

Squaw Mountain Road Bridge Repair Project

Wetland Mitigation Plan

July 24, 2013

Prepared for:
KB Home Coastal, Inc.
36310 Inland Valley Dr.
Wildomar, CA 92595

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard, Suite 200
La Mesa, CA 91942

Squaw Mountain Road Bridge Repair Project Wetland Mitigation Plan Report

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
I.	INTRODUCTION	1
II.	PROJECT SUMMARY	1
	A. Project Location	1
	B. Project Description	1
	C. Jurisdictional Impacts	2
	D. Mitigation Requirements	3
III.	MITIGATION SITE DESCRITPION	4
	A. Mitigation Location	4
	B. Environmental Setting	4
	C. Existing Functions and Services	5
	1. Vegetation	5
	2. Hydrology	5
	3. Wildlife	5
	D. Mitigation Site Suitability	5
IV.	MITIGATION DESIGN CONCEPT	6
	A. Mitigation Design	6
	B. Target Functions and Services	6
	C. Rationale for Expecting Implementation Success	6
V.	PROJECT RESPONSIBILITY	7
	A. Project Proponent	7
	B. Restoration Specialist	7
	C. Landscape Architect	7
	D. Installation/Maintenance Contractor	7
VI.	MITIGATION INSTALLATION	8
	A. Installation Schedule	8
	B. Plant/Seed Orders	8
	C. Pre-construction Meeting	8
	D. Delineating Limits of Work	8
	E. Irrigation	11
	F. Plant/Seed Installation	11
	G. Document Post-restoration Conditions	13
	H. As-built Conditions	13

TABLE OF CONTENTS (cont.)

<u>Section</u>	<u>Title</u>	<u>Page</u>
VII.	MAINTENANCE PLAN.....	14
	A. Maintenance Activities.....	14
	1. General Maintenance	14
	2. Non-native Plant Removal.....	14
	3. Invasive Plant Control	14
	4. Irrigation	15
	5. Other Pests	15
	6. Fertilization.....	15
	7. Pruning.....	15
	B. Maintenance Schedule.....	15
VIII.	MONITORING PLAN	16
	A. Pre-installation Documentation.....	16
	B. Installation Monitoring.....	17
	C. Post-installation Documentation	17
	D. Maintenance Monitoring.....	17
	E. Annual Technical Monitoring	18
	1. Photo Documentation.....	18
	2. Visual Estimates	18
	3. General Wildlife.....	18
	4. Annual Reports	18
IX.	SUCCESS CRITERIA.....	19
	A. 120-day Establishment Period.....	19
	B. Annual Assessments.....	19
	1. General Wildlife.....	19
	2. Vegetation Criteria.....	19
	C. Irrigation.....	21
X.	COMPLETION OF MITIGATION.....	21
	A. Notification of Completion	21
	B. Confirmation	21
XI.	CONTINGENCY MEASURES	21
	A. Initiating Procedures	21
	B. Natural Disaster.....	21
XII.	REFERENCES	22

TABLE OF CONTENTS (cont.)

LIST OF FIGURES

<u>No.</u>	<u>Title</u>	<u>Follows Page No.</u>
1	Regional Location Map	2
2	Project Location Map.....	2
3	Aerial Photograph	2
4	Aerial Photograph	2
5	USACE Impacts	2
6	CDFW Impacts	2
7	On-site Restoration	4

LIST OF TABLES

<u>No.</u>	<u>Title</u>	<u>Page No.</u>
1	Squaw Mountain Restoration Project Restoration Project USACE/CDFW Jurisdictional Impacts	3
2	Squaw Mountain Restoration Project Restoration Project USACE/CDFW Mitigation Summary for Temporary Impacts	4
3	Restoration Plan Checklist.....	9
4	Open Riparian Scrub Planting Palette	11
5	Open Southern Willow Scrub Planting Palette	12
6	Upland Planting Palette	12
7	Maintenance Schedule for the 5-year Restoration Period	16
8	Monitoring Schedule.....	17
9	Success Criteria for Riparian Scrub and Southern Willow Scrub Habitat Restoration	20

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

This report presents a restoration plan for wetland impacts associated with repairing a bridge crossing and drainage facility on Squaw Mountain Road. Based on meetings and correspondences, restoration proposed in this plan is anticipated to fulfill mitigation requirements of several resource agencies, including the U.S. Army Corps of Engineers (USACE; permit pending), Regional Water Quality Control Board (RWQCB; permit pending), and California Department of Fish and Wildlife (CDFW; permit pending), and fulfill the project's obligation under the California Environmental Quality Act (CEQA).

The goal of the overall bridge repair effort is to repair Squaw Mountain Road Bridge at Coldwater Wash, as well as associated erosion of the drainage both up and downstream of the bridge. All temporary impacts associated with the bridge and drainage repair will be restored to pre-existing conditions. The restored habitat is expected to approach the function and services of early successional habitat within 5 years. This plan addresses the all mitigation associated with the bridge and drainage repair. Nomenclature used in this report follows Oberbauer (2008) for vegetation communities, Rebman and Simpson (2006) for plants, American Ornithologists' Union (2009) for birds, and Baker et. al. (2003) for mammals.

II. PROJECT SUMMARY

A. PROJECT LOCATION

The Squaw Mountain Road Bridge is located in southwestern Riverside County, just south of the City of Corona, California. The project site is located in Temescal Canyon adjacent to Interstate 15 (Figure 1). The project site is located in Sections 2 and 3, Township 5 South, Range 6 West on the U.S. Geological Service Lake Matthews quadrangle (Figure 2), parcel numbers 290190047 and 290190028. The project site consists of the Squaw Mountain Road bridge where it crosses Coldwater Wash and an adjacent small tributary; the closest cross street is Temescal Canyon Road (Figures 3 and 4). The center of the project site is located at Latitude 33°46'6.575" N, Longitude 117°29'9.924" West.

The bridge was originally constructed as part of the Painted Hills Residential Development project. The RWQCB issued a Waiver of Waste Discharge Requirements and Water Quality Certification for the overall project on February 9, 2000. Currently, the 0.92-acre project site contains extensive disturbance from the bridge failure to native wetland and upland habitats (mostly in the northern and southern portions of the site (Figure 5). The site also contains scattered non-native habitats.

B. PROJECT DESCRIPTION

The existing Squaw Mountain Road Bridge is failing and is in danger of washing away. The scouring at the bridge was discovered after a large storm in January 2012. The impending failure of the bridge poses an imminent threat to life and property, necessitating the repairs to the structure. The County of Riverside Department of Transportation concurs with this assessment.

The proposed repairs would consist of lining the channel bottom below the bridge with concrete, connecting the concrete-lined channel to the existing bridge abutments, placing ¼-ton riprap on the upstream and downstream sides of the concrete-lined portion of the channel (some of which will be buried by fill), and installing riprap slope protection on the northwest slope. As part of the repairs, an existing asphalt access road would be extended approximately 40 feet.

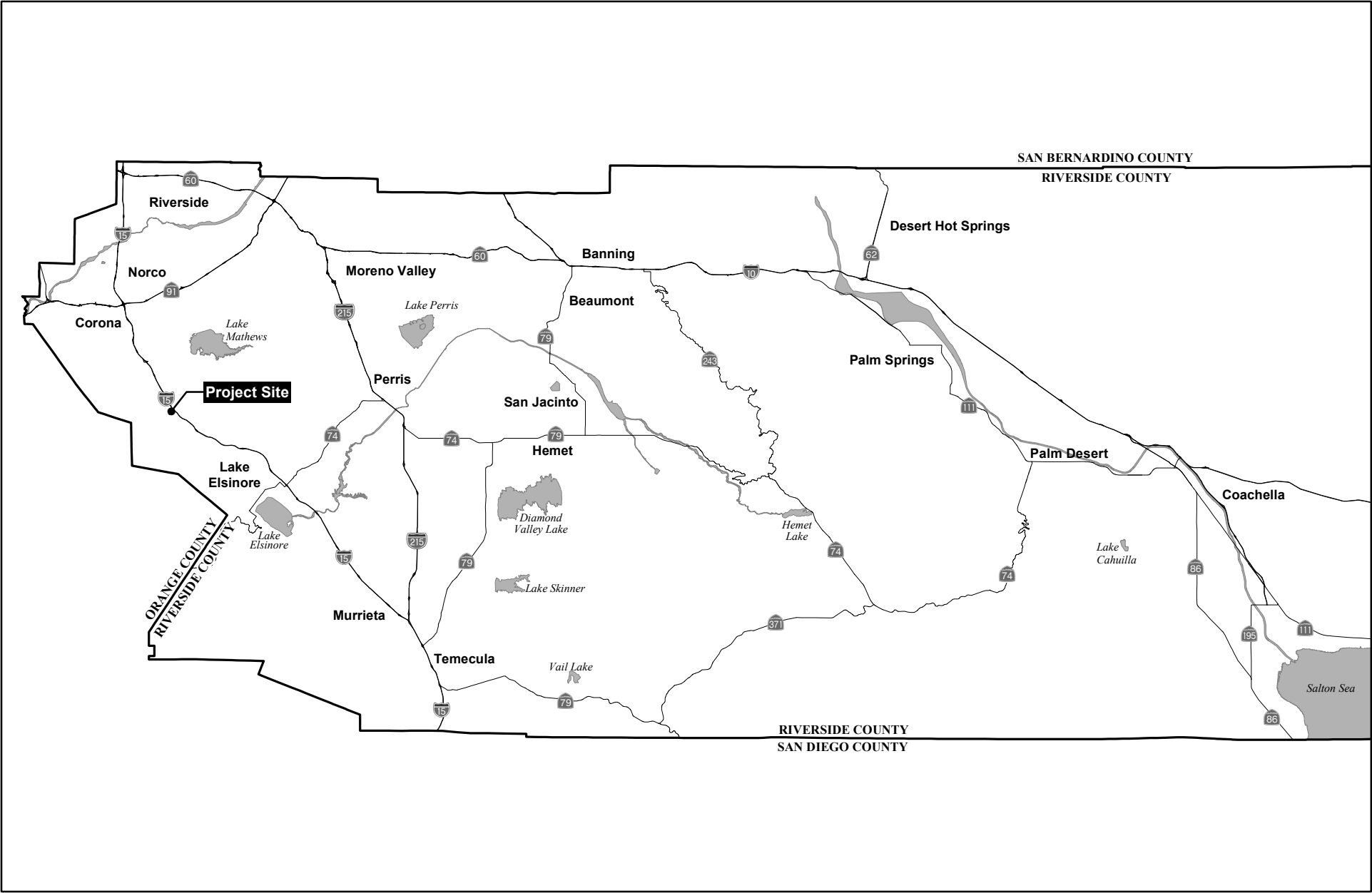
There is also a side tributary to Coldwater Wash that was realigned as part of the original Painted Hills Residential Development project and was intended to flow adjacent to Squaw Mountain Road before entering the wash. As a result of significant degradation of the channel wash, the side channel has head cut back from the wash and is now eroding into the slope of Squaw Mountain Road and needs to be stabilized. The proposed repairs would consist of regrading the upper portion of the channel to the appropriate elevation, leaving this portion of the channel as a natural drainage. Flows will then be picked up in a basin before entering into a pipe that will outlet at the base of the slope in Coldwater Wash.

The proposed project has been designed to avoid as much of the extant riparian vegetation as possible while still providing a hydraulically stable channel over the long term. Permanent impacts to jurisdictional areas will result from the installation of concrete lining below the bridge, connecting the concrete-lined channel to the existing bridge abutments, placing ¼-ton riprap on the upstream and downstream sides of the concrete lined portion of the channel, and installing riprap slope protection on the northwest slope. Permanent impacts associated with the project total approximately 0.41 acre and include 0.04 acre of mule fat scrub (MFS), less than 0.01 acre of Riversidean alluvial fan sage scrub (RAFSS), 0.03 acre of southern willow scrub (SWS), 0.14 acre upland habitat, and 0.20 acre of streambed. Temporary impacts total 0.51 acre and are comprised of 0.16 acre of MFS, 0.02 acre of RAFSS, 0.13 acre of SWS, 0.01 acre tamarisk scrub (TS), 0.13 acre of streambed, and 0.06 acre upland habitat.

C. JURISDICTIONAL IMPACTS

The USACE jurisdictional impacts would total 0.35 acre consisting entirely of non-wetland Waters of the U.S. (WUS; 0.14 acre of permanent impacts and 0.21 acre of temporary impacts; Table 1, Figure 5). Other wetland resources occurring on site would be avoided. The CDFW jurisdictional impacts total 0.72 acre and consist of permanent impacts to 0.27 acre of Waters of the State (WST) and temporary impacts to 0.45 acre of WST (Table 1; Figure 6). The CDFW jurisdictional areas to be impacted consist of 0.20 acre MFS, 0.02 acre of RAFSS, 0.16 acre of SWS, 0.01 acre tamarisk scrub, and 0.33 acre of streambed.

F:\PROJECTS\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Fig1_Regional.mxd KAB-157_07/11/13-EP

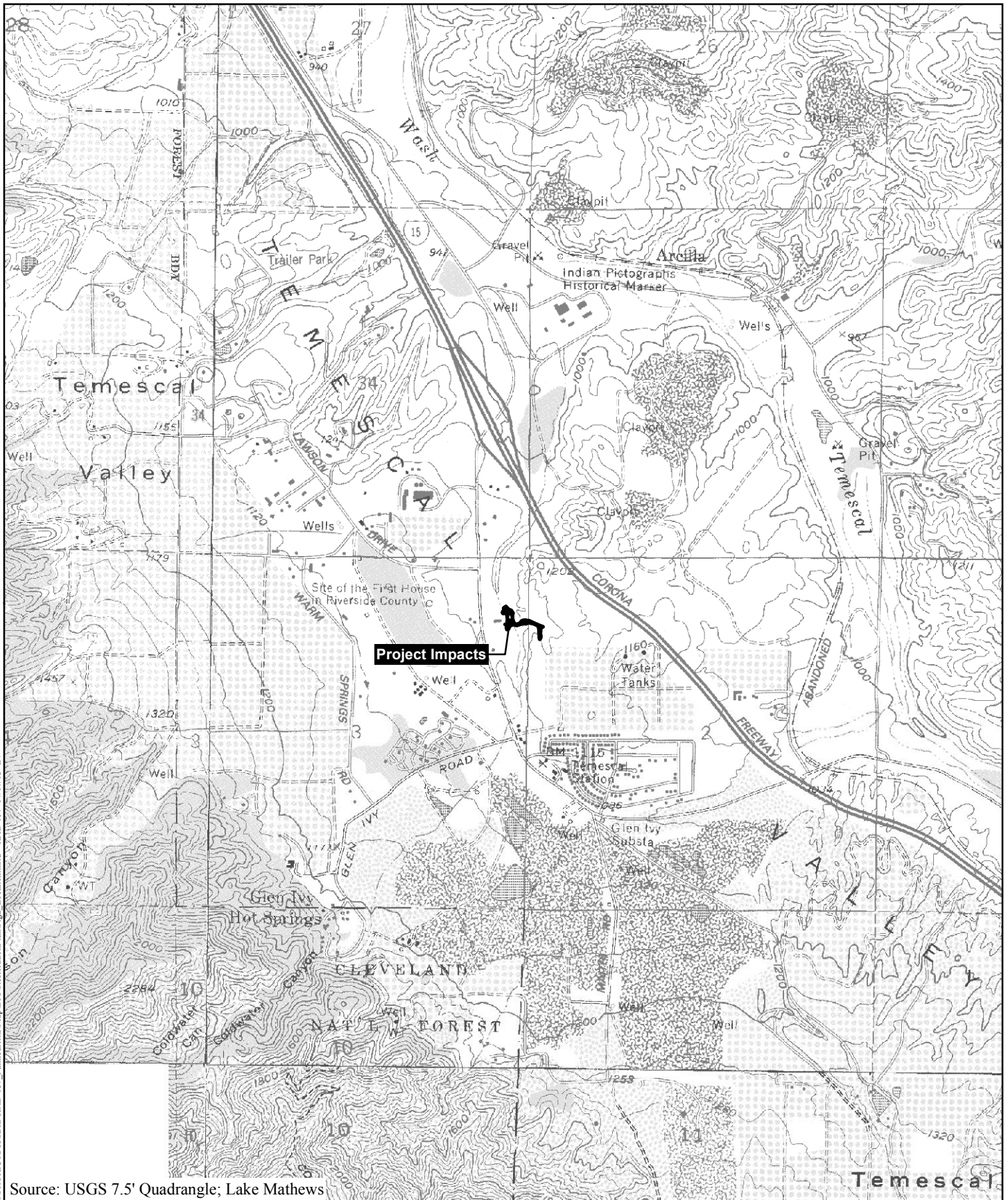


Regional Location Map

SQUAW MOUNTAIN ROAD



Figure 1



Project Location Map

SQUAW MOUNTAIN ROAD



I:\PROJECTS\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Fig3_Aerial_Regional.mxd KAB-157 04/17/13 -EV

Aerial Photograph

SQUAW MOUNTAIN ROAD

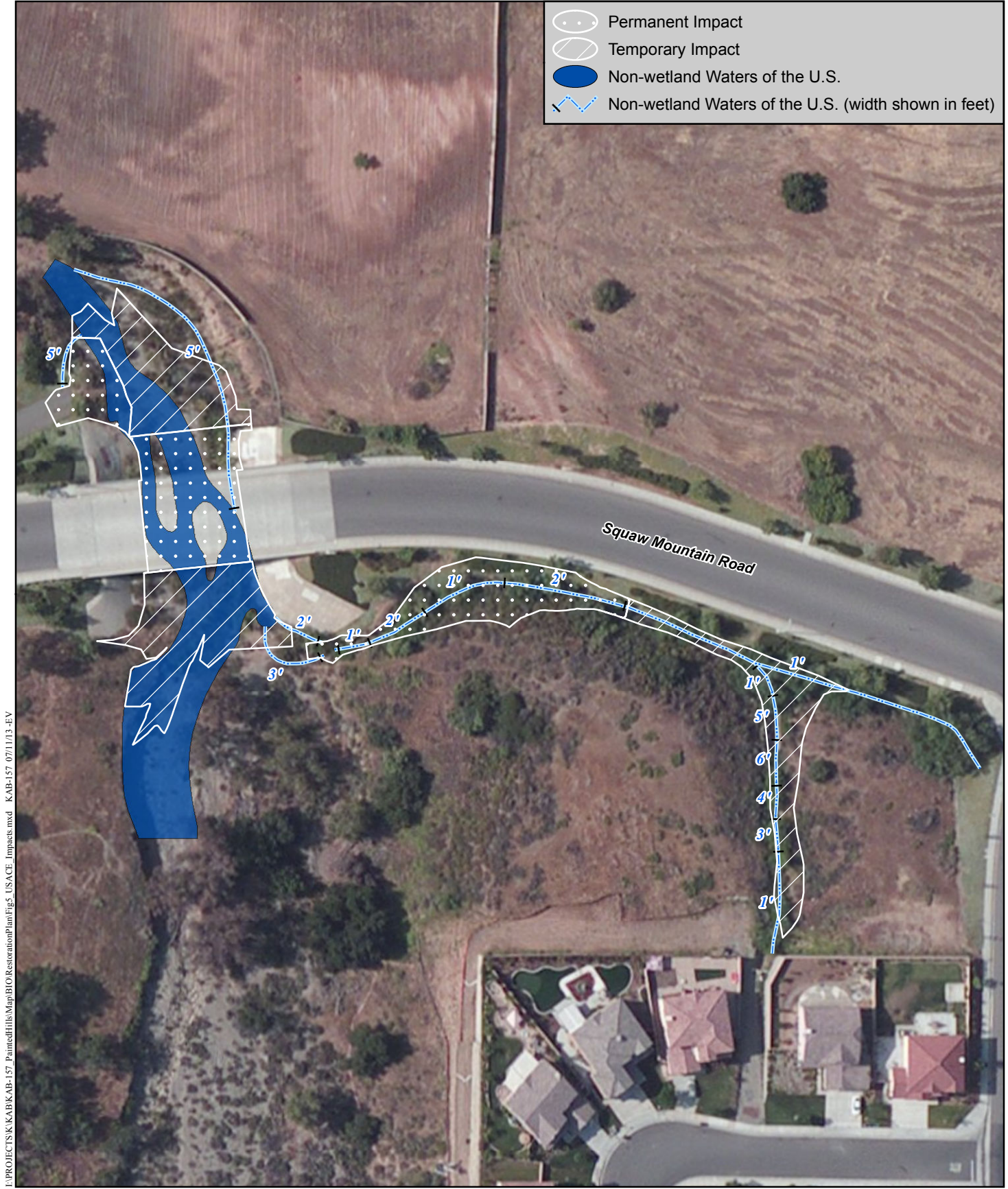


I:\PROJECTS\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Fig4_Aerial.mxd KAB-157_07/11/13-EV

Aerial Photograph

SQUAW MOUNTAIN ROAD

Figure 4



I:\PROJECTS\K\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Figs_USACE_Impacts.mxd KAB-157_07/11/13-4V

USACE Impacts
SQUAW MOUNTAIN ROAD



I:\PROJECTS\K\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Fig6_CDFW_Impacts.mxd KAB-157_07/11/13_EV

CDFW Impacts

SQUAW MOUNTAIN ROAD

Table 1
SQUAW MOUNTAIN ROAD RESTORATION PROJECT
USACE/CDFW JURISDICTIONAL IMPACTS
(Acre)

HABITAT	USACE			CDFW*		
	Permanent	Temporary	TOTAL	Permanent	Temporary	TOTAL
Mule fat scrub	0	0	0	0.04	0.16	0.20
Riversidean alluvial fan sage scrub	0	0	0	<0.01	0.02	0.02
Southern willow scrub	0	0	0	0.03	0.13	0.16
Streambed	0.14	0.21	0.35	0.20	0.13	0.33
Tamarisk scrub	0	0	0	0	0.01	0.01
TOTAL	0.14	0.21	0.35	0.27	0.45	0.72

*CDFW jurisdictional impacts include USACE impacted areas.

D. MITIGATION REQUIREMENTS

Pursuant to Section 404 of the federal Clean Water Act, the USACE regulates the discharge of fill material into WUS. and evaluates the impacts of the placement of proposed fill into such waters. Under Section 401 of the federal Clean Water Act, the RWQCB also has authority over USACE jurisdictional areas. To ensure no-net-loss of jurisdictional areas, as well as associated functions and services, the USACE requires compensatory mitigation for jurisdictional impacts. Jurisdictional impacts and mitigation can be assessed by mapping vegetation and delineating the USACE wetlands as specified in their current manuals (Environmental Laboratory 1987 and USACE 2008a). The CDFW regulates impacts to wetland habitats pursuant to Section 1602 of California Fish and Game Code.

The project proponent has submitted permit applications to the USACE under Section 404 of the federal Clean Water Act, to the CDFW under Section 1600 of the California Fish and Game Code, and to the RWQCB under section 401 of the federal Clean Water Act for impacts to jurisdictional areas. Proposed mitigation for temporary impacts to 0.45 acre of WUS and WST would be accomplished through on-site restoration of 0.45 acres (Table 2) while mitigation for permanent impacts to 0.27 acre would be accomplished by participation in the Riverside-Corona Resource Conservation District (RCRCD) In Lieu Fee program. Final mitigation requirements will be established through consultation with the regulatory agencies.

Table 2
SQUAW MOUNTAIN ROAD BRIDGE RESTORATION PROJECT
USACE/CDFW MITIGATION SUMMARY FOR TEMPORARY IMPACTS

HABITAT	USACE			CDFW ¹		
	Impact (acre)	Mitigation ²		Impact (acre)	Mitigation ²	
		Ratio	Acre(s)		Ratio	Acre(s)
Mule fat scrub	0	-	0	0.16	1:1	0.16
Southern willow scrub	0	-	0	0.13	1:1	0.13
Riversidean alluvial san sage scrub	0	-	0	0.02	1:1	0.02
Streambed	0.21	1:1	0.21	0.13	1:1	0.13
Tamarisk scrub	0	-	-	0.01	1:1	0.01
TOTAL	0.21	-	0.21	0.45	--	0.45

¹Includes USACE areas

²Mitigation to occur as on-site restoration of temporary disturbance areas.

III. MITIGATION SITE DESCRIPTION

This report addresses the on-site restoration of all temporary impacts associated with the repair of the Squaw Mountain Road bridge and associated drainage.

A. MITIGATION LOCATION

All mitigation for temporary impacts will occur on-site, in place (Figure 7). Upland mitigation will occur where upland habitat occurs prior to repairs while riparian scrub habitat will be restored where wetland vegetation and/or streambed currently occur.

B. ENVIRONMENTAL SETTING

The site is located along Coldwater Wash along a riparian corridor that stretches both up- and down-stream of Squaw Mountain Road. The main drainage (Coldwater Wash) runs north to south with a tributary drainage located to the east of the wash just south of Squaw Mountain Road. The tributary was realigned as part of the original development project and was intended to flow adjacent to Squaw Mountain Road before entering the wash. South of the bridge riverine habitat extends the width of the channel for about 50 feet and then narrows to a 20-foot wide strip along the west side of the channel. Elevations on site range between 1117 feet above mean sea level along the creek to 1042 feet above mean sea level.

The bridge and drainage repair site currently contains 4 wetland vegetation communities: SWS, MFS, RAFSS, and streambed as well as a small amount of non-native TS (Figure 6). In addition, the repair site contains a small amount of native upland habitat. Soils on site include Arbuckle gravelly loam (8 to 15 percent slopes), Cortina gravelly loamy sand (2 to 8 percent slopes), Arbuckle gravelly loam (2 to 8 percent slopes), and Terrace escarpments.



I:\PROJECTS\KAB\KAB-157_PaintedHills\Map\BIO\RestorationPlan\Fig7_On-siteRestoration.mxd KAB-157 07/23/13 - DR

On-site Restoration

SQUAW MOUNTAIN ROAD

C. EXISTING FUNCTIONS AND SERVICES

Wetland restoration is proposed to occur along the portions of Coldwater Wash that have been damaged by erosion and scouring and that would need to be temporarily impacted to implement bridge and drainage repairs. This section provides a brief overview of the functions and services currently provided by the proposed mitigation area based on a review of site maps and site visits to document pre-existing conditions. This information will be used for comparison with post-restoration annual assessments to measure the change in the system as a result of wetland habitat restoration.

1. Vegetation

The portion of the channel that is proposed for bridge and drainage repair currently contains jurisdictional areas comprised of native wetland habitat types including MFS, RAFSS, SWS, and non-native TS. Vegetation is sparse and open and there is also a substantial amount of unvegetated streambed. Typical plant species within this channel include native plants such as mule fat (*Baccharis salicifolia*), willows (*Salix* spp.), and mugwort (*Artemisia douglasiana*), and a minimal amount of non-native plants including tamarisk. In addition to wetlands, a small amount of native upland habitat would be impacted.

2. Hydrology

Coldwater Wash currently contains wetland hydrology along the bottom of the channel. The portion of the channel that is proposed for restoration currently provides various levels of wetland functions and services for groundwater recharge, nutrient removal, flood buffering, and sediment stabilization.

3. Wildlife

Existing wildlife functions and services are reduced because of the erosional damage and channel scouring within the proposed mitigation area. Although currently disturbed, this area retains at least moderate functions and services for wildlife since it is contiguous with intact native wetland and upland habitats both up- and down-stream of the bridge that support a diverse assemblage of plant and animal species.

D. MITIGATION SITE SUITABILITY

The proposed mitigation area is considered suitable for wetland habitat restoration due to the location of the site along an existing riparian corridor, and the presence of existing riparian habitat within the project area and both up- and downstream of the mitigation area. After repairs to the bridge and drainage are completed, native seed and container stock will be installed in temporarily disturbed areas. Wetland restoration is expected to be successful because this activity would occur in areas that currently support, or recently supported riparian habitat but need to be temporarily impacted to successfully repair the bridge and erosional portions of the drainage. Because the restoration areas will be graded to the appropriate elevation for wetland

hydrology, and occur interspersed within existing riparian habitat, restoration efforts are expected to have a high degree of success.

IV. MITIGATION DESIGN CONCEPT

To meet USACE, CDFW, and RWQCB (hereafter referred to as “resource agencies”) mitigation requirements, as appropriate, this plan recommends measures to restore open riparian scrub and associated upland habitat in temporarily impacted areas along Coldwater Wash. It is anticipated that the functions and services of wetland habitat along the temporarily disturbed portions of the channel will be restored with the proposed mitigation measures.

A. MITIGATION DESIGN

The proposed mitigation was designed to minimize impacts to the existing on-site native habitat. Temporarily impacted areas will be re-graded to appropriate wetland and upland elevations as part of the bridge and drainage repair activities. Following the completion of all grading, irrigation, plantings and seed will be installed such that a similar, open riparian scrub habitat to that occurring before bridge and drainage repair work was conducted can be restored. To most closely resemble the vegetation present prior to impacts, Coldwater Wash would be restored with 0.33 acre of open riparian scrub habitat while the tributary drainage would be restored with 0.12 acre of open southern willow scrub habitat. To resemble natural conditions, a significant amount of unvegetated streambed is expected to be established within these restored wetlands. A small amount of upland restoration (0.06 acre) will occur along the margins of the restored wetlands (Figure 7). Best Management Practices (BMP’s) such as gravel bags, fiber rolls, mulching, and silt fencing will be installed as needed around the restoration perimeter.

B. TARGET FUNCTIONS AND SERVICES

To fulfill resource agencies’ mitigation requirements, the overall goal of this mitigation effort is to at least replace jurisdictional acreage and related aquatic functions and services of open riparian habitat that will be impacted as part of the bridge and drainage repair effort. With the restoration of the wetland channel, it is expected that functions and services (flood control, water filtration, wildlife habitat, etc.) that are currently being performed by the wetlands within the channel would be restored by the end of the Year 5 mitigation effort.

C. RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

Wetland habitat restoration is anticipated to be successful due to its location along an existing creek, with intact native wetland/riparian habitat located both up- and downstream. Although the target area has been degraded by a previous erosion, the following measures will assist with the establishment of healthy wetland habitat: (1) the site will be graded to the same elevation as existing, adjacent wetland habitat (or within 12 to 24 inches of the groundwater table); (2) tree and shrub cuttings will be collected from the areas that will be impacted, to be used within the restoration area to the maximum extent practicable; (3) the planting and seed palette has been

based on species observed in existing on-site wetland habitat or other similar habitat in the project vicinity; and (4) temporary irrigation will be used to aid in plant establishment.

V. PROJECT RESPONSIBILITY

A. PROJECT PROPONENT

KB Home is Lead Agency for this project. Contact information is provided below.

KB Home
Contact: Mr. Mike Freeman
36310 Inland Valley Drive
Wildomar, CA 92595
(951) 691-5235
mfreeman@kbhome.com

B. RESTORATION SPECIALIST

Overall supervision of the installation, maintenance, and monitoring of this mitigation project will be the responsibility of a restoration specialist with experience in wetland habitat restoration. The restoration specialist will oversee the efforts of the landscape contractor(s) for the life of the project. Specific tasks of the restoration specialist include educating all participants with regard to mitigation goals and requirements; directly overseeing grading, planting, seeding, weeding, and maintenance; and coordinating annual assessments, including plant and avian surveys. The restoration specialist will ensure that the contractor does not inadvertently impact sensitive habitat areas (and sensitive species). When necessary, the restoration specialist will provide the project proponent and contractor with a written monitoring memo, including a list of items in need of attention. The restoration specialist will prepare and submit required reports to the project proponent(s) and resource agencies each year.

C. LANDSCAPE ARCHITECT

A licensed landscape architect will prepare the necessary construction documents, including grading, irrigation, and planting plans, and will provide the draft landscape plans to the agencies for review and approval prior to initiating construction. This person will inspect the irrigation system and assist in other inspections (e.g., plant deliveries), as necessary.

D. INSTALLATION/MAINTENANCE CONTRACTOR

The installation contractor will have wetland habitat restoration experience and be responsible for irrigation installation, pre-planting weed control, and planting and seeding. The restoration specialist will supervise the contractor regarding the installation of wetland plants.

After the installation contract is completed, the project proponent(s) will hire a maintenance contractor for the duration of the 5-year minimum monitoring period. The maintenance

contractor and the installation contractor may be the same entity. The project proponent may change contractors at its discretion. The maintenance contractor will have prior knowledge regarding the maintenance of native wetland habitat and be familiar with native and non-native plants. The maintenance contractor will service the entire mitigation area according to the maintenance schedule (Section VII.B, below). Service will include but not be limited to weed control, irrigation maintenance, trash removal, watering, dead plant replacement, and re-seeding. All activities conducted will be seasonally appropriate and approved by the restoration specialist. The maintenance contractor will meet the restoration specialist at the site when requested and will perform all checklist items in a timely manner as directed.

VI. MITIGATION INSTALLATION

A summary of all major tasks related to the project, starting with the pre-construction phase and ending with the end of the minimum 5-year maintenance and monitoring period, is provided in Table 3.

A. INSTALLATION SCHEDULE

Installation will begin immediately following completion of repair work and final grading activities.

B. PLANT/SEED ORDERS

The plant species selected for installation in this mitigation site have been documented to occur on site (LSA 2000) or are common in the region and known from this watershed. All plants and seed installed at the site will be propagated from on site or nearby sources, unless otherwise authorized by the restoration specialist. The collected seed will be labeled and stored in a cool, dry location until it is used at the mitigation site. The restoration specialist must approve all seed and container stock orders, including specific species and source locations, prior to finalizing.

C. PRE-CONSTRUCTION MEETING

Prior to initiation of restoration activities, an on-site meeting will be held with the project proponent, grading contractor (as part of the repair activities), installation contractor, and restoration specialist. Topics that will be addressed at this meeting include but are not limited to: (1) identification of sensitive areas and a strategy for avoidance, (2) defining site access routes and restrictions, (3) locating staging areas, and (4) the overall project goal.

D. DELINEATING LIMITS OF WORK

The outer limits of the mitigation area will be delineated by the extent of bridge and drainage repair activities. To protect existing riparian habitat from potential construction and erosion impacts, silt fencing and/or other erosion control measures would be installed along the periphery.

**Table 3
RESTORATION PLAN CHECKLIST**

CONSTRUCTION PHASE	RESTORATION TASK	APPLICABLE PARTIES					
		Project Proponent ¹	Landscape Architect	Installation Contractor	Maintenance Contractor	Restoration Specialist	Resource Agencies
Pre-Construction							
	Order container plantings and seed ²			X			
	Prepare Landscape Plans		X			X	X*
	Attend pre-construction meeting	X		X		X	
	Install erosion control to protect existing habitat					X*	
	Document pre-installation site conditions					X	
	Grading inspection (grading would be part of the bridge and drainage repair work)					X	
Installation							
	Install irrigation			X		X*	
	Inspect irrigation		X	X			
	Install container plantings, cuttings, and seed			X		X*	
	Non-native plant removal			X		X*	
	Document as-built conditions					X	
	Prepare/submit as-built report					X	
120-day Establishment Period							
	Maintain site for 120 days, or until sign off by the restoration specialist			X		X*	X*
	Replace dead container plantings, as needed			X		X*	
5-year Maintenance & Monitoring Period							
	Maintain site for minimum of 5 years until sign off by resource agencies				X	X*	X*

¹KB Home

²Must provide all source locations and receive authorization of final seed and plant lists prior to ordering

* Inspecting work related to this task

THIS PAGE INTENTIONALLY LEFT BLANK

E. IRRIGATION

Temporary, above-ground irrigation will be installed throughout the restoration area. The irrigation plans will be submitted to the USACE for review and approval prior to implementation. The project landscape architect, together with the installation contractor, will inspect the irrigation to ensure full coverage of target areas prior to plant/seed installation. Irrigation will be removed prior to signoff of the restoration effort by the resource agencies.

F. PLANT/SEED INSTALLATION

Container stock, cuttings, and seed from a variety of plants occurring in riparian habitats found on-site will be installed within restoration areas (Tables 4, 5, and 6; Figure 7). The restoration specialist must inspect all plant material prior to installation.

Table 4 OPEN RIPARIAN SCRUB PLANTING PALETTE (0.33 acre)					
CONTAINER PLANTINGS*					
Scientific Name	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre	Quantity Required
<i>Artemisia douglasiana</i>	mugwort	5	5	150	50
<i>Baccharis salicifolia</i>	mule fat	6	3	500	165
<i>Baccharis emoryi</i>	Emory's baccharis	5	5	200	66
<i>Sambucus mexicana</i>	blue elderberry	10	3	60	20
TOTAL				910	301
SEED MIXTURE					
Scientific Name	Common Name	% Purity / Germin.	Lbs./Acre	Lbs. Required	
<i>Ambrosia psilostachya</i>	western ragweed	20/30	4	1.3	
<i>Artemisia douglasiana</i>	mugwort	15/50	4	1.3	
<i>Baccharis salicifolia</i>	mule fat	10/20	4	1.3	
<i>Isocoma menziesii</i>	goldenbush	40/30	1	0.3	
TOTAL				13	4.2

*All plantings will be in 1-gallon sized containers.

Table 5
OPEN SOUTHERN WILLOW SCRUB PLANTING PALETTE
(0.12 acre)

CONTAINER PLANTINGS*					
Scientific Name	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre	Quantity Required
<i>Baccharis salicifolia</i>	mule fat	6	3	500	60
<i>Salix lasiolepis</i>	arroyo willow	10	3	190	23
<i>Salix gooddingii</i>	black willow	12	3	300	36
<i>Salix laevigata</i>	red willow	12	3	100	12
TOTAL				1,090	131
CUTTINGS					
Scientific Name	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre	Quantity Required
<i>Baccharis salicifolia</i>	mule fat	6	5	200	24
<i>Salix lasiolepis</i>	arroyo willow	10	3	200	24
<i>Salix gooddingii</i>	black willow	12	3	100	12
<i>Salix laevigata</i>	red willow	12	3	100	12
TOTAL				610	72
SEED MIXTURE					
Scientific Name	Common Name	% Purity / Germin.	Lbs./ Acre	Lbs. Required	
<i>Ambrosia psilostachya</i>	western ragweed	20/30	4	0.5	
<i>Artemisia douglasiana</i>	mugwort	15/50	4	0.5	
<i>Baccharis salicifolia</i>	mule fat	10/20	4	0.5	
TOTAL			12	1.5	

*All plantings will be in 1-gallon sized containers.

Table 6
UPLAND PLANTING PALETTE
(0.06 acre)

CONTAINER PLANTINGS*					
Scientific Name	Common Name	Spacing on Center (feet)	Grouping Size	Number Per Acre	Quantity Required
<i>Artemisia californica</i>	California sagebrush	5	5	400	24
<i>Eriogonum fasciculatum</i>	California buckwheat	5	10	400	24
<i>Encelia farinosa</i>	brittle bush	5	5	300	18

**Table 6 (cont.)
UPLAND PLANTING PALETTE
(0.06 acre)**

CONTAINER PLANTINGS* (cont.)					
<i>Ericameria pinifolia</i>	pine-bush	6	3	100	6
<i>Salvia apiana</i>	white sage	6	3	200	12
<i>Atriplex canescens</i>	four-wing saltbush	10	3	100	6
TOTAL				1,500	90
SEED MIXTURE					
Scientific Name	Common Name	% Purity / Germin.	Lbs./ Acre	Lbs. Required	
<i>Eriogonum fasciculatum</i>	California buckwheat	50/20	10	0.6	
<i>Encelia farinosa</i>	brittle bush	50/60	5	0.3	
<i>Artemisia californica</i>	California sagebrush	15/60	5	0.3	
<i>Salvia apiana</i>	white sage	70/30	5	0.3	
<i>Corethrogyne filaginifolia</i>	cudweed aster	15/30	5	0.3	
<i>Deinandra fasciculata</i>	fascicled tarplant	20/80	5	0.3	
<i>Eriophyllum confertiflorum</i>	golden yarrow	70/30	5	0.3	
TOTAL				40	2.4

*All plantings will be in 1-gallon sized containers.

G. DOCUMENT POST-RESTORATION CONDITIONS

Following installation completion, the restoration specialist will assess and photograph the restoration area to document the baseline condition of the channel. Results from this assessment will be used over the course of the 5-year monitoring effort to determine whether post-restoration functions and services improved as a result of the restoration effort.

H. AS-BUILT CONDITIONS

The restoration specialist shall submit a brief as-built letter report to the resource agencies within 30 days of completion of restoration activities and the 120-day establishment period. The report will describe restoration site preparation, installation methods, activities conducted during the 120-day establishment period, and the as-built status of the site. To document implementation of the restoration plan and baseline site conditions, the letter will include an as-built graphic on an aerial photo base as well as photos taken from the designated photo stations before and after restoration installation. The as-built letter will serve as the “time zero” report, noting when the 5-year maintenance and monitoring period began.

VII. MAINTENANCE PLAN

A. MAINTENANCE ACTIVITIES

These maintenance guidelines are specifically tailored for native plant establishment. A minimum 5-year maintenance program is proposed to ensure the successful establishment and persistence of the restored wetland habitat within 0.45-acre project temporary impacts. The maintenance program will include removal of trash, weed control, irrigation system maintenance, irrigation application rates and schedules, and any remedial measures deemed necessary for the success of the restoration program (e.g., re-seeding and re-planting). Maintenance activities will be directed by the restoration specialist.

1. General Maintenance

It is the contractor's responsibility to keep all planted areas free of debris, monitor irrigation function and scheduling, monitor plant material condition and health, and conduct weeding and erosion control. Maintenance personnel will be fully informed of the habitat creation program so that they understand the effort's goals and maintenance requirements. A professional with experience in and knowledge of native habitat restoration will supervise all maintenance activities.

Damage to plants, irrigation systems, and other facilities occurring as a result of unusual weather or vandalism will be repaired, as directed by the restoration specialist. The cost of such repairs will be paid for as extra work. The contractor will repair any damage caused by the contractor's inadequate maintenance or operation of irrigation facilities, as determined by the restoration specialist.

2. Non-native Plant Removal

Particular emphasis will be placed on pro-active removal of non-native plants. During the first 3 years of the program, eradication is expected to be necessary on a monthly basis between November and April (to cover the peak growing period for most plants) and 2 additional visits for the remainder of the year. For years 4 and 5 of the monitoring program, maintenance visits may be reduced to quarterly if approved by the restoration specialist. Non-native plants should be removed by hand or controlled with the proper herbicides. Maintenance personnel should be knowledgeable in distinguishing between native and non-native species; however, additional guidance will be provided, as needed, by the restoration specialist.

3. Invasive Plant Control

Non-native species considered to be highly invasive by the California Invasive Plant Council (Cal-IPC) shall be totally eradicated within restoration boundaries. Examples of invasive plants that occur on site include, but are not limited to, are castor bean and tamarisk. These species would be removed from the entire wetland mitigation area.

4. Irrigation

The goal is to obtain germination and growth with the least amount of irrigation. Frequent irrigation encourages weed invasion and leaches nutrients from the soil; therefore, water will be applied infrequently and only as needed to prevent plant and seedling mortality. Native plantings that are infrequently irrigated may grow slower initially but will ultimately be better able to withstand natural variations in rainfall and, therefore, be more successful in the long term. The irrigation schedule will attempt to develop deep-root growth with evenly spaced, infrequent, deep applications of water. To obtain deep penetration of water, the irrigation system may be activated several times in one 24-hour period. Irrigation will be minimized to the extent possible following natural rainfall events.

The irrigation system will be maintained until the restoration specialist determines that supplemental water is no longer required. At that time, irrigation will be permanently disconnected (e.g., the mainline will be cut), but not removed. Above-ground portions of irrigation will be removed when directed by the restoration specialist.

5. Other Pests

Insects, vertebrate pests, and diseases will be monitored. Generally, there will be a high threshold of tolerance before control measures are considered. As required by law, specific recommendations will be made only by a licensed pest control adviser. All applicable federal and state laws and regulations will be closely followed. The restoration specialist will be consulted on any pest control matters.

6. Fertilization

Fertilizer will not be applied except in extraordinary circumstances and only at the written direction of the restoration specialist.

7. Pruning

No post-installation pruning is necessary unless otherwise directed by the restoration specialist.

B. MAINTENANCE SCHEDULE

Maintenance will be performed as necessary to prevent re-seeding by non-native plants and will likely change with varying site conditions and seasons; the schedule outlined herein (Table 7) serves only as a guideline. At a minimum, the installation contractor will conduct monthly maintenance during the 120-day establishment period until the restoration specialist recommends sign off of the 120-day establishment period in writing. The maintenance contractor will be responsible for all maintenance activities during the minimum 5-year maintenance and monitoring period. For the first 3 years of the 5-year maintenance and monitoring period, maintenance is expected to be required once per month between January and June (to cover the peak growing period for most plants) and 2 additional visits for the remainder of the year. Maintenance visits may be reduced and become quarterly in Years 4 and 5 if approved by the

restoration specialist. The installation/maintenance contractor(s) will complete maintenance requests from the restoration specialist within 14 days of any written request or monitoring report.

Table 7 MAINTENANCE SCHEDULE FOR THE 5-YEAR RESTORATION PERIOD*	
TIME FRAME	SCHEDULE
Installation Contractor	
120-day Establishment Period	Monthly
Maintenance Contractor	
Year 1 through Year 3 January – June July – December	<i>8 visits per year</i> Monthly August and October
Years 4 and 5	Quarterly

*This schedule is only a guideline; maintenance will be performed as necessary and as directed by the restoration specialist.

VIII. MONITORING PLAN

Monitoring and annual assessments will be carried out under direction of the restoration specialist. This monitoring program will begin with habitat installation and continue for a minimum of 5 years following the end of the 120-day establishment period. Monitoring of the restoration effort is divided into 5 phases: (1) pre-installation data collection, (2) installation monitoring, (3) post-installation data collection, (4) maintenance monitoring, and (5) annual technical monitoring. Details of each phase are provided in this section of the mitigation plan.

A. PRE-INSTALLATION DOCUMENTATION

Prior to initiating construction activities, existing functions and services will be assessed in the area where restoration will be conducted. This includes conducting the following: (1) photographing pre-impact conditions at a minimum of 3 photo locations, (2) visually estimating vegetation cover, and (3) compiling a list of all animals observed or detected (by hearing vocalizations or seeing scat, tracks, or burrows) during the course of the assessment. The photo locations will be mapped using a Global Positioning System (GPS) for future comparison with post-restoration conditions. Pre-impact data collected will be used to assess project success in years 3 and 5.

B. INSTALLATION MONITORING

A restoration specialist will monitor all phases of the installation process, including site preparation (non-native plant removal) and installation of irrigation, plants, and seed (Table 8). The restoration specialist must inspect and authorize each phase of work before the next phase may begin. Pre-installation photos will be taken from designated photo documentation stations. This information will be used later to track the changes in vegetation as a result of site restoration.

Table 8 MONITORING SCHEDULE*	
PHASE	SCHEDULE
Installation Period	
Site preparation and installation	As needed, to be determined by the restoration specialist, but at least 4 times: Post project grading Post irrigation installation First day of plant installation After all installation is completed
5-year Restoration Period	
120-day establishment period	Monthly
Year 1 through 3 January to June July to December	8 visits per year Monthly August and October
Years 4 and 5	Quarterly

*This schedule is only a guideline; monitoring will be performed as necessary, as determined by the restoration specialist.

C. POST-INSTALLATION DOCUMENTATION

Following restoration installation, a restoration specialist will assess the area and document its status by taking photos from the established photo locations.

D. MAINTENANCE MONITORING

Following installation, the restoration specialist will monitor maintenance activities during the minimum 5-year restoration effort (Table 8), beginning immediately following the 120-day establishment period. For Years 1 through Year 3, monitoring visits will be conducted monthly from January through June, which corresponds with the growing season for wetland vegetation, and 2 other times during the remainder of the year. In Years 4 and 5, monitoring will be conducted 6 times per year. This monitoring schedule is the minimum; more frequent inspections may be necessary if there are problems with contractor performance or habitat

development. Monitoring memos noting any issues with plant establishment, irrigation, sediment control, etc., will be provided as necessary to the installation/maintenance contractor(s) and project proponent(s).

E. ANNUAL TECHNICAL MONITORING

In addition to maintenance monitoring visits, the restoration specialist will conduct an annual technical monitoring visit in August of each year during the 5-year restoration period. The timing of this assessment should correspond with the peak of the wetland vegetation growth for that year. Monitoring methods are described in more detail below.

1. Photo Documentation

Photos will be taken as part of all 5 annual monitoring events and will be included in the respective year's annual report. Photos will be taken at the same photo locations that are established prior to the start of the restoration effort. To visually demonstrate the progress of the restoration effort, photos taken immediately after restoration installation will be included in each report for comparison with the respective year's annual assessment photos. The photo locations will be permanently marked in the field and then mapped on an aerial photograph in the baseline monitoring report (as-built report following the 120-day establishment period) and all subsequent annual reports.

2. Visual Estimates

Visual estimates will be documented for container planting survivorship, cover by native and non-native plants, and average height of tree and shrub species.

3. General Wildlife

During each of the 5 annual assessments (and as part of the regular maintenance monitoring events), a complete list of all wildlife incidentally observed or detected will be documented for the restoration area.

4. Annual Reports

An annual report will be prepared each year during the 5-year monitoring period. Each of the 5 annual reports will be based on qualitative assessment data and focus on what (if any) adjustments are necessary to ensure ultimate success of the mitigation project. Each report will evaluate the success of the mitigation effort to date, along with any recommendations for future work that may be deemed necessary. Baseline post-restoration photos, as well as photos from the respective annual assessment, will be included in the annual reports, which will be submitted to the resource agencies in a timely manner.

IX. SUCCESS CRITERIA

The following sections provide standards to determine the successful completion of the wetland restoration effort as well as measurement methods for success criteria. Attainment of these standards indicates that the restoration area is progressing toward attaining the habitat function and services targeted by this plan.

A. 120-DAY ESTABLISHMENT PERIOD

Success at the end of the 120-day establishment period will be met if non-native cover is less than 10 percent at the time of the inspection, there is 80 percent survivorship of container stock, the irrigation system provides adequate cover, and there are no erosion-related issues. If any re-planting is conducted, container stock shall be in the ground for at least 30 days prior to the end of the establishment period. The minimum 5-year maintenance and monitoring period will begin immediately following this 120-day establishment period.

B. ANNUAL ASSESSMENTS

1. General Wildlife

No success criteria are specified for wildlife, but increasing use of the overall restoration area by species found at the impacted area would be a positive indicator that target wildlife functions and services have been restored at the site.

2. Vegetation Criteria

Survivorship Target

Container plantings should have at least 80 percent survival for the first 2 years. At the first and second anniversary of plant installation, container plantings should be added to the creation area if mortality exceeds 20 percent of the original plantings, unless the function of these plants has been replaced by native seed establishment (as determined by the restoration specialist). If plant mortality continues to be a problem, alternative measures (e.g., additional seeding or cuttings) should be considered.

Native Cover Target

Cover by native plants is a key component of determining project success. Annual performance goals relative to the estimated native cover and species richness existing within the proposed impact area have been established. Native cover and species richness goals are set lower than some restoration efforts due to the relatively large amount of unvegetated streambed and sparse, open nature of the vegetated portions of the existing wash and drainage. No specific cover criteria have been established for Years 1 or 2 because this is early in the development stage of the restoration area; however, cover will be assessed visually and if the vegetation is not on target to meet Year 3 goals, corrective measures (e.g., re-planting, re-seeding, adding cuttings, irrigation adjustments, and/or increasing removal of non-native species) should be implemented.

Starting in Year 3, the wetland restoration areas should attain at least 20 percent native cover (Table 9). At the end of the 5-year monitoring period, native cover will be at least 40 percent. If annual goals for vegetative cover are not met, remedial measures, including reseeding, planting, and increased weeding, may be implemented to ensure final success.

**Table 9
SUCCESS CRITERIA FOR RIPARIAN SCRUB AND SOUTHERN WILLOW SCRUB
HABITAT RESTORATION**

YEAR	PLANTING SURVIVORSHIP TARGET (percent)	NATIVE COVER TARGET (percent)	NON-NATIVE COVER LIMIT (percent)	INVASIVE PLANT COVER LIMIT (percent)	NATIVE SPECIES RICHNESS TARGET (species)
Wetland Restoration Areas					
1	80	--	10	0	--
2	80	--	10	0	--
3	--	20	10	0	3
4	--	30	5	0	3
5	--	40	5	0	3

Non-native Cover Limit

Non-native plants are typically a problem in habitat restoration projects, particularly at their outset. The areas designated for habitat restoration will be disturbed by grading, which favors the establishment of fast-germinating and fast-growing non-native annual species. As the restoration efforts take hold, non-native cover should decrease as a result of diligent removal of these species and expanding cover by native vegetation. In Years 1 through 3, cover by non-native species, exclusive of highly invasive species, shall account for no more than 10 percent within the restoration areas. In Years 4 and 5, cover shall not exceed 5 percent.

Invasive Cover Limit

A few Cal-IPC highly invasive plant species have been observed on site, including castor bean and tamarisk. The acceptable cover value for each of these species within the restoration areas will be 0 percent, which should then be maintained until the end of Year 5 (Table 9). Additional species may be added to this list if found to be a threat to the long-term success of the restoration effort.

Native Species Richness

The Year 5 goal is for the wetland restoration area to contain at least 3 native species. If interim species richness goals are not met, corrective measures (e.g., reseeding, planting, etc.) will be taken to help ensure eventual achievement of the 5-year goal.

C. IRRIGATION

To demonstrate that established vegetation is self-sustaining, all artificial water supplies will be off for at least 2 years prior to project sign off.

X. COMPLETION OF MITIGATION

A. NOTIFICATION OF COMPLETION

The resource agencies will be notified of completion of the restoration/mitigation effort through the submittal of the final (Year 5) monitoring report.

B. CONFIRMATION

If the project meets all success standards at the end of the 5-year monitoring period or sooner, and all irrigation has been discontinued for at least 2 years, then the mitigation will be considered a success; if not, the maintenance and monitoring program will be extended 1 year at a time until the standards are met. Specific remedial measures (approved by the resource agencies) will be used during any such extension. Monitoring extensions will be done only for areas that fail to meet final success criteria. This process will continue until all Year 5 standards are attained or until the resource agencies determine that other mitigation measures are appropriate. Should the mitigation effort meet all goals prior to the end of the 5-year monitoring period, the resource agencies, at their discretion, may terminate the monitoring effort. If requested, a site visit may be conducted with the resource agencies to verify site conditions.

XI. CONTINGENCY MEASURES

A. INITIATING PROCEDURES

If any of the resource agencies determine upon receipt of any of the annual monitoring reports that the mitigation effort is not meeting success standards for the project, the agencies shall notify the project proponent in writing that the restoration effort may require augmentation for successful implementation. The project proponent shall then have 30 days to respond to the correspondence, confirming that contingency measures will be required. The project proponent shall be responsible for all costs associated with restoration, monitoring, and any remedial measures.

B. NATURAL DISASTER

Should the restoration area fail due to a natural disaster such as an earthquake or flood, the project proponent will not be held responsible for replanting of any wetland habitat.

XII. REFERENCES CITED

- American Ornithologists' Union. 2009. List of the 2,055 Bird Species (with Scientific and English Names) Known from the AOU Check-list Area. URL: <http://www.aou.org/checklist/north/full.php>
- Baker, R.J., L.C. Bradley, R.D. Bradley, J.W. Dragoo, M.D. Engstrom, R.S. Hoffmann, C.A. Jones, F. Reid, D.W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico. Occasional Papers of the Museum, Texas Tech University 223.
- Bowman, R.H. 1973. Soil Survey of the San Diego Area, California, Part I. U.S. Department of Agriculture.
- California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory. February. URL: <http://www.cal-ipc.org/ip/inventory/index.php>.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. with Appendices.
- LSA Associates, Inc. (LSA) 2000. Assessment of biological resources and potential effects on endangered or threatened species. July.
- Natural Resource Conservation Service. 2004. Hydric Soils of the U.S. Internet web site. URL: <http://www.ca.nrcs.usda.gov/mlra02/abouthyd.html>.
- Oberbauer, Thomas. 2008. Terrestrial Vegetation Communities in San Diego County Based on Holland's Descriptions. Revised from 1996 and 2005. July.
- Rebman, Jon P. and Michael G. Simpson. 2006. Checklist of the Vascular Plants of San Diego County, 4th Edition. San Diego Natural History Museum and San Diego State University.
- Reed, P.B., Jr. 1988. National List of Plant Species that Occur in Wetlands: California (Region 0). USFWS Biological Report 88 (26.10).
- Sawyer, J.O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. CNPS. 472 pp.
- U.S. Army Corps of Engineers (USACE). 2008a. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Eds. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS; U.S. Army Engineer Research and Development Center.
- 2008b. Compensatory Mitigation for Losses of Aquatic Resources: Final Rule. April 10.