The Water quality BMPs would be designed to avoid hydromodification, including discharge of sediment and/or pollutants during construction.
- All BMPs would be consistent with the California Stormwater Quality Association guidelines and City water quality standards.

The study area does not occur adjacent to land targeted for conservation or existing MSHCP Conservation area. The drainages do connect to Murrieta Creek that is part of Constrained Linkage 7, approximately 1.4 miles southwest of the study area. In conformance with MSHCP Section 6.1.4, the project would reduce edge effects to the Urban/Wildland Interface through the following measures:

- Drainage (Urban and Storm Water Runoff): Flows generated by the project would not directly drain into any MSHCP Conservation Areas that could ultimately reach a downstream Conservation Area. Therefore, construction and post-construction BMPs would be implemented to maintain water quality.
- Toxic Material: The project would not discharge toxics that may adversely affect wildlife species, habitat, or water quality.
- Trash/Debris: The non-structural BMPs listed above will minimize and/or address the trash/debris created by the proposed project and deter trash/debris from entering downstream areas.
- Lighting: The study area is not located within or directly adjacent to an MSHCP Conservation Area. Therefore, construction lighting and ambient lighting from the proposed development would not reach the Conservation Area.
- Noise: The project does not occur within or directly adjacent to an MSHCP Conservation Area. Therefore, noise standards are not applicable. The project will comply with all City requirements pertaining to noise and traffic standards.
- Invasives: No invasive plants identified in Table 6-2 of the MSHCP would be used for erosion control, landscaping, or other purposes within the study area.
- Barriers: Since the study area is not directly adjacent to an MSHCP Conservation Area, barriers and signage are not necessary.
- Grading/Land Development and/or Fuel Modification Activities: No manufactured slopes associated with the project would extend into any MSHCP Conservation Area.

Least Bell's Vireo

Due to presence of suitable habitat for LBVI within the study area, focused USFWS protocol surveys for LBVI are being conducted. Four of the required eight surveys have been completed with negative results. If LBVI are not detected during focused surveys, no additional measures would be required. If LBVI are detected, the following avoidance and minimization measures shall be implemented to avoid potential indirect impacts to the species:

1. Construction activities (i.e., earthwork, clearing, and grubbing) shall occur outside of the breeding season for LBVI (March 15 through August 31).
2. If construction activities (i.e., earthwork, clearing, grubbing, etc.) are proposed within the breeding season of LBVI, focused protocol surveys for LBVI shall be conducted prior to commencement of construction activities, within all suitable habitat located on the study area, along with a 500-foot buffer where suitable habitat occurs, to determine whether the habitat is occupied. Focused surveys for LBVI shall be conducted by a qualified biologist and during the breeding season in accordance with the most recent USFWS guidelines. The results of the focused surveys shall be documented by the qualified biologist and submitted to USFWS and/or CDFW.

If the qualified biologist determines that LBVI do not occur within 500 feet of the proposed construction, the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that the habitat is occupied by LBVI, the following avoidance and minimization measures shall be implemented:

- a. No construction activities may occur within 500 feet of an active nest of a LBVI. A qualified biologist shall clearly delineate the required avoidance buffer around the active LBVI nest. The buffer shall be clearly marked with flags and/or fencing prior to the initiation of construction activities.
- b. If construction activities are proposed within 500 feet of an occupied nest, a biological monitor shall be required to observe the behavior of any breeding LBVI. The construction supervisor shall be notified if the construction activities appear to be altering the birds' normal breeding behavior. No construction activities will be allowed within 500 feet of an occupied nest until additional minimization measures have been performed. Such measures may include retaining a qualified acoustician to determine ambient noise levels and project-related noise levels at the edge of occupied habitat. Noise levels at the edge of the occupied habitat shall not exceed an hourly average of 60 decibels (dB[A]), or a 3 dB(A) increase in noise levels if ambient noise levels exceed 60 dB(A). If project-related noise levels at the edge of the occupied habitat are above 60 dB(A) or the 3 dB(A) increase in noise occurs, additional minimization measures shall be taken to reduce project-related noise levels to an acceptable level as determined by the biological monitor. Measures may include, but are not limited to, limitation on the use of certain equipment, placement of equipment, restrictions on the simultaneous use of equipment, use of noise barriers, or other noise attenuation methods as deemed appropriate by the biologist and acoustician. The USFWS and/or CDFW shall be notified of additional minimization measures taken to reduce noise during construction activities. If the biological monitor determines the construction activities are posing a potential risk to the nest after implementing the additional minimization measures, the noise generating construction activities shall cease until USFWS and/or CDFW are contacted to discuss alternative methods. The biological monitor shall prepare written documentation of all monitoring activities at the completion of construction activities, which shall be submitted to CDFW/or USFWS.
- c. All project personnel shall attend a training program presented by a qualified biologist prior to construction activities. The training program will inform project personnel about the life history of LBVI and all avoidance and minimization measures.
- d. The construction contractor shall only allow construction activities to occur during daylight hours and high noise levels shall generally be limited according to these hours.
- e. The construction contractor shall require functional mufflers on all construction equipment (stationery or mobile) used within or immediately adjacent to any 500-foot avoidance buffers to reduce construction equipment noise. Stationing

equipment situated so that noise generated from the equipment is not directed towards any habitat occupied by LBVI.

- f. The construction contractor will place staging areas as far as feasible from any occupied nest by LBVI.

6.0 CONCLUSION

The project is being implemented consistent with Section 6.1.2 of the MSHCP based on the following:

- No plant species targeted for conservation in Section 6.1.2 are known or expected to occur within the Riparian Areas proposed for impact.
- The project grading has been designed to minimize impacts to adjacent Riparian Areas.
- Edge effects to the MSHCP conservation area located 1.4 miles south of the project shall be minimized by the measures described in Section 5.2 of this document.
- Compensatory mitigation for direct impacts to 0.64 acre will total 1.11 acres comprising 0.04 acre of on-site riprap replacement and 1.07 acres off-site purchase of credits from an agency-approved mitigation bank or in-lieu fee program, or off-site habitat restoration. The credits will offset losses of riparian function and value.

Based on this DBESP assessment, the project is consistent with Section 6.1.2.

7.0 CERTIFICATION/QUALIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE:

June 18, 2020

SIGNED:



Robert Hogenauer

Senior Scientist

HELIX Environmental Planning, Inc.

Fieldwork Performed By:

Daniel Torres

B.S., Ecology and Natural Resources, Rutgers University, 2013

Ezekiel Cooley

B.S., Natural Resources with an emphasis in Wildlife, Central Michigan University, 2004

Rob Hogenauer

B.S., Biology with a minor in Zoology, California State Polytechnic University, Pomona, 2004.

8.0 REFERENCES

- California Department of Fish and Wildlife. 2020. California Natural Diversity Database and Rarefind. California Department of Fish and Wildlife: Sacramento, California. Available at: <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>. Accessed February 11, 2020.
- California Native Plant Society. 2020. Inventory of rare and endangered plants of California. California Native Plant Society. Available at: <http://www.rareplants.cnps.org/>. Accessed February 11, 2020.
- Dudek and Associates. 2003. Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Final MSHCP Volume I. Prepared for County of Riverside, Transportation and Land Management Agency. Available at: <http://www.rctlma.org/Portals/0/mshcp/index.html>.
- HELIX. 2020. The Palomar Street Phase I Road Improvements Project General Biological Resources Assessment. Prepared for the City of Wildomar. May 22, 2020.
- Historic Aerials. 1982. Aerial Imagery of the Palomar Street Improvement Project, 33.589389°, -117.252115°. Available at: <https://www.historicaerials.com/viewer>. Accessed February 10, 2020.
1938. Aerial Imagery of the Palomar Street Improvement Project, 33.589389°, -117.252115°. Available at: <https://www.historicaerials.com/viewer>. Accessed February 10, 2020.
- Natural Resources Conservation Service. 2019. Web Soil Survey. United States Department of Agriculture (USDA). Available at: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed February 12, 2020.
- Riverside, County of. 2006. Burrowing owl survey instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. Available from: http://rctlma.org/Portals/1/EPD/consultant/burrowing_owl_survey_instructions.pdf
- U.S. Fish and Wildlife Service. 2001. Least Bell's vireo survey guidelines. January 19. Available at: https://www.fws.gov/ventura/docs/species/protocols/lbv/leastbellsvireo_survey-guidelines.pdf. Accessed February 12, 2020.



Photograph 1: View of Drainage A in the central portion of the project site facing north (upstream) at box culvert.



Photograph 2: View of Drainage A in the central portion of the project site facing south (downstream).



Photograph 3: View of Drainage B in the western portion of the project site facing north (upstream) at culvert outlet.



Photograph 4: View of Drainage B in the western portion of the project site facing north (downstream) at culvert outlet.

H:\GIS\PROJECTS\PLW-A\PLW-01_Palomar\Map\GBRA\AppendixD_DrainagePhotos_1-4.indd PLW-01 5/12/20-EC

See Figure 6 for photograph locations.

Source: HELIX 2019



Photograph 5: View of Drainage C in the western portion of the project site facing south (downstream) at culvert inlet at Palomar Street.



Photograph 6: View of Drainage C in the western portion of the project site facing north (upstream) from culvert at Palomar Street.



Photograph 7: View of Drainage C in the western portion of the project site facing north (upstream) at culvert outlet at Palomar Street.



Photograph 8: View of Drainage C in the western portion of the project site facing south (downstream).

H:\GIS\PROJECTS\PLW-A\PLW-01_Palomar\Map\GBRA\AppendixD_DrainagePhotos_5-8.indd PLW-01 5/12/20-EC

See Figure 6 for photograph locations.

Source: HELIX 2019