

**DETERMINATION OF BIOLOGICALLY
EQUIVALENT OR SUPERIOR PRESERVATION**

BAXTER VILLAGE
APNs 367-180-015 & 367-180-043

CITY OF WILDOMAR, RIVERSIDE COUNTY, CALIFORNIA

**SECTION 6.1.2 RIPARIAN/RIVERINE AND VERNAL POOLS OF THE
WESTERN RIVERSIDE COUNTY MULTIPLE SPECIES HABITAT CONSERVATION PLAN**



AUGUST 2014

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Project Location:

U.S. Geological Survey (USGS) 7.5-minute
Wildomar topographic quadrangle map, Section 26, T. 6 S., R. 4 W.

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Surveys Conducted:

November 27, 2012; April 11, 2013;
May 10, 2013; June 13, 2013; and August 19, 2013

AUGUST 2014

Table of Contents

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Background and Purpose.....	1
1.2 Definition of the Project Site.....	1
1.3 Relationship to the MSHCP	1
2.0 PROJECT DESCRIPTION.....	3
2.1 Proposed Project.....	7
2.2 Project Alternatives.....	7
2.3 100 Percent Avoidance Analysis.....	8
2.4 Other Alternatives Considered.....	8
3.0 METHODOLOGY.....	13
3.1 Literature Review	13
3.2 Field Investigations.....	13
3.3 Plant Community Mapping	13
4.0 DESCRIPTION OF AVAILABLE BIOLOGICAL INFORMATION.....	15
4.1 Plant Communities	15
4.2 Sensitive Plant Species.....	15
4.3 Sensitive Wildlife Species	16
4.4 Jurisdictional Drainage Features.....	22
4.4.1 Jurisdictional Drainage Features	22
4.4.2 Non-jurisdictional Areas	23
4.5 Soils.....	24
5.0 ASSESSMENT OF RIPARIAN/RIVERINE AND VERNAL POOL RESOURCES.....	25
5.1 Assessment of Riparian/Riverine and Vernal Pool Features.....	27
5.1.1 Drainage B (MSHCP Riverine Area; Off-Site).....	27
5.1.2 Drainage C (MSHCP Riparian Area; Off-Site).....	28
5.1.3 Other Features.....	28
5.2 Assessment of Riparian/Riverine and Vernal Pool Plant and Wildlife Species	29
5.2.1 Riparian/Riverine Plant Species.....	29
5.2.2 Riparian/Riverine Wildlife Species	31
5.3 Assessment of Riparian/Riverine and Vernal Pool Ecological Processes	33
6.0 UNAVOIDABLE IMPACTS TO RIPARIAN/RIVERINE AND VERNAL POOL AREAS.....	35
6.1 Direct Impacts	35
6.1.1 Permanent Direct Impacts	35
6.1.2 Temporary Direct Impacts.....	35
6.2 Indirect Impacts.....	36
6.2.1 Permanent Indirect Impacts.....	36
6.2.2 Temporary Indirect Impacts	36
7.0 PROJECT AVOIDANCE, DESIGN FEATURES AND MITIGATION MEASURES.....	39

Table of Contents (Continued)

	<u>Page</u>
7.1 Avoidance.....	39
7.2 Design Features	39
7.2.1 Treatment Control BMPs	39
7.2.2 Non-Structural Source Control BMPs	40
7.2.3 Structural Source Control BMPs	40
7.3 Mitigation for Direct Impacts to MSHCP Riparian/Riverine Areas.....	43
7.3.1 Conceptual Mitigation Plan (Off-Site).....	41
7.3.2 Summary of Mitigation Compensation.....	44
7.3.3 Expected Functional Gains of the Mitigation	45
7.3.4 Success Criteria for the Mitigation.....	46
7.4 Project Design Features and Mitigation Measures to Address Edge Effects	47
8.0 DETERMINATION OF BIOLOGICALLY EQUIVALENT OR SUPERIOR PRESERVATION	51
8.1 Effects on Riparian/Riverine Planning Species.....	52
8.2 Effects on Conserved Habitats.....	53
8.3 Effects on Linkages and Functions of the MSHCP Conservation Area	53
9.0 REFERENCES	55

APPENDIX A: BIOLOGICAL RESOURCES ASSESSMENT AND WESTERN RIVERSIDE COUNTY MSHCP CONSISTENCY ANALYSIS

APPENDIX B: WILSON CREEK HABITAT RESTORATION PLAN

List of Figures

	<u>Page</u>
Figure 1 Regional Map.....	3
Figure 2 Vicinity Map.....	4
Figure 3 Site Photographs.....	5
Figure 4 Location within the Elsinore Area Plan of the MSHCP	6
Figure 5 Conceptual Site Plan.....	9
Figure 6a Drainage Photographs.....	10
Figure 6b Drainage Photographs.....	11
Figure 6c Drainage Photographs.....	12
Figure 7 Impacts to Distribution of Paniculate Tarplant	17
Figure 8 Drainage Features.....	25
Figure 9 Impacts to MSHCP Riverine Areas	37
Figure 10 Water Quality Management Features	41

List of Tables

	<u>Page</u>
Table 1	Existing/ Permanent Impacts to Plant Communities..... 16
Table 2	Jurisdictional Drainage Features 23
Table 3	MSHCP Riparian/Riverine Areas 27
Table 4	MSHCP Riparian/Riverine Plant Species..... 29
Table 5	MSHCP Riparian/Riverine Wildlife Species 32
Table 6	Permanent Impacts to MSHCP Riparian/Riverine Areas (CDFW Jurisdiction)..... 35
Table 7	Summary of Permanent Impacts and Mitigation for Riparian/Riverine Areas..... 44

1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

This document presents the results of a Determination of Biologically Equivalent or Superior Preservation (DBESP) conducted by **PCR Services Corporation (PCR)** for the proposed Baxter Village development (Project), Assessor Parcel Numbers (APNs) 367-180-015 and 367-180-043, as required under Section 6.1.2, Riparian/Riverine and Vernal Pools policy of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (Riverside County Integrated Project/RCIP, 2003; Dudek & Associates, 2003).

1.2 DEFINITION OF THE PROJECT SITE

The approximately 35.95-acre Project site and 9.08 acres off-site is generally situated just southwest of Interstate 15 (I-15), as shown in **Figure 1, Regional Map**. Specifically, the Project site is located northwest of the intersection of I-15 and Baxter Road. The Project site can be found on the U.S. Geological Survey (USGS) 7.5' Wildomar topographic quadrangle map, Section 26, T. 6 S., R. 4 W. (USGS 1953), as shown in **Figure 2, Vicinity Map**. Surrounding land uses include a mix of rural and suburban residential development to the north, northwest, west, and south; and I-15, rural residential development, and open space to the northeast and east.

The Project site and off-site areas consist primarily of disturbed fallow agricultural fields, with remnants of an olive orchard and a smaller component of native vegetation dominated by coast live oaks (*Quercus agrifolia*), California buckwheat (*Eriogonum fasciculatum*), and willows (*Salix* spp.). One jurisdictional on-site drainage feature, Drainage A, was observed in the western portion of the Project site, traversing the site in a northeast to southwest direction. Non-jurisdictional areas were also noted on-site, including an historic tributary and topographic low points. Two additional jurisdictional drainage features were identified off-site, namely Drainages B and C. No USGS blue line streams are mapped within the Project site or off-site areas.

The topography is relatively flat throughout the Project site and off-site areas. The site slopes gently in a northeast to southwest direction, with elevations ranging from approximately 1,330 feet above MSL along the southwestern boundary of the Project site to approximately 1,370 feet above MSL along the northeastern boundary of the Project site. Representative photographs of the Project site are included in **Figure 3, Site Photographs**.

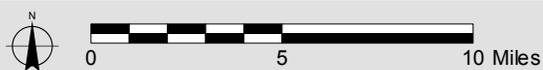
1.3 RELATIONSHIP TO THE MSHCP

The Project site is located in the Elsinore Area Plan of the MSHCP. The MSHCP is a multi-jurisdictional Habitat Conservation Plan to maintain biological and ecological diversity within a rapidly urbanizing region. Under the MSHCP, participating jurisdictions (in this case, the City of Wildomar) are authorized to allow “take” of specified plant and wildlife species within the MSHCP Plan Area. In addition, the wildlife agencies, namely California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS), allow take of habitat or individual species outside of the MSHCP Conservation Area in exchange for the assembly and management of a coordinated MSHCP Conservation Area.

The Project site is not within or adjacent to a criteria cell, as shown in **Figure 4, Location within the Elsinore Area Plan of the MSHCP**. A criteria cell is defined as a “unit within the Criteria Area” for which descriptions are provided “to guide assembly of the Additional Reserve Lands”. Since the Project site is not within a criteria cell, it is not subject to the Habitat Acquisition and Negotiation Strategy (HANS) process. The HANS process applies to properties within a MSHCP criteria cell which may be needed for inclusion in the MSHCP Conservation Area. The nearest Cell Group is approximately 0.6 mile northeast of the Project site (Cell Group J, specifically cells 5149 and 5248) (Riverside County TLMA, 2013b). The Project site is separated from the nearest cell group by the I-15 freeway immediately adjacent to the site, with undeveloped land and scattered rural residential lots northeast of the freeway.

Although the Project site is outside of a criteria cell, it is still subject to other plan wide requirements of the MSHCP. The Applicant is required to pay the Local Development Mitigation Fee established in the MSHCP Implementation Agreement (Section 8.5.1 of the MSHCP), comply with the Riparian/Riverine policy in the MSHCP (Section 6.1.2 of the MSHCP), and conduct burrowing owl surveys because the Project site is within the Burrowing Owl Survey Area (Section 6.3.2 of the MSHCP). The Project site is not within the MSHCP’s Narrow Endemic Plant Species Survey Area (Section 6.1.3 of the MSHCP), Criteria Area Species Survey Area, Amphibian Species Survey Area, or Mammal Species Survey Area (Section 6.3.2 of the MSHCP).

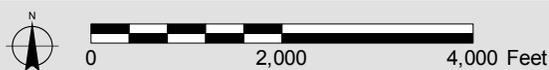
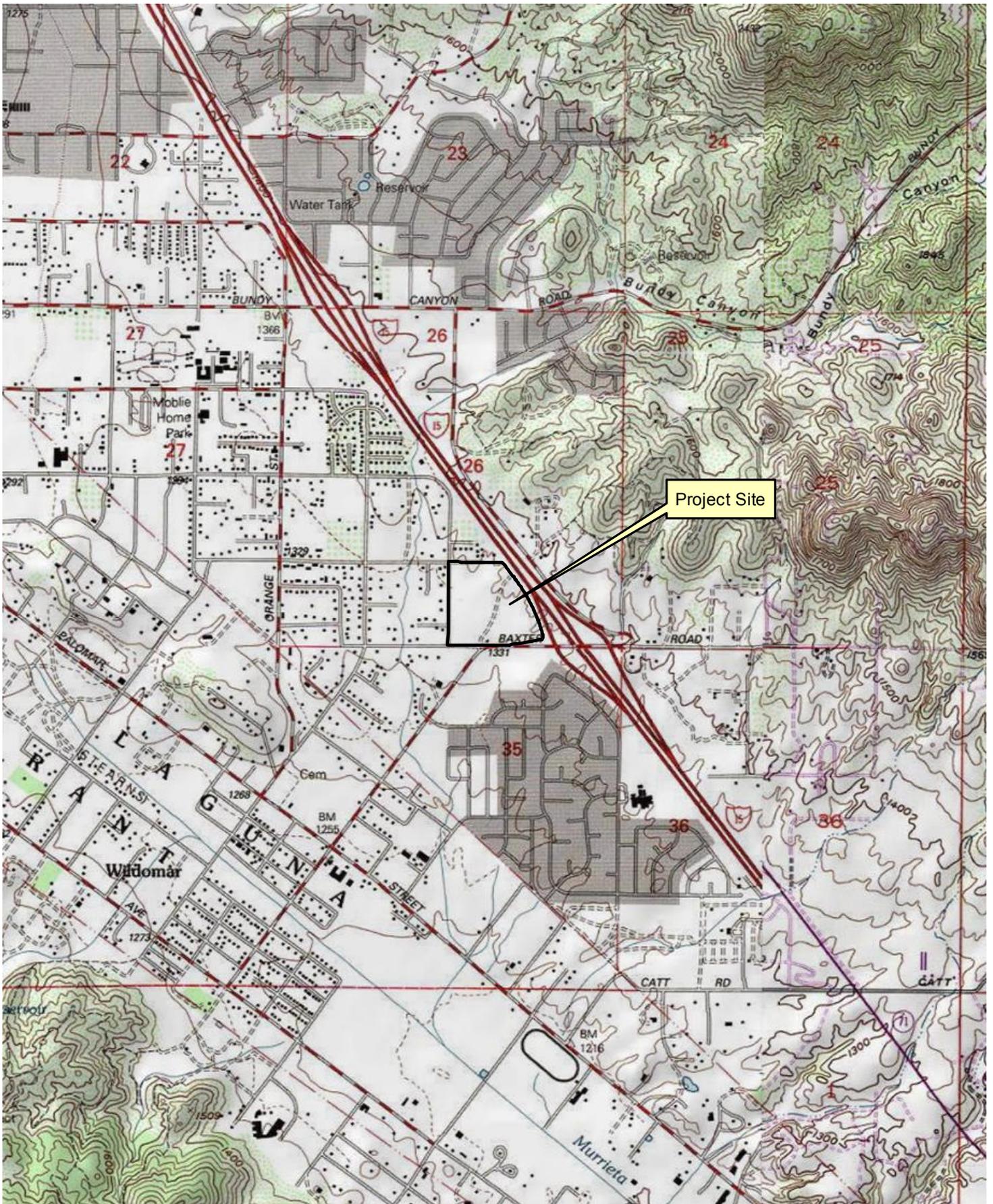
The Project site is not within any Core or Linkage areas as identified by the MSHCP (Dudek & Associates, 2003). The closest linkage to the Project site, Proposed Linkage 8, occurs just over one mile to the northeast associated with Sedco Hills. The closest Core areas occur less than five miles to the west (Proposed Extension of Existing Core 3, Lake Elsinore Soils), southwest (Core B, Cleveland National Forest), and south (Core F, Santa Rosa Plateau).



Regional Map

Baxter Village APNs 367180015 & 367180043
 Source: ESRI Street Map, 2009; PCR Services Corporation, 2014.

FIGURE
1



Vicinity Map

Baxter Village APNs 367180015 & 367180043

Source: USGS Topographic Series (Murrieta, Wildomar, CA); PCR Services Corporation, 2014.

FIGURE

2



Photograph 1: Photograph of Disturbed habitat located in the southeastern corner of the project site.



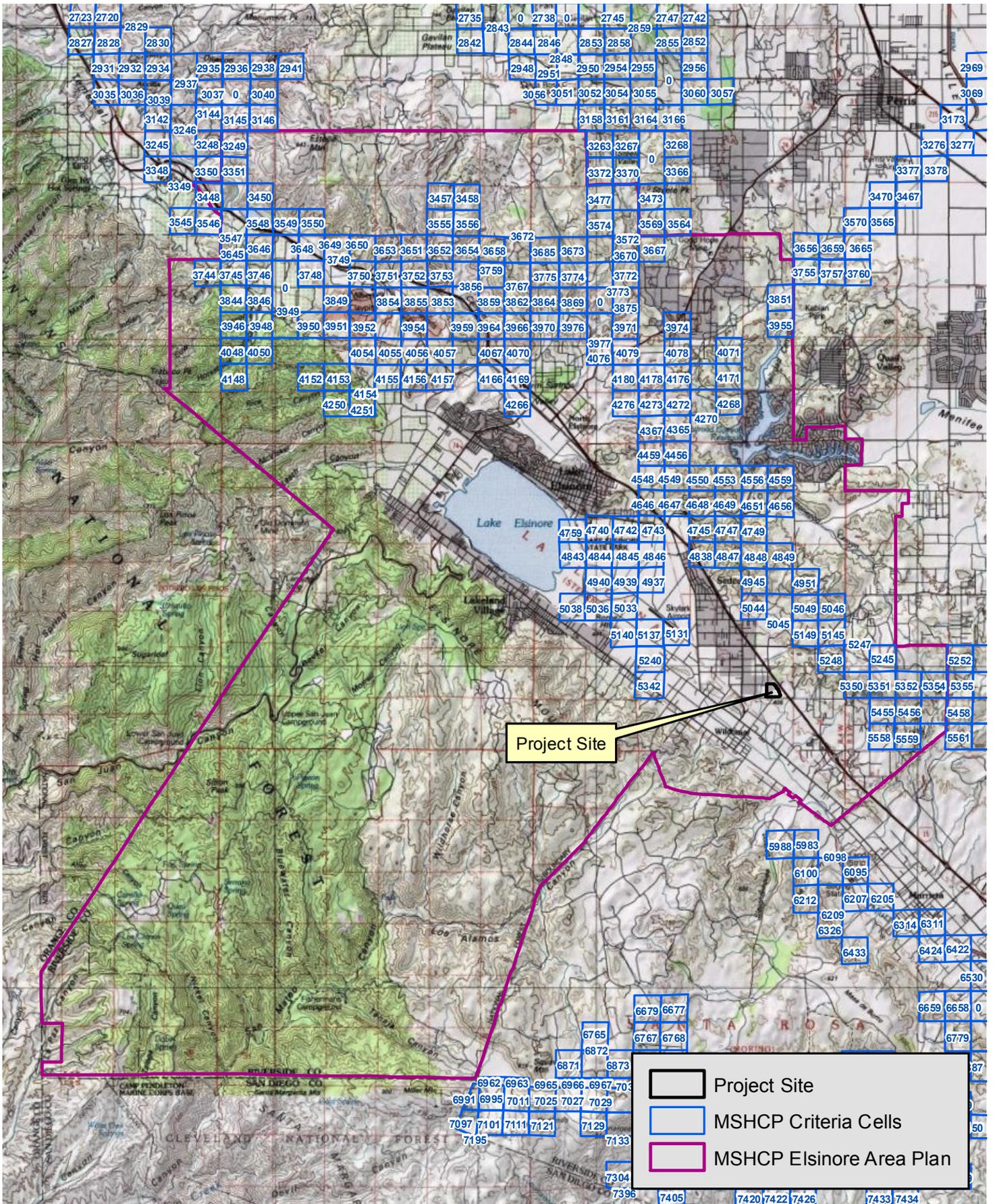
Photograph 2: Photograph of Buckwheat Scrub/Ruderal located within the southeastern portion of the project site.



Photograph 3: Photograph of Southern Willow Scrub/Eucalyptus Woodland located within the southern portion of the project site.



Photograph 4: Photograph of Southern Riparian Scrub located within the southeastern portion of the project site.



Location within the Elsinore Area Plan of the MSHCP

FIGURE

4

Baxter Village APNs 367180015 & 367180043
 Source: USGS Topographic Series; MSHCP; PCR Services Corporation, 2014.

2.0 PROJECT DESCRIPTION

2.1 PROPOSED PROJECT

The proposed Project is a mixed-use residential and commercial development as depicted on **Figure 5, Conceptual Site Plan**. The residential portion includes single family homes and apartments on the majority of the site. Specifically, single family residential houses are proposed along the entire western portion of the site, including 67 two-story front loaded homes with approximately 4,200 square feet lots totaling 9.8 acres. Three story walk-up apartment buildings are proposed in the northeastern portion of the site totaling 204 units and 480 parking spaces on 10.8 acres. A recreation and leasing building is also proposed as part of the apartment complex. The proposed commercial portion of the Project is located in the southeastern portion of the site and comprises 75,000 square feet of buildings and 412 parking spaces on 11.4 acres.

Additional features of the Project include a community multi-use trail, a recreation area/retention basin in the southwestern corner, a second retention basin in the southeastern corner, and a landscape buffer along the eastern boundary adjacent to the I-15. The main entry and secondary entry are both located off Central Avenue.

The 9.08 acres of off-site areas include linear buffers to the east and west of the Project site, and a larger area to the south of the Project site. The off-site areas are proposed to accommodate disturbance from grading activities associated with manufactured slopes, as well as road improvements associated with Baxter Road and Central Avenue along the southern Project limits as required by the City of Wildomar.

One on-site drainage feature, Drainage A, was observed in the western portion of the Project site, traversing the site in a northeast to southwest direction. Two additional jurisdictional drainage features were identified off-site, namely Drainages B and C. No USGS blue line streams are mapped within the Project site or off-site areas. Drainages B and C are considered MSHCP Riverine/Riparian Areas, respectively. Non-jurisdictional areas were also observed on the Project site, including an historic tributary to Drainage A and topographic low points. Representative photographs of the drainages and non-jurisdictional areas are included in **Figure 6a, Figure 6b, and Figure 6c, Drainage Photographs**.

2.2 PROJECT ALTERNATIVES

Avoidance of biological resources on the Project site would not allow the developable acreage necessary to make the Project economically feasible, and off-site impacts were minimized to those necessary to comply with the City of Wildomar requirements, as described further in section 2.3 below. However, the Project site does not support high function and value biological resources either on-site or off-site. As described in this report, the biological resources are limited to three ephemeral drainages (Drainage A on-site, and Drainages B and C off-site; 0.1 acre of southern riparian scrub is associated with Drainage C) and 0.36 acre of southern willow scrub/eucalyptus woodland (0.33 acre on-site and 0.03 acre off-site). Drainage A is a man-made erosional feature located entirely in uplands, and is isolated from any downstream connection. The drainage is predominately unvegetated and the downstream portion lacks drainage indicators. The southern willow scrub/eucalyptus woodland is remnant, isolated, in declining condition, and lacks any indicators of hydrology. Based on this, both Drainage A and the southern willow scrub/eucalyptus woodland were

considered of low function and value. Neither met the definition of Riparian/Riverine pursuant to the MSHCP, but Drainage A is considered CDFW and RWQCB jurisdictional “waters of the State” and the southern willow scrub/eucalyptus woodland is a CDFW sensitive community. As such, even though the drainage and vegetation community are of low function and value, impacts will be mitigated at a minimum 1:1 ratio based on their low quality pursuant to the CDFW Section 1602 of the Fish and Game Code and Section 401 of the Clean Water Act regulated by RWQCB for Drainage A, and the California Environmental Quality Act (CEQA) for the southern willow scrub/eucalyptus woodland. Drainages B and C were also considered of low function and value due to being either predominately unvegetated (Drainage B), or for being remnant and isolated, and lacking the appropriate vegetation structure to support wildlife species (Drainage C). Both drainages are considered Riparian/Riverine pursuant to the MSHCP and are regulated by USACE and/or CDFW and RWQCB, and impacts will also be mitigated at a minimum 1:1 ratio based on their low quality.

2.3 100 PERCENT AVOIDANCE ANALYSIS

In accordance with the MSHCP, a 100 percent avoidance alternative was considered to determine if a project could be developed on the property site that avoided 100 percent of the Riparian/Riverine areas present. The site supports three drainage features of which one is located on-site and two off-site, as described further in section 4.4, Jurisdictional Drainage Features, of this report. Only the off-site drainages were determined to meet the definition of MSHCP Riparian/Riverine Areas. In order to avoid all impacts to Riparian/Riverine areas, in addition to the on-site biological resources identified in section 2.2 above, the Project could not 1) implement the off-site improvements to Baxter Road/Central Avenue as required by the City of Wildomar, 2) provide the main and secondary access to the site off Baxter Road/Central Avenue as required by the City of Wildomar, and 3) support the developable acreage necessary to make the Project economically feasible. Therefore, the 100 percent avoidance alternative was determined to be infeasible and no further analysis was considered by the Project proponent with regard to 100 percent avoidance, or any part thereof.

Since the proposed Project is not within a MSHCP criteria cell, removing any possible development would place further development pressure on areas within MSHCP criteria cells. In addition, under the 100 percent avoidance alternative, there would be no off-site mitigation that would provide wider reaching watershed benefits than the isolated features and vegetation communities supported on the Project site and in the off-site areas (see section 7.3 of this report), or improvements to water quality downstream of the Project post-development.

In summary, a 100 percent avoidance alternative is not feasible because it would not allow the Applicant to realize Project objectives, it would increase development pressure within MSHCP criteria cells, and there would be no wide reaching watershed-level benefits.

2.4 OTHER ALTERNATIVES CONSIDERED

No other alternatives beyond those discussed in Sections 2.1 and 2.2 above were considered for the development based on the economical infeasibility and low function and value of the biological resources identified.



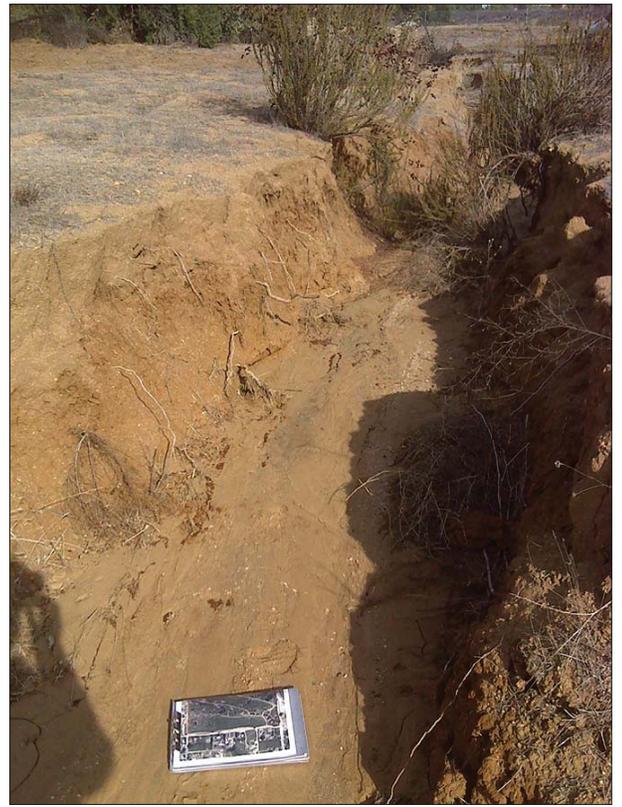
Conceptual Site Plan

Baxter Village APNs 367-180-015 & 367-180-043

Source: KTG, 2013.



Photograph 1: Drainage A erosional feature looking upstream/north near northern project boundary.



Photograph 2: View within incised portion of Drainage A erosional feature looking upstream/north. Note exposed roots along vertical banks suggesting recent high velocity flows consistent with anthropogenic discharge given lack of upstream watershed.

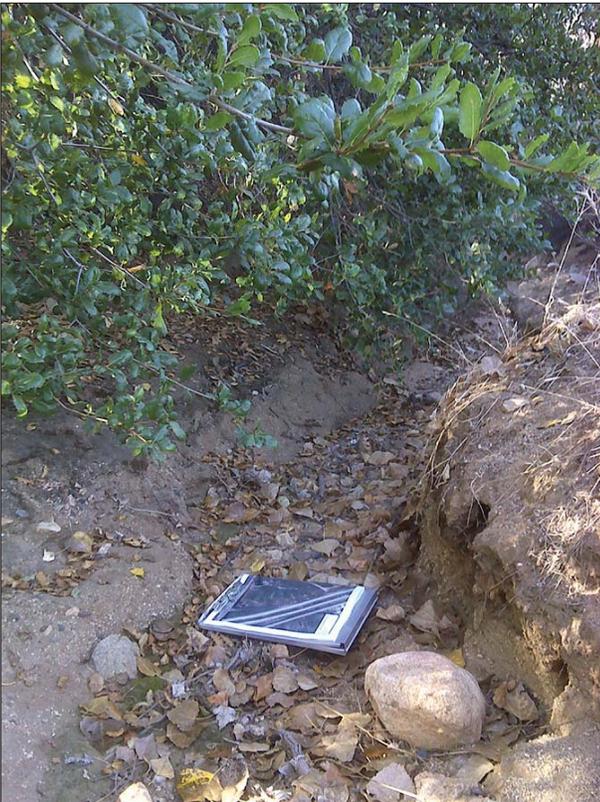


Photograph 3: Drainage A near central portion of site where streambed terminates and indicators of flow become indiscernible.

Note: Location of photographs are depicted on the Drainage Features Map provided as Figure 8.



Photograph 4: Off-site Drainage B looking south/downstream from shoulder of Baxter Road.



Photograph 5: Off-site Drainage C looking southwest/downstream within streambed near culvert beneath Baxter Road.



Photograph 6: Upstream Drainage C (off-site) looking south at cottonwood trees located directly downstream of culvert beneath the I-15 Baxter Road (Southbound) off-ramp.

Note: Location of photographs are depicted on the Drainage Features Map provided as Figure 8.





Photograph 7: Photo looking southwest within non-jurisdictional remnant drainage feature approximately 80 linear feet south of northern project boundary.



Photograph 8: Photo looking east from within topographic low-point of rolling hill contours occurring near southeast corner of site. Note lack of discernible streambed.



Photograph 9: Photo looking southwest with topographic low-point in foreground lacking a discernible streambed or indicators of jurisdiction. Note 0.36 acre southern willow scrub/eucalyptus woodland in distance.

Note: Location of photographs are depicted on the Drainage Features Map provided as Figure 8.

3.0 METHODOLOGY

The biological resources of the Project site are documented in the Biological Resources Assessment (PCR, 2013) (refer to **Appendix A**, *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*). An overview of the methods is provided below.

3.1 LITERATURE REVIEW

The assessment began with a review of relevant maps and literature on the biological resources of the Project site and surrounding vicinity. Initially, the California Natural Diversity Database (CNDDDB), a CDFW species account database; the MSHCP; and the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants were reviewed for all pertinent information regarding the localities of known observations of sensitive species and habitats in the vicinity of the Project site. Federal register listings, protocols, and species data provided by the USFWS and CDFW were reviewed in conjunction with anticipated federally- and state-listed species potentially occurring within the vicinity as necessary. In addition, regional flora and fauna field guides were utilized to assist in the identification of species and suitable habitats.

3.2 FIELD INVESTIGATIONS

The following field investigations were conducted by PCR. The detailed methodology for each type of survey can be found in Appendix A (section 3.0), *Biological Resources Assessment*.

- General biological survey (including sensitive species habitat assessments) and vegetation mapping was conducted on November 27, 2012 by PCR biologist Ezekiel Cooley.
- Jurisdictional delineation was conducted on November 27, 2012 by PCR Principal Regulatory Scientist Amir Morales.
- Focused sensitive plant surveys were conducted by PCR biologists Ezekiel Cooley, Bob Huttar, Florence Chan, and/or Amy Lee on April 11, 2013 and August 19, 2013. Surveys were conducted following CDFW and USFWS published guidelines.
- Focused Step I and Step II burrowing owl surveys were conducted on April 11, 2013 (PCR biologists Ezekiel Cooley and Bob Huttar), May 10, 2013 (PCR biologists Ezekiel Cooley and Amy Lee), June 13, 2013 (PCR biologists Florence Chan and Amy Lee), and August 19, 2013 (PCR biologists Amy Lee, Florence Chan, and Bob Huttar). The surveys were conducted in accordance with the MSHCP burrowing owl survey instructions (County of Riverside, 2006).

3.3 PLANT COMMUNITY MAPPING

Plant communities were mapped directly in the field utilizing a 100-scale (1"=100') aerial photograph. Plant community names and descriptions follow Holland (1986). After completing the fieldwork, the plant community polygons were digitized using Geographic Information System (GIS) technology to calculate acreages.

4.0 DESCRIPTION OF AVAILABLE BIOLOGICAL INFORMATION

This section summarizes the biological resources of the Project site and proposed impacts as documented in Appendix A, *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*. Observed species lists are included in Appendix A (as Appendix A of the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*).

4.1 PLANT COMMUNITIES

The Project site and off-site areas total 45.04 acres and support 42.84 acres of non-native dominated plant communities (34.74 acres on-site and 8.1 acres off-site) and 2.2 acres of native plant communities (1.23 acres on-site and 0.97 acre off-site). Non-native plant communities include 0.21 acre of eucalyptus woodland (0.18 acre on-site and 0.03 acre off-site), 3.3 acres of olive grove/ruderal (on-site only), 1.58 acres ruderal/buckwheat scrub (off-site only), 36.6 acres disturbed (31.26 acres on-site and 5.34 acres off-site), in addition to 1.15 acres developed (off-site only). Native plant communities include 0.77 acre of buckwheat scrub (off-site only), 0.42 acre of buckwheat scrub/ruderal (0.35 acre on-site and 0.07 acre off-site), 0.55 acre of coast live oak woodland (on-site only), 0.10 acre southern riparian scrub (off-site only), and 0.36 acre southern willow scrub/eucalyptus woodland (0.33 acre on-site and 0.03 acre off-site). Descriptions and a map of the plant communities are included in the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis* prepared by PCR (2013) (Appendix A).

All of the non-native and native plant communities described above would be permanently impacted by the Project. The total acreages of each plant community mapped within the Project site, equivalent to the permanent impacts to those communities, are summarized in **Table 1, Existing/Permanent Impacts to Plant Communities**.

4.2 SENSITIVE PLANT SPECIES

Sensitive plants include those listed by the USFWS, CDFW, and CNPS (particularly lists 1A, 1B, and 2). One potentially sensitive plant species was observed on the Project site, paniculate tarplant (*Deinandra paniculata*). This species is a CNPS List 4, which is classified as 'Plants of limited distribution – a watch list'. The paniculate tarplant was found in two locations on-site totaling 0.74 acre, including a moderate density area within a low lying location in the southeastern portion of the Project site (0.60 acre) and a low density area in the northeastern portion of the Project site (0.14 acre). The southeastern location consisted of several hundred individuals in a moderately dense cluster, and solitary individuals were scattered for a distance of approximately 50 yards. The species was flowering at the time of the survey.

All of the paniculate tarplant would be permanently impacted as a result of the Project (see **Figure 7, Impacts to Distribution of Paniculate Tarplant**). This species is widely distributed in Riverside County, as documented on Calflora, including 31 CNPS and other records, in addition to georeferenced coordinates for several hundred observations (Calflora, 2012). In addition, it is not a species covered by the MSHCP, nor was it considered for coverage under the MSHCP. Based on the distribution of this species within Riverside County, the lack of consideration of this species for coverage under the MSHCP, and the CNPS listing of 4, this

Table 1

Existing/Permanent Impacts to Plant Communities

Plant Community	On-Site Existing/Impacts (acres)	Off-Site Existing/Impacts (acres)	Total Existing/Impacts (acres)
Buckwheat Scrub	-	0.77	0.77
Buckwheat Scrub/Ruderal	0.35	0.07	0.42
Coast Live Oak Woodland	0.55	-	0.55
Southern Riparian Scrub	-	0.10	0.10
Southern Willow Scrub/Eucalyptus Woodland	0.33	0.03	0.36
Eucalyptus Woodland	0.18	0.03	0.21
Olive Grove/Ruderal	3.30	-	3.30
Ruderal/Buckwheat Scrub	-	1.58	1.58
Disturbed	31.26	5.34	36.6
Developed	-	1.15	1.15
Total	35.97	9.07	45.04

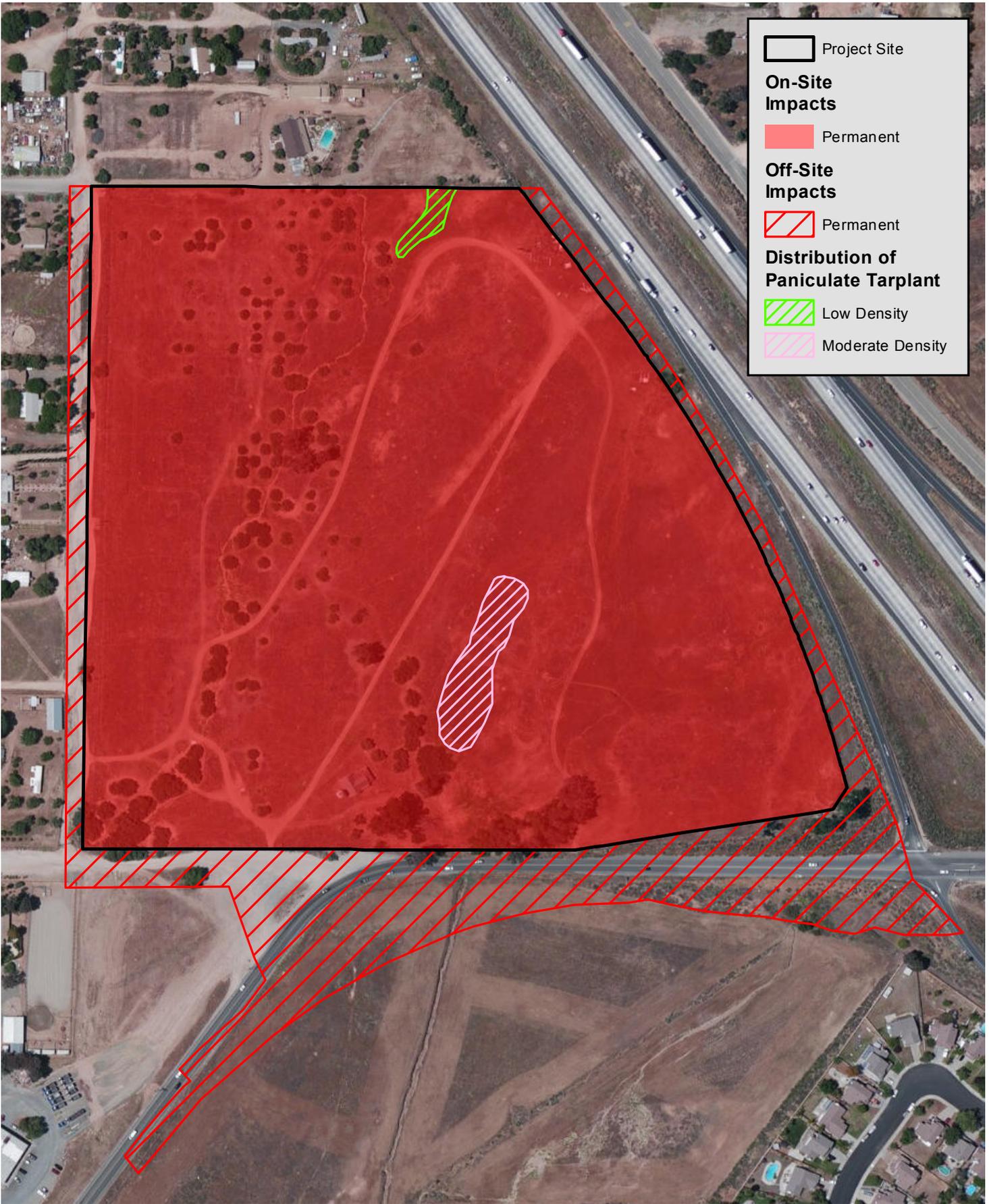
Source: PCR Services Corporation, 2013.

species is not considered sensitive. Therefore, impacts to paniculate tarplant would be considered a less than significant impact and no mitigation measures would be required.

As discussed in the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013), no other sensitive plant species were observed on-site. The Project site is not within the MSHCP Narrow Endemic Plant Species Survey Area or Criteria Area Species Survey Area.

4.3 SENSITIVE WILDLIFE SPECIES

Sensitive wildlife species include those species listed as Endangered or Threatened under the Federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA), candidates for listing by the USFWS or CDFW, and Species of Special Concern to the CDFW. Several sensitive wildlife species were reported in the vicinity based on CNDDDB, totaling 42 species within the 9-quadrangle search. Of these, a total of 25 species were considered to have no potential to occur due to the lack of suitable habitat or the Project site's location outside of the species' range, 1 species (burrowing owl/*Athene cunicularia*) was determined absent based on focused surveys, and 12 species were determined to have a very low, low or moderate potential to inhabit or forage on-site (an additional 4 species were also determined to have a potential to occur and are discussed under the migratory bird and raptor species discussion). A summary table of these species is provided in Appendix C of the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013). No sensitive wildlife species were observed on the Project site. The results of the focused burrowing owl survey are provided below, in addition to a summary of 12 species with potential to occur, and a discussion of migratory bird and raptor species.



Project Site
On-Site Impacts
 Permanent
Off-Site Impacts
 Permanent
Distribution of Paniculate Tarplant
 Low Density
 Moderate Density

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Burrowing Owl

Burrowing owl is a California Species of Special Concern that is known to occur in the Project vicinity based on CNDDDB and the MSHCP. The Project site is within an overlay in the MSHCP that requires additional surveys. Therefore, focused Step I and Step II surveys for burrowing owls were conducted on the Project site. As outlined in the survey report provided as Appendix D of the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013), suitable habitat was identified on-site during the Step I survey, including disturbed, low-growing vegetation; bare ground; and small fossorial mammal burrows. Burrowing owls often use the burrows of California ground squirrels (*Spermophilus beecheyi*); ground squirrels were observed on-site, mostly in areas where trees were present, particularly the eucalyptus trees located near the abandoned house/barn in the southwest portion of the Project site (a fair amount of garbage was also observed concentrated in this area). A few shallow old burrows were found in the open fields northeast of the house. Also, the site is fairly open, which burrowing owls prefer. Although the Project site supports some suitable habitat, no owls were observed on-site during the focused Step II surveys, or within approximately 500-feet of the Project site as required by the survey protocol. Therefore, the Project site and adjacent area does not currently support burrowing owls.

However, due to the presence of suitable habitat and in compliance with the MSHCP, a pre-construction survey for burrowing owl is required within 30 days prior to ground disturbance to avoid potential direct take of burrowing owls in the future. A Condition of Approval requiring this survey is recommended in Section 8.0 of the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013), in addition to a recommended mitigation measure should burrowing owls be present in the future pursuant to CDFW published guidelines.

Species With Potential to Occur

The following 12 species were determined to have a potential to occur on the Project site:

- **Coast horned lizard (*Phrynosoma blainvillii*):** This reptile species is a state species of special concern and is a Covered Species pursuant to the MSHCP. Coast horned lizard was determined to have a potential to occur on the Project site and off-site areas based on the presence of limited scrub and wash habitat. However, the potential to occur was considered low to moderate due to the limited habitat that is scattered and disturbed. No incidental sightings of this species were made during site surveys conducted in 2012 and 2013.
- **Orange-throated whiptail (*Aspidoscelis hyperythra*):** This reptile species is a state species of special concern and a Covered Species pursuant to the MSHCP. Orange-throated whiptail was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub, dry and disturbed habitats. However, the potential to occur was considered moderate due to the high level of disturbance. No incidental sightings of this species were made during site surveys conducted in 2012 and 2013.
- **Coastal California Gnatcatcher (*Polioptila californica californica*):** This bird species is listed as federally Threatened, a state species of special concern, and a Covered Species pursuant to the MSHCP. Coastal California gnatcatcher was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub vegetation and an occurrence of the species documented by CNDDDB within 1 mile of the site. However, the potential to occur was considered low due to the limited, scattered and highly disturbed nature of the site.

- **Least Bell's Vireo (*Vireo bellii pusillus*):** This bird species is listed as federally Endangered, state Endangered, and a Covered Species pursuant to the MSHCP (with additional surveys required in proposed impact areas). Least Bell's vireo was determined to have a potential to occur within the Project site within the southern willow scrub/eucalyptus woodland, as migratory stop-over habitat only. Although the community supports a willow scrub understory beneath the eucalyptus woodland canopy, the structure of the habitat was not considered optimal for nesting habitat for the species. Least Bell's vireo are known to require dense cover within 3 to 6 feet of the ground where nests are typically located, and a dense, stratified canopy for foraging (USFWS, 1998). The structure of the willow scrub understory habitat on the Project site was observed in decline, consisting of many fallen willows and the lack of young saplings, likely a result of the effects of overshadowing by the eucalyptus canopy; the vegetation also displayed signs of stress. The habitat is also remnant and was likely associated with an historic drainage that has been cut off from the upstream watershed by the I-15 and agricultural dry-farming activities on the site, and from any downstream connection due to development. As such, no signs of a drainage feature were observed in association with this habitat. The habitat is isolated from nearby similar habitats; the nearest patch of riparian habitat from the Project site is approximately 2 miles south/downstream within Murrieta Creek and 1 mile northeast associated with an unnamed tributary within Bundy Canyon. Furthermore, the community is limited to a 0.36-acre patch (0.33 acre on-site and 0.03 acre off-site) that is generally too small for a breeding territory; territory sizes of the species range from 0.5 to 7.5 acres (USFWS, 1998). In consideration of these factors, the potential for this species to occur was considered low and as a stop-over habitat only for birds migrating between suitable habitats in the region to the south and northeast. No potential for least Bell's vireo to nest on-site was considered, and the species is not expected to occur in the off-site southern riparian scrub habitat due to the lack of understory structure.
- **Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*):** This mammal species is listed as a state species of special concern and a Covered Species pursuant to the MSHCP. Northwestern San Diego pocket mouse was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub habitat. However, the potential to occur was considered very low; although small rodent burrows (unidentified species) were observed, the habitat is limited and highly disturbed.
- **Stephen's kangaroo rat (*Dipodomys stephensi*):** This mammal species is listed as federally endangered, state threatened, and a Covered Species pursuant to the MSHCP. Stephen's kangaroo rat was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub habitat. However, the potential to occur was considered very low; although small rodent burrows (unidentified species) were observed, the habitat is limited and highly disturbed.
- **Los Angeles Pocket Mouse (*Perognathus longimembris brevinasus*):** This mammal species is listed as federally endangered, state threatened, and a Covered Species pursuant to the MSHCP (with additional surveys required in survey overlay areas). Los Angeles pocket mouse was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub habitat and potential burrows observed within 1 mile of the Project site. Small rodent burrows (unidentified species) were observed. Although potential burrows of this species have been observed close to the Project site, the potential for this species to occur was considered low due to the limited habitat that is scattered and highly disturbed.
- **Jacumba Pocket Mouse (*Perognathus longimembris internationalis*):** This mammal species is listed as a state species of special concern. Jacumba pocket mouse was determined to have a potential to occur within the Project site and off-site areas based on the presence of scrub habitat and

potential burrows observed within 1 mile of the Project site. Small rodent burrows (unidentified species) were observed. Although potential burrows of this species have been observed close to the Project site, the potential for this species to occur was considered low due to the limited habitat that is scattered and highly disturbed.

- **San Diego black-tailed jackrabbit (*Lepus californicus bennettii*):** This mammal species is a state species of special concern and a Covered Species pursuant to the MSHCP. San Diego black-tailed jackrabbit was determined to have a potential to occur on the Project site and off-site areas based on the presence open scrub habitat and an occurrence in CNDDDB within 1-mile of the site. However, the potential to occur was considered low due to the limited habitat on-site that is scattered and highly disturbed. Furthermore this species is typically highly active and visible during the day, and none were observed during site surveys conducted in 2012 and 2013.
- **Western Mastiff Bat (*Eumops perotis californicus*):** This mammal species is a state species of special concern. Western mastiff bat was determined to have a potential to occur on the Project site and off-site areas for foraging only based on the presence of open habitat. However, the potential to occur was considered low due to the limited habitat. No suitable roosting habitat was determined present on- or off-site.
- **San Diego Desert Woodrat (*Neotoma lepida intermedia*):** This mammal species is a state species of special concern. San Diego desert woodrat was determined to have a potential to occur on the Project site and off-site areas based on the presence of open habitat. However, the potential to occur was considered very low based on the limited habitat and the absence of any recorded observations in CNDDDB within 10 miles of the site.
- **Pallid Bat (*Antrozous pallidus*):** This mammal species is a state species of special concern. Pallid bat was determined to have a potential to occur on the Project site and off-site areas for foraging only based on the presence of open habitat. However, the potential to occur was considered low based on the limited habitat.

Of the 12 species above, 7 are Covered Species pursuant to the MSHCP (coast horned lizard, orange-throated whiptail, coastal California gnatcatcher, northwestern San Diego pocket mouse, Stephen's kangaroo rat, Los Angeles pocket mouse, and San Diego black-tailed jackrabbit). No surveys or mitigation is required for these Covered Species assuming payment of the MSHCP development fee and implementation of MSHCP measures, including the Standard Best Management Practices provided in Appendix C of the MSHCP (see also section 6.3.6 *Consistency with Adopted Natural Community Conservation Plan* below). For the remaining 5 species, 1 is a Covered Species with additional surveys required in impact areas (least Bell's vireo), 2 species are state species of special concern with very low or low potential based on the limited, scattered and disturbed scrub habitat on- or off-site and occurrences in the region (Jacumba pocket mouse and San Diego desert woodrat), and two species are state species of special concern bats with potential for foraging only (western mastiff bat and pallid bat – foraging habitat is limited). No impacts to least Bell's vireo, and no significant impacts to the remaining species, are expected, as discussed in the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013; section 6.3.1.2). Impacts to least Bell's vireo are discussed further below in sections 6.1 and 6.2 of this report.

Migratory Birds and Raptors

The Project site and off-site areas support potential nesting and foraging habitat for birds (limited to shrubs and trees for nesting), in addition to potential foraging habitat for birds including raptors (primarily in the disturbed areas and more open scrub habitat). Several species of non-listed birds were observed on-site and

special-status birds were identified by CNDDDB as potentially occurring within the 9-quadrangle search area (see Appendix C). Only one of the special-status non-raptor species, loggerhead shrike (*Lanius ludovicianus*), was determined to have the potential to occur within the Project site and off-site areas (low potential for nesting, and moderate potential for foraging). In addition to the observed and special-status bird species, additional CDFW Watch List non-raptor species include California horned lark (*Eremophila apestria actia*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), and Bell's sage sparrow (*Amphispiza belli belli*).

According to CNDDDB, there is also a potential for special-status raptors such as northern harrier (*Circus cyaneus*/Species of Special Concern), bald eagle (*Haliaeetus leucocephalus*/Fully Protected), golden eagle (*Aquila chrysaetos*/Fully Protected), and white-tailed kite (*Elanus leucurus*/Fully Protected) within the 9-quadrangle search area, in addition to CDFW watch list species such as Cooper's hawk (*Accipiter cooperii*), and ferruginous hawk (*Buteo regalis*). Of the special-status raptors only bald eagle was determined to have no potential to occur due to the lack of aquatic habitats associated with the Project site; the remaining species were determined to have potential to occur for foraging only but were not incidentally observed by PCR during any surveys. Raptors observed on-site were limited to non-listed species including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and American kestrel (*Falco sparverius*).

No significant impacts to foraging habitat for migratory birds and raptors is expected based on the low quality of habitat as a result of historical disturbance on-site and due to surrounding development. The loss of foraging habitat as a result of the Project would not expect to impact the foraging of these species. Therefore, impacts to foraging habitat would be considered less than significant and no mitigation measures would be required. Direct impacts to these species would be avoided through compliance with the Migratory Bird Treaty Act (MBTA), as discussed in the *Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis*, attached (PCR, 2013; sections 4.7.5 and 6.3.1.2).

4.4 DRAINAGE FEATURES

4.4.1 Jurisdictional Drainage Features

Based on the results of the delineation, there is one on-site erosional feature identified as Drainage A and two off-site drainage features identified as Drainages B and C. The 35.96-acre Project site has a very limited watershed due to the construction of I-15 which diverts a significant portion of the historic watershed away from the site. The site drains toward the south/southeast and the off-site drainages are ultimately tributary to Murrieta Creek as part of the Santa Margarita Watershed. The on-site erosional feature (Drainage A) is not associated with any historic drainage features based on review of the USGS Wildomar Quadrangle. Although a minor drainage feature may have previously occurred in the location of Drainage A during historic (i.e. pre-interstate) conditions, the current on-site erosional feature (Drainage A) is not associated with any significant historic drainage features based on review of the USGS Wildomar Quadrangle and historic aerial imagery. According to relatively recent aerial imagery, Drainage A appears to have been formed solely by anthropogenically controlled discharge (e.g. pool discharge) from the rural land owner directly to the north. The imagery clearly shows a pipe from the adjacent land owners property intended to discharge at the point where the drainage feature becomes unnaturally incised and eroded given the lack of an upstream watershed and/or any discernible streambed north of Drainage A. As a result, Drainage A is formed entirely in uplands, is otherwise isolated from downstream jurisdictional features, and is therefore presumed not to support USACE jurisdictional "waters of the U.S." It should be noted that the USACE is

currently evaluating the man-made isolated nature of the on-site erosional feature by way of a Jurisdictional Determination to determine if they concur with PCR’s assessment of Drainage A¹. However, CDFW and the RWQCB reserve the right to regulate such man-made erosional features as isolated “waters of the State” and Drainage A is therefore presumed to support RWQCB and CDFW jurisdictional “waters of the State” for the purpose of this DBESP.

The drainages are mapped on **Figure 8, Drainage Features** and summarized in **Table 2, Jurisdictional Drainage Features**. Representative photographs of the drainages are provided in Figure 6a and Figure 6b.

Drainages B and C are considered to meet the MSHCP definition of Riverine and Riparian Areas, respectively, while Drainage A is not considered the meet the MSHCP definition of a Riparian or Riverine Area. The extent of Riparian/Riverine Areas associated with Drainages B and C are considered to be equivalent to the CDFW jurisdiction, as discussed in section 5.0 of this report, below.

Table 2
Jurisdictional Drainage Features

Feature	Length (ft)	Area (acres) ^a			Flow
		USACE	RWQCB	CDFW	
Drainage A (On-Site)	924	0.00 ^b	0.02	0.06	Anthropogenic
Drainage B (Off-Site)	109	0.01	0.01	0.02	Ephemeral
Drainage C (Off-Site)	149	0.01	0.01	0.11	Ephemeral
Total	1,182	0.02	0.04	0.19	

^a Jurisdictional acreages overlap and are not additive (e.g., USACE acreages are included in the total RWQCB and CDFG jurisdictional acreages).

^b Drainage A is currently presumed to be an isolated drainage feature not regulated as “waters of the U.S.” pending the results of a Jurisdictional Determination currently under review by the USACE.

Source: PCR Services Corporation, 2013.

4.4.2 Non-jurisdictional Areas

One historic tributary to Drainage A was observed, which initiates at the northern property boundary approximately 160 feet east of Drainage A. However, the feature was determined to be non-jurisdictional due to a lack of any discernible evidence of flow such as an OHWM or other field indicators indicative of jurisdictional features. The feature was also determined not to support jurisdiction due to the dominance of upland vegetation such as buckwheat and ruderal grasses within the historic feature, and the lack of any streambed indicators directly upstream of the site where rural disturbance appears to have prevented the reestablishment of a drainage feature or erosion of a new channel. All of these observations support the conclusion that the feature is remnant in nature and no longer conveys the hydrology necessary to constitute a functional streambed subject to regulation by the resource agencies. A photograph of the non-jurisdictional feature is provided in **Figures 6c, Drainage Photographs** (see photo 7). Areas of lower

¹ If the USACE determines that Drainage A is subject to regulation under the Clean Water Act as “waters of the U.S.,” the total extent of USACE jurisdiction in Drainage A will be consistent with the acreage of RWQCB jurisdiction in Drainage A.

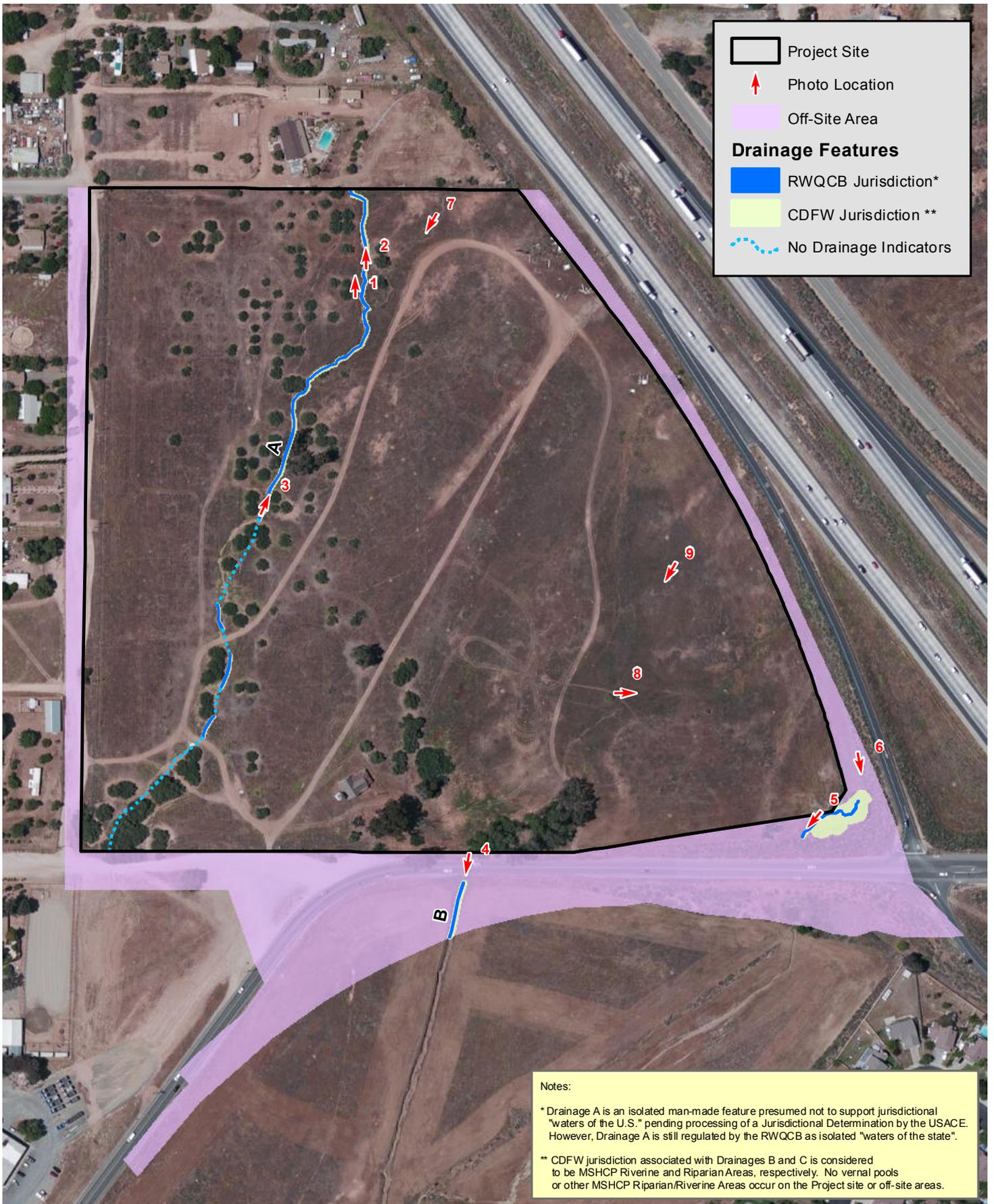
topographic relief associated with gentle rolling hill contours occurring on the east/southeast portion of the site were also not determined to support streambeds. The topographic low-points were examined during the jurisdictional field assessment and did not support any discernible jurisdictional field indicators such as an OHWM, a defined bed and bank, or streambed associated vegetation. Therefore, no jurisdictional features were determined to occur in this portion of the site. Photographs of the areas are provided in **Figure 6c** (see photos 8 & 9).

In addition, an approximately 0.33 acre on-site area and contiguous 0.03 acre off-site area determined to support disturbed southern willow scrub/eucalyptus woodland vegetation occurs adjacent to the central portion of the southern project boundary. This area appears to support remnant habitat that existed on the site prior to the historic diversion of much of the upstream watershed due to the construction of I-15, and was not observed to support jurisdictional field indicators associated with a streambed such as the presence of an OHWM or a defined bed and bank. As a result, the approximately 0.33 acre on-site and 0.03 acre off-site southern willow scrub/eucalyptus woodland area does not support jurisdictional waters regulated by the USACE, RWQCB, or CDFW. A photograph of the vegetation area is provided in **Figure 6c** (see photo 9).

4.5 SOILS

Mapping provided by the Department of Agriculture Natural Resources Conservation Service (NRCS) identified seven soil types on the Project site and off-site areas as follows (NRCS, 2012):

- Greenfield sandy loam (GyC2), 2 to 8 percent slopes, eroded
- Greenfield sandy loam (GyD2), 8 to 15 percent slopes, eroded
- Hanford coarse sandy loam (HcC), 2 to 8 percent slopes
- Monserate sandy loam (MmD2), 8 to 15 percent slopes, eroded
- Monserate sandy loam (MmD2), shallow, 5 to 15 percent slopes, eroded
- Ramona sandy loam (RaB2), 2 to 5 percent slopes, eroded
- Ramona sandy loam (RaB2), 8 to 15 percent slopes, eroded



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5.0 ASSESSMENT OF RIPARIAN/RIVERINE AND VERNAL POOL RESOURCES

5.1 ASSESSMENT OF RIPARIAN/RIVERINE AND VERNAL POOL FEATURES

Section 6.1.2, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*, of the MSHCP provides for the protection of Riparian/Riverine Areas and Vernal Pools within the MSHCP Plan Area. Riparian/Riverine areas are defined in the MSHCP as “lands which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year.” Vernal pools are defined in the MSHCP as “seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season.”

The Project supports two MSHCP Riparian/Riverine Areas on the off-site portion of the Project only, specifically a Riverine Area associated with Drainage B and a Riparian Area associated with Drainage C. The limits of the Riparian/Riverine Areas are considered equivalent to the CDFW jurisdiction mapped on Figure 8 and summarized in **Table 3**, *MSHCP Riparian/Riverine Areas*, totaling 0.13 acre off-site only (no MSHCP Riparian/Riverine Areas occur on-site). A description of Drainages B and C is provided below in sections 5.1.1 and 5.1.2, respectively, and representative photographs are provided as Figure 6a and

Table 3

MSHCP Riparian/Riverine Areas

Drainage	Riparian		Riverine	
	On-site	Off-Site	On-Site	Off-Site
A (Anthropogenic)	-	-	-	-
B (Ephemeral)	-	-	-	0.02
C (Ephemeral)	-	0.11	-	-
Total	0.00	0.11	0.00	0.02

Source: PCR Services Corporation, 2013

Figure 6b. A description of features not considered to meet the definition of Riparian or Riverine Areas is provided in section 5.1.3.

5.1.1 Drainage B (MSHCP Riverine Area; Off-Site)

Drainage B is an unvegetated ephemeral drainage feature that initiates off-site directly south of a culvert beneath the existing Baxter Road. The drainage accepts sheet flow from the eastern portion of the Project site and extends due south for approximately 109 linear feet within the limits of proposed improvements to Baxter Road. The drainage feature is incised vertically by several feet and appears to be somewhat remnant in nature possibly due to a significant reduction in flow following the construction of I-15 to the

north/northeast several decades prior, which greatly reduced the upstream watershed area. Drainage B is unvegetated and supports sandy loam soils.

The biological functions and values of Riparian/Riverine Areas do not exist in Drainage B due to the absence of riparian/riverine associated vegetation (the area is mapped as disturbed and the drainage itself is unvegetated). MSHCP Riverine Area associated with Drainage B is equivalent to CDFW jurisdiction totaling 0.02 acre off-site only (see Table 3 and section 4.4 above).

5.1.2 Drainage C (MSHCP Riparian Area; Off-Site)

Drainage C is an off-site ephemeral drainage feature located directly northwest of the intersection formed by the southbound I-15 Baxter Road off-ramp and Baxter Road. The drainage feature initiates from a small pipe culvert located beneath the off-ramp structure and meanders off-site near the southeast corner of the Project site for approximately 149 linear feet prior to draining into a pipe culvert beneath Baxter Road.

The Riparian Area associated with Drainage C (specifically the southern riparian scrub; the remainder of Drainage C is unvegetated), is not considered suitable for the amphibians, birds, fish, invertebrate-crustacean, and plant species afforded protection under the MSHCP, as discussed below in section 5.2, and as such no further surveys are required.

MSHCP Riverine Area associated with Drainage C is equivalent to CDFW jurisdiction totaling approximately 0.11 acre off-site only (see Table 3 and section 4.4. above).

5.1.3 Other Features

The Project site supports other features that do not meet the definition of MSHCP Riparian/Riverine Areas, including Drainage A, a remnant tributary to Drainage A, topographic low points, and the 0.36 acre of southern willow scrub/eucalyptus woodland (see also section 4.4.2). The on-site Drainage A and the remnant tributary drainage feature that joins Drainage A were not considered to meet the definition of Riparian Areas due to the lack of riparian vegetation (Drainage A is primarily unvegetated with some patches of upland native and non-native vegetation), or the definition of Riverine Areas (i.e., “*areas with fresh water flow during all or a portion of the year*”) based on a lack of OHWM within the downstream portion of the drainage and no downstream connection to other drainages. Drainage A is considered to be an erosional feature that was artificially created in uplands by anthropogenically controlled discharge (e.g. pool drainage) from the rural land owner directly to the north based on review of historic aerial imagery. Pursuant to the MSHCP, artificially created features like Drainage A that are not mitigation areas or alterations of natural stream courses are not considered to meet the definition of Riparian/Riverine areas. The remnant tributary to Drainage A is associated with a topographic low-point that may have been associated with an historic drainage but was hydraulically disconnected by the construction of I-15, and is therefore incapable of supporting water flow since its watershed was altered several decades ago. Drainage A was not considered USACE jurisdictional “waters of the U.S.”, however the CDFW and RWQCB will likely regulate it as “waters of the State”. As such, proposed impacts to this drainage by the Project will be mitigated pursuant to Section 1602 of the Fish and Game Code regulated by CDFW and Section 401 of the Clean Water Act regulated by RWQCB, as outlined in the Biological Resources Assessment (Appendix A, attached). Impacts are proposed at a 1:1 ratio based on the low function and value of the drainage, and would be expected to satisfy USACE mitigation requirements should the agency decide the drainage does qualify as “waters of the U.S.” The

mitigation is consistent with that proposed for the compensatory mitigation to MSHCP Riparian/Riverine Areas outlined in section 7.3 of this report.

Topographic low-points associated with gentle rolling hill contours occurring on the east/southeast portion of the site were also not considered to meet the definition of Riparian Areas or Riverine Areas due to a lack of riparian vegetation or evidence of water flow.

In addition, the 0.36 acre of southern willow scrub/eucalyptus woodland (0.33 acre on-site and 0.03 acre off-site) was also not considered to meet the MSHCP definition of a Riparian/Riverine Area due to the remnant, isolated, and declining condition of the vegetation community and absence of hydrology. The area was not considered CDFW, USACE or RWQCB jurisdictional due to the absence of any field indicators of hydrology including a bed and bank or OHWM. The hydrology to this area appears to have been diverted as a result of historic alterations to the watershed (i.e., the I-15 upstream and historic dry-farming activities on the site; there is also no downstream connection due to development). The southern willow scrub vegetation community is an understory component to the eucalyptus woodland and is showing signs of stress including fallen willow trees with epicormic shoots, likely a result of overshadowing by the eucalyptus canopy and lack of hydrology. The remnant community is isolated from any nearby similar habitats, and was not considered suitable breeding habitat for least Bell's vireo or other riparian/riverine associated species (see section 5.2 below). As such, no focused surveys are warranted. Although the southern willow scrub/eucalyptus woodland is not considered an MSHCP Riparian/Riverine Area, southern willow scrub habitats are considered a high priority for inventory in the CNDDDB (also referred to as a sensitive vegetation community). As such, the proposed impacts to southern willow scrub by the Project would be considered potentially significant under CEQA and mitigation is proposed as a minimum 1:1 ratio based on the low quality of the vegetation, as outlined in the Biological Resources Assessment for the Project (Appendix A, attached). The mitigation is consistent with that proposed for the MSHCP Riparian/Riverine Areas (see section 7.3 below).

Other kinds of aquatic features that could provide suitable habitat for Riparian/Riverine species, such as fairy shrimp, are not present within the on- or off-site portions of the Project site (i.e. vernal pools, swales, vernal pool-like ephemeral ponds, seasonal ponds, stock ponds, or other human-modified depressions such as tire ruts, etc.).

5.2 ASSESSMENT OF RIPARIAN/RIVERINE AND VERNAL POOL PLANT AND WILDLIFE SPECIES

5.2.1 Riparian/Riverine Plant Species

A habitat assessment was conducted for species listed in Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, of the MSHCP. The results are presented in **Table 4**, MSHCP Riparian/Riverine Plant Species. No Riparian/Riverine plant species are expected to occur within the on- or off-site portions of the Project site due to the lack of suitable habitat, the location of the Project site outside of the species range, or based on the negative results of focused surveys.

Table 4

MSHCP Riparian/Riverine Plant Species

Species	Potential to Occur within the Study Area
Brand's phacelia <i>Phacelia stellaris</i>	Suitable habitat occurs; however, none were observed during the 2013 focused plant surveys.
California Orcutt grass <i>Orcuttia californica</i>	Not expected to occur due to the lack of vernal pools.
Coulter's matilija poppy <i>Romneya coulteri</i>	Suitable habitat occurs; however, none were observed during the 2013 focused plant surveys.
Engelmann oak <i>Quercus engelmannii</i>	Not observed and not expected to occur. This is a conspicuous tree species that would have been detected if present.
Fish's milkwort <i>Polygala cornuta</i> var. <i>fishiae</i>	Not expected to occur due to the lack of suitable habitat.
Graceful tarplant <i>Holocarpha virgata</i> ssp. <i>elongata</i>	Suitable habitat occurs; however, none were observed during the 2013 focused plant surveys.
Lemon lily <i>Lilium parryi</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species is restricted to the San Jacinto Mountains.
Mojave tarplant <i>Deinandra mohavensis</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species is restricted to the San Jacinto Mountains.
Mud nama <i>Nama stenocarpum</i>	Not expected to occur due to the lack of wetlands. Also, none were observed during the 2013 focused plant surveys (this species can occasionally occur in non-wetlands).
Ocellated Humboldt lily <i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	Not expected to occur due to the lack of suitable habitat.
Orcutt's brodiaea <i>Brodiaea orcuttii</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species occurs in wetland areas at the Santa Rosa Plateau, Miller Mountain, and San Jacinto River.
Parish's meadowfoam <i>Limnanthes gracilis</i> ssp. <i>parishii</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species is restricted to the Santa Rosa Plateau within the MSHCP Plan Area.
Prostrate navarretia <i>Navarretia prostrata</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species is restricted to the Santa Rosa Plateau within the MSHCP Plan Area.
San Diego button-celery <i>Eryngium aristulatum</i> var. <i>parishii</i>	Not expected to occur due to the lack of suitable habitat. Also, the Project site is outside the species range; this species is restricted to the Santa Rosa Plateau within the MSHCP Plan Area.
San Jacinto Valley crownscale <i>Atriplex coronata</i> var. <i>notatior</i>	Not expected to occur due to the lack of suitable habitat.
San Miguel savory <i>Satureja chandleri</i>	Suitable habitat occurs; however, none were observed during the 2013 focused plant surveys.

Table 5

Table 4 (Continued)
MSHCP Riparian/Riverine Plant Species

Species	Potential to Occur within the Study Area
Santa Ana River woollystar <i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>	Not expected to occur. The Project site is outside the species range; this species is restricted to the Santa Ana River and alluvial fan sage scrub habitat which does not occur within the Project site.
Slender-horned spineflower <i>Dodecahema leptoceras</i>	Not expected to occur due to the lack of alluvial fan habitat. None were observed during the 2013 focused plant surveys.
Smooth tarplant <i>Centromadia pungens</i> ssp. <i>laevis</i>	Suitable habitat occurs; however, none were observed during the 2013 focused plant surveys.
Southern California black walnut <i>Juglans californica</i>	Not expected to occur. This is a conspicuous tree species that would have been detected if present.
Spreading navarretia <i>Navarretia fossalis</i>	Not expected to occur due to the lack of vernal pools.
Thread-leaved brodiaea <i>Brodiaea filifolia</i>	Not expected to occur due to the lack of clay soils.
Vernal barley <i>Hordeum intercedens</i>	Not expected to occur due to the lack of alkaline areas and vernal pools. Also, none were observed during the 2013 focused plant surveys (this species can also occasionally occur in coastal scrub).

Source: PCR Services Corporation 2013.

5.2.2 Riparian/Riverine Wildlife Species

Habitat assessments were conducted for wildlife species listed in Section 6.1.2, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*, of the MSHCP. Two species have the potential to occur on the Project site, including least Bell's vireo (on-site only, as a stop-over habitat for migrants) and the American peregrine falcon (on- and off-site, for foraging only), as indicated in **Table 5**, *MSHCP Riparian/Riverine Wildlife Species*.

Least Bell's vireo has only a low potential to occur as suitable habitat is limited to the small patch (0.36-acre, including 0.33-acre on-site and 0.03 acre off-site) of remnant southern willow scrub/eucalyptus woodland habitat on-site that is not associated with a drainage feature or an MSHCP Riparian/Riverine Area (see section 5.1.3 above), is not contiguous with any off-site habitat, and is isolated from other similar habitats in the area by approximately 1 to 2 miles. Although a willow understory occurs beneath the eucalyptus canopy, the habitat structure was in decline due the lack of young saplings and fallen stressed willows, and was therefore not considered suitable for nesting. Furthermore, the size of the habitat is generally too small for a breeding territory. As a result, the potential for least Bell's vireo to occur on the Project site is considered limited to use as a stop-over for birds during migration to suitable habitats in the region located to the south and northeast. No potential for least Bell's vireo was considered to occur in the off-site southern riparian scrub habitat due to the lack of an appropriate understory. Further detail is also provided in section 4.3

Table 6

MSHCP Riparian/Riverine Wildlife Species

Species	Potential to Occur within the Study Area
Arroyo toad <i>Anaxyrus californicus</i>	Not expected to occur due to the lack of suitable habitat.
Mountain yellow-legged frog <i>Rana muscosa</i>	Not expected to occur due to the lack of suitable habitat.
California red-legged frog <i>Rana aurora draytonii</i>	Not expected to occur due to the lack of suitable habitat.
Bald eagle <i>Haliaeetus leucocephalus</i>	Not expected to occur due to the lack of suitable habitat.
Least Bell's vireo <i>Vireo bellii pusillus</i>	Low potential as a migrating stop-over habitat. Habitat is limited to an isolated 0.36-acre patch of southern willow scrub/eucalyptus woodland that is not suitable for nesting (0.33 acre on-site and 0.03 acre off-site).
American peregrine falcon <i>Falco peregrinus anatum</i>	Very low potential for foraging (not observed). No suitable breeding habitat occurs within the Project site (on- or off-site).
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	Not expected to occur due to the lack of suitable habitat.
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	Not expected to occur due to the lack of suitable habitat.
Santa Ana sucker <i>Catostomus santaanae</i>	Not expected to occur due to the lack of suitable habitat.
Riverside fairy shrimp <i>Streptocephalus woottoni</i>	Not expected to occur due to the lack of suitable habitat.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	Not expected to occur due to the lack of suitable habitat.

Source: PCR Services Corporation 2013.

above. The American peregrine falcon has a very low potential to forage only within both the on- and off-site portions of the Project; no suitable breeding habitat (cliffs or tall buildings) occurs. This species can be found foraging in nearly any open habitat, but most likely near areas such as lake edges and mountain chains. The nearest of these areas is Lake Elsinore approximately 3.8 miles to the northwest, and Sedco Hills approximately 1 mile to the northeast. No other species are expected to occur due to the lack of suitable habitat.

Direct impacts are considered to be those that involve the loss, modification, or disturbance of natural resources or habitats (i.e., vegetative communities or substrate) that in turn, directly affect plant and wildlife species dependent on that habitat. Direct impacts include the destruction of individual plants or wildlife of low mobility (i.e., plants, amphibians, reptiles, and small mammals). The collective loss of individuals may also directly affect area-wide population numbers or result in the physical isolation of populations thereby

reducing genetic diversity and population stability. Mitigation to compensate for direct impacts is outlined in section 7.0 of this report.

5.3 ASSESSMENT OF RIPARIAN/RIVERINE AND VERNAL POOL ECOLOGICAL PROCESSES

The Riparian/Riverine Areas are located off-site and total only 0.13 acre, of which 0.03 acre is unvegetated and surrounded by predominately disturbed vegetation (0.02 acre of Drainage B and 0.01 acre of Drainage C) and 0.1 acre of southern riparian scrub (associated with Drainage C). Based on the minimal vegetation and small overall acreage, the Riparian/Riverine drainages have a limited capacity to provide functions including flood storage, groundwater recharge, flood flow attenuation, velocity dissipation, nutrient and sediment transport and trapping, carbon transport, and toxicant trapping from the stormwater and nuisance urban runoff entering these features. Furthermore, the drainages provide only a seasonal (ephemeral) water source that provides a small contribution (based on the size of the drainages) to the hydrology of the downstream watershed and associated habitats for Conserved Species, such as within Murrieta Creek where the flows ultimately drain. The drainages also provide limited foraging habitat for wildlife species (based on limited vegetation and water), and opportunities for wildlife movement are restricted based on the lack of vegetation and/or connectivity with habitat downstream. The riparian habitat associated with Drainage C is not considered suitable to support associated species of amphibians, birds, fish, invertebrate-crustacean, and plant species, as outlined in sections 5.2.1 and 5.2.2 above. Based on this, the biological functions and values of Riparian/Riverine Areas do not exist in Drainages B and C, and the hydrological functions and values are considered low.

6.0 UNAVOIDABLE IMPACTS TO RIPARIAN/RIVERINE AND VERNAL POOL AREAS

6.1 DIRECT IMPACTS

6.1.1 Permanent Direct Impacts

As shown in **Figure 9**, *Impacts to MSHCP Riparian/Riverine Areas*, and **Table 7**, *Permanent Impacts to MSHCP Riparian/Riverine Areas (CDFW Jurisdiction)*, the proposed Project would result in permanent direct impacts to all Riparian/Riverine Areas, totaling 0.13 acre off-site only associated with Drainages B and C (no on-site Riparian/Riverine Areas exist). These impacts are equivalent to the extent of impacts to CDFW streambed, including 0.02 acre in Drainage B and 0.11 acre in Drainage C. The impacts include 0.1 acre of southern riparian scrub (Drainage C) and 0.03 acre of unvegetated drainage (0.02 acre in Drainage B and 0.01 acre in Drainage C).

No direct loss of individuals of least Bell’s vireo or their potential habitat is expected as a result of the Project. No impacts to potential least Bell’s vireo habitat will occur since the riparian habitat (southern willow scrub/eucalyptus woodland) was ruled out as suitable for nesting based on the declining structure of the understory and the size of the habitat which is generally too small for a breeding territory. The habitat could be used as a stop-over rest area during migration of individuals to suitable breeding habitats in the region. However, no direct impacts are anticipated to least Bell’s vireo as no nests are anticipated. If the species is present, only migrant birds would be expected on the Project site for a short duration just prior to the start of the breeding season when the birds have not yet established their breeding territories (breeding season starts around April 10, depending on their arrival from wintering areas). The migrating birds would

Table 7

Permanent Impacts to MSHCP Riparian/Riverine Areas (CDFW Jurisdiction)

Drainage	Area (acres)	
	Existing	Impacts
B (Riverine)	0.02	0.02
C (Riparian)	0.11	0.11
Total	0.13	0.13

Source: PCR Services Corporation, 2013.

be expected to flush from the vegetation, if present, on commencement of vegetation clearing. In addition, pre-construction nesting bird surveys are proposed prior to commencement of Project construction as outlined in the Biological Resources Assessment (see Appendix A, attached).

6.1.2 Temporary Direct Impacts

No temporary direct impacts are proposed as part of the Project.

6.2 INDIRECT IMPACTS

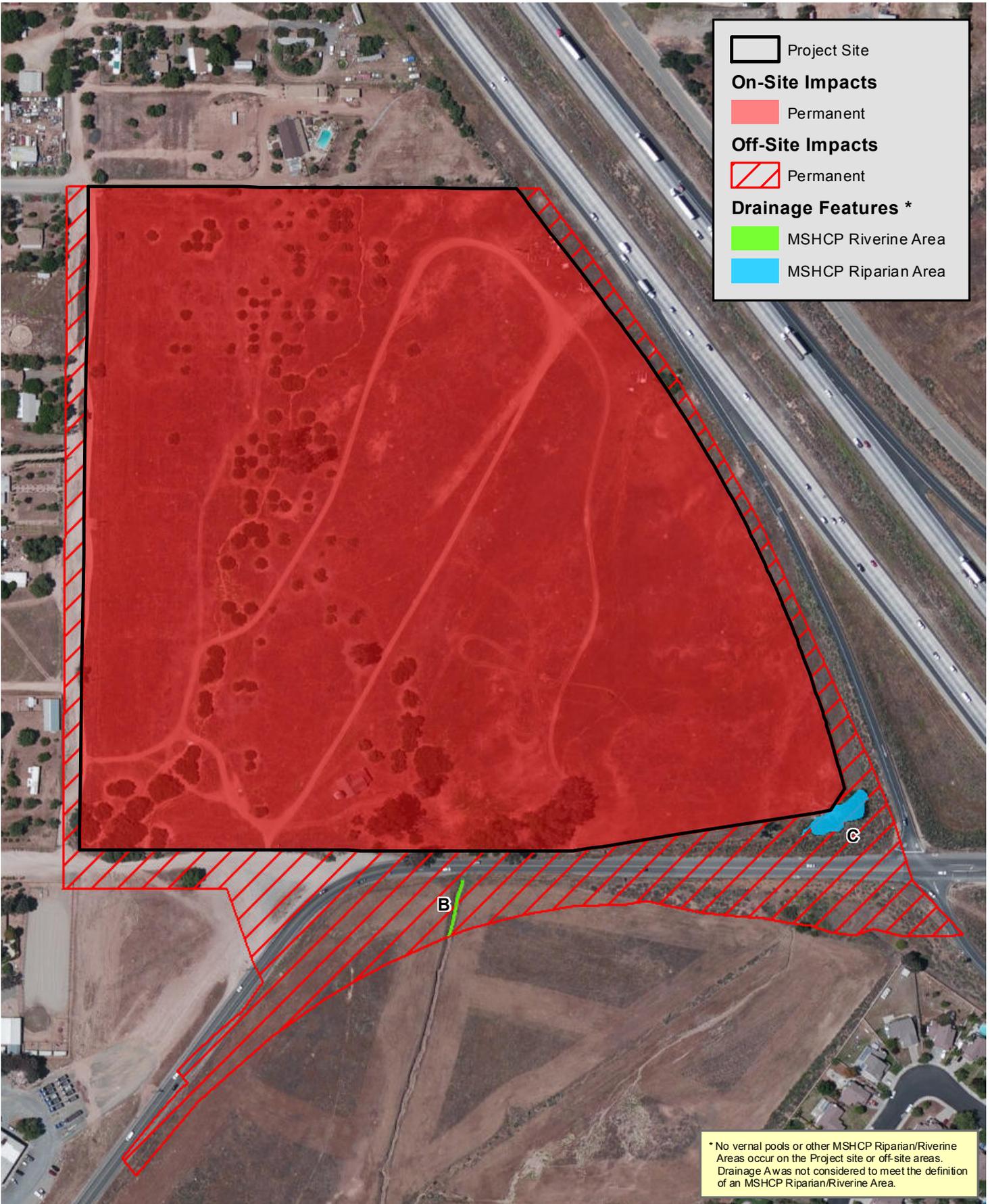
Indirect impacts are considered to be those impacts associated with the Project that involve the effects of alteration of the existing habitat and an increase in human population within the Project site and off-site areas. These impacts are commonly referred to as “edge effects” and may result in changes in the behavioral patterns of wildlife and reduced wildlife diversity and abundance in habitats adjacent to the Project site. Indirect impacts can occur to the following functions: hydrologic regime, flood storage, flood flow modification, nutrient retention and transformation, sediment trapping and transport, toxic trapping, public use, and wildlife habitat (downstream effects to Conserved Species). Measures to address potential indirect impacts are provided in section 7.0 of this report.

6.2.1 Permanent Indirect Impacts

Permanent indirect impacts include the effects of increases in ambient levels of sensory stimuli (e.g. noise, light), unnatural predators (e.g. domestic cats and other non-native animals), competitors (e.g. exotic plants, non-native animals), and trampling and unauthorized recreational use due to the increase in human population. Other permanent indirect effects may occur that are related to water quality and storm water management, including trash/debris, toxic materials, and dust. Permanent indirect impacts may be associated with the eventual habitation/operation of a Project. These impacts would affect the limited functions provided by these drainages, as outlined in section 5.3 above. No permanent indirect impacts (e.g., noise from the development) to least Bell’s vireo are anticipated as only migrant birds are expected to utilize the site as a temporary stop-over area, if at all (see section 6.1 above).

6.2.2 Temporary Indirect Impacts

Temporary indirect impacts may be associated with the construction and eventual habitation/operation of a project; therefore, these impacts may be both short-term and long-term in their duration. Temporary indirect impacts may include increases in ambient levels of sensory stimuli (e.g. noise, light), dust, and trampling due to construction within the Project site. No temporary indirect impacts (e.g., noise from Project construction) to least Bell’s vireo are anticipated as only migrant birds are expected to utilize the site as a temporary stop-over area, if at all (see section 6.1 above).



Impacts to MSHCP Riparian/Riverine Areas

Baxter Village APNs 367180015 & 367180043
 Source: Microsoft, 2010 (Aerial); PCR Services Corporation, 2014.

FIGURE

9

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7.0 PROJECT AVOIDANCE, DESIGN FEATURES AND MITIGATION MEASURES

Avoidance of the small acreage of MSHCP Riparian/Riverine Areas was not feasible, as discussed in sections 2.2 above and 7.1 below. The design features and mitigation measures to compensate for unavoidable direct impacts to Riparian/Riverine Areas and indirect edge effects are discussed in this section.

7.1 AVOIDANCE

The Project is required by the City of Wildomar to conduct off-site improvements associated with Baxter Road and Central Avenue to the south of the site. As such, avoidance of the small acreage (0.13 acre) of MSHCP Riparian/Riverine Areas in the off-site area is not feasible (no Riparian/Riverine areas exist on-site).

7.2 DESIGN FEATURES

The Project design includes Best Management Practices (BMPs) to address water quality, as outlined in the Preliminary Water Quality Management Plan (WQMP), including minimizing urban runoff, minimizing the impervious footprint, and minimizing directly connected impervious areas (JLC Engineering and Consulting, Inc., 2014). The Property Management and Home Owner's Association (HOA) will be responsible for operations and maintenance of the BMPs. Detailed operations and maintenance, including specific activities and checklists, will be provided during final engineering. A description of the BMPs is provided below based on slight modification of the text provided in the WQMP.

7.2.1 Treatment Control BMPs

The proposed Project will construct five sand filter basins to promote on-site ponding and infiltration, porous pavers, and two subsurface basins (gravel filtration) for treatment of water quality and mitigation for hydrologic conditions of concern. Additionally, porous pavers will be utilized in 50 percent of the street area in the single family residential development as a source control measure, and a grassed/vegetated swale will be utilized between the single family residential and the apartments/commercial area to minimize the directly connected impervious areas. A graphic depicting these features taken from the WQMP is provided as **Figure 10**, *Water Quality Management Features*.

The sand filter basins and a portion of the porous pavers (located within the commercial area adjacent to Baxter Road) will be utilized for water quality treatment. Four of the five sand filter basins, in addition to the two subsurface basins, will be utilized for mitigation of increased runoff. The additional porous pavement areas located within the single family residential development will be utilized as a source control measure, and for additional mitigation storage volume if required during final engineering.

Sand Filter Basin A is located in the southwest corner of the Project site and collects flows from onsite Area "A". Flows from Area A are treated for water quality purposes and mitigated for increased runoff within Sand Filter Basin A. Sand Filter Basin B is located in the south east corner of the Project site and collects flows from onsite Area "B". Flows from Area B are treated for water quality purposes within Sand Filter Basin B. Flows in excess of the required water quality volume will enter the Subsurface Basin B system

immediately north of the basin. The flows will be mitigated for increased runoff within the subsurface system. Sand Filter Basin C is located in the central portion of the Project site and collects flows from the northerly portion of Area C. Flows from the tributary area are treated for water quality purposes within Sand Filter Basin C, and flows in excess of the required water quality volume will be conveyed to the subsurface system located in the south westerly commercial area (Subsurface System C). Flows from the commercial area in the south portion of Area C will be treated within the proposed porous pavers. Flows in excess of the required water quality volume will be conveyed to Subsurface System C. All flows from Area C will be mitigated for increased runoff within the Subsurface Basin C. Sand Filter Basins D and E are provided to treat and mitigate flows associated with the improvement for Baxter Road. All on-site flows will discharge into one of two off-site storm drain systems conveyed through the Project site.

As outlined in the WQMP, post-project flow rates are mitigated to less than or equal to pre-project levels; detailed basin routing calculations will be performed for each system to demonstrate this during final engineering.

7.2.2 Non-Structural Source Control BMPs

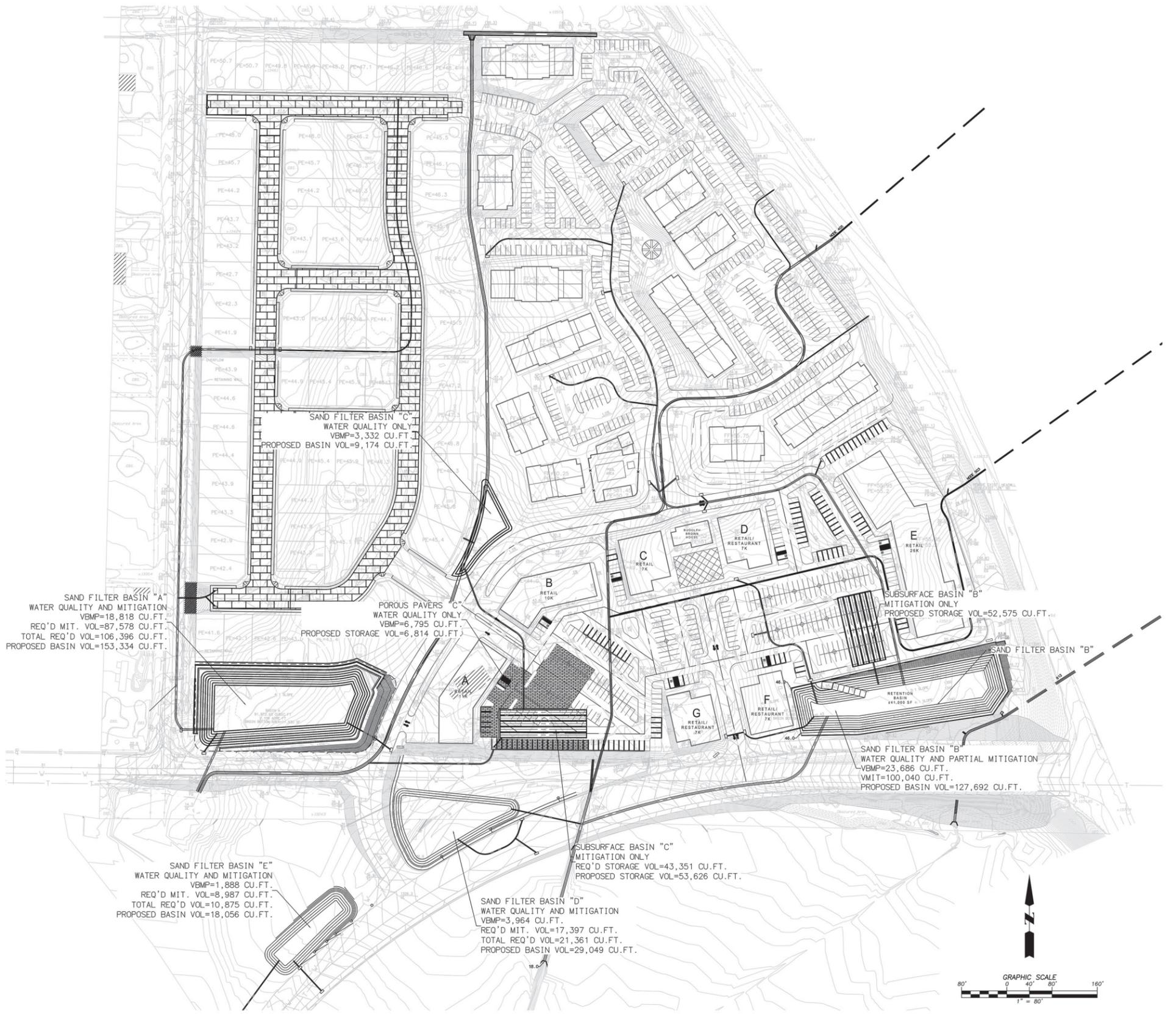
The Project design includes the following non-structural source control BMPs:

- Education materials will be provided to property owners, occupants, operators and employees at the time of purchase, occupancy or hire, as included in the WQMP.
- Activity restrictions will be enforced, including prohibiting power washes, prohibiting blowing of landscaping and debris into catch basins, swales, sand filter basins, and porous pavers, prohibiting dumping of oils into the streets, prohibiting discharges of fertilizer, pesticides, or animal wastes to streets or storm drains, requiring trash receptacles to be kept covered or sheltered by a roof overhang or canopy, and prohibiting discharges of paint or masonry waste to streets or storm drains.
- The irrigation system and landscape maintenance shall be maintained by property owners and a professional contractor. The professional contractor shall be determined by the HOA)
- Street sweeping and waste management will be implemented.
- All drainage facilities will be inspected and maintained by the HOA.

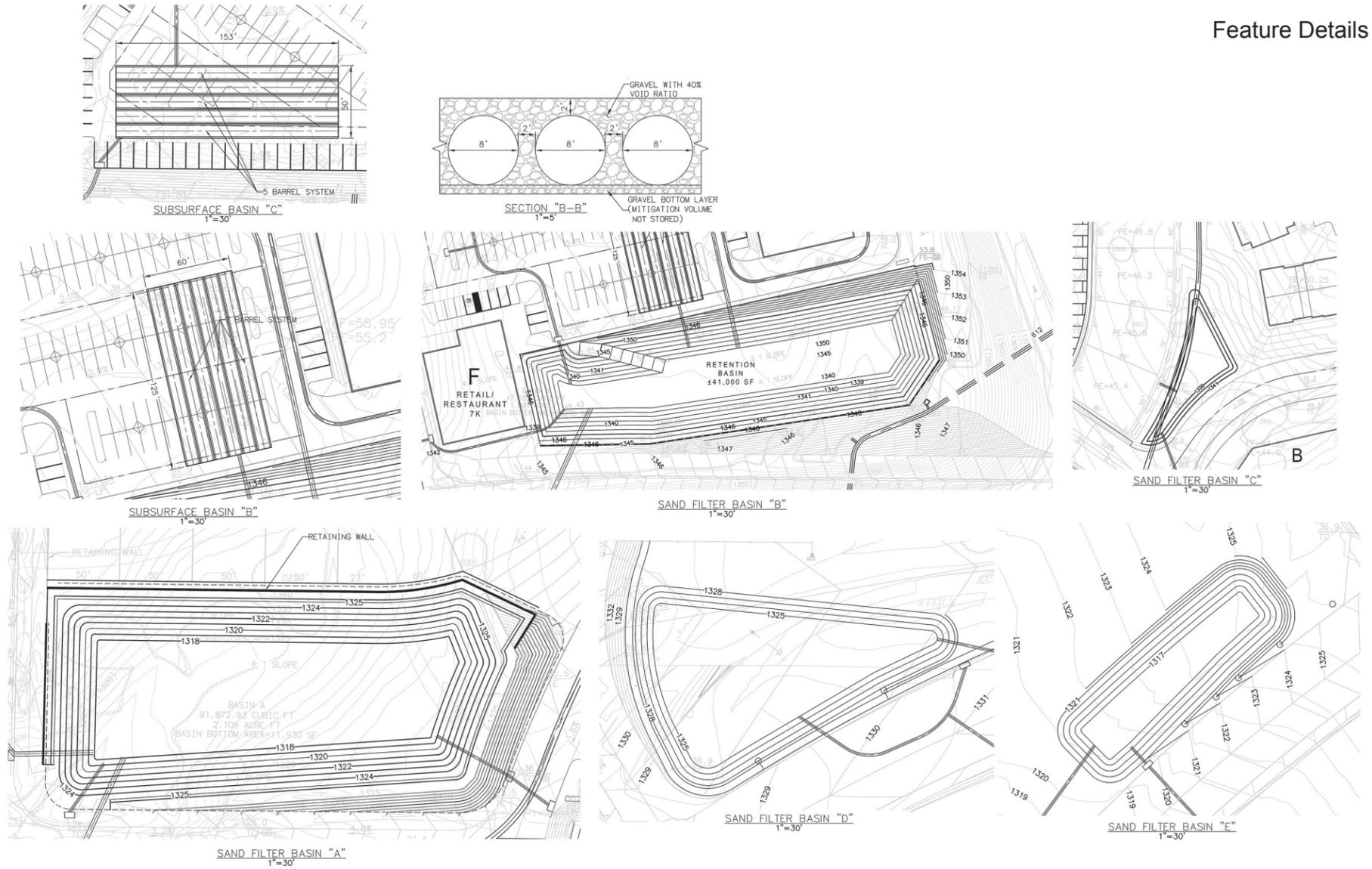
7.2.3 Structural Source Control BMPs

The Project design includes the following structural source control BMPs:

- Landscaping and associated irrigation will be incorporated into the commercial and residential areas
- Slopes and channel will be protected by landscaping.
- The following features will be properly designed: trash storage areas, loading docks, maintenance bays, outdoor material storage areas, outdoor work areas or processing areas.



Feature Details



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7.3 MITIGATION FOR DIRECT IMPACTS TO MSHCP RIPARIAN/RIVERINE AREAS

7.3.1 Conceptual Mitigation Plan (Off-Site)

This DBESP proposes off-site mitigation for permanent impacts to MSHCP Riparian/Riverine Areas (equivalent to CDFW jurisdictional areas) on the Project site to demonstrate biologically equivalent or superior preservation pursuant to requirements of the MSHCP. Off-site mitigation provides wide-reaching watershed benefits since it is typically part of a larger effort and/or within an area with more habitat diversity, and would be preserved in perpetuity and managed by a pre-identified entity or entities. As such, impacts to the low function and value ephemeral systems on the Project site would be compensated with off-site mitigation within a larger drainage system in the watershed and pre-secured for in-perpetuity preservation and management by an agency-approved entity. Off-site mitigation is preferred by the USACE as it has been demonstrated to have a higher rate of success than on-site mitigation in general.

The proposed off-site mitigation would require regulatory agency approval during the permitting process for impacts to jurisdictional drainages.² The intent is to provide the same mitigation to satisfy the requirements of the regulatory agencies and Regional Conservation Authority (RCA) to avoid double-mitigating for impacts to the same drainages. Due to the uncertainty in the forthcoming regulatory permit application process, a specific off-site mitigation option cannot be selected at present. As such, this DBESP identifies the potential off-site mitigation options and assesses them based on available information. Currently, there are no agency approved mitigation banks or in-lieu fee programs available in the watershed to provide off-site compensatory mitigation. However, mitigation is currently available within Wilson Creek through a permittee-responsible³ mitigation effort, and other potential opportunities could occur on lands owned by the RCA or on alternate off-site lands as part of a collaborative group of developers.

The off-site mitigation would include creation, restoration and/or enhancement of habitat associated with existing drainages in the Santa Margarita Watershed or possibly within an adjacent watershed. The off-site mitigation would be proposed at a minimum 1:1 ratio for impacts to acreage. Feasible off-site mitigation opportunities as close to the Project site as possible will be selected and it should be noted that off-site mitigation outside of the watershed, if approved by the resource agencies, will require a higher mitigation ratio of no less than 2:1 to adequately offset Project impacts. It is expected that the mitigation would include at minimum removal of non-native weed species to increase native plant species establishment, and potential planting with native habitat consistent with the type of drainage systems being impacted on the Project site. Since Drainage B is unvegetated, an example of compensatory mitigation planting would consist of drier upland vegetation often associated with ephemeral drainage systems in the region, such as buckwheat scrub. For Drainage C, an example of compensatory mitigation planting would consist of southern riparian scrub consistent with existing habitat. As such, the off-site mitigation would establish habitats with equivalent function and value (southern riparian scrub; in-kind mitigation for impacts to Drainage C) or higher (drier upland vegetation such as buckwheat scrub for the unvegetated Drainage B).

² Permit applications would include a Section 404 Nationwide Permit through the USACE under the Clean Water Act (CWA), a Section 401 Water Quality Certification through the RWQCB under the CWA, and a Streambed Alteration Agreement through the CDFW under Section 1602 of the California Fish and Game Code.

³ Off-site mitigation currently available through Wilson Creek Farms, LLC is not a resource agency approved mitigation bank or In-Lieu Fee program, but has recently been accepted by the agencies as compensatory mitigation for jurisdictional streambed impacts associated with public and private projects and continues to be evaluated by the agencies for regulatory permitting compensation on a project-by-project basis.

The off-site mitigation would be part of a larger mitigation effort that would be implemented, monitored and maintained pursuant to a document prepared for the entire program. For approved mitigation banks or in-lieu fee programs this would consist of an existing document such as a Habitat Restoration Plan (HRP), Habitat Mitigation and Monitoring Plan (HMMP), or similar, that the regulatory agencies would have required as part of the approval process for the bank or in-lieu fee program. The Wilson Creek Habitat Restoration Area is a permittee-responsible mitigation option that is not an approved bank or in-lieu fee program, but has recently been accepted by the resource agencies as mitigation for other projects in the watershed on a case-by-case basis based on the Wilson Creek HRP included as **Appendix B, Wilson Creek Habitat Restoration Plan**. In the absence of a resource agency approved bank or in-lieu fee program at the time of regulatory permit processing, the Wilson Creek HRP demonstrates equivalent or superior mitigation as analyzed by this DBESP at a minimum 1:1 mitigation ratio if available at the time of regulatory permitting for the Project. If other permittee-responsible off-site mitigation opportunities become available, such as land purchased for mitigation by the Project, a HMMP will be prepared and provided to the regulatory agencies for review and approval; the final HMMP would be provided to the RCA. The Wilson Creek HRP would provide an example of the methodology, success criteria, and long-term conservation that a similar mitigation effort on a different site would be required to implement in order to maintain consistency with this DBESP, since the Wilson Creek HRP was prepared in compliance with the USACE approved guidance for the preparation of HMMP's and the USACE's 2008 Mitigation Rule.

Proof of off-site mitigation purchase would be provided to the regulatory agencies and RCA for participation in an approved mitigation bank, in-lieu fee program, private bank, or off-site permittee responsible mitigation opportunities such as within Wilson Creek. As mentioned above, the off-site mitigation would provide compensation for the loss of both unvegetated ephemeral habitat and a small acreage of southern riparian scrub by at minimum the removal of non-native weeds to encourage increased native plant establishment, and potential planting with native habitat as appropriate. The expected functional gains and success of the off-site mitigation is discussed in section 7.3.3 below.

7.3.2 Summary of Mitigation Compensation

The mitigation proposed provides a minimum 1:1 ratio of compensation for impacts to acreage of Riparian/Riverine Areas thus resulting in no net loss of habitat. A summary is provided below in **Table 8, Summary of Permanent Impacts and Mitigation for Riparian/Riverine Areas**.

Table 8

Summary of Permanent Impacts and Mitigation for Riparian/Riverine Areas

Drainage	Existing (Acres)*	Impacts (Acres)	Mitigation (Acres)
B (Riverine)	0.02	0.02	-
C (Riparian)	0.11	0.11	-
Total	0.13	0.13	0.13

* All MSHCP Riparian/Riverine Areas are located off-site.

Source: PCR Services Corporation, 2014

7.3.3 Expected Functional Gains of the Mitigation

The off-site mitigation set forth in section 7.3.1 above will compensate for the loss of ephemeral streambed and associated habitat within the Project site. Although a site-specific analysis of off-site mitigation cannot be completed at present since the resource agencies have yet to determine what they will accept as compensatory mitigation for the Project, the mitigation would be expected to include the creation, restoration, and/or enhancement of a drainage with native species, likely within a larger drainage system than supported on the Project site. The Wilson Creek HRP, attached as Appendix B, provides an example of measures that are considered appropriate to implement off-site permittee-responsible mitigation should such off-site mitigation outside of Wilson Creek be chosen as preferred mitigation for future project regulatory permits. Mitigation within Wilson Creek, at a formal bank, or an in-lieu fee program would also be part of a wider-reaching effort and would therefore result in a more collective benefit to the watershed. The off-site mitigation would result in a higher function and value than the ephemeral drainages currently on the Project site, specifically an unvegetated drainage (Drainage B) and a small acreage of predominately southern riparian scrub that lacks connectivity to adjacent habitat (Drainage C). This would be achieved through the removal of weeds to encourage native plant establishment and potential planting of native species, as appropriate, and by being part of a larger drainage system and/or a wider-reaching mitigation effort. Any planting would be designed to increase species and structural diversity and density within the habitat. There is also the potential that new drainage habitat could be created as part of the mitigation. Considering these factors, the following functional gains would be expected:

1. Compensation for impacts to predominately unvegetated channel and limited associated southern riparian scrub with native vegetated habitat of increased species/structural diversity and density will provide biogeochemical and water quality functions.

The off-site mitigation would be expected to include removal of non-native species to encourage increased native plant establishment, and potential planting with natives as appropriate. The drainages on the Project site are predominately unvegetated within the channel, with associated vegetation limited to a small acreage of southern riparian scrub associated with Drainage C. The planting would be designed to increase species and structural diversity and density within the habitat utilizing native species appropriate for the area. As such, the proposed off-site removal of non-natives and increased native plants would improve water quality and provide biogeochemical functions within the watershed. Specifically, the vegetation will result in increased trapping of sediment, and the microbial action in the root zone of plants removes toxins, nitrogen, and other nutrients from the runoff, thereby improving water quality and helping to reduce the impacts of non-point source pollution (Schaefer and Brown, 1992) through natural filtering of pollutants (bio-filtration effects). Heterotrophic microorganisms, which thrive in riparian areas, are also responsible for converting detritus from leaf litter and other dead organic matter into consumable organic matter. This organic material forms the base for the riparian food chain and, within the drainages, can be released downstream as dissolved organic matter (Gregory, et al., 1991; Schaefer and Brown, 1992). Knight and Bottorff (1984) reported that up to 1000g/m²/yr of detritus are processed by aquatic macrophytes in riparian zones and this provides a food chain base for these ecosystems, promoting their biodiversity. Improvement of water quality and biogeochemical functions will take place as these nutrients pass through the drainage and are transformed or sequestered into the plant tissue. In addition, the deposition of fine and coarse woody debris will provide important habitat for amphibians,

reptiles, and other wildlife. Improving these functions within a larger drainage system and/or as part of a wider-reaching mitigation effort would also provide a collective benefit to the watershed.

2. Compensation for impacts to predominately unvegetated channel and limited associated southern riparian scrub with native vegetated habitat of increased species/structural diversity and density will provide hydrologic functions.

Improving the quality of native habitat with increased native species and structural diversity, in addition to an increase density of vegetation, will provide energy dissipation and storage during storm events that is currently limited on the Project site. Increasing plant cover also stabilizes soil to deter channel and habitat degradation by storm flows. Interception and retention of storm flows by vegetation regulates sharp run-off peaks and slows discharges over a longer time period to avoid erosional issues and may also contribute to groundwater recharge. Improving these functions within a larger drainage system and/or as part of a wider-reaching mitigation effort would also provide a collective benefit to the watershed.

3. Compensation for impacts to predominately unvegetated channel and limited associated southern riparian scrub with native vegetated habitat of increased species/structural diversity and density will provide biological functions.

The proposed increase in native vegetation will increase potential wildlife habitat by providing a higher diversity of plant species to provide improved forage and cover for wildlife species that utilize drainage areas for breeding and foraging. In turn, an increase in structural and spatial diversity would be expected that would be expected to increase the diversity of wildlife species utilizing the habitat. Improving these functions within a larger drainage system and/or as part of a wider-reaching mitigation effort would also provide a collective benefit to the watershed.

7.3.4 Success Criteria for the Mitigation

In addition to compensating for streambed loss, the off-site mitigation will provide increased quality of native plant cover for wildlife habitat and to stabilize the drainage system. For banks or in-lieu fee programs it is expected that the success criteria below are already incorporated into a restoration plan prepared for the entire effort. However, if lands are secured for off-site mitigation, these success criteria will be incorporated into a final HMMP to ensure long-term success of the mitigation, consistent with the Wilson Creek HRP (see Appendix B).

1. The habitat mitigation will contribute to regional biodiversity in perpetuity.

The proposed mitigation will include the goal of increasing native plant cover, structure and diversity and removing non-native weeds. This will create habitat for wildlife populations within the mitigation site and general area to ensure a more diverse habitat structure and stable watershed. Off-site mitigation within an approved mitigation bank, private bank, or in-lieu free program will be part of a larger mitigation effort benefitting the regional watershed that is preserved in perpetuity typically through an existing preservation mechanism. For

off-site land purchased for preservation, a preservation mechanism will be established to ensure in-perpetuity conservation of the mitigation.

2. *The habitat mitigation will be self-sustaining and will not require supplemental watering or outside input for recruitment and propagation of plant species.*

For off-site mitigation on acquired lands, a HMMP will be prepared and will include a number of specific interim and ultimate success criteria over a five-year program that would require the site to be self-sustaining. It is expected that agency approved mitigation banks, in-lieu fee programs, and private banks would have existing success criteria outlined in a plan prepared as part of the larger mitigation effort, such as the Wilson Creek HRP (see Appendix B). Any plans prepared by the Project, such as for lands acquired for mitigation outside the Wilson Creek Habitat Restoration Area, would include criteria for demonstrating the mitigation is self-sustaining consistent with the Wilson Creek HRP.

3. *The entire range of biological components, processes, and interactions will be present in each community.*

As discussed above, success criteria will be developed as part of the HMMP or are anticipated to be part of existing plans for approved mitigation banks, in-lieu fee programs, and private banks. These will, or are expected to, include criteria related to habitat structural diversity, habitat coverage and spatial diversity, percent of non-native vegetation, and hydrologic regime, and will allow for monitoring of the expected range of biological components, processes and interactions within the mitigation site.

4. *Natural processes of ecological succession will be allowed to occur.*

The success criteria and/or goals in the HMMP or existing plans will ensure the long-term survivability of the habitats created, including self-sustaining habitat that will follow natural ecological succession including processes such as nutrient cycling.

7.4 Project Design Features and Mitigation Measures to Address Edge Effects

Section 6.1.4, *Guidelines Pertaining to the Urban/Wildlands Interface*, of the MSHCP presents a number of guidelines that are intended to address indirect effects associated with locating developments in proximity to a MSHCP Conservation Area. These guidelines address the quantity and quality of any runoff generated by the development, night lighting, noise, and domestic predators. The Project site is not within or adjacent to any Criteria Cells and is separated from the nearest identified Conservation Areas by the I-15. Specifically, these areas are located northeast of the Project site and include Cell Group J' approximately 0.6 miles away and Proposed Linkage 8 associated with Sedco Hills just over one mile away. As such, potential for indirect effects is anticipated to be limited to. Project design features are proposed that will address indirect impacts of the proposed Project and to minimize edge effects beyond the limits of grading at the urban/wildlands interface, consistent with Section 6.1.4 of the MSHCP.

Drainage (Urban and Storm Water Runoff): The BMPs described in section 7.2 above and outlined in the preliminary WQMP are designed to preserve baseline flows at a minimum, treat the water, maintain water quality, and address flood control/erosion pursuant to RWQCB and City of Wildomar standards. Examples include the construction of water quality basins, the implementation of street sweeping and waste

management, dust-control measures during construction that will be outlined in the Storm Water Pollution Prevention Plan (SWPPP), and providing education materials to inform the owners, occupants and operators on water quality issues. Thus, all water leaving the development will be of a higher quality compared to existing site conditions and will contribute to the overall improvement of water quality downstream, in addition to being at discharge rates that will prevent downstream erosion. In addition, while the discharge flow rate to downstream areas will be similar to existing conditions, the overall volume of water will increase due to the additional water input from the development (e.g., from irrigation) which will be beneficial to the drainage and downstream areas by providing increased hydrology to at minimum maintain existing wildlife habitat, with the potential to support additional habitat. This will avoid any indirect effects to downstream MSHCP Conservation Areas as a result of the proposed Project.

Toxic Material: Construction of the proposed Project will incorporate erosion control measures (e.g., sand bags and/or straw wattles as appropriate) around the perimeter of the work area to ensure all water leaving the site is filtered and an increase in siltation does not occur. In addition, for the long-term operation of the Project, the BMPs outlined in the preliminary WQMP (see section 7.2 above) will treat project-generated flows and remove pollutants.

Trash/Debris: A number of non-structural BMPs are listed in section 7.2 above that will minimize and/or address the amount of trash/debris created by the proposed Project, and avoid trash/debris from entering downstream areas. These include activity restrictions placed on the occupants, the distribution of educational materials, street sweeping and waste management.

Lighting: The Project is not within or adjacent to any open space areas, preserved land, or MSHCP Conservation Areas and, as such, lighting as part of the development will not affect any of these areas. However, the Project has been designed to minimize night lighting while remaining compliant with City of Wildomar ordinances related to street lighting.

Noise: The proposed use of the site for residential and commercial development is not anticipated to result in noise-generating activities apart from increased traffic noise. The Project will comply with all City of Wildomar requirements pertaining to noise and traffic standards. Furthermore, the closest MSHCP Conservation Area is located 0.6 mile northeast (and upstream) of the Project and separated from it by Clinton Keith Road. As such, neither post-project noise, nor temporary short-term increases in noise during construction, is anticipated to impact MSHCP Conservation Areas.

Invasives: To the maximum extent practicable, native plants will be used in the landscape plans for the common areas of the Project. No invasive, non-native plant species listed in Table 6-2 of the MSHCP, *Plants That Should Be Avoided Adjacent To The MSHCP Conservation Area*, will be utilized in the landscape plans. This will avoid dispersal of invasive plant seeds in the watershed.

Barriers: The MSHCP requires the incorporation of barriers, such as native landscaping, rocks/boulders, fencing, walls, and/or signage, for proposed land uses adjacent to preservation areas to minimize unauthorized public access, trampling, introduction of urban wildlife, and/or illegal dumping within the preservation areas. The proposed Project is not located adjacent to any preservation areas and, as such, is not required to incorporate barriers pursuant to the MSHCP. However, the Project will likely include fences and/or walls around the entire development.

Grading/Land Development and/or Fuel Modification Activities: The proposed Project is not within or adjacent to any open space areas, preserved land, or MSHCP Conservation Areas and, as such, no impacts to these areas will occur as a result of the Project. Manufactured slopes shall be contained within the Project site and/or off-site areas identified in this report and analyzed in the Biological Resources Assessment (Appendix A, attached). Brush management, as well as all ground disturbing activities associated with construction and operation of the Project, shall also be contained within the Project's impact footprint and shall not encroach into the avoided areas in accordance with Section 6.4 of the MSHCP.

The Fuels Management guidelines presented in Section 6.4 of the MSHCP are intended to address brush management activities around new development within or adjacent to the MSHCP Conservation Area. No fuel modification is expected for the proposed Project.

8.0 DETERMINATION OF BIOLOGICALLY EQUIVALENT OR SUPERIOR PRESERVATION

Section 6.1.2 of the MSHCP, Volume I, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, is intended to ensure protection of Riparian/Riverine Areas within the entire MSHCP Plan Area such that habitat values are preserved for those species within the MSHCP Conservation Area. No sensitive species listed in Section 6.1.2 of the MSHCP are expected to occupy the Project site due to the lack of suitable habitat.

The proposed Project, inclusive of all project design features and mitigation measures, is biologically superior to an avoidance alternative by replacing low function and value MSHCP Riparian/Riverine Areas with higher function and value mitigation, and avoiding any potential impacts to downstream areas through features such as improved water quality. A summary of this statement is provided below based on the analysis in this report, and further assessed in sections 8.1 through 8.3.

- The proposed impacts are limited to 0.13 acre of MSHCP Riparian/Riverine Areas with low function and value, including 0.03 of unvegetated drainage and 0.1 acre of southern riparian scrub that is not contiguous to other habitats and was determined to not be suitable for any sensitive species.
- Proposed mitigation for impacts is proposed at a 1:1 ratio (0.13 acre) through creation, restoration and/or enhancement of drainage habitat off-site at an approved mitigation bank/in-lieu fee program, a private bank, or on land purchased for mitigation. This mitigation would provide higher function and value than the existing drainages proposed for impacts by removing non-native species and encouraging increased native species coverage, including the potential to plant with appropriate native species to create higher density, diversity and structure. The increase in native vegetation would result in an increase in native habitat acreage than currently exists on the Project site, and would provide improved functions such as water quality, water storage and wildlife habitat. Furthermore, the mitigation has the potential to provide additional function and value by being part of a larger drainage system and/or mitigation program, thus resulting in wider-reaching watershed benefits.
- The off-site mitigation would be protected in perpetuity through a legal instrument, which is expected to be in place for banks and in-lieu fee programs. Preservation will ensure protection of MSHCP Riparian/Riverine Areas as intended pursuant to Volume I, Section 6.1.2 of the MSHCP, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*. Currently the on-site drainages are unprotected and subject to disturbance.

- The success of the off-site mitigation would be ensured through an approved plan. If the mitigation occurs on lands acquired solely for mitigation purposes, a project-specific HMMP will be prepared and submitted to the USACE, RWQCB, and CDFW for review and/or approval as part of the regulatory permitting process. A copy would also be provided to the RCA. The mitigation would be monitored regularly pursuant to a five-year program, and analyzed against a number of interim and target success criteria. The success criteria will ensure that the mitigation efforts are successful. Off-site mitigation at a mitigation bank, in-lieu fee program, or private mitigation bank will be part of a larger program and, as such, will be monitored pursuant to an existing agency-approved plan prepared for the entire program.
- The Project is not located within or adjacent to any MSHCP Conservation Areas but will avoid indirect impacts to any such areas downstream through BMPs proposed in the preliminary WQMP that will manage daily nuisance flows and initial first flush storm flows generated by the development, as outlined above in section 7.2 of this report. As such, the water discharged downstream will be treated for both sediment and pollutants. Also, as outlined in section 7.4, current flow rates to downstream areas will be maintained to prevent erosion, but the overall volume of water discharged downstream will increase providing at minimum sufficient hydrology to maintain and even increase downstream habitats. Increased native plant species coverage in the off-site mitigation area is also expected to increase biofiltration, providing further water quality benefits for the watershed system.
- A number of additional project design features have been incorporated to address edge effects (i.e., indirect impacts) such as avoiding impacts from trash/debris, toxics, and non-native invasive species, as discussed above in section 7.4.

8.1 EFFECTS ON RIPARIAN/RIVERINE PLANNING SPECIES

- Suitable habitat was determined present on the Project site for two Riparian/Riverine bird species, including the least Bell's vireo and American peregrine falcon. The falcon was determined to have a very low potential for foraging only due to the low quality of foraging habitat and absence of nesting habitat. The least Bell's vireo was determined to have a low potential to use on-site riparian habitat that is not jurisdictional or an MSHCP Riparian/Riverine Area for migrating stop-over only; the off-site MSHCP Riparian Area, consisting of predominately southern riparian scrub habitat, was not considered suitable for least Bell's vireo due to the lack of understory structure. No sensitive species were observed during the site surveys. Based on this, no significant effects on Riparian/Riverine planning species are expected to occur as a result of the Project.
- The mitigation is proposed at a 1:1 ratio to impacts, including removing non-native species and an increase in native habitat pursuant to an agency approved plan outlining methods and success criteria. This mitigation will at minimum result in no net loss of acreage of native habitat and is expected to increase the spatial, structural and species diversity to encourage wildlife use. The mitigation will also improve water quality and hydrology functions. As such, the proposed mitigation will improve the quality of the habitat for wildlife species and provide potential habitat for Riparian/Riverine planning species. Wildlife habitat is currently lacking in the MSHCP Riparian/Riverine Areas associated with the Project.
- The improved quality of water and expected increase in volume of water due to impervious surfaces and additional input (e.g., from irrigation; the flow rate will not increase), would be beneficial to

areas downstream of the Project for supporting any existing wildlife habitat and potentially allowing additional habitat to establish.

8.2 EFFECTS ON CONSERVED HABITATS

- The proposed Project impacts a small acreage (0.13 acre) of low function Riparian/Riverine Areas that are not preserved and are not contiguous with any habitats, conserved or otherwise. As such, the Project impacts would not result in any effects to conserved habitats. The proposed off-site mitigation would be preserved in perpetuity and would therefore contribute to the acreage of conserved habitats within the MSHCP.
- The proposed Project would contribute higher function and value habitat to be conserved within the MSHCP. The Riverine Area on the Project site is unvegetated and the Riparian Area lacks appropriate habitat features to support residents of the Riparian/Riverine wildlife species listed under Section 6.1.2 of the MSHCP. The main hydrologic function of the ephemeral drainages within the Project site is the transport of water during storm events, with limited ecological functions (i.e., limited sediment transport, transport of nutrients and aquatic chemicals to downstream waters, seasonal flood storage, flood flow attenuation, toxicant trapping, and velocity dissipation). The proposed mitigation would provide these ecological functions at a greater magnitude due to the removal of non-native species and an increase in native species within an appropriate off-site area that would occur pursuant to an agency approved plan, and would likely be part of a larger mitigation effort. The mitigation would be designed to provide increased wildlife habitat that could support species listed in Section 6.1.2 of the MSHCP. Furthermore, the mitigation would allow for greater nutrient and toxicant trapping, which would be beneficial to downstream water quality. The off-site mitigation would be protected through a legal instrument (which is expected to be in place for approved mitigation banks or in-lieu fee programs). Based on the above, the off-site mitigation would be biologically superior to the Riparian/Riverine resources which currently exist on-site that will be impacted by the proposed Project.

8.3 EFFECTS ON LINKAGES AND FUNCTIONS OF THE MSHCP CONSERVATION AREA

- The Project site is not located within or adjacent to any MSHCP Cores, Linkages or Conservation Areas, and measures have been incorporated into the project design to avoid potential indirect edge effects to such areas, including maintaining the flows and improving water quality to downstream areas. As such, the Project would not impact the functions of any MSHCP Cores, Linkages or Conservation Areas.
- The proposed Project impacts low function and value Riparian/Riverine Areas that would be replaced with higher function and value habitat by the proposed off-site mitigation. The off-site mitigation would also be protected through a legal instrument to contribute to the MSHCP Conservation Area acreage.
- The Project's WQMP and associated BMPs will ensure that water quality standards are met. The flow rate will be similar to existing conditions; however the volume of water will increase which will be beneficial to the drainage and downstream areas by providing increased hydrology to support wildlife habitat functions. In addition, the BMPs will protect against flooding, prevent downstream erosion, and improve water quality by filtering pollutants from previously untreated flows. Thus, all

water leaving the Project site will be of a higher quality compared to existing site conditions. The off-site mitigation is also expected to provide additional biofiltration functions through an increase in native vegetation. As such, both the Project development and off-site mitigation would improve the overall water quality of flows downstream and within MSHCP Conservation Areas, and potentially improve the habitat for MSHCP planning species, making this a superior alternative to existing conditions.

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Appendix A: Biological Resources Assessment and Western Riverside County MSHCP Consistency Analysis

Appendix B: Wilson Creek Habitat Restoration Plan

HABITAT RESTORATION PLAN

WILSON CREEK

AGUANGA, CALIFORNIA



OCTOBER 2011

HABITAT RESTORATION PLAN

WILSON CREEK

AGUANGA, CALIFORNIA

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Table of Contents

	Page
1.0 INTRODUCTION.....	1
1.1 Project Location.....	1
1.2 General Site Description.....	1
1.3 Jurisdictional Areas.....	2
1.4 Assessment of Functions and Values (HGM Assessment).....	9
1.4.1 Overview of the Santa Margarita Regional HGM Guidebook.....	10
1.4.2 Existing Stream Condition and Function.....	10
1.4.3 Reach 1 (Transect 1).....	13
1.4.4 Reach 2 (Transect 2).....	15
1.4.5 Reach 3 (Transect 3).....	15
1.4.6 Summary of Wilson Creek Functional Condition.....	16
2.0 GOAL FOR RESTORATION.....	16
2.1 Habitat Enhancement and Restoration Concept Plan.....	17
2.1.1 Enhancement – Tamarisk Eradication (Part One).....	17
2.1.2 Restoration – Progressive Planting (Part Two).....	17
2.1.3 Pilot Planting Project.....	18
2.2 Functions and Values to be Improved.....	18
2.3 Rationale for Expecting Successful Implementation.....	20
2.4 Responsible Parties.....	20
3.0 ENHANCEMENT AND RESTORATION – GUIDELINES AND SPECIFICATIONS.....	21
3.1 Enhancement – Tamarisk Eradication.....	21
3.2 Restoration – Planting and Seeding.....	21
3.3 Schedule.....	22
3.4 Site Preparations.....	22
3.4.1 Temporary Irrigation.....	23
3.4.2 Pre-Planting Weed Control.....	23
3.5 Planting Plan.....	23
3.5.1 Plant Materials.....	24
3.5.2 Installing Cuttings or Container Plant Stock.....	24
3.5.3 Seed Application.....	27
3.6 Install Complete (As-Built) Reports - For Each Phase.....	27
4.0 MAINTENANCE DURING MONITORING PERIOD.....	28
4.1 Maintenance Activities.....	28
4.2 Weed Eradication.....	28
4.2.1 Annual Weeds.....	28
4.2.2 Perennial Weeds.....	28
4.3 Herbicide Applications.....	29

Table of Contents (Continued)

	Page
4.4 Pest Control	29
4.5 Replacement of Dead or Diseased Plant Materials.....	29
5.0 MONITORING PLAN	29
5.1 Performance Standards.....	29
5.1.1 HGM Functional Assessment.....	30
5.1.2 Percent Cover.....	30
5.2 Monitoring Procedures.....	32
5.2.1 Line Intercept Transect Method	33
5.2.2 Point-Step Method	33
5.3 Reports.....	34
5.3.1 Recording the Initial Planting Effort (by Phase)	35
5.3.2 Annual Monitoring and Reports	35
5.4 Contingency Measures.....	36
6.0 REFERENCES.....	36

List of Figures

	Page
Figure 1 Regional Map.....	3
Figure 2 Vicinity Map.....	4
Figure 3 Wilson Creek Restoration Area	5
Figure 4 Jurisdictional Limits and Photo Locations	6
Figure 5 Representative Photographs	7
Figure 6 Transect Location Map.....	11

List of Tables

	Page
Table 1 Location and Size of Reaches within the Study Area.....	9
Table 2 HGM Functional Scores for Wilson Creek Assessment Area	14
Table 3 Riparian Scrub – Cuttings (per acre).....	24
Table 4 Riparian Habitat Seed Palette – Seed Rate (per acre).....	25
Table 5 Target Total Native Coverage Guidelines.....	32

Habitat Mitigation and Monitoring Plan

1.0 INTRODUCTION

This Habitat Restoration Plan (HRP, “Plan”) describes a strategy and presents guidelines and specifications for the enhancement and restoration of riparian habitat along a section of Wilson Creek in Aguanga, California (**Figure 1, Regional Map**). The restoration site area covers approximately 19.4 acres (**Figure 2, Vicinity Map**). The project will involve tamarisk eradication throughout the entire area with supplemental planting efforts to reestablish native riparian woodland and scrub vegetation. The site is proposed to be planted in phases with the first phase of planting to commence in the fall of 2012 and planting in Phases 2 and 3 planned in the 2013 and 2014, respectively (**Figure 3, Wilson Creek Restoration Area**). However, Wilson Creek Farms, LLC may conduct all planting in just one or two phases. The phasing and schedule for initial planting will be determined prior to implementation of the planting currently planned as Phase 1 to commence in Fall 2012. The proposed enhancement and restoration efforts prescribed herein are intended to increase habitat quality and improve functional values associated with this section of Wilson Creek. The restored areas will be made available for projects conducted off site by others that require compensatory habitat mitigation to offset impacts to jurisdictional areas regulated by the U.S. Army Corps of Engineers (ACOE), Regional Water Quality Control Board (RWQCB), and/or California Department of Fish and Game (CDFG). Each project will be subject to review and approval by the resource agencies through individual Habitat Mitigation and Monitoring Plan’s (HMMP) to ensure consistency with the intent of this HRP as appropriate.

This Plan describes the objectives, procedures, and performance criteria for habitat enhancement and restoration and provides discretionary recommendations to guide noxious weed eradication, site preparations, planting, maintenance, monitoring activities, and specifies requirements for reporting the implementation and progressive results of the prescribed habitat restoration efforts.

1.1 Project Location

The proposed project site encompasses approximately 19.4 acres within the rural Lancaster Valley area of Aguanga, situated in unincorporated Riverside County, California. The site lies to the east of Vail Lake just north of State Route (SR) 79 and approximately 16.7 miles east/southeast of the Interstate 15 (I-15) and Interstate 215 (I-215) interchange. The site is accessed from the end of the Cottonwood School Road which lies approximately 1.2 miles up Sage Road (County Road No. 3) north from the SR-79. The project site is found on the U.S. Geological Survey (USGS) 7.5-minute quadrangle map for Vail Lake, California, in Sections 17 and 18, Township 8 South, Range 1 East (Figure 2). The Universal Transverse Mercator (UTM) coordinates corresponding to the approximate center of the project site are 508935.52 m E and 3705008.43 m N (UTM Zone 11).

1.2 General Site Description

The restoration site in Wilson Creek is located in a rural area surrounded by active agriculture and natural open space with very little development in the near vicinity. The subject site and immediately adjacent farming areas vicinity lie within a relatively flat valley bottom. This segment of Wilson Creek is almost 3,000 feet in length and slopes gradually downward from east to west in the direction of flow. This

streambed area ranges in elevation from approximately 1,700 feet above mean sea level (MSL) at the eastern limits to about 1,645 above MSL at the western limits.

Wilson Creek is the single significant drainage feature in the area and it flows from east to west toward Sage Road. The southern banks of Wilson Creek are characterized by a historic levee that ranges from approximately 8 to 15 feet in height. The levee was constructed in the late 1800's to isolate Wilson Creek from farming activities in the Lancaster Valley just south of the Creek. In the last 20 years the project reach has been subjected to invasion by non-native tamarisk. Historic aerial imagery indicates that tamarisk has migrated upstream from Sage Road, located directly off-site to the east, until it became the dominant vegetation throughout the entire streambed up to the eastern boundary of the proposed 19.4-acre tamarisk removal area.

1.3 Jurisdictional Areas

Wilson Creek is an intermittent drainage feature and riparian corridor that is subject to CDFG regulatory jurisdiction. The streambed area and the active floodplain between the northern and southern embankments are also considered Waters of the U.S. and thus subject to ACOE and RWQCB jurisdiction (**Figure 4, Jurisdictional Limits and Photo Locations**).

Wilson Creek is considered to support intermittent flow through the Lancaster Valley as evidenced by USGS topographic blue-line stream mapping of Wilson Creek (see Figure 2). However the flow within this portion of the creek is ephemeral in nature due to the gentle topographic relief of the streambed, the presence of excessively well drained sandy soils, and the occurrence of historic farming levees that confine the creek and minimize hydrologic inputs from historic tributaries and/or upland sheet flow¹. The Wilson Creek restoration area supports ephemeral surface flows through a braided network of low-flow channels separated by sand bars that are experiencing incision due to stabilization by dense patches of tamarisk shrubs. However, evidence of continued lateral migration of smaller low-flow channels was observed in the field. Soils within the channel are dominated by Riverwash (Rw) based on Natural Resources Conservation Service (NRCS) Soil Web mapping in Google Earth, which are typically considered to be non-soils (NRCS 2011).

Given the dynamic nature of this streambed system, the sandy ephemeral classification of the stream, and its location in the arid southwest, the limits of ACOE jurisdiction were assessed based on the limits of the active floodplain pursuant to *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (ACOE, 2008). CDFG jurisdiction was assessed based on the top-of-bank of the historic farming levee along the southern extent of the boundary only, as the northern boundary is contained entirely within the floodplain of the creek. The active floodplain of the restoration area supports an average width ranging from 300-600 feet in width and includes approximately 3,000 linear feet of braided channel.

Vegetation within the study area supports dense thickets of tamarisk scrub intermixed with sparse stands of mature cottonwood trees (*Populus fremontii*) and several species of mature willow trees (*Salix* sp.) that are mainly located along the southern perimeter of the Wilson Creek study area. More drought tolerant species such as scale broom (*Lepidospartum squamatum*), tarragon (*Artemisia dracunculus*) and California buckwheat (*Eriogonum fasciculatum*), and occasional cacti specimens including prickly pear cactus (*Opuntia*

¹¹ Ephemeral streambeds generally support flow during, and immediately after, a rain event.



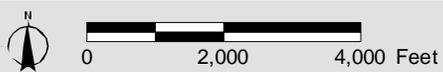
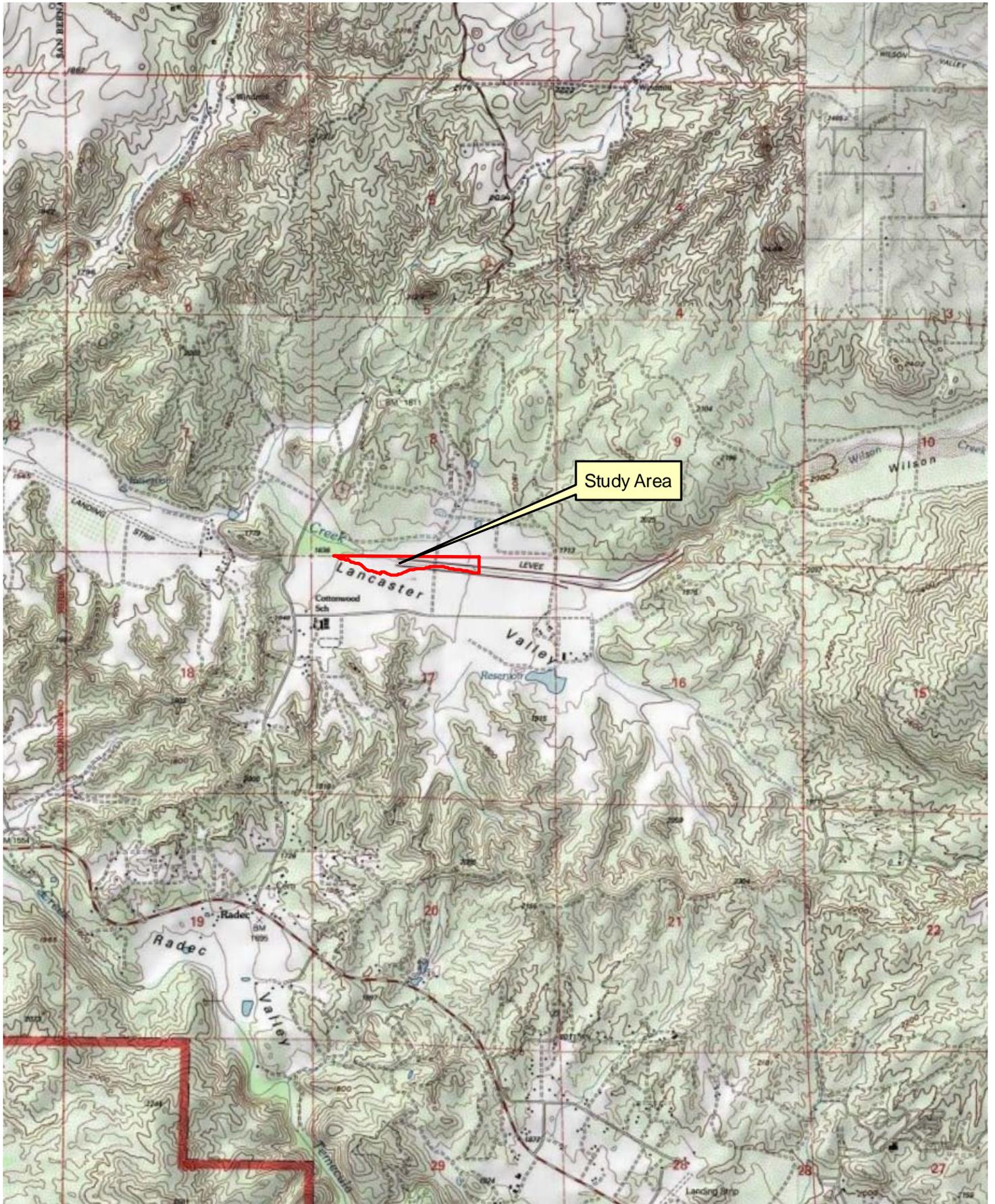
Regional Map

Wilson Creek Restoration Area

Source: ESRI Street Map, 2009; PCR Services Corporation, 2011.

FIGURE

1



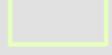
Vicinity Map

Wilson Creek Restoration Area
 Source: USGS Topographic Series (, CA); PCR Services Corporation, 2011.

FIGURE
2





 ACOE Jurisdiction (18.1 acres)
 CDFG Jurisdiction (19.4 acres)
 Photograph Locations



Representative Photograph 1



Representative Photograph 2



Representative Photograph 3



Representative Photograph 4

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littoralis) and cholla (*Cylindropuntia* sp.) are present on the benches and low terraces within the floodplain and represent a form of alluvial scrub vegetation that is common in similar situations in this region. Representative photographs of on-site vegetation are included on (**Figure 5, Representative Photographs**).

1.4 Assessment of Functions and Values (HGM Assessment)

PCR has conducted a baseline functional assessment for the restoration area using the Santa Margarita Regional Riverine Hydrogeomorphic (HGM) Guidebook (Lee et al., 1997). The application of the HGM functional assessment is consistent with that of a previous assessment conducted by PCR in October 2001 for a section of Wilson Creek upstream from Sage Road, including the restoration area (PCR, 2001). The use of the HGM model for this assessment, as opposed to the California Rapid Assessment Method (CRAM) was directed by recommendations from the ACOE. The results of the HGM assessment, presented below, provide a baseline for comparison with the progress of the restoration efforts. Using the same parameters, the performance criteria for the restoration involves demonstrating functional improvements to at least two streambed functions as detailed in Section 5.1.

Methods

PCR biologists conducted a field assessment of the approximately 19-acre study area in order to characterize the physical structure, evaluate the biological condition, and assess the functional condition of the stream consistent with the HGM performed by PCR in 2001. Field investigations were performed on October 5, 2011 by PCR Principal Environmental Scientist, Amir Morales and Biologist, Zeke Cooley. Although only minor geomorphic and vegetative differences were observed throughout the study area, the creek was divided into three relatively homogenous “reaches” for the purpose of this assessment. Data was collected along three transects and used to characterize the condition of each reach. Given the homogenous nature of the vegetative cover in each reach, it was determined that one transect per reach would provide an adequate baseline assessment of functions within each reach for the purpose of this HRP. **Table 1, Location and Size of Reaches within the Study Area** provides a summary of the location and size of each reach of the study area and depicts transects that were used to evaluate that reach as depicted on (**Figure 6, Transect Location Map**).

Table 1

Location and Size of Reaches within the Study Area

Reach	Location	Transect	Length (feet)	Acres
1	Lancaster Valley	1	190	1.4
2	Lancaster Valley	2	1,750	12
3	Lancaster Valley	3	1,050	5

Source: PCR Services Corporation, 2011

At each transect, data was collected with regard to the physical and biological structure of the stream and a semi-quantitative functional assessment was performed using the Draft Santa Margarita Regional Riverine HGM Guidebook (Lee et al., 1997). Measures of the physical structure included channel geometry, number of geomorphic surfaces, soil characteristics and presence of hydrologic indicators. Measures of the biological

structure included documentation of the plant community composition, vertical structure of the habitat, and patchiness of different habitat types.

1.4.1 Overview of the Santa Margarita Regional HGM Guidebook

The HGM (Smith et al., 1995), developed by the U.S. Army Corps of Engineers Waterways Experiment Station assesses wetland functional capacity (as opposed to functional opportunity). The HGM approach uses variables measured in the field to compute Functional Indices for biotic, hydrologic, and biogeochemical riverine functions. Variables are the attributes or characteristics of a riverine ecosystem or surrounding landscape, that influence the capacity of a streambed to perform one or more functions. Variables are scored using an ordinal scale (in the case of the Santa Margarita model) from 0.0 to 1.0, based on their similarity to local sites with reference standard conditions. Comparing the variables assessed for the Wilson Creek study area against representative local reference sites within the same watershed, allows for a relative understanding of functional variations. Functional Capacity Indices (FCI's) are calculated based on defined relationships between variables for riverine systems that have been applied to similar resources across the watershed. FCI's range from 0 to 1.0, with 0 representing the most degraded condition and 1.0 representing functional capacity comparable to that found at standard reference sites.

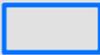
The Santa Margarita Regional Riverine HGM Guidebook (Lee et al., 1997) was developed to evaluate the functional capacity of riverine wetlands and waters of the U. S. in the Santa Margarita Watershed. The regional model is divided into six subclasses and was calibrated based on data collected from approximately 150 reference sites in the watershed. Although a peer review workshop was conducted in October 1997, the recommendations that were developed from this workshop have never been incorporated into the model. Consequently, the model is still considered draft and does not comply with all requirements of the National Action Plan to Develop the Hydrogeomorphic Approach for Assessing Wetland Functions (Federal Register: August 16, 1996, Vol. 61, No. 160, pp 42593-42603).

1.4.2 Existing Stream Condition and Function

Wilson Creek is one of the major tributaries in the upper Santa Margarita Watershed. Below the confluence with Cahuilla Creek, Wilson Creek is a fourth order stream and is one of two major streams that flows into Vail Lake; the other being Temecula Creek. Through the study area, the active floodplain varies in width from 300 to 600 feet in channel width (from southern levy to northern property boundary) and encompasses a braided network of low-flow channels. The creek supports gentle topographic relief evidenced by an elevation of approximately 1,700 feet above mean sea level (msl) in Reach 1 (upstream reach) and at approximately 1,650 feet above msl in Reach 3 (downstream reach). Figure 6, depicts the Wilson Creek restoration area.

Wilson Creek is considered to support intermittent flow through the Lancaster Valley as evidenced by USGS topographic blue-line stream mapping (Figure 2) of the creek. However the flow within this portion of the creek is in ephemeral in nature due to the gentle topographic relief of the streambed, the presence of excessively well drained sandy soils, and the occurrence of historic farming levees that confine the creek and minimize hydrologic inputs from historic tributaries and/or upland sheet flow. This condition is exacerbated by the ongoing spread of tamarisk (salt cedar) that results in the reduction of available moisture from the surface and subsurface of the streambed through evapotranspiration, resulting in a drier habitat compared to pre-invasive conditions. The levees limit the ability of flows to overtop the channel and spread across the floodplain, thereby reducing the following functions: energy dissipation, surface water storage,



	Study Area
	Reaches
	Transects

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detention of particulates, and detention of elements and compounds. Vegetation within the study area supports dense thickets of tamarisk scrub intermixed with sparse stands of mature cottonwood trees (*Populus fremontii*) and several species of mature willow trees (*Salix* sp.) that are mainly located along the southern perimeter of the Wilson Creek study area. Dense monotypic stands of tamarisk shrubs generally exhibit higher water-use and increased evapotranspiration rates when compared to native riparian species such as cottonwoods, willows, and mule fat. Over time, water table levels are reduced through the rapid progression of dense stands of tamarisk which results in direct competition with, and eventually mortality of, native riparian vegetation (Zouhar, 2003). Such mortality of native riparian vegetation is evident on the restoration site as much of the cottonwood and willow trees throughout the study area are significantly stressed and/or are in different stages of decline or mortality due to the long-term reduction in the water table and increased competition from invading salt cedar. The salt cedar stands have also stabilized the sand bars to the point where many of the low-flow channels are becoming more stable and incised. Figure 5 provides representative photographs of the non-native invasive dominated riparian habitat present in the study area. The location of each site photographs is depicted on Figure 4, *Jurisdictional Areas*.

Based on the NRCS Web Soil Survey in Google Earth, the restoration area encompasses Riverwash (RsC), Tujunga loamy sand (TvC) and Visalia sandy loam (VIC2), with the Riverwash soils occurring predominately in Reaches 1 and 2. Riverwash soils consist of unconsolidated sands, gravels, and cobbles that are typically considered "non-soils." Portions of Tujunga loamy sand and Visalia sandy loam occur in Reach 3 and consist of very deep, somewhat excessively drained soils, formed in alluvium weathered mostly from granitic sources.

The majority of the landscape surrounding Wilson Creek is currently in agricultural production or has been in the recent past consistent with historic conditions. The adjacent uplands off-site to the north of the study area, which is not currently in agricultural production, are relatively free of non-native grasses that are typically associated with prior clearing or grazing². The characteristics and functional condition of each reach are discussed in the sections below:

1.4.3 Reach 1 (Transect 1)

Characteristics of the Stream Reach

Reach 1 begins approximately 0.8 miles east of Sage Road, where the active floodplain habitat transitions from alluvial fan sage scrub to dense tamarisk scrub with remnant stands of cottonwood and willow trees located mainly along the perimeter of the study area. In Reach 1, the active floodplain of Wilson Creek ranges from 400 to 500 feet wide and is generally confined between earthen levees. Reach 1 supports confined flows within the creek levees, which consequently reduces the opportunity for overbank flow onto the historic floodplain. Between the levees, Reach 1 of Wilson Creek is a braided ephemeral stream, with each flow path being several feet wide and approximately one to two feet deep, with numerous interspersed sand bars dominated by tamarisk. It appears that much of the cottonwood and willow trees in this area, and throughout the study area, are significantly stressed, and many are in different stages of mortality likely due to the long-term reduction in the water table and competition from invading salt cedar. The interior portion of the creek is dominated by dense thickets of tamarisk scrub. In this area, the salt cedar grows in monotypic

² A general biological assessment of the upland resources south of the study area has been completed by PCR Services Corp. (2001), and is available under separate cover.

stands and has largely excluded the establishment of cottonwood or willow saplings and/or seedlings resulting in the presence of sparse old growth native vegetation. The salt cedar stands have also stabilized the bars to the point where some of the flow areas are beginning to incise. Total canopy cover is estimated at approximately 55 percent of the total study area. Overall, salt cedar accounts for between 65 percent and 75 percent of the canopy cover in Reach 1. Areas adjacent to the creek (outside the levees) are primarily ruderal or agriculture.

Functional Condition

As indicated in **Table 2**, *HGM Functional Index Scores for Wilson Creek*, the average Functional Capacity Index (FCI) scores were 0.55 or greater. Hydrologic and biogeochemical functions are depressed due to the constriction of the floodplain between the earthen levees. The levees limit the ability of flows to overtop the channel and spread across the floodplain, thereby reducing the following functions: energy dissipation, surface water storage, detention of particulates, and detention of elements and compounds. Reach 1 supports less structurally diverse riparian habitat than the downstream reaches of the Wilson Creek study area. The dominant vegetation type within the interior portion of Reach 1 is the non-native invasive salt cedar, which reduces habitat function for most organisms. Reach 1 supports riverine functions that have been reduced significantly due to the spread of invasive salt cedar.

Table 2

HGM Functional Scores for Wilson Creek Assessment Area

	Transect		
	1	2	3
Hydrologic Functions			
Maintenance of Characteristics Channel Dynamics	0.58	0.64	0.47
Dynamic Surface Water Storage and Energy Dissipation	0.38	0.54	0.38
Long-term Surface Water Storage	0.50	0.50	0.50
Dynamic Subsurface Water Storage	0.67	0.67	0.67
	0.53	0.59	0.50
Biogeochemical Functions			
Nutrient Cycling	0.25	0.42	0.17
Detention of Imported Elements and Compounds	0.41	0.50	0.38
Detention of Particulates	0.46	0.61	0.43
Organic Carbon Export	0.56	0.65	0.55
	0.42	0.54	0.38
Habitat Functions			
Maintain Characteristic Plant Community	0.35	0.40	0.25
Maintain Habitat Interspersion and Connectivity	0.45	0.55	0.55
Maintain Characteristic Detrital Biomass	0.75	0.83	0.71
Maintain Spatial Structure of Habitat	0.50	0.56	0.42
Maintain Characteristic Invertebrate Diversity	0.75	0.75	1.00
Maintain Characteristic Vertebrate Diversity	1.00	1.00	1.00
	0.63	0.68	0.66

Source: PCR Services Corporation, 2011

1.4.4 Reach 2 (Transect 2)

Characteristics of the Stream Reach

Reach 2 begins 0.6 miles east of Sage Road, where stream habitat consists of dense tamarisk intermixed with patches of cottonwood and willow trees. In Reach 2 Wilson Creek ranges from 400 to 600 feet wide and is generally confined between earthen levees. Reach 2 appears to be effective at containing flows within the creek, and consequently reducing the opportunity for overbank flow onto the floodplain. Between the levees, Reach 2 of Wilson Creek is a braided stream, with each flow path being several feet wide and approximately two feet deep, with numerous interspersed vegetated sand bars. It appears that most of the cottonwood and willow trees in Reach 2, and throughout the study area, are significantly stressed and many are in different stages of mortality likely due to the long-term reduction in the water table and competition from invading salt cedar. Similar to Reach 1, in Reach 2 the salt cedar grows in monotypic stands and has largely excluded the establishment of cottonwood or willow saplings and/or seedlings, leaving only old growth native trees in the area. The salt cedar stands have also stabilized the bars to the point where some of the flow areas are beginning to incise. Total canopy cover is estimated at approximately 60 percent in Reach 2. Overall, salt cedar accounts for between 70 and 75 percent of the canopy cover in Reach 2.

Functional Condition

As indicated in **Table 2**, *HGM Functional Index Scores for Wilson Creek*, below, the average FCI scores for all functions ranged from 0.64 to 0.70. Hydrologic and biogeochemical functions are depressed due to the constriction of the floodplain between the earthen levees. The levees limit the ability of flows to overtop the channel and spread across the floodplain, thereby reducing the following functions: energy dissipation, surface water storage, detention of particulates, and detention of elements and compounds. The dominant vegetation type within the interior portion of the creek is the non-native salt cedar, which reduces habitat function for most organisms. Reach 2 contains a 400 to 600-foot wide riparian corridor that supports riverine functions which have been reduced due to the infestation of invasive salt cedar.

1.4.5 Reach 3 (Transect 3)

Characteristics of the Stream Reach

Reach 3 begins approximately 0.4 miles east of Sage Road, where the streambed associated habitat transitions from tamarisk scrub with intermixed cottonwood trees, to a disturbed mule fat scrub among dense stands of tamarisk shrubs. In Reach 3 Wilson Creek ranges from 300 to 400 feet wide and is generally confined between earthen levees. Reach 3 appears to be effective at containing flows within the creek, and consequently reducing the opportunity for overbank flow onto the historic floodplain. Between the levees, Reach 3 of Wilson Creek is a braided stream, with each flow path being several feet wide and approximately one to two feet deep, with numerous interspersed vegetated sand bars. Reach 3 exhibits field indicators of ephemeral flow; however, this reach supports a slightly wetter plant community than Reaches 1 and 2. A backwater effect behind Sage Road may contribute to greater soil moisture in this area compared to other Reaches 1 and 2 upstream. In this reach, salt cedar grows in monotypic stands and has largely excluded the establishment of cottonwood or willow saplings and/or seedlings. Although vegetative cover is less than Reaches 1 and 2, a slightly greater density of native mule fat has established in this area.

Functional Condition

As indicated in Table 2, the average FCI scores for all functions associated with Reach 3 range between 0.43 and 0.67. The individual FCI scores for Reach 3 range between 0.25 and 1.0. Hydrologic and biogeochemical functions are depressed in this area due to the constriction of the floodplain between the earthen levees. Reach 3 supports less structurally diverse riparian habitat than the upstream portions of Wilson Creek. However, the dominant vegetation type within the interior portion of the creek is the non-native salt cedar, which reduces habitat function for most organisms. Total canopy cover is estimated at approximately 50 percent in Reach 3. Overall, salt cedar accounts for between 65 and 70 percent of the canopy cover in Reach 3. Reach 2 contains a 300 to 400-foot wide streambed corridor that supports riverine functions which have been reduced significantly due to the spread of invasive salt cedar.

1.4.6 Summary of Wilson Creek Functional Condition

All 3 reaches represent intact riverine systems with low to moderate topographic and geomorphic complexity, and spatially and structurally low habitat diversity. The historic floodplain adjacent to the study area has been subjected to anthropogenic alteration through the construction of levees dating back over 100 years. The levees limit the ability of flows to overtop the channel and spread across the floodplain, thereby reducing the following functions: energy dissipation, surface water storage, detention of particulates, and detention of elements and compounds. No direct impacts from anthropogenic disturbance within the streambed were observed. The Wilson Creek floodplain is contiguous up and downstream, but is laterally confined within a relatively broad floodplain area bound within the farming levees. Reaches 1, 2, and 3 support a reduced functional capacity compared to pre-anthropogenic influences due primarily to constriction of the floodplain and significant infestation with non-native salt cedar. The average FCI for these reaches ranges from 0.43 to 0.70, indicating that this portion of Wilson Creek supports a measureable reduction in function and value compared to more pristine riverine resources within the region. Construction of earthen levees has reduced floodplain connection, resulting in lower hydrologic and biogeochemical functions. In the study area, the high rates of infiltration into the deep alluvium of the Lancaster Valley, combined with the high rates of evapotranspiration from salt cedar infestation have resulted in a more xeric habitat. The habitat in the assessment area has substantially lower structural and spatial diversity than similar reference reaches within the watershed. Removal of salt cedar, and native restoration through the installation of local vegetation cuttings are believed to be the most productive methods to increase hydrologic, biogeochemical, and/or habitat functions within this portion of Wilson Creek.

2.0 GOAL FOR RESTORATION

Under this plan, the goal of the prescribed enhancement and restoration efforts is to eliminate the current coverage of noxious invasive weeds in the project area and promote replacement of the non-native vegetation with appropriate native riparian species. This goal will be accomplished using a two-part approach that includes 1) clearing the site of noxious vegetation followed by selective weed control for several years, and 2) progressively planting and seeding the site to restore native plant coverage in this segment of Wilson Creek.

These efforts are expected to result in improvement in two or more of the important characteristic functions and values attributed to this resource area. The improvements in resource functions and values is planned to provide mitigation for third parties that are required to provide compensatory habitat mitigation for

unavoidable project impacts in the local region. Implementation of compensatory mitigation measures will be subject to review and approval of a project-specific Habitat Mitigation and Monitoring Plan (HMMP) by the appropriate resource agencies. Project-specific HMMP's will be prepared and implemented by Wilson Creek Farms, LLC on behalf prospective permittees to ensure consistency with the intent and framework of this restoration Plan.

Proceeds from the granting of compensatory mitigation within the restoration area are anticipated to assist with funding of the following activities:

1. Implementation of the restoration efforts summarized in this Plan, which will be accomplished on a project-by-project basis through individual Habitat Mitigation and Monitoring Plans (HMMP) that will be reviewed and approved by the resource agencies to ensure consistency with this plan as appropriate.
2. Installation of piezometers to collect water table readings over the course of this Plan.
3. Preparation and processing of a prospectus and associated HMMP for 30-100 acres of streambed creation in Wilson Creek (upstream of the restoration area) through the lateral expansion of existing levees.
4. ACOE approval of the proposed upstream streambed creation area as part of a private mitigation bank for compensatory streambed mitigation.

2.1 Habitat Enhancement and Restoration Concept Plan

This plan consists of two parts. The first part involves enhancement through the eradication of Tamarisk from the project site; part two consists of habitat restoration by re-establishing native riparian vegetation in areas cleared of tamarisk.

2.1.1 Enhancement – Tamarisk Eradication (Part One)

Tamarisk eradication – the first part of the plan - constitutes substantial enhancement of the project area for at least two reasons. First, it provides an ample opportunity for restoration by providing open areas for establishing natural riparian habitat. Second, it should also significantly reduce water loss from this part of the hydrologic system via evapotranspiration, which is believed to be disproportionately high in areas dominated by tamarisk. Part one is proposed to commence immediately (e.g., November 2011) and will occur throughout the 19.4-acre project area in this sandy ephemeral floodplain. Eradication will first involve cutting and stump treatment of standing live tamarisk with the aboveground portion of plants being ground up in place using a flotation tire-mounted Barko Fecon mulcher. In addition to initial tamarisk removal and stump treatment with herbicide, other noxious invasive species such as tree tobacco (*Nicotiana glauca*) and castor bean (*Ricinis communis*) will also be cut and stump treated wherever they may occur on the project site. Subsequent to initial removal and treatment of these invasive exotic species, the entire project area will be monitored for re-growth and treated as needed to eliminate these species for five years.

2.1.2 Restoration – Progressive Planting (Part Two)

Restoration of native riparian vegetation is proposed to be conducted in a total area covering approximately 19.4 acres comprising the “site”. Establishment of native vegetation is not currently proposed to commence

all at one time, although it is entirely possible that planting may occur in just one or two phases instead of three. In any case, planting will start upstream and progress downstream. The first round of planting in the first phase of the restoration is proposed to formally commence in the late fall next year (2012). Phase 1 is expected to involve at least three to five acres near the eastern, upstream end of the. The second phase, as presently envisioned, would commence one year later, and the third phase the year after that, with each subsequent phase expected to include 5 acres or more, downstream from the previous phase area. Figure 4 depicts the progressive planting scheme and shows the separation between the phases as a dashed line since the exact acreage of each phase is not yet certain but will depend on the amount of mitigation required by participants.

2.1.3 Pilot Planting Project

Once initial tamarisk removal is completed, a preliminary trial or “pilot project” will be conducted to test and evaluate planting materials and methods within one or more small portions of the enhancement area. The location and extent of the pilot areas will be determined by Wilson Creek Farms based on recommendations by PCR and/or the RM. However, this HRP anticipates the implementation of 1-3 pilot project areas ranging from approximately 0.10-0.50 acre. The pilot program is being implemented voluntarily by Wilson Creek Farms to help identify the most successful approach to reestablishing native vegetation prior to implementation of Part 2 of this HRP (see Section 2.1.1). Planting in the trial site(s) will include installation of cuttings of native riparian scrub and woodland species such as mule fat, willow, and cottonwood, at varying soil depths, along with seed applications in a few patch areas. The trial effort is planned to avoid or minimize the use of supplemental irrigation as much as possible. If the weather is particularly dry and/or hot during the winter and spring months, or if the majority of installed plant materials appear to be severely stressed, supplemental irrigation may be applied. If applied, irrigation would involve direct hose application to installed plants and/or spray application directed into specific areas for short periods until the desired area is irrigated appropriately.

Seed germination, survivorship of cuttings, and potential irrigation requirements will be observed by Wilson Creek Farms and the knowledge gained from the trial planting and seeding will help determine the best methods and materials to be used during the actual planting effort that will commence with Phase 1 in 2012. Pilot project areas not immediately subject to performance criteria, but will ultimately be integrated into project-specific restoration efforts that will be subject to the performance criteria detailed in Section 5.1 of this HRP. The Year 2 monitoring “time clock” associated with project-specific mitigation areas will commence upon implementation of the Part 2 native revegetation efforts detailed in Section 2.1.1, and will include those project mitigation areas that may encompass a pilot site. Although implementation of pilot trial sites will occur immediately after the tamarisk removal enhancement (Part 1), and prior to the installation of project-specific restoration, trial sites will be integrated into project-specific mitigation areas by supplementing them with native vegetation as needed to meet the necessary vegetation densities proposed for the restoration effort (Part 2).

2.2 Functions and Values to be Improved

Implementation of this Plan is anticipated to provide both local and regional streambed benefits through the replacement of noxious tamarisk with native riparian vegetation, and the eradication of a significant source of tamarisk seed from the Wilson Creek sub-watershed. Although most streambed functions are expected to significantly increase over the long-term, the scope of this restoration Plan and associated five-year

monitoring schedule³ will be to demonstrate a benefit to a minimum of two of the following streambed functions:

1. Hydrology Function
2. Biogeochemical Function
3. Habitat Function

Successful performance of a minimum of two, of the three functions listed above, will be based on 1) the HGM results, 2) the percent native/non-native coverage, 3) the groundwater elevation results, or any combination of these factors that will be assessed in years 3 and 5 of the restoration monitoring effort. Functions assessed as part of the HGM assessment for this restoration Plan include all three streambed functions (hydrologic, biogeochemical, habitat) as detailed in Section 1.4 of this Plan. Estimation of riparian native/non-native coverage will support habitat based streambed functions, while groundwater elevation monitoring may support a determination of an increase in hydrologic streambed function.

The prescribed efforts will improve habitat quality by greatly decreasing noxious weed cover in favor of increased cover and diversity by native vegetation. In turn, the shift from tamarisk dominance to native dominance should improve nutrient cycling and increase subsurface water storage through decreased evapotranspiration rates. Although piezometers (wells) will be installed to monitor subsurface (water table) conditions, it's unclear if data from the wells will conclusively demonstrate a measurable increase in water table elevations over the scope of this restoration Plan. However, data will be kept over the course of the proposed phases of restoration in the event that useful information regarding the correlation of water table elevations and the reduction of salt cedar can be derived.

Establishing substantially higher percentages of native vegetative cover throughout the drainage feature as compared with the existing conditions is intended primarily to improve wildlife habitat values. Other intended benefits will include improved water quality through improved bio-filtration effects, dissipation of energy from storm flows within the braided washes, and soil stabilization. In general, establishing native vegetation in the subject area is intended to:

- Provide reasonably effective erosion control to deter channel and habitat degradation by natural flows;
- Enhance hydrologic and biogeochemical functions by reducing vegetative evapotranspiration rates contributing to more natural soil moisture levels;
- Enhance Beneficial Uses for Wilson Creek including an increase in "groundwater recharge" benefits within the restoration area through removal of tamarisk;
- Enhance biological values (e.g., species diversity, forage and cover for wildlife), as compared with existing conditions, by replacing existing ruderal (weedy) vegetation with predominantly native plants;

³ *The monitoring schedule proposed by this restoration Plan is anticipated to include one year of monitoring following tamarisk removals (part 1) followed by four years of monitoring after installation of native vegetation (part 2).*

- Substantially deter the establishment, reestablishment, and migration of particularly noxious invasive species (e.g., tamarisk, tree tobacco, giant reed, perennial pepperweed, castor bean).

2.3 Rationale for Expecting Successful Implementation

Successful implementation of habitat restoration may be expected based on the following factors:

- Tamarisk eradication methods have proved successful in other sites in the region.
- The plant palettes consist of site-appropriate native species and include dominant and common native species found in existing habitat on-site in Wilson Creek.
- Plant palette includes long-lived dominant perennial grasses and short-lived, aggressive “weed beater” species, nitrogen-fixing legumes, and mycorrhizal hosts.
- Planting will take place during the appropriate seasons and supplemental irrigation will be provided in case of extended drought conditions during the establishment period.
- The riparian restoration areas are situated in the low-lying floodplain with less than 3 feet elevation difference between the planting surface and the near adjacent braided low-flow stream bottom. Runoff from large tracts of adjacent agriculture on both sides of this segment of Wilson Creek is also anticipated to provide significant subsurface flows to the subject area along with storm runoff from the surrounding hillsides.

2.4 Responsible Parties

Wilson Creek Farms LLC, or its successors in interest or assigns, is responsible for implementation of the habitat restoration and monitoring efforts and will provide funding to implement this plan. Wilson Creek Farms intends to assign responsibilities for various plan elements to representative agents or contractors it engages to implement or oversee various plan elements. The planting and maintenance actions prescribed under this plan will be conducted or directed by a contractor with demonstrated habitat restoration experience. It will also be necessary to provide for adequate oversight, monitoring, and periodic assessment and reporting of planting and maintenance activities and site progress.

Therefore, a qualified firm with experience in planning and monitoring native habitat creation projects in the region should be retained by Wilson Creek Farms or its designated agent/representative for this purpose. The monitoring firm, hereinafter referred to as the Restoration Monitor (RM) will oversee implementation of all elements of this plan and will advise and assist Wilson Creek Farms or its designated representative and its contractor(s) with issues pertaining to the mitigation effort. The RM will:

- Provide appropriate recommendations where discretion or remedial measures are indicated and will be responsible for documentation and agency coordination.
- Observe the critical phases of habitat implementation including site preparations, topsoil salvage and redistribution, irrigation system function, seeding, and supplemental planting (if required).
- Document deviations from the plan and provide reasonable justification for changes.
- Periodically observe, assess and document maintenance activities and habitat development until the performance criteria have been satisfied.

- Communicate to the Applicant or designated representative regarding site implementation, maintenance activities, and habitat creation progress, and prepare annual monitoring reports for submittal to CDFG, ACOE, and RWQCB, if required.

3.0 ENHANCEMENT AND RESTORATION – GUIDELINES AND SPECIFICATIONS

3.1 Enhancement – Tamarisk Eradication

It is anticipated that initial tamarisk removal efforts will be conducted by Washburn Grove Associates (contractor), a licensed/bonded/insured company, with significant experience conducting large-scale mechanized and non-mechanized non-native invasive vegetation removals within jurisdictional streambeds. Tamarisk will be removed by cutting, grinding, and stump treatment of tamarisk with approved herbicides by licensed applicators, using low pressure rubber-tired mechanized equipment. Tamarisk shrubs adjacent to native riparian vegetation will be removed by hand crews with chain saws. Tamarisk removal is anticipated to take approximately one week. In the event that significant rain events are forecasted in the Aguanga area, the tamarisk removal effort will be temporarily demobilized and all equipment removed from the streambed until the next dry period. Tamarisk cuttings will be stock piled within the floodplain outside of low-flow channels, and will be protected with the appropriate Best Management Practices (BMP's) during rain events to minimize transport downstream. The RM (a qualified biologist) will conduct a thorough site inspection with the contractor to assure that native vegetation is avoided during tamarisk removals to the extent feasible. The RM will assist the contractor and perform subsequent inspections as necessary to observe that impacts to native vegetation are avoided.

Access to the site is available via existing unpaved Arizona crossings to the east and west of the nearly 21-acre tamarisk removal area. Cutting and mulching will be performed using a Barko 930 Mulcher with a Recon Cutting Head mounted on low ground pressure flotation tires to minimize ground disturbance. Applicators will follow immediately behind the cutting and mulching equipment to uncover fresh cut stumps and apply herbicide directly.

Subsequent herbicide applications will be necessary for at least two to three years after initial cut- stump treatments to assure complete eradication. Follow up treatments will generally consist of low volume foliar spray applications wherever new tamarisk or regrowth appears. Herbicide applications will be conducted in accordance with product labels and manufacturer's instructions and/or as directed by a licensed Pest Control Adviser. Monitoring and maintenance will continue for at least three years to assure effective eradication as described in Section 4 below.

3.2 Restoration – Planting and Seeding

Areas that do not already contain native vegetation in the 19.4 acre site will receive seed and/or be planted with appropriate plant materials representing the existing native species that naturally occur in this section of Wilson Creek. In general, the lower-lying areas will be planted and/or seeded with species typical of riparian scrub and cottonwood-willow riparian woodland while the more elevated areas (e.g., terraces and upper benches) in the floodplain should be seeded with more drought tolerant alluvial fan scrub species such as California buckwheat and scale broom. The combination of proposed seeding of representative plant species in both habitat types, along with installing cuttings or containerized native trees and shrub plantings are expected to provide stratified canopy coverage.

Results of seeding and planting observed in the trial planting pilot project area will be used to refine the selection of the specific plant materials and techniques to be used. Cuttings and/or container plantings (if used) will be installed during late fall or winter using materials, densities, and techniques derived from the pilot project results.

As each phase of the Restoration effort commences, specific planting area acreage will be identified and the portion of the area where tamarisk has been removed will be planted and/or seeded with appropriate native species. Seeded areas will then be raked over lightly with available mulch and loose dirt to protect the seed bed and deter weed germination.

Supplemental irrigation may be supplied by installing and operating a temporary irrigation system designed and built to provide overhead spray coverage within planted areas.

Maintenance will consist primarily of weed control and would be required mostly during the spring and early summer months.

Monitoring of the revegetation process will be conducted periodically throughout the year and annual performance evaluations will be performed in the summer when the site is driest. Annual monitoring reports will be submitted to the resource agencies, if requested, describing the site's performance through the year and any supplemental planting conducted.

3.3 Schedule

Enhancement efforts involving initial mulching and stump treatments to eradicate tamarisk is expected to commence by mid-November 2011. The trial planting and seeding in the pilot project will commence directly thereafter in December 2011. Planting and seeding efforts in subsequent Phases 1, 2, and 3 (depending on actual schedule for phased planting TBD), to formally commence progressive habitat restoration in selected areas, are expected to commence in the late fall of 2012, 2013, and 2014, respectively. Initial seeding and installation of cuttings and container planting (if any) should be conducted during the late fall and early winter (October 15 - January 15) after installation of a temporary irrigation system (if needed). Likewise, supplemental planting and seeding (if needed) should be conducted in the late fall or early winter in subsequent years.

3.4 Site Preparations

Site preparations prior to planting in each of the sections of the restoration site, by phase, may include a certain amount of clearing ruderal (weedy) vegetation and excessive accumulations of vegetative debris (as may be left behind by mulching tamarisk) to provide exposed soils for planting and seeding. This effort should be accomplished by manual raking. If substantial ruderal cover becomes established in areas slated for seeding or planting, it may be advantageous to perform a selective foliar herbicide application several weeks, in the spring and/or just prior to planting to reduce weed cover in specific planting sites.

Depending on the results observed in the pilot project, it may also be desirable to provide for temporary irrigation to sustain plants for the first two to three years after planting.

3.4.1 Temporary Irrigation

The prescribed upland habitat type is composed mainly of drought tolerant species and is not expected to require supplemental irrigation beyond the first three years during plant establishment. However, if the results of the pilot project indicate the need to provide temporary irrigation in order to promote seed germination and plant establishment and growth, particularly in case of extended drought conditions, a temporary irrigation system may be needed. If so, it will be necessary to provide a reliable connection to the local water source and may be prudent to provide a water tank and pumping device(s) to assure sufficient volume and pressure is available for use.

Since the irrigation system will not be a permanent installation, a simple surface system with a basic layout is recommended, and no elaborate landscape plans or designs are necessary; only a basic "design-build" is warranted. The system should provide overhead spray coverage throughout the specific areas designated for planting and seeding. Supplemental irrigation applications will follow the natural rainfall patterns, with watering provided to assist with germination and establishment of plantings. Supplemental irrigation is typically decreased in the second year after planting and discontinued at the end of three years following plant installation. The RM should determine adjustments to irrigation scheduling and whether to discontinue and remove irrigation at 2-3 years.

3.4.2 Pre-Planting Weed Control

If necessary, prior to planting in each successive phase area, control of perennial woody species such as castor bean, tamarisk, and tree tobacco and other noxious perennials may include cutting and removal followed by direct stump treatment with herbicide. Annual herbaceous weeds may be mowed or weed whipped before they can germinate to prevent growth, flowering and seed set. Any pesticide application must be performed in coordination with the RM and must be conducted or directly supervised by someone in possession of either a Qualified Applicator License (QAL) or a Qualified Applicator Certificate (QAC) issued by the California Department of Pesticide Regulation (DPR).

3.5 Planting Plan

In general, planting and seeding will be performed in areas that are currently occupied by tamarisk or are otherwise lacking significant native cover. Tamarisk cover currently ranges from 25 to 50 percent of total cover in most patch areas. However, existing native vegetation also provides up to 25 percent or more of the cover in some areas. Therefore, on average, planting and seeding is expected to be performed in not more than about half the acreage in any given patch area. Thus, the quantities of plants to be installed or pounds of seed applied per acre, is substantially lower for this project than it would typically be if the areas exhibited little or no vegetation. Moreover, in order to install plants or apply seed in some areas where tamarisk cover was particularly dense prior to treatment and mulching, patches may need to be raked clear of excessive organic debris to expose soil in preparation to receive plants or seed.

Initial seeding and planting must be conducted during the late fall or early winter and should not be performed later than January 15 to maximize the benefits of natural precipitation and cool weather for germination and growth seedlings as well as for rooting and development of cuttings and container plants through the rainy season.

3.5.1 Plant Materials

Seed materials should be derived from the local region. Installing propagules of local origin, which are adapted to local conditions, increases the likelihood that revegetation will be successful, and helps to maintain the genetic integrity of the local ecosystem. However, widespread herbaceous species and grasses are more likely to be genetically homogeneous and site specificity is a less important consideration. Therefore, seed for native grasses and wildflowers may be procured from commercial sources in Southern California, unless local sources are readily available. If seed for certain species is unavailable in the local area, the RM will request information regarding available sources in the region and determine whether more distant sources will be acceptable.

Container plants will be grown from local obtained cuttings or from reputable nurseries in the region that specialize in native and drought tolerant plants (e.g., Native Grow, Mockingbird Nursery, Tree O'Life). Container stock originating from cismontane southern California may be used. For species that occur over widespread areas in southern California, it is not critical to procure custom grown, site-specific plant materials.

The species selected for planting and seeding are listed on **Table 3, Riparian Scrub - Cuttings**, and **Table 4, Riparian Habitat Seed Palette**, respectively. All species listed were observed on site and/or are native to the local area. The total number and type of cuttings installed may be modified, or cuttings may be substituted with rooted container plants, subject to approval by the RM.

Table 3

Riparian Scrub – Cuttings (per acre)

Scientific Name	Common Name	Size	Quantity (spacing)
<i>Baccharis salicifolia</i>	Mule fat	Cuttings	450 (8' - 10')
<i>Populus fremontii</i>	Cottonwood	Cuttings	25 (15'-20')
<i>Salix exigua</i>	Sandbar willow	Cuttings	50 (10'-12')
<i>Salix laevigata or gooddingii</i>	Red or Black Willow	Cuttings	50 (10'-12')
<i>Salix lasiolepis</i>	Arroyo Willow	Cuttings	50 (10'-12')

Source: PCR Services Corporation, 2011

3.5.2 Installing Cuttings or Container Plant Stock

Only native riparian species that are indigenous to the area will be planted. Willows (*Salix* spp.) and mule fat are used extensively due to their high survival rates and commonness in the project area. Some cottonwoods will be planted at low densities in an effort to supplement the plant palette given the presence of cottonwoods in the area today. However, the successful establishment of cottonwood saplings may be not be feasible over a 5 year period, given the long-term reduction of the water table by tamarisk and the generally poor health of many of the existing cottonwood specimens on the site due to the tamarisk invasion. Cottonwoods that do not survive installation may be replaced by willows and/or mule fat per the discretion of the RM.

Table 4
Riparian Habitat Seed Palette – Seed Rate (per acre)

Botanical Name	Common Name	Life Form	Seed Count	Total Bulk Lbs.
<i>Ambrosia psilostachya</i>	Western ragweed	Herb	20,000	2.0
<i>Artemisia douglasiana</i>	Mugwort	Forb	500,000	1.0
<i>Artemisia dracunculus</i>	Tarragon	Sub-shrub	350,000	1.0
<i>Baccharis salicifolia</i>	Mule fat	Shrub	12,000,000	0.5
<i>Cressa truxillensis</i>	Alkai weed	Herb	60,000	0.3
<i>Eriodictyon crassifolium</i>	Yerba santa	Shrub	500,000	1.0
<i>Eriogonum fasciculatum</i>	Cal. buckwheat	Shrub	20,000	3.0
<i>Heliotropium curassavicum</i>	Wild heliotrope	Herb	900,000	0.2
<i>Lepidospartum squamatum</i>	Scale broom	Shrub	390,000	0.5
<i>Muhlenbergia rigens</i>	Deergrass	Grass	1,500,000	1.0
<i>Plantago insularis</i>	Plantain	Herb		6.0
			Subtotal (Pounds)	16.5

Source: PCR Services Corporation, 2011.

Cuttings should be collected and installed during the winter season when the plants are dormant before the leaves utilize the food reserves stored in the stem. When planted during the season of relative dormancy food reserves will be primarily used in the development of a root system if the stem is in contact with moisture.

Collecting and Installing Live-stakes (Plant Cuttings):

Plant cuttings will be collected locally and installed during periods of ample moisture, preferably during the winter season, to ensure establishment of the root system.

- Collect cuttings from many individual plant specimens in the immediate area. To improve survival, cuttings should be at least 40" long, preferably 48" or more, to enable planting at least 3' of the stake in the ground for maximum soil contact and proximity to ground water.
- Make the cuttings as straight and clean as possible so there are no split ends or torn bark. The optimum diameter is one inch and the minimum length is 40 inches with 48 inches preferred when practical.
- After the cutting is removed from the tree, cut off the side branches as close to the stem as possible. Cut the stem to the chosen length and remove any leaves.
- Sharpen the bottom of the cutting to aid in staking. Keep cuttings moist at all times by storing them in water or covering with a wet fabric until they are planted.
- Punch a hole in the desired planting location to a minimum depth of 3'. A long pry bar is typically used to open the hole to insert the live stake.
- Irrigate the hole (i.e., using a hose or bucket of water) prior to inserting the live stake.

- Drive the cutting into the ground until 75 to 80 percent of the length is below ground (about 3 feet of a 48" stake).
- Maximize soil contact by firmly tamping the soil around the stake. It must be firmly in the ground so it cannot be easily moved or pulled up.

Installing Container Plants

Planting is presently proposed to rely primarily on the use of locally collected cuttings. However, planting rooted container stock from one or more species of the same group of woody riparian plants is also acceptable and may be an appropriate alternative. Therefore, the pilot project effort is intended to utilize some plantings of rooted container plants using one gallon or smaller container sizes. As this is the case, and planting in the successive project phases may utilize such materials for planting in place of or as a supplement to installing live stake cuttings, the following guidelines are provided for storing and planting container stock:

- **Container Plant Inspection.** The RM will inspect all container plants upon delivery and reject any specimens that are unsatisfactory (e.g., diseased, root bound, wrong species, etc.) and should specify storage areas and watering requirements until specimens are planted to prevent overheating or drying out.
- **Root Protection.** Roots should be adequately protected at all times from sun and/or drying winds.
- **Planting Holes.** All planting holes should be dug with a shovel or posthole digger. The holes should have vertical sides with roughened surfaces, and be initially excavated to a depth to at least twice as deep as the container plant's root ball and two times as wide.
- **Planting Location Preparation.** Existing non-native vegetation, thatch, and debris must be cleared at least 18 inches away from plant centers (e.g., clear a 3-foot diameter area around each planted stem).
- **Container Plant Preparation.** The root ball should be thoroughly soaked while still in the container. After removing the root ball from the container, any roots wrapped around the sides of the container should be pulled loose from the root ball. The sides of the rootball may need to be scarified and tangled roots pulled free to promote new root growth into the surrounding soil.
- **Mycorrhizal Inoculation.** Add and thoroughly mix three (3) teaspoons of mycorrhizal fungi inoculum, either Endonet or Bionet to native backfill material replaced in each planting hole.
- **Watering In Plants.** After excavation and before planting, planting holes should be thoroughly wetted by filling each empty hole approximately half full with water, then backfill with thoroughly broken up native topsoil, then add water to the filled hole and tamp down firmly to eliminate air pockets and avoid excessive settling after installation.
- **Installing Plants.** Set the root ball atop the moistened soil backfill so that the collar (crown) sets between one-half inch to one full inch higher than the finished grade (or mean grade on slopes). Thoroughly water at least once or twice again after plants are set. Check each plant after deep soaking to determine whether the specimen has sunk. Replant if necessary to reset crown slightly above grade.

Irrigation basins or berms should be formed around each plant (downslope side only, for plantings set on slopes) to trap water so that it infiltrates the root zone. Berms must be tamped firmly to form at least a 2 inches high ridge at a minimum 18-inch radius around the stem.

- **Initial Watering.** Each plant must be individually watered at the time of planting as specified above, with sufficient water to reach to the lower roots.
- **Mulching.** A 1 inch to 2-inch thick top dressing of coarse, organic, weed-free mulch (e.g. bark, woodchips) is recommended to be placed around each plant stem to cover the entire basin area (at least 2-foot diameter). "Green waste" is not an acceptable form of mulch material.
- **Post-planting Irrigation.** Shortly after plants are set and mulch is placed, each specimen should receive additional hand watering as follows. Irrigate from the top, filling the basin with water and sprinkling around to settle the backfill, mulch, and berm. Allow water to soak in and repeat.

3.5.3 Seed Application

Manual broadcast seeding and raking will be performed to selectively distribute and lightly rake seed into the soil in the restoration areas. Seed shall be spread in patches that are relatively free from excessive amounts of organic debris and existing vegetation. In some cases, only very small amounts of seed may need to be scattered within the interstitial spaces where soil is exposed between clumps of existing vegetation. The seed palette provided in Table 4 may be pre-mixed, but it is recommended that the more drought tolerant species (e.g., scale broom and buckwheat) should be spread separately on the highest ground in the restoration area such as across the upper benches and embankments. Specifications for seed materials, rates and application technique may be adjusted by the RM, based on performance observed in the pilot project site and based on specific site conditions.

Seeded areas should be thoroughly watered with a fine spray as soon as possible after application (i.e., same day or next day). Therefore, it is recommended that initial seeding be performed when a significant rain event is forecast in the immediate future. It is also recommended that seed applied in barren areas should be protected by spreading a thin application of certified weed-free straw or other carbon based mulch (e.g., bark, wood chips) over seeded areas. Carbon-based mulch materials absorb the soil nitrogen, reducing the high nitrogen levels that promote rapid weed growth. The carbon based materials later breakdown providing a slow release of nitrogen back to the native plants within a year or two.

3.6 Install Complete (As-Built) Reports - For Each Phase

An As-Built Report will be prepared within 30 days of implementing the initial enhancement effort to cut down and chip existing tamarisk. This report will be submitted to the owner, CDFG, the San Diego RWQCB, and if requested, to the ACOE to provide a record of the initial tamarisk removal effort. In subsequent years as the restoration efforts commence in the several project phases, memoranda will be prepared and submitted to the owner and each regulatory agency within 30 days of completion of initial planting efforts for each phase of the project to indicate how and when site preparations and planting efforts were completed and to document and explain any significant modifications to, or deviations from the prescribed methods and materials as indicated in this Plan.

4.0 MAINTENANCE DURING MONITORING PERIOD

4.1 Maintenance Activities

Appropriate maintenance efforts are vital to the successful establishment of the planted and seeded areas until the desired vegetation becomes established. The restoration area will require regular maintenance and periodic inspections to determine if actions are needed to address or correct erosion, weed invasion, irrigation adequacy, plant stress, or other adverse conditions. Each phase of the restoration planting area will be maintained regularly for up to five years, or as stipulated by the agencies following installation. In general, maintenance should include any activity required to meet the performance standards set forth in this mitigation plan. The RM is responsible for making recommendations regarding maintenance to the contractor.

4.2 Weed Eradication

4.2.1 Annual Weeds

The purpose of controlling annual weeds is two-fold, to temporarily immobilize completion and prevent the production of additional seeds. Annual weeds are extremely fast-growing and high water/nitrogen consumers. This allows these plants to quickly produce seeds before conclusion of their annual life cycle. Maintenance activities should be conducted in a manner that controls these annual weeds so that slower growing target species have an opportunity for water and sunlight. These activities may include pulling weeds, spraying herbicides, and mowing. The main goal is to promote the germination and growth of the project target species by controlling the annual weeds. In no way should the annual weed control methods damage, destroy, or hamper the target species. Eradication of unwanted species will include those invasive species identified by the California Invasive Plant Council but weed eradication will not be limited to those species alone. Appropriate timing is critical to control seed production. The contractor must remove, kill, or mow annual weeds before seed production. If the contractor misses the window to remove annual weeds before seed production, any mowing, spraying, or removal activities are unnecessary. These annual weeds will die once seed production occurs. Regardless of the success of target species, limitations in the production of annual weed seeds significantly decreases annual weed challenges in the following growing season.

4.2.2 Perennial Weeds

Unlike annual weeds, perennial weeds must be completely killed or removed in order to maintain these species. Mowing in most cases enhances the growth of these species. In order to mow these plants shorter than the re-growth height, the contractor would also be cutting the target species too short. Perennial weeds most likely need to be hand pulled or sprayed with appropriate herbicides. Regardless of the success of target species, good removal of perennial weeds will offer significant advancements in project success.

As tamarisk is the primary target species for eradication for this site, it will be the focus of most of the maintenance effort to control this noxious perennial. The contractor will be responsible for eliminating tamarisk specimens during their normal routine maintenance visits and may use any appropriate means to carry out this task as long as any herbicide applications are approved for use in California and are applied as specified below:

4.3 Herbicide Applications

In specific circumstances, herbicide applications may be necessary. The contractor is responsible for determining the appropriate herbicide to achieve the maintenance goals. The contractor is also responsible for assuring that herbicides are applied in a manner that will not damage desirable plants in the mitigation areas or in adjacent areas. Also, any herbicide or pesticide application must be performed in coordination with the RM and must be conducted or directly supervised by a person in possession of either a QAL or a QAC issued by the California DPR.

4.4 Pest Control

Insect and rodent (herbivore) damage is not typically observed to interfere with habitat mitigation projects. The contractor is encouraged to tolerate reasonable levels of predation or disruption by wildlife species during habitat establishment. However, under certain occasions, for example, extreme levels of insect infestation or browsing by deer, pocket gophers, or rabbits, may require the contractor to take appropriate measures to deter or suppress pest populations.

4.5 Replacement of Dead or Diseased Plant Materials

Any container plants or other nursery materials should be surveyed by the RM for one year following installation. Container plantings that die off or exhibit disease during the initial 120-day warranty period following installation should be replaced by the contractor that installed (unless no warranty is provided). After the first year the maintenance contractor (or staff) may be required to perform supplemental planting or seed applications as directed by the RM in coordination with the owner to assure that the project's several restoration areas meet the performance standards set forth in Section 5, *Monitoring Plan*, below.

5.0 MONITORING PLAN

5.1 Performance Standards

The performance standards for assessing success of the Wilson Creek restoration area will be based on demonstrating an increase in a minimum of two (2) streambed functions within the restoration area. Intuitively, the eradication and replacement of tamarisk within native vegetation within a streambed will result in significant benefits to hydrologic, biogeochemical, habitat functions. However, the true scope of such benefits is likely to occur over a much longer period of time than five years, considering that the current level of late succession tamarisk domination has taken decades to establish. However, we believe that a measurable increase in a minimum of two streambed functions can be demonstrated over the time frame for this restoration Plan as requested by the San Diego Regional Water Quality Control Board. Therefore, the objective of this restoration Plan during the course of its five-year monitoring schedule⁴ will be to demonstrate an improvement to a minimum of two (2) streambed functions based on the HGM functional scores and/or the combination of any of the following criteria to be measured in years 3 and 5 of the monitoring effort:

⁴ *The monitoring schedule proposed by this restoration Plan is anticipated to include one year of monitoring following tamarisk removals (part 1) followed by four years of monitoring after installation of native vegetation (part 2).*

- HGM functional assessment compared to baseline data;
- Percent of native and non-native vegetation coverage;
- Groundwater elevation data via monitoring of piezometers to be installed in proximity to the restoration area.

Functions assessed as part of the HGM assessment for this restoration Plan include hydrologic, biogeochemical, and habitat functions as detailed in Section 1.4 of this Plan. Estimation of riparian native/non-native coverage will support habitat based streambed functions, while groundwater elevation monitoring may support a determination of an increase in hydrologic streambed function.

5.1.1 HGM Functional Assessment

Section 4.1 provides a summary of the Functional Capacity Indexes (FCI) utilized to determine the baseline functions for hydrologic, biogeochemical, and habitat functions assessed within the restoration area prior to implementation of Part 1 of this plan. The FCI's are developed using 20 HGM variables derived by the Santa Margarita Regional Riverine HGM Guidebook consistent with the methods utilized in the PCR functional assessment performed in 2001 which included the restoration area. Success using solely the HGM assessment will require a measurable increase in two of three of the baseline streambed functions in year 5 of the restoration effort. However, the percent of vegetation cover and/or the groundwater data may be independently used to demonstrate a measurable increase in streambed function.

5.1.2 Percent Cover

In part, the success of the revegetation effort for the habitat restoration area is based on establishing a reasonable and progressively increasing amount of cover by native species. Native grasses and herbaceous species may constitute most of the vegetative cover during the first year after planting. Scrub species are expected to provide most of the native cover by the end of the third year. Tree species should provide reasonable canopy cover after three or four years. In general, establishing progressively higher percentages of native vegetative cover is intended to:

- Provide reasonably effective erosion control;
- Enhance biological values (e.g., species diversity, forage and cover for wildlife), as compared with pre-existing conditions in the restoration areas that complements existing habitat in the local vicinity and in the adjacent segments of Wilson Creek;
- Exhibit characteristics that indicate the habitat is self-sustaining. A primary characteristic of self-sustaining habitat would be that it requires no supplemental irrigation for two years with little or no mortality. .
- Substantially deter the establishment of non-native species, particularly noxious invasive species (e.g., tamarisk, castor bean, artichoke thistle (*Cynara cardunculus*)), while impeding the continued migration of these species up and downstream from the restoration area.

The primary macro-criteria for measuring habitat function are total vegetative cover, relative cover by native species, and diversity. Cover may be expressed in terms of the total cover (all vegetation) throughout the treated areas, as well as the relative cover (percent of vegetated areas) provided by native plants. Diversity

is expressed in terms of the number of species of native plants that are dominant or sub-dominant in the restoration area.

The following minimum standards must be achieved or exceeded for the revegetation effort to be deemed as supporting an increase in habitat function related to the streambed:

1. **Relative Native Vegetation Coverage (50%):** Native species must provide at least 50 percent of the relative coverage within the mitigation area. Therefore, in any area covering at least $\frac{1}{4}$ of the mitigation area (e.g., patch area covering greater than or equal to 0.25 acre) that exhibits the minimum of 50 percent total cover by plant material (e.g., if the remaining 20 percent is barren) appropriate native species must contribute at least 50 percent of the relative cover in that particular mitigation area. Native vegetation may include seeded species as well as “volunteers” (naturally recruited specimens), native to the area.
2. **Exotic/Invasive Vegetation Coverage:** Particularly noxious invasive exotic species (e.g., tree tobacco, artichoke thistle, castor bean, pampas grass, tamarisk, arundo etc.) must not contribute more than 5 percent of all vegetative cover. In addition, non-native invasive species listed as “high” or “moderate” in the California Invasive Plant Council (Cal-IPC) Inventory menu (Cal-IPC, 2006) must not contribute more than 10 percent of tree and shrub cover. Generally, no more than 10 percent of all vegetative cover may consist of ruderal non-native species. However, of the ruderal species “permitted” within the mitigation site, only species of common, “naturalized,” non-native grasses and herbs (e.g., California Brome),, oat (*Avena spp.*), mustard (*Brassica spp.*) may be allowed to contribute more than 10 percent of the total cover (see criterion 3 below), particularly if their removal would be likely to promote erosion or incur significant collateral damage to healthy native species.
3. **Irrigation Limitation:** If irrigation is warranted, based on results observed from the “pilot program”, supplemental irrigation will be discontinued in the mitigation area for a minimum of two years. In order to reach success the mitigation areas must be self-sustaining without irrigation for two years prior to release from regulatory oversight.

During post-installation monitoring, several features may be considered to represent progress toward successful establishment of native vegetation.

- Germination and growth of a variety of seeded plant species (total area coverage may be somewhat sparse through the first year following seed application).
- Lack of evidence of significant erosion.
- Evidence of resistance to invasion by non-native species (0-5 percent composition of non-natives).
- Evidence of natural recruitment of a variety of native species apparent by the third year after planting.

Table 5, Target Total Native Coverage Guidelines, provides a guideline for the total percent cover values exhibited by all native plant species combined that may be considered to represent an acceptable increase in streambed habitat function during the annual monitoring inspections.

Table 5

Target Total Native Coverage Guidelines

Year	Acceptable Range
1	10 - 15%
2	20 - 25%
3	25 - 30%
4	35 - 45%
5	Minimum 50%)

Source: PCR Services Corporation, 2011

5.2 Monitoring Procedures

Progress monitoring and performance assessments will be conducted by the RM. After initial seeding is accomplished, for the first year, the revegetation areas will be inspected quarterly winter (January/February), spring (April/May), at least once in late summer (August/September), and once again prior to the onset of the rainy season (October/November). The fall inspection provides the opportunity to determine plans and specifications for any supplemental planting and seeding and maintenance actions that may be warranted during the winter. Monitoring reports will be grouped by phase and will provide the independent monitoring results associated with each individual project mitigation area within that phase.⁵ Each project area will be surveyed and marked in the field to ensure the RM can accurately distinguish individual project areas during monitoring activities.

Qualitative surveys, consisting of a general site walkover and characterization of the coverage and species distribution exhibited in each channel segment, will be completed during each monitoring visit and will include each project area as defined in the individual HMMP's. General observations, such as fitness and health of the revegetation species, weed or pest problems, signs of over watering, and drought stress, will be noted in each site walkover.

A qualitative visual estimate of cover values in within each individual restoration area and over the aggregate total area will be useful for comparison with the data recorded from the linear transects to determine whether the transect data is representative of prevailing conditions of the mitigation site. The RM should visually estimate and record the total cover provided by vegetation within the treated area. The mitigation areas may be divided into six equivalent segments and identified on a simple diagram for reference and inclusion with progress reports. The RM should also visually estimate and list the dominant species in each discrete quadrant area (all species that individually account for more than 1 to 5 percent of vegetative cover in each stratum) and estimate the approximate relative coverage provided by each. Quantitative data will be collected annually (typically in June/July) to determine survivorship, relative and total coverage by species, and to assess species composition. A list of species present is compiled for each planned vegetation community making up the mitigation. Cover estimates for individual species are used to calculate the total vegetation cover, total cover of non-natives, total cover of bare ground, total cover of litter and debris, and total cover for each vegetation strata.

⁵ Each project HMMP will be modeled after this HRP and is subject to approval by the appropriate resource agency.

Either of the two techniques described below may be employed to assess percent coverage of plant species in the revegetated areas during the annual quantitative surveys: line intercept transect sampling or the point-step method.

5.2.1 Line Intercept Transect Method

At least one permanent sampling transect for annual quantitative monitoring is established within each one-acre patch of the relevant restoration area at appropriate locations as determined by the RM. Transects are typically a minimum length of 100 feet (approximately 30 meters). Then data on plant coverage or bare ground is collected by extending a measuring tape between two staked points marking the ends of the permanent transects. Percent cover is then determined by measuring the plant intercept length, which is the length of the plant directly under the tape measure, for each species intercepted under (or over) the line. Ocular estimates of percent absolute areal cover (cover) are recorded for each entry. Cover is the vertical projection of vegetation from the ground as viewed from above. Areal cover includes the extent of the entire plant canopy. Absolute cover is measured relative to the entire sampling unit (i.e., mitigation component) including unvegetated surfaces, recorded as “bare ground”, and vegetative overlap. Intercept length measurements are made for each individual plant (or cluster) and summed for each species to provide percent cover for each species. From the sum for each species the total native and non-native cover can be calculated according to the following equation: $PC = t/T \times 100$, where “PC” is percent coverage, “t” is the sum of all intercepts for a species, and “T” is the total length of the transect. Percent coverage figures can be greater than 100 percent due to the overlap between the herbaceous and shrub canopies.

5.2.2 Point-Step Method

The point-step method provides a quantitative determination of native and exotic plant cover using a series of transects laid out to represent the entire restoration area. When applying this method, the position of the transects is not fixed but is determined independently at the time of each annual survey. The intention is not to document the progress of small permanent strips of habitat in each successive year, but to measure the performance of the whole area. (In this case the “whole area” would consist of the relevant Phase of planting being evaluated.) This is accomplished with a large number of points laid down randomly or nearly so in an independent manner on each sampling date.

Since vegetation is intrinsically variable and its measurement necessarily imprecise, this method of sampling is based on the idea that the number of samples is more important than the precision of their placement, as long as no systematic bias is built into the method of placement.

To facilitate collection of a large number of data points the following procedures should be followed for their placement and evaluation:

- An initial direction for the first transect will be selected by tossing an object from the edge toward the interior of the vegetated area.
- The RM will walk in a straight line in the indicated direction, passing through the interior of the area until reaching the opposite boundary of the area.

- Upon reaching the opposite boundary the RM will turn at an angle approximately equal to the angle of approach to the boundary. This motion resembles that of a billiard ball bouncing from the edge of the table. A similar turn will be made each time the edge of the area is reached.
- At each step the RM will note the position of the same point on the toe of his or her left shoe. That point is the intercept point and each plant species intercepted by a vertical line through that point is recorded. There may be from none to several plant species intercepted, and the record must record clearly that all intercepted species are assigned to that intercept.
- The intercept is a single vertical line, not a circle or volume of space. The calculation of depends heavily on adherence to the one-dimensional line.
- At the discretion of the biologist the number of points may be doubled by considering corresponding points on each shoe.
- When the RM encounters an impassible object such as a large boulder, cactus patch, hole, or body of water, the biologist will move to the side of the object and proceed in the same direction. As soon as possible the RM will return to the original track. While off the intended pathway the RM will record from as near as possible the intercepts that would have been encountered had he been able to remain on the original course.
- During the course of the survey any native or exotic species seen within the planted area but not encountered on the transect will be recorded on a separate list.
- Plant species not immediately known to the biologist will be designated with a number or code and specimens or photographs taken for later identification.
- The procedure will be continued until the entire planted area has been covered to an approximately equal extent by the straight-line transects. The final number of points must be at least 200, and may be higher in the case of large or irregularly-shaped areas.
- The procedure will be repeated for each defined or separately mapped restoration area.
- Within each survey area, the number of “hits” on each plant species will be tallied. The number of points is recorded and is lower than the number of points.
- The number of points for each species divided by the number of points, then multiplied by 100 is the absolute percent cover for that species. Bare ground is treated as a plant species, except that it is not recorded if there is any plant present. The total cover will be greater than 100 percent unless there are no points with more than one plant species.
- The number of plant species recorded on the transects, plus the number of additional species within the Site, but not on a transect, is the species richness. Both cover and species richness will be expressed separately for native and exotic plant species.

5.3 Reports

Monitoring results will be recorded within each distinct project mitigation area and included in the annual monitoring reports submitted to the appropriate resource agencies and the Applicant, if requested.

Documentation will include the following:

5.3.1 Recording the Initial Planting Effort (by Phase)

Upon completion of seeding and planting in each phase of the restoration area, the RM should prepare an installation As-Built Report to document the implementation of the mitigation site preparations, planting and seeding. This report should describe the site preparation methods used, species and quantities of seed and container stock installed, seeding methods, and planting locations. Any significant problems encountered will be recorded. Documentation of the finished installation will include a graphic exhibit depicting each area as planted or seeded and whether treatments varied from the alternative methods provided in this HMMP. Any significant deviations from this plan must be reported, particularly with respect to site preparation activities, plant materials actually installed, and irrigation facilities and coverage. This document will be submitted to the Applicant and the regulatory agencies, if requested, to confirm completion of initial installation and commencement of the maintenance and monitoring phase.

5.3.2 Annual Monitoring and Reports

Each successive phase of the restoration area shall be monitored quarterly during the first year, semi-annually during the second and third years, and at least annually during the last two years. Each phase of the restoration will encompass one year of monitoring following tamarisk removals⁶, followed by four years of monitoring following the installation of native material to be detailed in project-specific HMMP's, for a total monitoring period of five years. Therefore, the Year 2 monitoring "time clock" associated with project-specific mitigation areas will commence upon implementation of the Part 2 native revegetation efforts detailed in Section 2.1.1. Observations will be recorded and memoranda provided to the Applicant and contractor as needed to report site progress and identify necessary maintenance actions. In the month of June/July following the first full growing season after initial installation, quantitative assessments will be conducted as described above and a progress report summarizing monitoring results will be prepared and distributed by the RM not later than January 1 each year.

Monitoring will commence through individual project HMMP implementation after the primary planting and seeding is performed in each successive phase and will continue for five years in each Phase or until either: (1) it can be demonstrated that functions and values have met or exceeded final success criteria; (2) the resource agencies determine that monitoring is no longer required.

Each annual report will document mitigation and maintenance activities and site performance and recommend corrective measures if deficiencies are observed. Annual reports will also describe observed features including qualitative estimates of species cover and survivorship, success or failure rates of seeded species, growth of perennial species, and will report quantitative measurements of the total vegetative cover and the percentage of relative cover by native species. Coverage values will be determined both by general inspection and by direct sampling using the line-intercept transect procedures described above. The frequency and volume of irrigation if utilized, observed weed or pest problems, additional maintenance procedures, and general condition and health of the vegetation will also be noted in each annual report. Photographs taken from each photo station will provide visual records of the site's progress. Recommendations and schedules for corrective measures will be identified and described.

⁶ *Tamarisk removals currently scheduled for November 2011 will be implemented throughout the entire 19.4-acre restoration area by Wilson Creek Farms and will be integrated into project-specific HMMP's as part of Year 1 monitoring/reporting.*

5.4 Contingency Measures

If the interim success criteria are not attained by the 3rd year or the ultimate success criteria are not attained by the 5th year of monitoring then contingency measures will be triggered whereby the responsible parties will consult with the regulatory agencies to examine the cause of the deficiency. Remedial actions will be developed at that time to correct the cause of the deficiency. If the deficiency cannot be corrected then alternative mitigation sites or actions will be developed.

6.0 REFERENCES

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