VOLUME 2 - APPENDICES

Final Habitat Mitigation and Monitoring Plan

Devil's Gate Sediment Removal and Management Project

Pasadena, California
(Los Angeles County)

U.S. Army Corps of Engineers Permit No. SPL-2014-00591-BLR

Prepared for:

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November 2018

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APPENDIX A

Off-Site Mitigation HMMP

Devil's Gate Off-Site Mitigation Project
Habitat Mitigation and Monitoring Plan

Petersen Ranch Mitigation Bank
Los Angeles County, California

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BMP	Best Management Practice
BRI	Biological Resources Inventory
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
Corps	United States Army Corps of Engineers
ECORP	ECORP Consulting, Inc.
HMMP	Habitat Mitigation Monitoring Plan
Impact Site	Reservoir above Devil's Gate Dam
LACFCD	Los Angeles County Flood Control District
LTMP	Long-term Management Plan
Project	Devil's Gate Turnkey Project
Mitigation Site	Pond D and surrounding area
RWQCB	Regional Water Quality Control Board
SRMA	Southwest Resource Management Association
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WOUS	Waters of the United States
WRA	WRA, Inc.

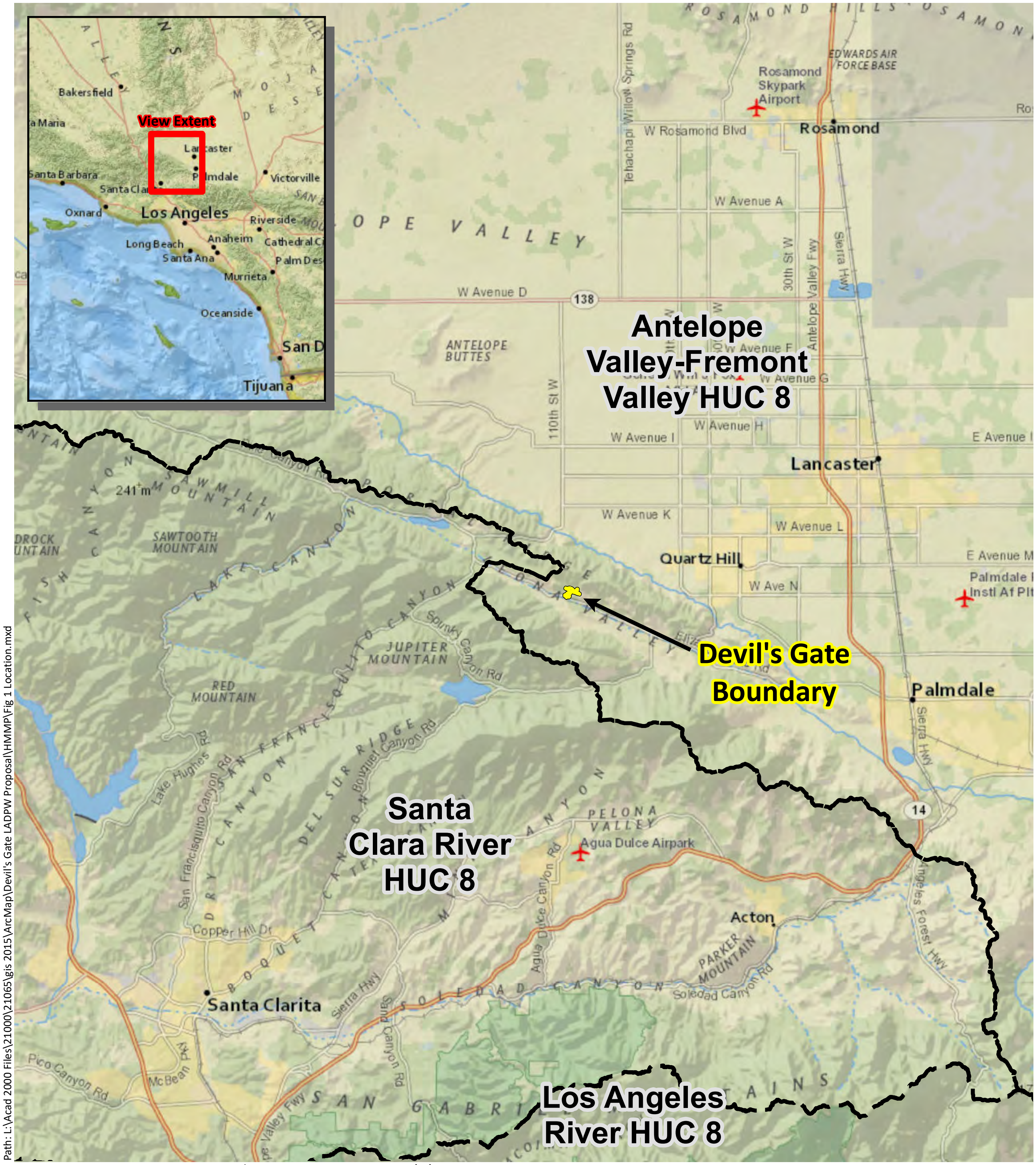
1.0 INTRODUCTION

The Los Angeles County Flood Control District (LACFCD) intends to implement the Devil's Gate Sediment Removal and Maintenance Project which will remove vegetation and 1.7 million cubic yards (cy) of sediment from a 65.56 acre area within the reservoir above the Devil's Gate Dam (Impact Site). The Sediment Removal Project will directly impact 1.52 acres of United States Army Corps of Engineers (USACE) jurisdictional wetlands and 32.54 acres of USACE non-wetland Waters of the United States (WOUS). LACFCD proposes to compensate for these temporary and permanent impacts through a combination of on-site and off-site mitigation projects, as required by the USACE Section 404 Permit (SPL-2014-00591), the California Department of Fish and Wildlife (CDFW) Lake or Streambed Alteration Agreement (1600-2015-0263-R5), and the Regional Water Quality Control Board (RWQCB) Section 401 Certification (15-053). On-site mitigation objectives are described in the Devil's Gate Sediment Removal and Management Project Habitat Mitigation and Monitoring Plan (ECORP 2018).

LACFCD will satisfy the off-site mitigation requirement by engaging Land Veritas Corp (Bank Sponsor) to implement the Devil's Gate Turnkey Project (Project) in a 31.55–acre portion of the Petersen Ranch Mitigation Bank (Bank). The Bank is located in Los Angeles County near Leona Valley, California (Figures 1 and 2). Mitigation actions will focus on enhancing existing seasonal wetlands that support mulefat and willow populations, creating new mulefat/willow dominated wetlands, and preserving alluvial scrub areas on and around a large sag pond. The created, restored, and preserved communities will be of a similar type and provide similar functions to those affected at the Impact Site. The mitigation is taking place within the Petersen Ranch Mitigation Bank, an existing mitigation bank, and will be overseen by the entities already overseeing the implementation and management of the Bank. Since it was entitled in 2016, the Bank has met each of its required performance monitoring criteria for its restored, enhanced, and preserved habitats. The Bank Sponsor's oversight and management of the Mitigation Site will reduce uncertainty associated with permittee-responsible mitigation. This Habitat Mitigation and Monitoring Plan (HMMP) describes the actions, justifications, monitoring activities, and long-term management arrangements being proposed to satisfy the off-site portion of LACFCD's compensatory mitigation requirements as stipulated in the USACE Section 404 permit, the RWQCB 401 Certification, and the CDFW Lake and Streambed Alteration Agreement.

1.1 Brief Description of the Compensatory Mitigation Project

The Project will take place at and surrounding a large sag pond in Area D ("Mitigation Site") of the Bank. The proposed activities include excluding cattle grazing with the use of wildlife friendly fencing, removing and managing invasive plant species, and planting mulefat and willow species to augment existing and establish new populations. Temporary irrigation would be provided to the planting areas for multiple years and after the new plants are established, additional irrigation may be provided on an as-needed basis supplied by the local water district and/or on-site wells. These actions will enhance and restore 17.41 acres of existing wetland riparian habitats, enhance 8.19 acres of existing riparian buffers through planting of willow and mulefat, and preserve 3.06 acres of riparian buffers and 3.54 acres of alluvial scrub upland buffer. These activities total 32.20 acres via recordation of a conservation easement that will be held by the Southwest Resource Management Association (SRMA), the existing conservation easement holder for the Bank.



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Sources: National Geographic, WRA | Prepared By: czumwalt, 8/2/2018

Figure 1. Location Map

Petersen Ranch Mitigation Bank
Los Angeles County, California

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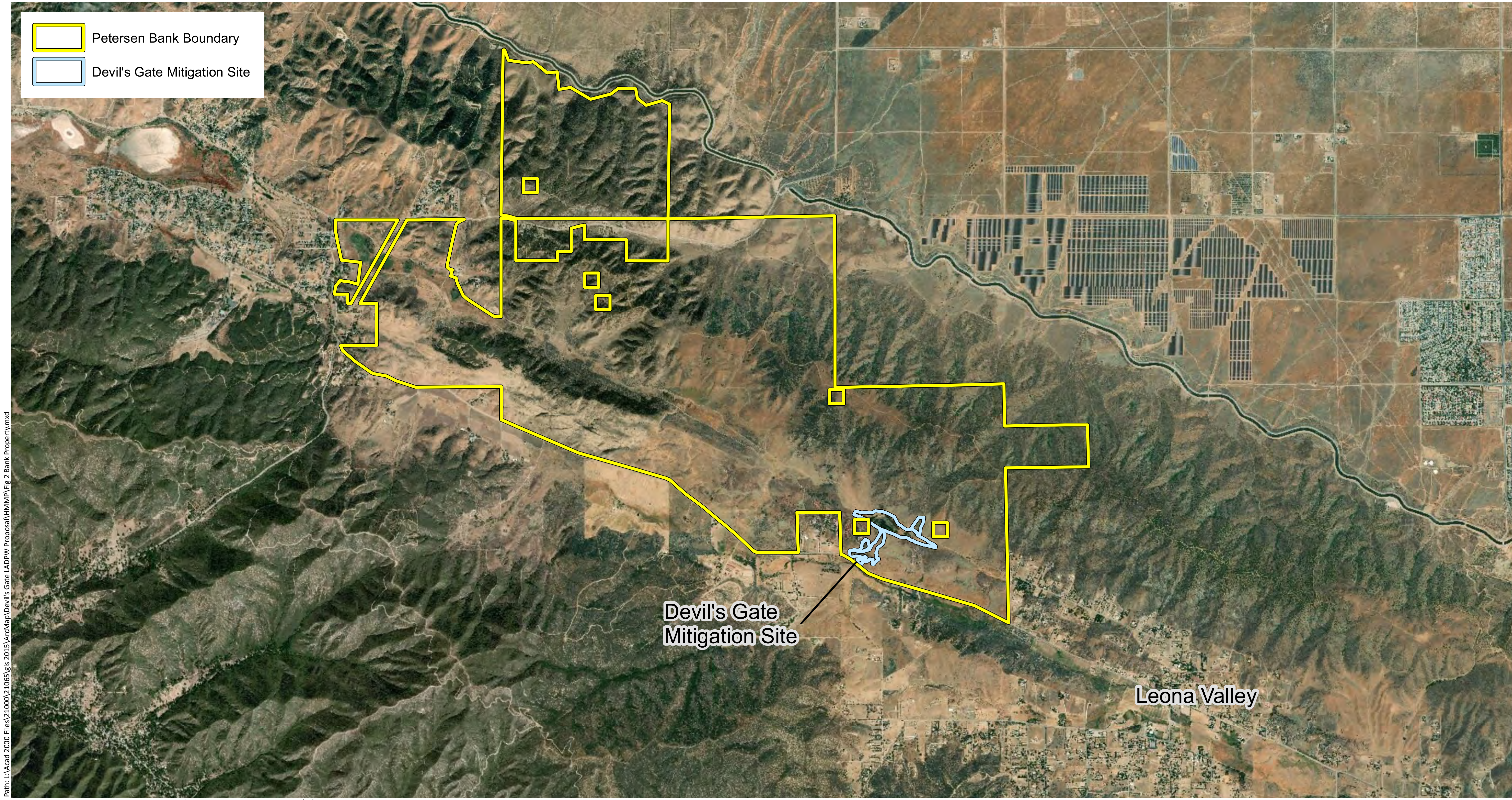

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\Devil's Gate LADPW Proposal\HMMP\Fig 2 Bank Property.mxd

Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: czumwalt, 8/2/2018

Figure 2. Bank Property Map

Petersen Ranch Mitigation Bank
Los Angeles County, California

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1.2 Objectives

The objective of this HMMP is to enhance, restore and preserve habitat as compensatory mitigation to off-set impacts at the Devils Gate Reservoir. Compensatory mitigation for permanent and temporary impacts and the temporary loss of function and values will be achieved in accordance with the USACE and U.S. Environmental Protection Agency (EPA) Final Rule (33 Code of Federal Regulations [CFR] parts 325 and 332 and 40 CFR part 230) on Compensatory Mitigation for Losses of Aquatic Resources, the CDFW Lake and Streambed Alteration Agreement, and the RWQCB Section 401 Water Quality Certification Permit. Specific objectives for the compensatory mitigation activities include:

- Planting of mulefat and willow within 17.41 acres of existing wetland and riparian habitats
- Planting 8.19 acres of willow and mulefat to enhance existing riparian buffers and convert adjacent upland areas into riparian buffers
- Preservation of 3.06 acres of riparian buffers and 3.54 acres of upland buffer
- Increasing the aquatic resource functions for wetlands, WOUS, quality of riparian and upland vegetation communities, habitat connectivity, and riparian habitat structure and diversity,
- Reducing invasive plant species cover and prevalence, and
- Developing mitigation areas that could provide suitable habitat for federally and state-listed species, including least Bell's vireo (*Vireo bellii pusillus)*

1.3 Impacts to USACE Jurisdictional Areas

The removal of vegetation and 1.7 million cubic yards of sediment from the reservoir behind Devil's Gate Dam will impact 1.52 acres of wetlands and 32.54 acres of non-wetland WOUS under the jurisdiction of the USACE. These impacts are being mitigated on-site at identified mitigation locations within the reservoir and off-site as described in this HMMP. For additional details about the jurisdictional wetlands impacted at the Impact Site, refer to Devil's Gate Sediment Removal and Management Project HMMP (ECORP 2018).

1.4 Total Impacts to Disturbed Areas and Vegetation Communities

Vegetation communities temporarily and permanently impacted by reservoir improvement activities at the Impact Site are identified in Table 1 and available in further detail in the Devil's Gate Sediment Removal and Management Project HMMP (ECORP 2018). A total of 65.56 acres of vegetation communities and disturbed areas will be impacted and mitigated for through a combination of mitigation actions taking place within the on- and off-site mitigation areas.

Table 1. Impacted Vegetation Communities

Vegetation Community	Permanent Impacts	Temporary Impacts	Total Impacts
***Salix gooddingii* alliance**	18.67	1.65	20.32
***Baccharis salicifolia* alliance**	10.92	0.89	11.81
***Lepidospartum squamatum* alliance**	1.97	13.16	15.13
***Artemesia californica—Eriogonum fasciculatum* alliance**	0.01	0.12	0.13
***Quercus agrifolia* alliance**	0.13	0.07	0.20
Non-native or Disturbed alliances	17.68	0.36	18.04
TOTAL	49.38	16.25	65.56

*summing discrepancy due to rounding

Table 2 Comparison of Pre- and Post-Construction Conditions

Pre-Construction Site Condition						Post-Construction Site Conditions				
Habitat Type	**Vegetation Communities**	**Cowardin**	**HGM**	**Hydrology**	**CRAM**	**Activity**	**Habitat Type**	**CDFW Mitigation**	**USACE/RWQCB Mitigation**	**Acres**
Alluvial Scrub	Parish's Sagebrush, Thick Leaf Yerba Santa Scrub,	Upl, Rip	NA	Ephem.	Episodic	Preservation	Alluvial Scrub	Alluvial Scrub Preservation	Riparian Buffer Preservation	3.06
Alluvial Scrub	California Buckwheat Scrub, Annual Grassland, Rubber Rabbitbrush Scrub	Upl	NA	NA	NA	Preservation	Alluvial Scrub	Alluvial Scrub Preservation	Upland Buffer Preservation	3.54
Uplands	Rubber Rabbitbrush Scrub, Annual Grassland, Bare Ground	Upl	NA	NA	NA	Planting	Mulefat/Willow	Mulefat/Willow Creation	Riparian Buffer Enhancement	6.36
Non-Wetland Riparian,	Mulefat Thickets, Fremont Cottonwood Forest, Rubber Rabbitbrush Scrub,	Rip	Dep.	Sat	Slope, Dep	Planting	Mulefat/Willow	Mulefat/Willow Restoration	Riparian Buffer Enhancement	1.83
Wetland Riparian	Mulefat Thickets, Mexican Rush Marsh, California Bulrush Marsh, Red Willow Thickets, Open Water, Rubber Rabbitbrush Scrub, Annual Grassland	Palustrine	Dep., Slope	Seas., Saturated	Dep, Slope	Planting	Mulefat/Willow	Mulefat/Willow Restoration	Wetland Riparian Enhancement	17.41
									Total	32.20

1.5 USACE and RWQCB Compensatory Mitigation

This mitigation proposal includes; supplemental planting of mulefat and willow within 17.41 acres of existing wetland and riparian habitats, planting 8.19 acres of willow and mulefat to enhance existing riparian buffers and convert adjacent upland areas to riparian buffers through planting. Additionally preservation of 3.06 acres of riparian buffers and 3.54 acres of upland buffer is proposed along with construction of wildlife friendly cattle exclusion fencing, management of invasive species and protection of all 32.20 acres via recordation of a conservation easement.

1.6 CDFW Compensatory Mitigation

This Project will create and restore 25.60 acres of willow and mulefat dominated communities, 6.36 acres of new streambed habitat, and 19.25 acres within existing streambed habitat. Additionally this Project will result in the preservation of 6.60 acres of alluvial scrub habitats dominated by the locally rare Parish's sagebrush, thick leaf yerba santa, and California buckwheat.

1.7 Measures Designed to Create a Beneficial Impact

The Project will offset the impacts at the Impact Site through targeted willow and mulefat revegetation, exclusion of cattle from riparian areas, and permanent site protection through recordation of a conservation easement. The creation of thickly vegetated woody wetland areas may provide habitat for wildlife species that require structural diversity and thick cover, such as least Bell's vireos (*Vireo bellii pusillus*) and potentially support southwestern willow flycatchers (*Empidonax traillii extimus*), and other sensitive species. Ongoing management of invasive plants in these areas will ensure that these areas will continue to provide habitat function.

2.0 SITE SELECTION CRITERIA

The Mitigation Site was selected to offset impacts to CDFW and USACE jurisdictional features during Project implementation based on the following criteria:

- Potential to fulfill the watershed approach set forth in the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources;
- Availability of adequate hydrology (both surface, subsurface, and potential for augmentation from nearby sources) to sustain the mitigation areas for the long-term;
- Opportunity to conserve off-site lands containing aquatic resources that are located in close proximity to existing preserved lands or open space, and;
- Opportunity to conserve lands that may provide suitable habitat for least Bell's vireo, a federally and state listed wildlife species.

2.1 Watershed Overview

The Mitigation Site is located within the Amargosa Creek watershed (1809020614), which is included within the Antelope-Fremont Valley HUC-8 and in the Southern California Mountains Major Land Resource Area (MLRA). The sediment contributed by streams and washes in the Southern California Mountains MLRA creates colluvial slopes and alluvial fans in the larger valleys and on the coastal plains to which they drain (USDA 2006). This MLRA is characterized by steep mountains, valleys, and streams with actively eroding channels. Both the Mitigation Site and the Impact site consist of alluvial valleys drained by steep sided canyons in the Southern California Mountains MRLA.

2.1.1 Mitigation Site Location

The Mitigation Site is located approximately 32 miles north of the Impact Site in the Petersen Ranch Mitigation Bank, an agency-approved mitigation bank. The areas fall within Phase D of the Petersen Ranch Property which is part of a larger 4,103-acre bank. Within Phase D, a large sag pond and associated wetland complex has been identified as having opportunities for improving the existing habitat. Opportunities include establishment and enhancement of wetlands, non-wetland WOUS and associated buffer habitats. The buffer habitats will be restored and enhanced to not only provide protection for the on-site aquatic resources but also to improve the overall function of the watershed. Additional details describing the mitigation bank can be found in the Bank Enabling Instrument (BEI) (Land Veritas Corp. 2016) and in the Biological Resource Inventory (Exhibit H, of the BEI).

2.1.2 Mitigation Site Watershed Condition

The Amargosa Creek Watershed is a sub-watershed of the Antelope-Fremont Valley watershed, which is an inland watershed. Flows originating in the Mitigation Site area fill a sag pond and seep down the south facing slopes adjacent to Elizabeth Lake Road eventually flowing into culverts beneath Elizabeth Lake Road and into Amargosa Creek that drains to the Antelope Valley. No major obstacles within the watershed impede flow between the sag pond and the confluence with Amargosa Creek.

The character of the upper watershed remains relatively natural with waterways being ephemeral in nature. The vegetation of the upper watershed is characterized by a variety of upland scrub and woodland types with riparian communities limited to waterways found in low-lying areas. Downstream of the sag pond, much of the watershed's natural character has been replaced by channelized waterways surrounded by urbanization.

2.2 Landscape Setting and Position

The Mitigation Site is located within the Castaic Range and lies at the intersection of the San Gabriel Mountains to the east, the Sierra Madre Mountains to the west, and the Tehachapi Mountains to the north. The Tehachapi range is the only in-tact wildlife corridor that connects the Coast Range, by way of the Sierra Madre Mountains, to the Sierra Nevada Mountains. The Mitigation Site also falls within the San Andreas Rift Zone Significant Ecological Area (SEA) as designated by the Draft County of Los Angeles General Plan (LA County 2012). The San Andreas Rift Zone SEA connects the Portal Ridge/Liebre Mountain SEA and the Tehachapi Foothills SEA. The San Andreas Rift Zone SEA supports a high diversity of vegetation communities because of its varied topography, elevation, and relatively low density urban development.

2.2.1 Mitigation Site Landscape Position

The Mitigation Site is located within a rift valley running South-easterly throughout the Bank. The rift valley is caused by the San Andreas Fault and contains numerous low-lying wetland and naturally ponded areas.

The sag pond provides minor flood control function because, during storm events, it captures stormwater, sediment, and debris from the upper portion of the watershed. Ritter Ridge is located to the north of the mitigation area and the San Gabriel Mountains are located to the south of the mitigation area. Both are characterized by steep slopes and foothills. The sag pond sits at approximately 3,100 feet above mean sea level (amsl). The topography in the areas adjacent to the pond is generally flat with a slight incline to the north and south.

2.2.2 Mitigation Site Policies and Surrounding Land Uses

The Mitigation Site is within Area D of the Bank. In total, the Bank contains roughly 4,103 acres across two properties, and the entire Bank is divided into six distinct geographic areas (Areas A – F). Currently, two of these areas (Areas A and E) have already been entitled and put under conservation easements and have undergone restoration, preservation, enhancement, and/or rehabilitation actions. Area D is the most southeast portion of the Bank. Historically, the primary land uses within the Bank appear to have been ranching and agricultural production. Evidence of past agricultural use includes remnant portions of fruit tree orchards, several dams for water storage, an excavated reservoir and pumping facilities, ranch roads, and dwelling foundations. Contemporary infrastructure is minimal. A dirt ranch road traverses the proposed bank and barbed wire fences delineate the extent of the Bank. The Mitigation Site is currently managed as grazing land.

2.2.3 Abutting Open Space

The Mitigation Site is nestled within a Mitigation Bank totaling over 4,100 acres of protected space. The Mitigation Site is situated between large tracts of preserved public and private lands. The Mitigation Site is also located directly north of the Angeles National Forest (ANF). Ranches and agricultural fields with small, individual houses separate the ANF from the Bank Property. The Bank is bordered by the California Aqueduct to the north. Additionally, the Bank is adjacent to significant protected areas including the Antelope Valley Poppy Preserve to the northwest, the California Desert Conservation Area Bureau of Land Management (BLM) managed land to the north and is in the immediate vicinity of the proposed Tule Wilderness Area, further enhancing the landscape linkage function of the area. Tejon Ranch is the largest privately owned, contiguous land holding in California and is located approximately 15 miles northwest of the Mitigation Site via Portal Ridge. The Tejon Ranch Conservancy has protected 240,000 acres of the property in perpetuity. Further to the west is Los Padres National Forest.

2.2.4 Habitat Connectivity

The proposed mitigation activities will expand and improve the function and values in the sag pond and will result in much higher quality habitat than currently exists. Improvement of habitat in the sag pond will increase the value of the area as a critical linkage and provide additional opportunities for wildlife. Not only do wildlife species reside in the area but they also use the area for juvenile dispersal, seasonal migration, and home range connectivity. Improving the habitat will increase the quality and quantity of available habitat for tri-colored blackbird (*Agelaius tricolor*) amongst other sensitive wildlife species.

The Mitigation Site has few barriers impeding local wildlife movement on a wildlife corridor scale. The principal habitat corridor occurs along the valley floor of the Bank. The local topography, perennial sources of water, and riparian woodland all trend in an east-west direction providing connectivity to lands adjacent to the Mitigation Site. Woodland, chaparral, and scrub habitats in the higher-elevation portions of the Mitigation Site and the remainder of Area D are also contiguous with such habitats in the surrounding land parcels.

2.2.5 Connectivity to Aquatic Resources

The San Andreas rift zone is so named because it lies along the San Andreas Fault. Geologic activity along the fault has created a linear series of lakes, sag ponds, and wetlands nearly 50 miles long from Palmdale Lake in the east to Castaic Lake in the west. This is likely an important stopover point for migrating waterfowl and riparian nesting birds–including southwestern willow flycatcher. Additionally, the areas in which water is abundant provide year-round forage for herbivores, aggregation of vertebrate prey for predators, and watering locations for all species of wildlife.

2.2.6 Existing and Proposed Buffer Width and Condition.

The location of the Mitigation Site – completely within the larger Bank - establishes an atypically large buffer for its resources. The Mitigation Site is located near the southern border of Area D. The nearest non-natural feature to portions of the Mitigation Site is Elizabeth Lake Road, and at least 30 feet of buffer will be between Elizabeth Lake Road and the downstream portion of the Mitigation Site. The Mitigation Site and its resources are buffered for approximately a half mile to the east, two miles to the north, and a tenth of a mile to the west before reaching any developed areas. No developed areas drain to the Mitigation Site.

2.3 Site Specific Information

The Mitigation Site is located within Area D of the 4,103–acre Petersen Ranch Mitigation Bank located near Leona Valley, Los Angeles County, California. The Bank is being established in phases; and to-date Areas A and E have been implemented. Area D of the Bank has been identified as a future phase of the Bank, consisting of approximately 1,233 acres in the southeastern portion of the Bank. The Mitigation Site is located at a large sag pond in the San Andreas Rift Valley portion of Area D on parcel 3215-018-021, within the Del Sur USGS 7.5-minute Quad.

2.3.1 Ownership Information

LACFCD is the applicant for the Project requiring the mitigation described in this HMMP. Therefore, the permittee will retain responsibility for satisfying the conditions of their permits, including the successful performance of the mitigation described in this HMMP. The land of the Mitigation Site is solely owned by the LV-BP Investors Ranch, LLC (Property Owner). The Property Owner will grant a perpetual conservation easement for the Mitigation Site, to SRMA.

Permittee:

Los Angeles County Flood Control District
900 S, Fremont Avenue
Alhambra, CA 90803

Property Owner:

LV-BP Investors Ranch, LLC
1001 Bridgeway #246
Sausalito, CA 94965
(415) 729-3734

2.3.2 Hydrology

The Mitigation Site lies within the San Andreas Rift Valley, a naturally occurring rift valley that contains numerous low-lying wetland and naturally ponded areas. The majority of hydrology within the Mitigation Site is precipitation and shallow groundwater. Water quality is protected due to the Mitigation Site's location in the headwaters of the watershed.

2.3.3 Soils Characteristics

The Los Angeles County Soil Series (USDA 1969), Lancaster Area Soil Series (USDA 1922), Angeles National Forest Area (USDA 1980), and Soilweb (CSRL 2013) indicate that the Mitigation Site contains five soil series: the Castaic-Balcom series, Chino Loam series, Hanford series, Ramona series, and Vista series. These soil series are coarse loamy soils, characteristic of alluvial slopes, and the Chino Loam series is a hydric soil common in low-lying wetland and riparian areas. These soils are described in detail in Section 3.3 of this document and their distribution throughout the site is shown in Figure 3.

2.3.4 Stream Order and Hydrologic Regime

An ephemeral stream, Strahler Order 1, terminates just along the northern boundary of the Mitigation Site outside of the pond footprint. Flows are usually on the surface but can also occur subsurface.

2.3.5 Existing Habitats and Presence of Known Species or Habitats of Concern

Several habitats of concern exist at the off-site mitigation area, including *Schoenoplectus californicus* Herbaceous Alliance, *Juncus mexicanus [J. arcticus* var. *mexicanus*] Herbaceous Alliance, *Forestiera pubescens* patches, *Populus fremontii [P. deltoides*] Forest Alliance, *Baccharis salicifolia* Shrubland alliance, *Artemisia tridentata* Shrubland alliance and *Eriodictyon crassifolium* Provisional Shrubland Alliance. In addition, several commonly occurring habitats exist in the offsite mitigation area including Annual Grassland, *Eriogonum fasciculatum* Shrubland Alliance and *Ericameria nauseosus* Shrubland Alliance. Past biological surveys in the Mitigation Site, have documented the presence of Parish's sagebrush (*Artemisia tridentata* ssp*. parishii*) and Peirson's morning-glory (*Calystegia peirsonii*). Special status species observed within the mitigation bank and have the potential to occur include tri-colored blackbird, Swainson's hawk (*Buteo swainsoni*), and western pond turtle (*Actinemys marmorata*).

2.3.6 Water and Mineral Rights

All surface and subsurface mineral rights for the Mitigation Site are owned by the Property Owner. All surface water rights are similarly retained by the Property Owner. Therefore, there is no expected risk to the Mitigation Site from either mining activity or water withdrawals. In addition, the Property Owner has sufficient stock in, and sufficient water rights to ensure water supply from, the Lake Elizabeth Mutual Water Company (LEMWC). Mineral and water rights for the Bank are discussed and documented in detail in Exhibit E of the BEI.

2.3.7 Long-Term Protection

Southwestern Resource Management Association (SRMA) holds a perpetual conservation easement for Areas A and E of the Mitigation Bank. No conservation easement or any easements that would conflict with the conservation purposes of the Mitigation Site occur within Area D. The Property Owner will record a perpetual Conservation Easement with SRMA to ensure long-term protection of the Mitigation Site. This Conservation Easement will be recorded once restoration is completed and the as-built documents are finalized. These actions are expected to be completed in approximately May 2019.

3.0 BASELINE INFORMATION

Petersen Ranch Mitigation Bank has been the subject of resource assessments and studies performed by WRA and others. These include:

- Biological Resources Inventory (BRI; WRA 2012a)
- Wetland Delineation Report (WRA 2012b)

Summaries of relevant information from these documents is included in the sections below.

3.1 Topography

The topography of the Mitigation Site is relatively flat. The general slope is from north to south, with the sag pond at roughly 3,400 feet above sea level. North of the sag pond lies Portal Ridge, which are generally mountainous with steep canyons and drainages generally vegetated by thick chaparral. The elevation of the Mitigation Site drops gently to the south from the sag pond, with the southern edge of the Mitigation Site being near the bottom of Leona Valley.

3.2 Hydrology

The Mitigation Site lies within the San Andreas Rift Valley, a naturally occurring rift valley that contains numerous low-lying wetland and naturally ponded areas. Water enters the Mitigation Site from the mountains to its north or south, or from surface water travelling south east through the rift valley. The majority of the hydrology supporting aquatic resources within the Mitigation Site is precipitation and shallow groundwater. Annual rainfall in the area is approximately 12 inches.

3.3 Soils

Soilweb (CSRL 2013) indicate that the Mitigation Site contains 4 soil series: the Castaic-Balcom series, Chino Loam series, Hanford series, Ramona series, and Vista series. These soil series are described in detail below and depicted in Figure 3.

<u>Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded (CMF2)</u>: The Castaic soil series consists of silty clay loam horizons formed in residuum weathered from shale, sandstone, and mudstone. Castaic soils are well drained, moderately slowly permeable, with very rapid runoff. This soil series is found on strongly sloping to very steep sides of rounded hills at elevations of 50 to 2,500 feet. These soils are generally used for range with a few areas used for growing grain and citrus fruits. Other vegetation includes annual grasses, forbs, with few scattered live oak trees and brush (CSRL 2013).

A representative pedon of this series consists of an A-horizon of slightly acid (pH6.5), brown (10YR 5/3) silty clay loam, which is dark brown (10YR 4/3) when moist. This is subtended by a B-horizon of neutral (pH 7.2), yellowish brown (10YR 5/4) silty clay loam, which is dark yellowish brown (10YR 4/4) when moist. The B-horizon is underlain by a Cl-horizon of slightly alkaline (pH 7.8), brown (10YR 6/4) shaly clay loam, which is dark yellowish brown (10YR 4/4) when moist. A four inch layer of shale-banded with mudstone and seams of lime can be found beneath the Cl-horizon (CSRL 2013).

Chino Loam (CO): The Chino soil series consists of gray, calcareous silt loam or silty clay loam horizons formed in alluvium derived from granitic rocks. This soil series is located on flood plains at elevations near sea level to 3,100 feet. These soils are considered hydric, and are somewhat poorly drained with very slow runoff and moderately slow permeability. Soils in this series stay moist between depths of four and 12 inches from November until May. These soils are commonly used for grazing, or drained areas are used for growing irrigated row crops. Vegetation includes annual grasses, weeds, and shrubs (CSRL 2013).

A representative pedon of this series consists of A-horizons of moderately alkaline (pH 8.2), strongly effervescent, gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) when moist. This is underlain by C-horizons that are moderately alkaline (pH 8.2), strongly effervescent, light gray (10YR 6/1) silty clay loam, very dark gray (10YR 3/1) when moist. Chino loam soils are considered to be hydric and are often found in drainage-ways. Chino Loam soils are problematic for conducting wetland delineations due to their alkalinity which inhibits biological processes as well as the solubility of iron, manganese and other minerals thereby minimizing redoximorphic processes.

Water (W): This map unit consists of open water.

Ramona Coarse Sandy Loam, 5 – 9 percent slopes (RcC); Ramona Coarse Sandy Loam, 9 – 15 percent slopes (RcD): This series consists of brown fine loamy soils formed from alluvium derived mostly from granitic and related rock sources. These soils can be found on terraces and fans at elevations of 250 to 3,500 feet. Ramona soils are well-drained with slow to rapid runoff and moderately slow permeability. These soils are primarily used for production of grain, grain-hay, pasture, irrigated citrus, olives, truck crops, and deciduous fruits. Natural vegetation includes annual grasses, forbs, chamise or chaparral (CSRL 2013).

Hanford coarse sandy loam, 2 to 9 percent slopes (HbC); Hanford Sandy Loam, 2-9 percent slopes (HcC): This series consists of very deep, coarse loamy soils formed in moderately coarse textured alluvium predominantly derived from granite and other quartz bearing rocks. These soils can be found on stream bottoms, floodplains, and alluvial fans with slopes of zero to 15 percent at elevations of 150 to 3,500 feet. Hanford soils are well-drained with negligible to low runoff and moderately rapid permeability. Hanford soils are used for growing fruits, vegetables, and general farm crops. Additionally, they are used for urban development and dairies. Natural vegetation is dominated by annual grasses and associated herbaceous plants (USDA 1922, USDA 1969, CSRL 2013).

A representative pedon for this series consists of an A-horizon of slightly acidic, pale brown (10YR 6/3) fine sandy loam, which is dark brown (10YR 4/3) when moist. This is underlain by a C-horizon of neutral to slightly alkaline, pale brown (10YR 6/3) fine sandy loam, which is yellowish brown (10YR 5/4) when moist (CSRL 2013). This soil series is not considered to be hydric and does not occur on the USDA (2012) list of hydric soils.

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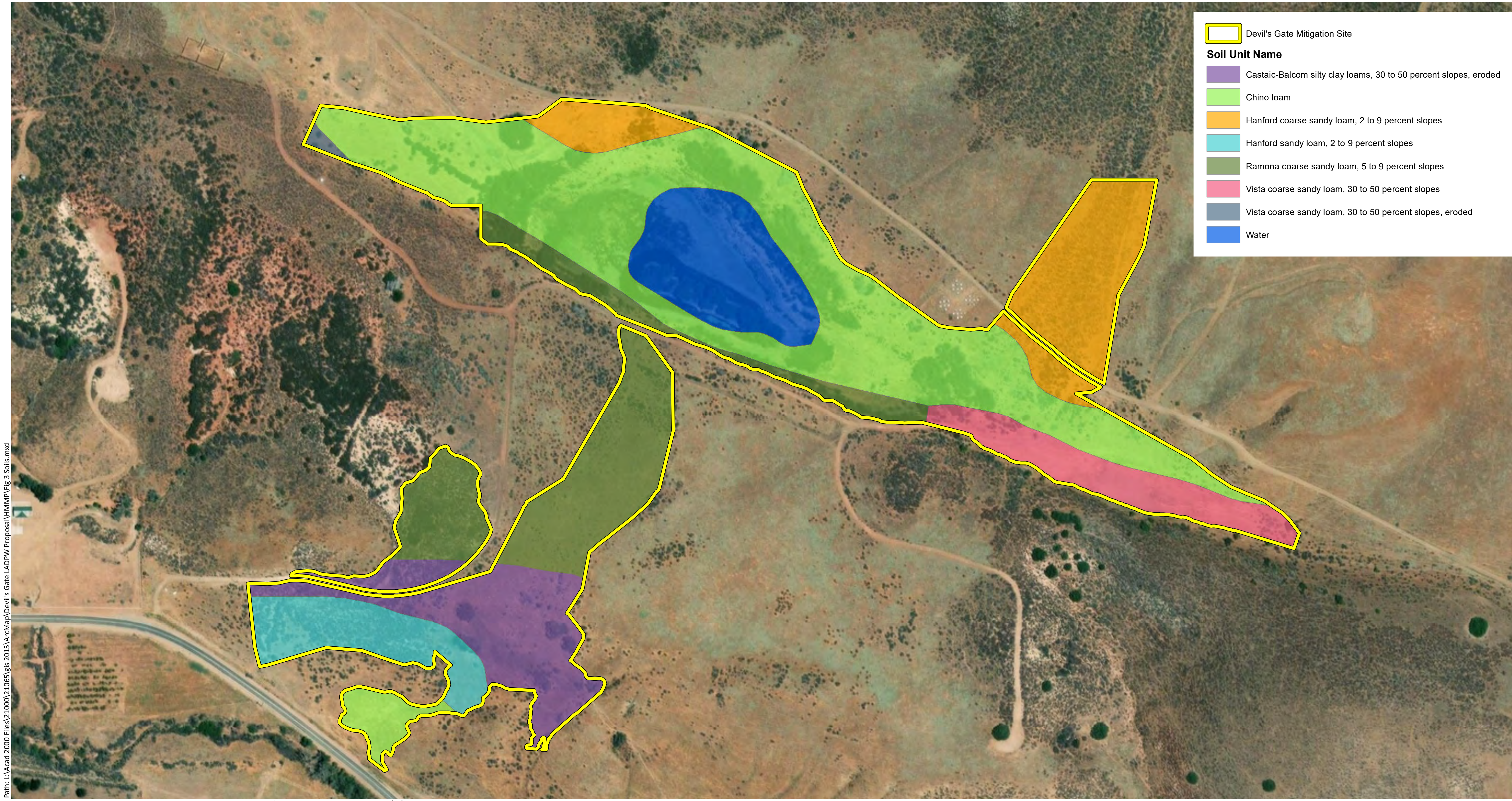

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\Devil's Gate LADPW Proposal\HMMP\Fig 3 Soils.mxd

Sources: 2016 DigitalGlobe Aerial, WRA, USDA SSURGO soils | Prepared By: czumwalt, 8/2/2018

Figure 3. Soils

Petersen Ranch Property
Los Angeles County, California

0 200 400 Feet
N

WRA ENVIRONMENTAL CONSULTANTS

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Vista coarse sandy loam, 30 to 50 percent slopes, eroded (VsF2); Vista coarse sandy loam, 30 to 50 percent slopes (VsF). This series consists of moderately deep, coarse loamy soils formed from material weathered from decomposed granitic rocks. These soils can be found on hills and mountainous areas with slopes of 2 to 85 percent and elevations from 400 to 3,900 feet in southern California and at less than 3,500 feet in central California. Vista soils are well drained with slow to rapid runoff and moderately rapid permeability. These soils are used for irrigation avocados and citrus in areas with favorable temperature, or winter truck crops in a few small areas. Dry-land grain and hay are grown in areas of moderate relief. Additionally, this soil is commonly used for un-cultivated range. Natural vegetation includes California sagebrush, scrub oak, lilac, chamise, sumac, flattop buckwheat, annual grasses, forbs, and other shrubs (CSRL 2013).

A representative pedon of this series consists of an A-horizon of neutral (pH 6.7) to slightly acidic (pH 6.5) brown (10YR 4/3) coarse sandy loam, dark brown (10YR 3/3) when moist. This is underlain by a B-horizon of slightly acidic (pH 6.3) brown (10YR 4/3) or yellowish brown (10YR 5/4) coarse sandy loam, dark brown (10YR 3/3) or dark yellowish brown (10YR 3/4) when moist. This is subtended by a C-horizon of very pale brown (10YR 7/3), brown (10YR 5/3), and yellowish brown (10YR 5/4) weathered quartz diorite grus (CSRL 2013). Soils in the vista series are not considered hydric and were not found on the USDA (2012) list of hydric soils.

3.4 Biological Communities

A biological inventory was conducted by WRA, Inc. at the Bank Property in January and February of 2013 (WRA 2013). In total, ten separate biological communities were identified within the Mitigation Site: two wetlands and waters communities, three riparian communities, two sensitive terrestrial communities, and three non-sensitive terrestrial communities.

Wetlands and Waters Communities

California bulrush marsh (Schoenoplectus californicus Herbaceous Alliance), 401, 404, 1600, Porter-Cologne, G5, S4. California bulrush is a native, perennial rhizomatous forb that occurs throughout the state (Baldwin et al., 2012). California bulrush marsh occurs in brackish to freshwater marshes, shores, bars, and channels of river mouth estuaries. Soils have a high organic content and are poorly aerated. California bulrush comprises greater than 50 percent relative cover in the herbaceous layer (Sawyer et al., 2009). This vegetation alliance consisted of one vegetation association—*California bulrush association*—which was dominated by California bulrush. Other species observed include water smartweed (*Persicaria [Polygonum] amphibia,* OBL), common cattail (*Typha latifolia,* OBL), Fremont cottonwood (*Populus fremontii [P. deltoides],* FAC), and willow (*Salix lasiolepis, FACW; Salix laevigata, FACW).* California bulrush marsh intergraded with Fremont cottonwood forest and willow thickets.

Mexican rush marshes (Juncus mexicanus [J. arcticus var. mexicanus] Herbaceous Alliance), 401, 404, 1600, Porter-Cologne, G5, S4. Mexican rush is a native, perennial rhizomatous forb. Mexican rush marsh occurs throughout the state in seasonally flooded sites from the coast to the high montane; associated species vary greatly depending on location (Baldwin et al., 2012). Mexican rush marshes contain greater than 50 percent relative cover of Mexican rush in the herbaceous layer (Sawyer et al., 2009). This alliance consisted of one association: *Mexican rush association*.

Riparian Communities

Desert olive (stretchberry) patches (Forestiera pubescens), CEQA, G3 S2.2 Desert olive patches occur in floodplains, stream banks, springs, rivers, terraces, and washes (Sawyer et. al, 2009). Desert olive is moderately widespread and occurs in the Mojave Desert, San Bernardino Mountains, Peninsular Ranges, Desert Mountains, Tehachapi Mountain Area, High Sierra Nevada, East Sierra Nevada, White and Inyo Mountains, inner south coast ranges, San Francisco Bay Area, and Inner North Coast Ranges (Baldwin, 2012). Desert olive patches are uncommon and generally occur in slightly drier conditions upslope of flowing water in areas with subsurface moisture from washes, river terraces, springs in hilly terrain, and narrows in desert canyon bottoms where moisture is forced to the *surface*. Desert olive patches occur on silty clay loam soils to coarse sand. Desert olive comprised greater than 50 percent relative cover in the shrub canopy. Desert olive intergrades with red willow woodland, elderberry stands, Mexican rush marsh, arroyo willow thickets, birch leaf mountain mahogany scrub, scrub oak chaparral, chamise chaparral, California juniper woodland, buckwheat scrub, scale broom scrub, and oak gooseberry thickets. This vegetation alliance is composed of one vegetation associations: *desert olive patches.* Desert olive patches were located at the base of steep drainages with highly erodible, sandy or gravelly soils. Patches were dominated by desert olive with greater than 50% relative cover in the shrub layer. Other shrubs included oak gooseberry (*Ribes quercetorum,* NL), scale broom (*Lepidospartum squamatum,* NL*)*, California buckwheat, chamise (*Adenostoma fasciculatum,* NL), elderberry, and arroyo willow, amongst others. The herbaceous groundcover was dominated by non-native brome grasses, purple needlegrass (*Stipa [Nassella] pulchra,* NL), Mexican rush, and ruderal weeds.

Fremont cottonwood forest (Populus fremontii [P. deltoides] Forest Alliance), 1600, Porter-Cologne, G4, S4. Fremont cottonwood forests occur in floodplains along low-gradient rivers, perennial or seasonally intermittent streams, and springs, and in lower canyons in desert mountains, in alluvial fans, and in valleys with a dependable sub-surface water supply which may vary considerably during the year (Sawyer et al. 2009). Fremont cottonwood is widespread and can be found across the state of California, excluding Modoc plateau (Baldwin et al. 2012). This alliance was mainly concentrated along the margins of the Area D Pond. Fremont cottonwood forests were also found in other topographically low areas with seasonally high subsurface water tables and along ephemeral streams and seasonal swales. Fremont cottonwood forest intergraded with red willow thickets, arroyo willow thickets, mulefat thickets, stretchberry thickets, and Mexican rush marshes. This community was not mapped to the association level since all members of this alliance, found within riparian areas, have the same level of sensitivity described in section 1600 of the CFG and Porter Cologne Act. Fremont cottonwood comprised greater than 50 percent relative cover in the tree canopy, or greater than 30 percent relative cover in the tree canopy if willows were present. Red willow was often a co-dominant. The understory shrub layer often contained arroyo willow and mulefat. Herbaceous groundcover was composed of Mexican rush, clustered field sedge (*Carex praegracilis*), stinging nettle, and ripgut brome (*Bromus diandrus*).

Mulefat thickets (Baccharis salicifolia Shrubland alliance), 1600, PC, G5 S4. The Mulefat thickets alliance is widespread in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels (Sawyer et. al, 2009). Mulefat can be found across the state of California, excluding Sierra Nevada and Mono counties, (Baldwin et al. 2012). Mulefat thickets intergraded with Fremont cottonwood forest, arroyo willow thickets, mulefat thickets, stretchberry thickets, and Mexican rush marshes. This community was not mapped to the association level since all members of this alliance, found within riparian areas, have the same level of sensitivity described in section 1600 of the CFG and Porter Cologne Act. Mulefat comprised greater than 50 percent relative cover in the shrub layer. Typically, mulefat was the only species in the shrub layer. In rare instances, other shrub species included arroyo willow, elderberry (*Sambucus nigra,* FAC), and stretchberry. Herbaceous groundcover was composed of Mexican rush, clustered field sedge, stinging nettle, ripgut brome, and ruderal weeds.

Red willow thickets (Salix laevigata Woodland Alliance), 1600, Porter-Cologne, G3 S3. Red willow thickets occur is widespread in ditches, floodplains, lake edges, and low gradient depositions along streams (Sawyer et. al, 2009). This alliance covered 0.65 acres of the Mitigation Area, covering an area within Pond D itself. This community was not mapped to the association level since all members of this alliance, found within riparian areas, have the same level of sensitivity described in section 1600 of the CFG and Porter Cologne Act. Red willow comprised greater than 50 percent relative cover in the tree canopy, or greater than 30 percent relative cover in the tree canopy if arroyo willow was in the subcanopy. The understory shrub layer often contained mulefat. Herbaceous groundcover was composed of Mexican rush, clustered field sedge, stinging nettle, water smartweed, ripgut brome, and ruderal weeds.

Sensitive Terrestrial Communities

Big sagebrush scrub (Artemisia tridentata Shrubland alliance), Locally rare, G5 S5. In the property, big sagebrush scrub typically occurred in sandy to gravelly loam on low to moderately sloped hillsides and valley. Big sagebrush scrub also occurred along dry washes and alluvial fans. In Area D, big sagebrush scrub intergraded with annual grassland, rabbitbrush scrub, California Juniper woodland, and California buckwheat scrub. Other species included non-native brome grasses, annual forbs, rabbitbrush, wild tarragon, and bullthistle. Although big sagebrush scrub is not considered to be rare in the CDFW list (CDFG, 2010), it is considered to be locally sensitive by Los Angeles County (LA County, 2012). Populations south of Owen's Valley are considered to be relic stands from prehistoric times when the community extended much further south than it does today (Mary Meyer personal communication, as reported in section 4.5.3.4.5.10 page 4.5-224 of Corps, 2007). Additionally, although the southern extent of the big sagebrush range extends into northern Mexico, the populations in Los Angeles, specifically the San Gabriel Mountains, are isolated due to the topography of the area. Big sagebrush scrub occurrences are rare and isolated in island communities in the Mojave Desert and San Joaquin Valley. Additionally, large continuous populations in the Sierra Nevada are only observed north of Tehachapi (CCH, 2013). Because of this, there is no continuity between populations in the Transverse Ranges and populations in the Southern Sierra Nevada. Many isolated plant populations are considered to be locally rare by CNPS due to the unique morphological, ecological, and genetic divergence of isolated populations. Protecting these plants preserves the biodiversity and genetic diversity of local flora not seen elsewhere in California (CNPS 2013). Additionally, Parish's sagebrush, a locally rare species, was observed in all big sagebrush scrub populations.

Thick leaf yerba santa scrub (Eriodictyon crassifolium Provisional Shrubland Alliance), G3, S3. Thick leaf yerba santa scrub occurs on typically exposed, lower to upper slopes with granitic or sedimentary substrates in the Peninsular Ranges, Transverse Ranges, Tehachapi Area, and outer South Coast Ranges (Sawyer et al. 2009, Baldwin et al. 2012). Throughout the Property this alliance intergraded with scrub oak chaparral, California buckwheat scrub, buckwheat-chaparral yucca scrub, and giant wild rye stands. Thick leaf yerba santa comprised greater than 50 percent relative cover in the shrub canopy. One vegetation associations were mapped within this alliance: *thick leaf yerba santa scrub*. Thick leaf yerba santa scrub was located on generally flat, neutral aspects at the bottom of topographic, often dry wash, drainages. Soils were generally white and chalky or red in color. There was little to no tree cover. Other subdominant shrubs included California buckwheat (*Eriogonum fasciculatum*) with five percent relative cover, and rubber rabbitbrush with one percent relative cover.

Non-sensitive Terrestrial Communities

Annual grassland, no ranking. Annual grassland was widespread throughout the Property. Annual grassland was composed of non-native grass species including red brome, cheatgrass, ripgut brome, slender oat (*Avena barbata,* NL), and annual ruderal weeds. The majority of the southern hills in the Property were vegetated by annual grassland.

California buckwheat scrub (Eriogonum fasciculatum Shrubland Alliance), G5, S5. California buckwheat scrub occurs on upland slopes, intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits on coarse, well drained soils in the Peninsular Ranges, South Coast, Transverse Ranges, South Coast Ranges, Central Coast, San Francisco Bay Area, Tehachapi Mountain Area, Southern Sierra Nevada and Foothills, and throughout the Desert Province (Sawyer et al. 2009 and Baldwin et al. 2012). In the Property, this alliance covered approximately 882.95 acres and intergraded with most upland vegetation communities. California buckwheat comprised greater than 50 percent of the relative cover in the shrub canopy. Two associations were mapped in the Property: *California buckwheat scrub.* California buckwheat scrub was extensive on moderate to gentle slopes of all aspects in the Property. There was generally no tree cover and vegetation cover totaled approximately 85 percent relative cover. The shrub layer was dominated by California buckwheat at greater than 50 percent relative cover. Additional sub-dominant shrubs included rubber rabbitbrush, Mormon tea (*Ephedra viridis,* NL), thick leaf yerba santa, chamise, and other mixed chaparral species. The herbaceous layer was sparse and was dominated by non-native annual graminoids including cheatgrass, with a 15 percent cover, and wild oats which occurred only as a trace.

Rubber rabbitbrush scrub (Ericameria nauseosus Shrubland Alliance), G5, S5. Rubber rabbitbrush scrub occurs in most topographic settings on well drained sands and gravels, especially following disturbance such as fire, flooding, overgrazing, or land grading (Sawyer et al. 2009). Rubber rabbitbrush scrub is found throughout inland cismontane California (exclusive of the Great Valley), as well as throughout the Great Basin and Desert Provinces (excluding the Sonoran Desert) (Baldwin et al. 2012). This community was particularly abundant amongst nonnative grassland and sagebrush scrub. Rubber rabbitbrush comprised greater than 50 percent relative cover. One association was mapped within this alliance: *rubber rabbitbrush scrub*. Rubber rabbitbrush scrub was located on gradually sloping to neutral aspects throughout large portions of the Property. Vegetation cover was approximately 75 percent relative cover. There was no tree cover. Shrub cover was dominated by rubber rabbitbrush at greater than 25 percent relative cover in the shrub layer. Big sagebrush was also common in the shrub layer. The herbaceous layer was intermittent to well-developed and was generally dominated by nonnative annual graminoids including soft chess, ripgut brome, red brome, and cheatgrass, wild tarragon, tall tumble mustard (*Sisymbrium altissimum*), and short-podded mustard (*Hirschfeldia incana*).

No special-status plants have been observed at the Mitigation Property. Several plant species, however, have been observed within a 5-mile radius of the Mitigation Property (CNDDB 2017).

3.5 Invasive Plant Species

Invasive plant species within the vicinity of the Mitigation Site are currently being monitored and managed as part of the management of the overall Bank. A Biological Resources Inventory (BRI) for the entire Bank was conducted throughout January and February of 2013, in which forty-six plant species considered invasive by the California Invasive Plant Council (Cal-IPC) were present within the overall Bank (Cal-IPC, 2006). Of these, two species occur within the Mitigation Site (Table 3) and two others located in areas surrounding the mitigation site and have potential to become established at the site after wetland establishment (Table 4).

Table 3 Invasive Plant Species within the Mitigation Site

Species	Cal-IPC Rating
Lens-podded hoary cress ***Lepidium chalipens***	Moderate
Non-native annual grasses	Limited to High

Table 4 Invasive plant species within adjacent areas

Species	Cal-IPC Rating
Bull thistle ***Cirsium vulgare***	Moderate
White top ***Melilotus albus***	Moderate

Invasive species pose risks to natural habitats through their ability to alter the fire regime and intensity, contribute to erosion, alter soil moisture regimes, and compete with native plant species, particularly in disturbed habitats. The Mitigation Site will be monitored for invasive weeds rated "High" by Cal-IPC. If found, the species will be mapped and treated as soon as possible, based on the appropriate timing and phenology of the invasive species. Dense populations of invasives that are not rated "High" may also be treated, if determined necessary to ensure performance standards are met.

3.5 Wildlife

3.5.1 Special Status Wildlife.

No special-status wildlife species have been observed at the Mitigation Site. Pronghorn, presumably from the reintroduced population at Tejon Ranch, were observed in the Mitigation Site in 2017, and several other special status wildlife species have been observed within the Bank, including tricolored blackbird, western pond turtle, and Swainson's hawk.

3.6 Wetlands and Waters of the U.S.

In 2013, WRA performed a wetland delineation for the entire Bank property (WRA 2013). Eleven wetland units and 1 open water unit fall within the Mitigation Site totaling 17.41 acres, the delineation was included in Exhibit I of the BEI. Considerable portions of the perennial wetland vegetation and waters found during the 2013 delineation were supported by artificial irrigation and have since dried to more seasonal habitats once irrigation stopped.

3.7 Historic and Current Land Use

Historically, the primary land uses within the Petersen Ranch Bank Property have been cattle ranching, hay farming and hunting. Evidence of past uses still remain, including numerous buildings, dirt roads, wire fencing, ponds, and water tanks. A review of historic aerial photographs from 1948 indicate early land uses included wide-spread manipulation of natural habitats through clearing brush to create and maintain open pasture and hay fields, alteration of natural drainages to create ponds or to redirect flows, and the pumping of water to irrigate fields and fill constructed ponds (WRA 2013). The lasting effects of these land use practices can still be observed on the Property, however many of these practices have been reduced considerably compared to past uses.

4.0 MITIGATION WORK PLAN

4.1 Responsible Parties

The following parties are responsible for implementing this HMMP and maintaining the Mitigation Site in perpetuity.

Mitigation Implementing Entity

The Sponsor of the Bank, and the party responsible for implementing this HMMP is Land Veritas Corp. Land Veritas Corp., and their designees, will be responsible for implementing the Mitigation Work Plan, Interim Management, Performance Monitoring, and Reporting during the Performance Monitoring Period.

Land Veritas Corp.
1001 Bridgeway #246
Sausalito, CA 94965
(415) 729-3734
Contact: Tracey Brownfield
tracey@landveritas.com

Mitigation Site Property Owner/Land Manager

LV-BP Investors Ranch, LLC (Property Owner) owns the Mitigation Site and all mineral and water rights associated with the Mitigation Site (Appendices B and C). The Property Owner will be Responsible for implementing long-term management, maintenance and monitoring of the Mitigation Site to preserve its habitat and conservation values in perpetuity.

LV-BP Investors Ranch, LLC
1001 Bridgeway #246
Sausalito, CA 94965
(415) 729-3734
Contact: Tracey Brownfield
tracey@landveritas.com

Lead Consultant

WRA, Inc. has conducted all biological field studies, wetland delineations and restoration planning work for the Mitigation Site and has authored this HMMP. WRA, or another qualified entity, will assist Land Veritas Corp. and the Property Owner during the implementation, monitoring and management of the Mitigation Site.

WRA, Inc.
2169-G East Francisco Blvd.
San Rafael, CA 94901
Contact: Nathan Bello
Phone: (415) 524-7238
Email: bello@wra-ca.com

4.2 Description of Mitigation Site

The Mitigation Site is entirely located within Area D of the Bank. The sag pond in its center is the crucial feature of the Mitigation Site and will be the aquatic resource supporting the planned mitigation activities. The sag pond lies within the aforementioned rift valley and is one of a series of wetlands, sag ponds, and aquatic resources running along it. Lake Elizabeth Road lies to the south, and unpaved access roads controlled by the Property Owner provide access to the Mitigation Site along its northern, southern, and western borders. The Mitigation Site drains from the pond down slope to the south toward Elizabeth Lake Road.

4.3 Planned Mitigation Activities

The Project will involve installing cattle exclusion fencing, removing and managing invasive plant species, planting mulefat and willow, and supplementing hydrology when necessary to sustain the new habitat area, as well as guaranteeing the long-term legal protection of the Mitigation Site with a conservation easement. These activities are depicted in Figure 4.

4.3.1 Preservation Areas

Two distinct areas, located in the northeast and southwest of the Mitigation Site, will be preserved via recordation of a conservation easement. These two preservation areas are dominated by California buckwheat in the northeast, and big sagebrush, thick leafed yerba santa, and California buckwheat in the southwest. In total, 6.60 acres will be preserved. These areas are located on alluvial fans and ephemeral drainages that receive periodic sediment and surface flows and support high quality habitat for xeric riparian communities.

4.3.2 Planting Areas

Planting areas are within and immediately surrounding areas that currently support sparse or scattered stands of mulefat, willow and other riparian species. These areas will be planted with mulefat and willow live stakes to achieve 500-stems per acre average density, similar to existing high density mulefat and willow stands within the Mitigation Site. Initial planting will use a clustered approach that will create large patches of dense cover relatively quickly, with open spaces between clusters. Over time, spaces between clusters are anticipated to fill in to achieve near total cover of mulefat and willow.

Wildlife friendly cattle exclusion fencing will be constructed to keep livestock out of the wetland and riparian areas. Wildlife friendly fencing is designed to allow safe passage of deer, pronghorn, coyote and other medium to large mammals while excluding cattle. These actions will occur in and around the sag pond as well as the southern slope and will create 6.36 acres of additional 1600 habitat, restore 19.25 acres of existing 1600 habitat, and enhance 17.41 acres of existing 404 habitat. In addition, the proposed restoration actions also change some 404 buffer types from upland buffer to riparian buffer resulting in 8.19 acres of enhanced riparian buffer. The total amount of mitigation generated for each of these categories is discussed further in Section 5.0.

The habitat improvements yielded by the proposed restoration actions has the potential to also provide high quality habitat for several special status wildlife species, including California Red Legged Frog (*Rana draytonii)*, Least Bell's Vireo (*Vireo bellii pusillus*), Tricolored Blackbird (*Agelaius tricolor*), Western Pond Turtle (*Actinemys marmorata)*, Southwestern Willow Flycatcher (*Empidonax traillii extimus*), and Pronghorn Antelope (*Antilocapra americana*). The more dependable water source provided by the supplemental irrigation could provide an attractant for these species, especially during the dry summer months.

4.4 Implementation Schedule

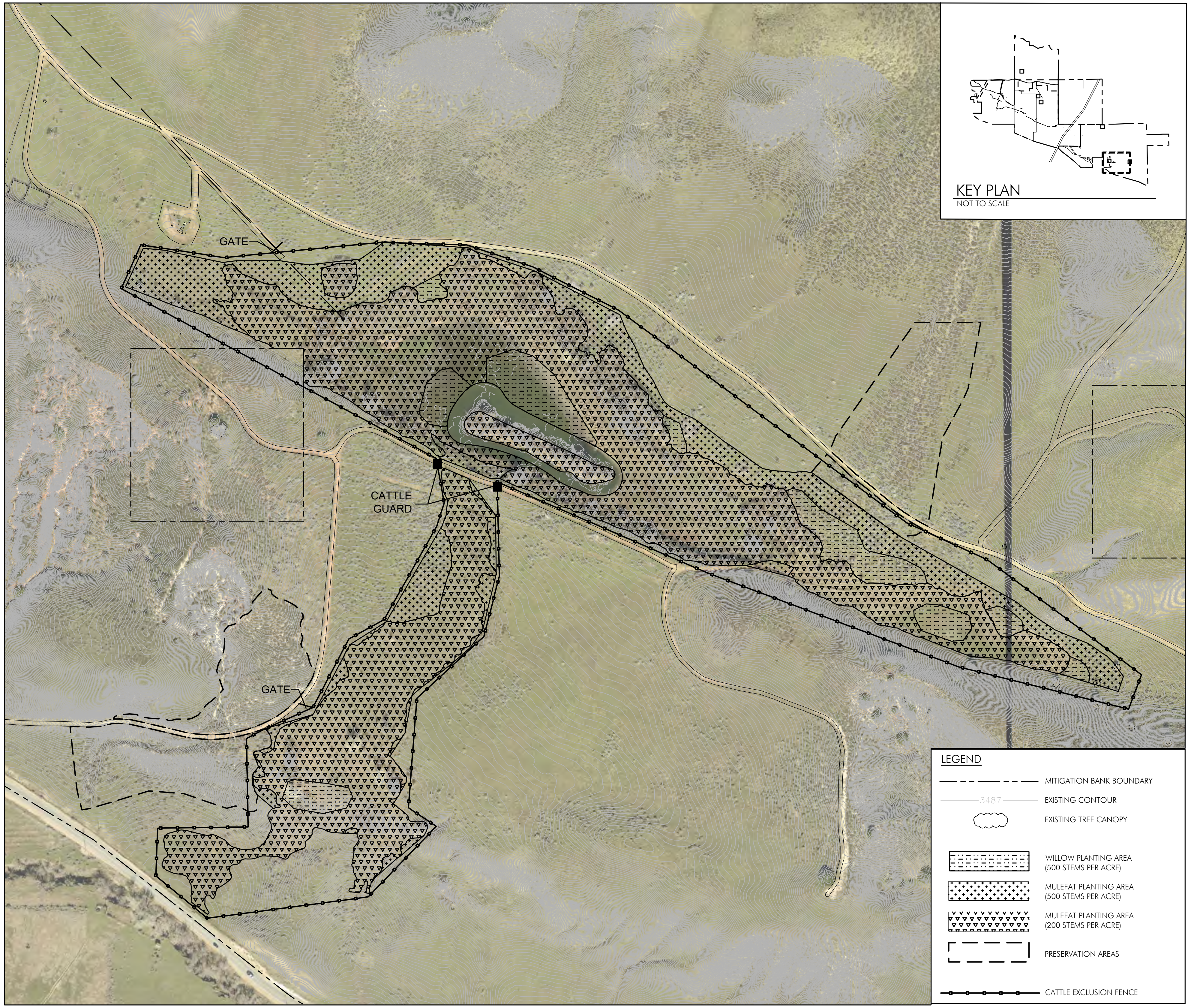
Cattle exclusion fencing and the irrigation system installation will commence immediately pending agency approval of this HMMP. Willow and mulefat pole cuttings will be harvested and planted between the fall of 2018 and spring of 2019.

4.5 Site Preparation

No earthwork is being proposed as part of the Project. Cattle exclusion fencing will be constructed first around the planting areas to prevent livestock from interfering with site construction while preventing further grazing pressure on riparian plants. Wetlands and riparian zones, including the Area D Pond, are particularly sensitive to deleterious effects of cattle grazing due to nutrient inputs, sedimentation, erosion, and over utilization of riparian vegetation during the summer months. The high amounts of nutrients can lead to detrimental algal and bacterial blooms. Installing cattle exclusion fencing would create grazing setbacks around the Area D Pond, encouraging the development of vegetated buffer strips while protecting the pond from potential dangers associated with eutrophication, sedimentation, nutrient deposition, and fecal bacteria. Vegetated buffer strips comprised of just five meters (16.4 feet) of herbaceous vegetation and one meter (3.3 feet) of woody vegetation have been shown to significantly reduce nitrogen pollution to streams and wetlands through uptake in aboveground plant biomass (Borin and Bigon 2002). Five-meter grass buffer strips have been shown to reduce fecal bacteria pollution (Tate et al. 2004, Tate et al. 2006). In this way, removing cattle from the Area D Pond will allow growth of dense wetland and riparian vegetation, decrease nutrient loads from cattle manure, and increase filtering of nutrients from the water column within the fenced area.

Light to medium construction equipment might be used to bring materials onsite and aid in construction of the fencing. Wildlife friendly cattle exclusion fencing will be constructed using a combination of barbed and smooth wire, with smooth wires located on the bottom to avoid injuring wildlife traveling under the fence. Wire spacing, and fence height specifications are included in Figure 4.

The irrigation system will be installed following completion of the cattle exclusion fencing and will be tested prior to planting. Prior to planting the irrigation system may be run to help aid in conducting grow-kill cycles of invasive species prior to planting. Invasive species within the planting areas will be mowed, sprayed or hand pulled prior to planting.



PLANTING AND FENCING PLAN

SCALE: 1 " = 300 '

MULEFAT AREA PLANT SCHEDULE (500 STEMS / ACRE)

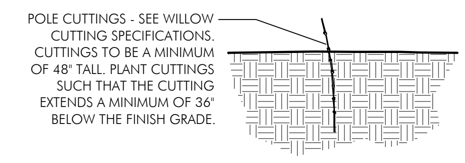
BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	QUANTITY
BACCHARIS SALICIFOLIA	MULEFAT	4' LIVE STAKE	2,749

WILLOW AREA PLANT SCHEDULE (500 STEMS / ACRE)

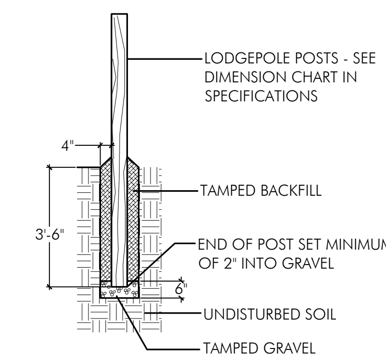
BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	QUANTITY
SALIX LAEVIGATA	RED WILLOW	4' LIVE STAKE	628
SALIX LASIOLEPIS	ARROYO WILLOW	4' LIVE STAKE	628

MULEFAT AREA PLANT SCHEDULE (200 STEMS / ACRE)

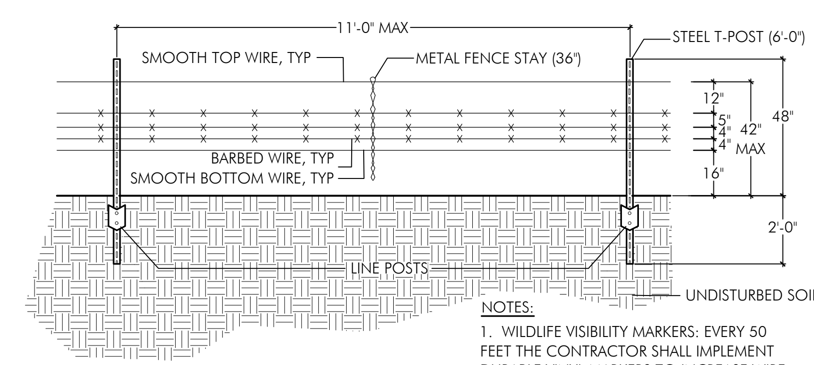
BOTANICAL NAME	COMMON NAME	CONTAINER SIZE	QUANTITY
BACCHARIS SALICIFOLIA	MULEFAT	4' LIVE STAKE	3,421



1 POLE CUTTING DETAIL
NOT TO SCALE



3 BRACE POST INSTALLATION
NOT TO SCALE



NOTES:

1. WILDLIFE VISIBILITY MARKERS: EVERY 50 FEET THE CONTRACTOR SHALL IMPLEMENT DURABLE VINYL MARKERS TO INCREASE WIRE VISIBILITY.

2 FENCE LINE SECTION
NOT TO SCALE

wra
ENVIRONMENTAL CONSULTANTS
2169-G East Francisco Blvd.
San Rafael, CA 94901
(415) 454-8868 Phone
(415) 454-0129 Fax

WRA JOB #21065
DATE: 8/2/2018
DESIGNED BY: RBB/RFP
DRAWN BY: RFP
CHECKED BY: RBB

NO.	DATE	BY	REVISIONS

PETERSEN RANCH MITIGATION BANK

LEONA VALLEY, LOS ANGLES COUNTY CA

FIGURE 4: DEVIL'S GATE OFFSITE MITIGATION PLAN

Sheet 1 Of 1
Scale: as shown

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4.6 Planting Plan

Live stake mulefat and willow plantings will be installed throughout the planting areas using a clustered spacing approach to create dense patches large enough to encourage immediate use by wildlife. Plantings will take place between fall and spring, timed with rainfall and temperatures, to improve plant survivorship. All plantings will be live pole cuttings harvested from plants within the Bank Property to preserve local genetics. Willow plantings will be focused in the wettest portion of the Mitigation Site, primarily around the sag pond, and in a few other locations where groundwater seeps are sufficient to support the species. Mulefat plantings will be more widespread throughout the Mitigation Site. Live stakes will be approximately 5 feet long, with a minimum diameter of approximately 1 inch, and will be planted to a depth of 3 feet beneath the ground surface.

4.7 Water Sources

The sag pond within the Mitigation Site will be filled naturally by a combination of direct precipitation and surface water run-off. Much of the Mitigation Site is anticipated to be supported by the natural hydrology of the pond and shallow subsurface groundwater. Supplemental irrigation will be provided via an existing pipeline and pump system owned by the Bank Sponsor. The water delivered to the planting areas can be sourced from untreated water from the Lake Elizabeth Municipal Water Company, or through wells located within the Bank.

4.8 Invasive Species Management and Considerations

Invasive species pose risks to natural habitats through their ability to alter the fire regime and intensity, contribute to erosion, alter soil moisture regimes, and compete with native plant species, particularly in disturbed habitats. Initial weed eradication efforts will include targeted grow kill cycles, and control of any non-grass invasive species present within the planting areas (including CAL-IPC moderate and limited species). Following initial control efforts, invasive species will be monitored and managed throughout the restoration and creation areas as soon as possible, based on the appropriate timing and phenology of the invasive species. Plants rated 'high' by Cal-IPC, with the exception of invasive grasses, will be managed so as to not allow the species to invade the planting and preservation areas. Dense populations of invasive species that are not rated "High" may also be treated, if determined necessary to ensure performance standards are met.

4.9 Work Plan Expenses

Table 5: HMMP Implementation Expenses

CONSTRUCTION & IMPLEMENTATION	Cost
Fencing Costs 9,268 LF @ $4.50/LF	$41,706
Weeding and Site Preparation (5 laborers for 2 months)	$40,000
Material Sourcing and Planting 8,000 live stakes	$48,000
Irrigation install	$171,322
Total	$301,028

Table 6: HMMP Monitoring and Maintenance Expenses

OPERATIONS & MAINTENANCE	Cost
Reporting/Monitoring for 5 years	$60,000
Irrigation for 3 years	$74,340
Maintenance and Invasive Species Control	$15,000
Total	$149,340

4.10 Avoidance Measures

While the proposed work is not anticipated to result in any deleterious impacts to the Mitigation Site's habitats and wildlife, the following avoidance and minimization measures will be implemented:

- Live stake harvesting, and planting are planned to be conducted between fall 2018 and spring 2019, outside of the nesting bird season. Should harvesting and planting activities occur during the nesting bird season, pre-construction surveys will be conducted to ensure no impacts to nesting birds occur within 50 feet of planting activities.
- Live stake harvesting will be limited to no more than 10% of the total number of stems of each host plant.
- No riparian or wetland vegetation will be removed, other than live stakes harvested for implementation of this HMMP.

5.0 COMPENSATORY MITIGATION

5.1 Corps and RWQCB Mitigation

The Bank's Development Plan originally planned to preserve and/or enhance certain habitats within Area D. Enhancement, per the Development Plan was earned based on exclusion of cattle and management of invasive species. In this mitigation proposal, cattle exclusion will occur over a larger area and additional enhancement measures will occur including planting of willow and mulefat. Despite the increased functions being proposed, the project team is continuing to call this mitigation enhancement due to the fact that supplemental hydrology may be required for some planting areas into the long-term. As written in the USACE 2008 Mitigation Rule (33 CFR 332), enhancement is defined as the following:

> *"Enhancement means the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area."*

Preservation will occur in alluvial scrub areas consisting of Parish's sagebrush, thick-leaved yerba santa, and California buckwheat scrub.

5.1.1 Habitats Improved

Wetland Riparian Habitat*:* Following implementation of planting efforts, all of the jurisdictional habitats will be classified as Wetland Riparian Habitat. Wetland riparian habitat contains an understory of wetland plants and a canopy of woody, riparian shrub and tree species. Vegetation will typically be comprised of Mexican rush, mulefat, and willows, although it may include cottonwood, elderberry, and stretchberry.

Resource Buffers: The project will also enhance riparian and upland buffers located adjacent to the wetland riparian areas described above. Riparian buffers will consist of similar riparian species, but lack hydrology to be considered wetland, and upland buffers consist of upland species. Through planting, more of the upland areas surrounding the existing wetland habitats will be converted to Riparian Buffers. As defined in the Final Mitigation Rule (33 CFR 332.2):

> "*'Buffer' means an upland, wetland, and/or riparian area that protects and/or enhances aquatic resource functions associated with wetlands, rivers, streams, lakes, marine, and estuarine systems from disturbances associated with adjacent land uses."*

Because anthropogenic stressors usually originate outside of the aquatic resources in the surrounding landscape or watershed, buffers are key components in intercepting and eliminating these stressors (CRAM 2013). For example, an unvegetated, highly disturbed upland buffer can result in increased runoff and sediment inputs into aquatic resources causing erosion, down cutting and sediment deposition that adversely affects downslope streams or wetlands. Whereas buffers that contain a large amount of biodiversity and differing age classes of native plants will stabilize the soil, filter pollutants, act as barriers to destructive uses, reduce the risk of invasion from non-native species, and help to maintain the overall functionality of streams or wetlands. Additionally, buffers near aquatic resources provide valuable nesting and forage habitat for birds and wildlife (CRAM 2013). In addition to reducing or eliminating external stressors that may affect aquatic resources, some of the functions and services that are often associated with aquatic resources are actually provided by aquatic resource buffers. The services provided directly by intact buffers include short-term water storage, moderation of subsurface flows and discharge, cycling of nutrients, filtration of pollutants, and maintenance of plant and wildlife communities (CRAM 2013).

5.1.2 Amount of Compensatory Mitigation and Proposed Mitigation Ratios

Implementation of this HMMP will result in 17.41 acres of Wetland Riparian Enhancement, 8.19 acres of Riparian Buffer Enhancement, 3.06 acres of Riparian Buffer Preservation, and 3.54 acres of upland buffer preservation. These mitigation types are depicted on Figure 5.

Exhibit C-1 ("Development Plan") of the Bank Enabling Instrument ("BEI") for the Bank, as approved by the IRT, states that Area D planned to generate 5.23 "Uniform Re-establishment" Credits and 9.34 Preservation Credits through the preservation and enhancement of wetland riparian, open water, seasonal wetland, and non-wetland riparian habitats and their associated upland and/or riparian buffers.

If using the same crediting methodology as approved for the Bank the proposed plantings, cattle exclusion and site protection in this mitigation proposal would generate 5.99 "Uniform Re-establishment" Credits by expanding the amount of land excluded from cattle grazing and through the enhancement of the wetland riparian, seasonal wetland, and open water habitats present within the Mitigation Site. This proposal would also generate 3.06 acres of riparian buffer preservation and 3.54 acres of upland buffer preservation. The process, justification, and results of this crediting are detailed below.

"Uniform Re-establishment Credit" is used in the context of the Bank to represent the functional lift provided by one acre of aquatic resource Establishment that is equal in quality to the highest quality aquatic resource in the watershed. The methods for generating, and the use of, "Uniform Re-establishment" Credits were approved by the Corps in the Petersen Ranch Mitigation Bank BEI (2016).

Uniform Re-establishment Credits are generated through enhancement of the aquatic resources and their buffers. Each of these mitigation types are expected to generate a certain amount of functional lift. This functional uplift was determined based on an analysis of the expected change of California Rapid Assessment Method (CRAM) scores. Based on the expected lift of each of the mitigation types, a crediting ratio is applied to calculate the number of Waters of the U.S. "Uniform Re-establishment Credits" awarded for each mitigation type. The following ratios were used by the IRT to determine the number of potential uniform re-establishment credits resulting from the different mitigation types at the Bank. Preservation credits are not converted to Uniform Re-establishment Credits.

Table 7: Crediting Ratios from Petersen Ranch Mitigation Bank

Mitigation Type	Functional Uplift (compared to reference score)	Credit Ratio
Enhancement	6%	1:4
Riparian Buffer Enhancement	11%	1:5

Proposed Mitigation Ratios

Based on the anticipated functional increases resulting from the above enhancement actions compared to the anticipated functional losses at the Devil's Gate Dam reservoir, we prepared draft mitigation ratio setting checklists for this mitigation proposal (Appendix B). The ratios obtained from the checklist are consistent with those used for the Bank Uniform Re-establishment credits. Based on the checklists we propose use of the following mitigation ratios for the proposed mitigation types, which would off-set 6.51 acres of impact.

Table 8: Proposed Mitigation Acreages and Ratios for the Devil's Gate Off-site HMMP

404 Mitigation Types	Acres	Mitigation Ratio	Mitigable Acreage
Wetland Riparian Enhancement	17.41	4:1	4.35
Riparian Buffer Enhancement	8.19	5:1	1.64
Riparian Buffer Preservation	3.06	11:1	0.28
Upland Buffer Preservation	3.54	14:1	0.25
Total	**32.20**		**6.51**

5.2 CDFW Compensatory Mitigation

The proposed mitigation actions discussed above will result in the creation of 6.36 acres of new streambed habitat consisting of a matrix of mulefat and willow dominated communities. An additional 19.25 acres of existing streambed habitat will be restored as a result of implementation of this HMMP. These restored habitats will be converted from existing degraded wetland and riparian habitats with very little cover of willow or mulefat, into dense intact stands of riparian scrub. When mature, these habitats will provide nearly continuous canopy of mulefat and willow scrub canopy with scattered openings and riparian trees such as red willows and cottonwoods. These activities combined will result in 25.60 acres of new willow and mulefat dominated riparian habitats within the Mitigation Site. These mitigation areas are depicted in Figure 6.

Additionally, 6.60 acres of alluvial scrub habitat will be preserved on the alluvial fan that feeds into Pond D, and in the ephemeral drainage on the west side of the Mitigation Site. These alluvial scrub habitats provide high quality native cover of California buckwheat, thick leaf yerba santa and the locally rare Parish's sagebrush.

Table 9: CDFW Compensatory Mitigation Acreage for the Devil's Gate Off-site HMMP

Mitigation Type	Acres
Mulefat/Willow Scrub Creation	6.36
Mulefat/Willow Scrub Restoration	19.25
Sub-Total Mulefat/Willow	**25.61**
Alluvial Scrub Preservation	6.60
Total Mitigation Acreage	**32.21***

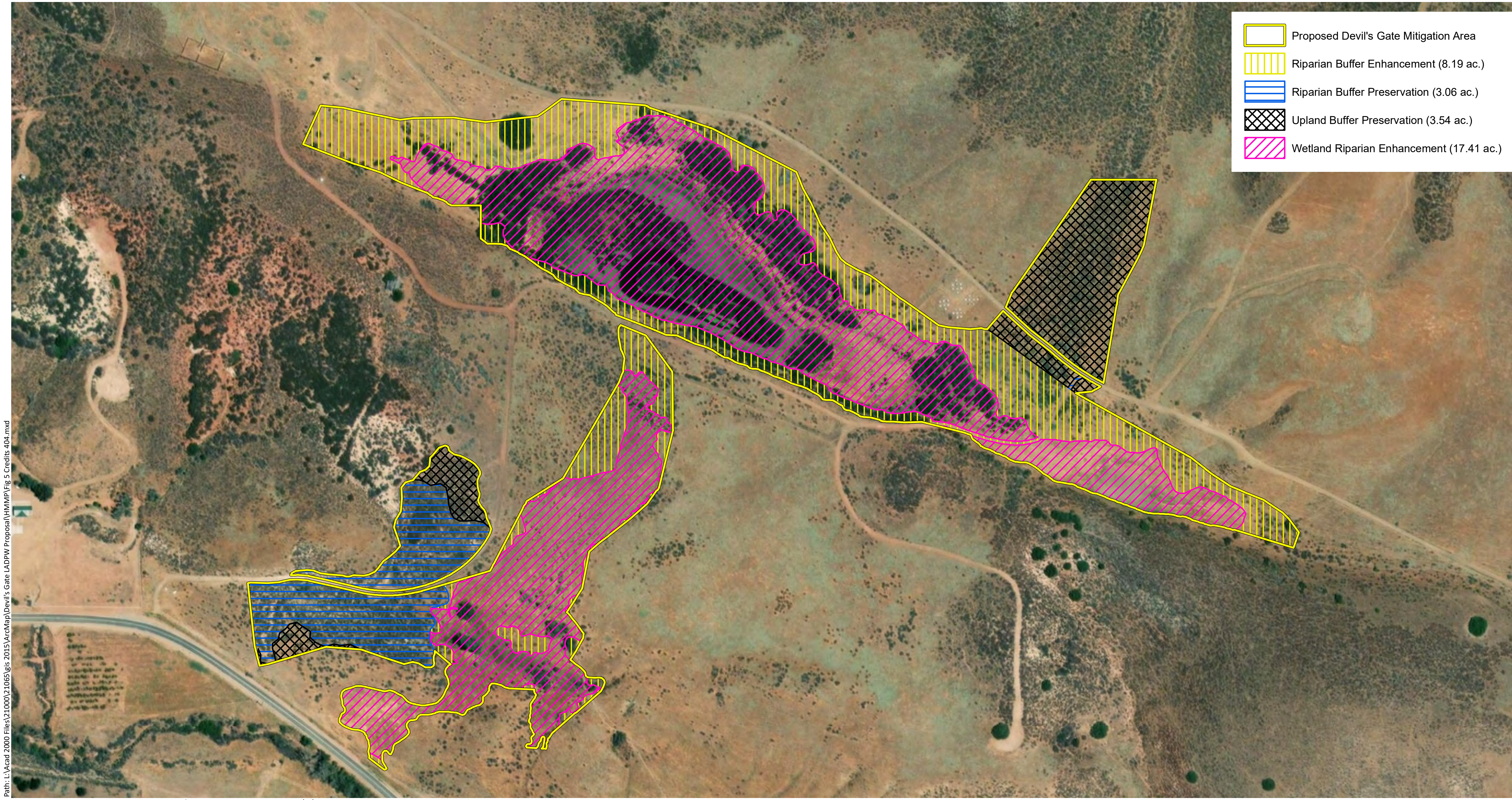
*summing discrepancy with Table 2 due to rounding

6.0 SITE PROTECTION INSTRUMENT

Upon completion of restoration activities and the preparation of the as-built documentation, a conservation easement will be recorded over the Mitigation Site ensuring that the conservation values of the site are protected in perpetuity.

The Southwestern Resource Management Association (SRMA) holds the existing conservation easements and endowment for the protected acreage of the Bank and has agreed to hold the conservation easement and endowment for this Mitigation Site. SRMA will be responsible for conducting easement compliance monitoring and reporting, and for administering the endowment fund to pay for long-term management of the Mitigation Site.

Southwestern Resource Management Association
4500 Glenwood Drive
Riverside, CA 92501
Contact: Shelli Lamb
Email: lambsrma@gmail.com



Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: czumwalt, 8/2/2018

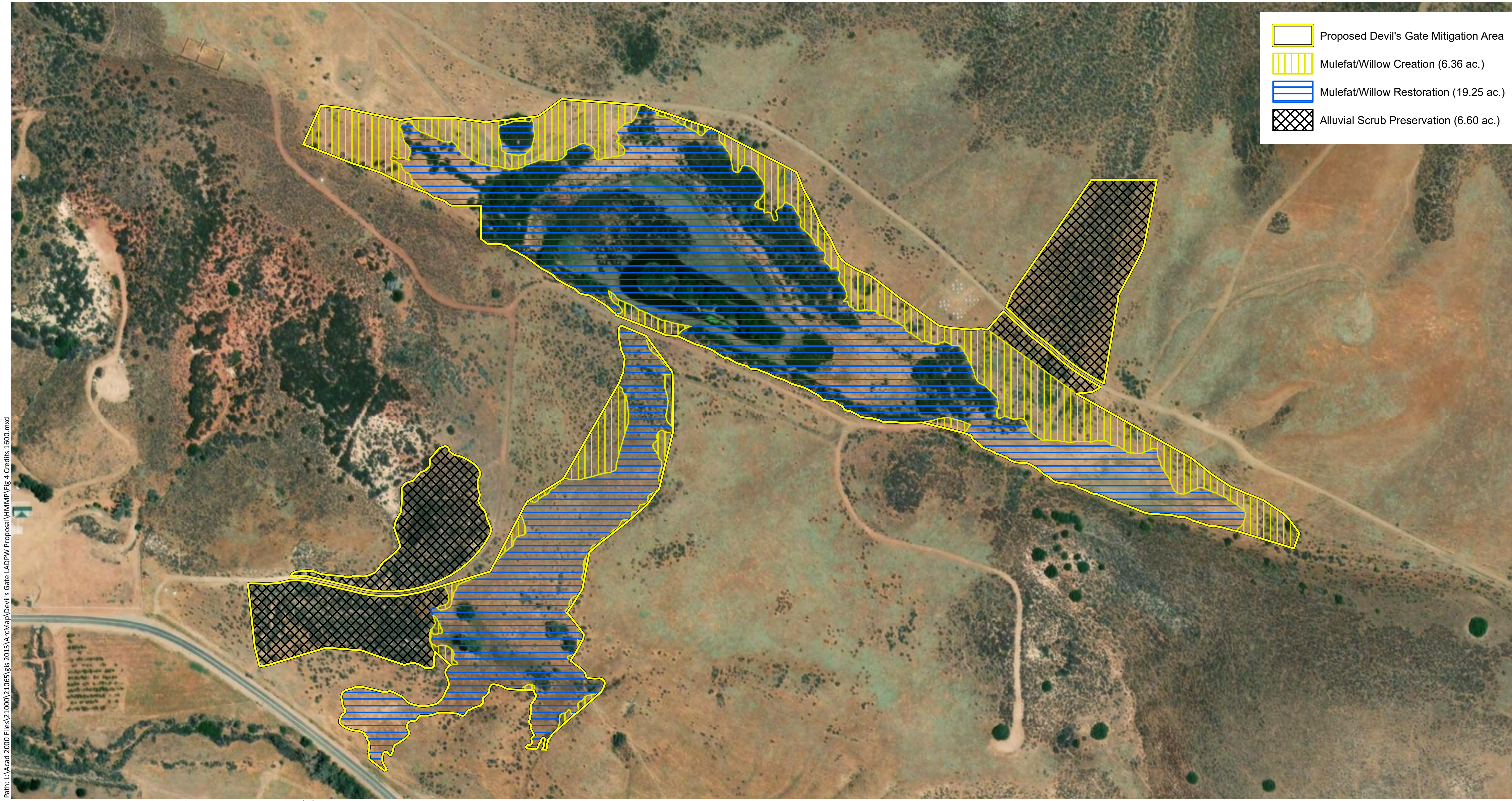
Figure 5. 404 Mitigation Types

Petersen Ranch Mitigation Bank
Los Angeles County, California

0 245 490 Feet

N

wra
ENVIRONMENTAL CONSULTANTS



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Sources: 2016 DigitalGlobe Aerial, WRA | Prepared By: czumwalt, 8/2/2018

Figure 6. 1600 Mitigation Types

Petersen Ranch Mitigation Bank
Los Angeles County, California

0 245 490 Feet

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wra ENVIRONMENTAL CONSULTANTS

7.0 MAINTENANCE PLAN

The purpose of the maintenance program is to help ensure success of riparian vegetation habitat being created and enhanced. Site maintenance will continue for the length of the five-year monitoring period or until the site meets the approval of the RWQCB, CDFW, and USACE.

7.1 Maintenance activities

Maintenance activities during a five-year plant establishment period in the created and enhanced riparian areas will include:

1. Erosion control and repair on slopes, should an extreme storm event occur.
2. Inspections for colonization of non-native plants and actions to control them
3. Inspections of wildlife friendly cattle exclusion fencing to ensure no grazing inside the Mitigation Site occurs and actions to repair the fence as needed
4. Adjustment to water augmentation methods to ensure proper hydrologic conditions for plant establishment

These conditions will be checked multiple times per year and if deficiencies are noted, they will be assessed, documented, and remedied as quickly as necessary to prevent further damage.

7.2 Responsible parties

The Bank Sponsor, and its assigns or successors, are responsible for all maintenance activities at the Mitigation Site.

8.0 MONITORING AND PERFORMANCE STANDARDS

Monitoring will be performed in order to determine whether the Mitigation Area has achieved the proposed success criteria. Monitoring will be conducted in the summer of each year. Survival and percent cover of all planted willows and mulefat plants within the Mitigation Site will be assessed using quadrats randomly spaced along four permanent 50-meter transects. Target invasive plants will be mapped annually and treated on an as-needed basis. Success will be evaluated based on achieving the target cover of mulefat and willow plants presented in this Plan.

8.1 Planting Areas Success Criteria

Success criteria for woody plants installed in the planting areas will be based on survival rates and relative cover assessed by visual observation during the five-year monitoring period. Absolute cover of mulefat and/or willow will be recorded in planting areas. The criteria that will be used to determine the success of the Mitigation Area are shown in Table 10.

Table 10. Performance Standards for Planting Areas

Performance Standard	Monitoring Year					Monitoring Frequency
	1	2	3	4	5	
By year 2, the planting areas must contain 10% or more absolute cover of mulefat or willow, or demonstrate 80% survivorship.		x				Annually
By year 3, the planting areas must contain 25% or more absolute cover of mulefat or willow, or demonstrate 80% survivorship			x			Annually
By year 4, planting areas must contain 40% or more absolute cover of mulefat or willow.				x		Annually
By year 5, planting areas must contain 68% or more absolute cover of mulefat or willow					x	Annually
Percent cover of CAL-IPC rated high broad leaved invasive plant species must cover no more than 10% absolute cover of the Mitigation Site.		X	X	X	X	Annually

8.2 Target Functions and Values

This proposed project will improve the chemical and biological functions provided by the aquatic resources within the Mitigation Site. Successful planting of the Mitigation Site will improve habitat quality for native wildlife, increase diversity and cover of native vegetation, improve nutrient cycling and removal of elements and compounds, and improve carbon export to downstream waterbodies. The increased biomass will uptake and store more nutrients, and the stands of dense woody vegetation will help to stabilize soils and trap particulates.

8.3 Target Jurisdictional and non-jurisdictional acreage

Implementation of this HMMP is not anticipated to increase the acreage of USACE jurisdictional features, however it will convert upland buffer areas to riparian buffers, and it will improve the habitat and chemical functions of the existing resources. The Planting efforts will increase acreage of CDFW jurisdiction by 6.36 acres.

8.4 Monitoring Schedule

Monitoring will be conducted annually for five years to demonstrate success of the mitigation plantings. Monitoring will be conducted in spring or early summer, and will be timed to precede the blooming periods of target weed species, so that any necessary control measures can be implemented prior to the invasive species setting seed.

8.5 Annual Reports

Annual reports discussing monitoring methodology and results will be submitted to RWQCB, CDFW, and USACE. These reports will assess the progress in meeting performance standards and identify any problems identified within the Mitigation Site. If necessary, recommendations to improve success in achieving performance standards will be made. A final report describing the performance of the mitigation in meeting the performance standards, and the success of any necessary corrective measures, will be prepared and submitted to applicable agencies in the final year of monitoring (Year 5). Mitigation site monitoring and reports will be conducted and prepared by a qualified biologist with experience in mitigation monitoring.

The first monitoring report shall be delivered to the RWQCB, CFDW, and USACE one full year after planting, by January 31st. Subsequent reports will be submitted annually by January 31st thereafter for the five year period commencing with planting, unless otherwise agreed by RWQCB, CDFW, and USACE.

9.0 LONG-TERM MANAGEMENT

An approved Long-Term Management Plan (Appendix C) was prepared for the Bank (Exhibit D-5 of the BEI) and clearly outlines management objectives and timelines for the Bank Property, including the Mitigation Site. This Mitigation Site will be monitored and managed in accordance with the approved Long-term Management Plan (LTMP) for the Bank.

9.1 Responsibility

Implementation of the LTMP will be the responsibility of the fee title owner of the Mitigation Site, and their successors and assignees (Land Manager). The Land Manager will be responsible to monitor and manage the Mitigation Property during the Long-term Management Period to preserve its habitat and conservation values in accordance with the Mitigation and Monitoring Plan.

9.2 Long-term Management Period

The Land Manager is required to conduct maintenance, management, and monitoring activities in accordance with the LTMP beginning when all Performance Standards have been met. Activities covered by the LTMP include changing grazing practices, monitoring restoration sites for degrading conditions and invasive species, fence and irrigation maintenance, trash removal, and other tasks as necessary. These tasks will continue in perpetuity.

9.3 Supplemental Irrigation

In addition to the monitoring and management activities covered under the LTMP, supplemental irrigation may be needed on an ongoing basis to support a healthy riparian system in the Mitigation Site. Drought, climate change and other factors may cause periodic decline in canopy health of planted riparian species, to adapt to these conditions a water delivery and irrigation system will be maintained to provide supplemental irrigation to the Mitigation Site on an as-needed basis. This system will require coordination from the Land Manager as well as periodic maintenance, operation, and replacement of components.

9.4 Reporting

The Land Manager will provide an annual report on all management tasks conducted and synthesize the general site conditions Easement Holder, and the regulatory agencies as outlined in the LTMP. This annual report will include photo-documentation of site conditions, as well as general photographs to document changes in habitat characteristics and quality. Land Manager will provide recommendations with regard to (1) any habitat enhancement measures deemed to be warranted, (2) any problems that need near short and long-term attention (e.g., weed removal, fence repair, erosion control), and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date. The annual report will be completed and circulated to the regulatory and other parties by late January of each year.

9.5 Funding

The approved Endowment Fund Analysis and Schedule (Appendix D) for the Bank summarizes the anticipated costs of long-term management and easement compliance for each area of the Bank as outlined in the LTMP. These costs include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, weed mowing, trash removal, fence repair, and a prorated calculation of funding needed to fully replace the fences. The Bank Sponsor will fully fund the $382,317 endowment for Area D prior to meeting the final Project performance standards

In addition to the approved endowment amount for area D to cover implementation of the LTMP and Conservation Easement compliance costs, additional funds will be required to support the potential ongoing supplemental irrigation as discussed in section 8.3. An endowment analysis to cover the costs associated with operating, maintaining and replacing the irrigation system is included in Appendix C. This portion of the endowment, $494,170, will be funded concurrently with the Area D endowment. The total endowment funded to manage and monitor Area D, including the Mitigation Site, will be $876,487.

Southern Resource Management Association (SRMA) shall hold the Endowment Fund in accordance with the Endowment Agreement (Exhibit D-2, of the BEI). The interest monies from the Endowment Fund will fund the long-term management activities on the Mitigation Property in a manner consistent with the LTMP.

Land Manager shall consult with SRMA on a year to year basis to determine the amount of funding available for long-term management activities. Interest monies from the Endowment Fund will remain in the Endowment Fund for the Mitigation Property for long-term management activities and adaptive management actions as detailed in the Endowment Agreement.

9.6 Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Land Manager and the regulatory agencies shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the regulatory agencies and as authorized by the regulatory agencies in writing.

10.0 ADAPTIVE MANAGEMENT

Adaptive management means an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the regulatory agencies in discussion with the Land Manager. Adaptive management includes those activities necessary to address the effects of climate change, fire, flood, or other natural events, force majeure, etc. Before considering any adaptive management changes to the LTMP, the regulatory agencies will consider whether such actions will help ensure the continued viability of the Mitigation Property's biological resources.

11.0 FINANCIAL ASSURANCE

LACFCD will coordinate a Fund Designation and Credit agreement with CDFW, to provide financial assurances for the Devil's Gate mitigation requirements, including a line item for the offsite mitigation. This fund designation for offsite mitigation includes acquisition and financial assurances, including the construction and performance securities. A construction security in the amount of $151,000, calculated based on 50% of the HMMP implementation costs, will be available until restoration is completed and as-builts are approved by the permitting agencies. A performance security in the amount of $100,000, calculated based on 20% of the incremental Devil's Gate endowment ($494,170 per section 9.5 of this HMMP), will be available from the date as-builts are approved until the final performance standards have been met. This fund designation will provide assurances that this HMMP will be implemented and that the restored habitats meet the performance standards as outlined in section 8.0.

ITEM	Site Preparation and Implementation (50%)
Fencing Costs (9,268 LF @ $4.50/LF)	$ 21,000
Weeding and Site Preparation (5 laborers for 2 months)	$ 20,000
Material Sourcing and Planting (8,000 live stakes)	$ 24,000
Irrigation Install	$ 86,000
Subtotal	$ 151,000

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Appendix A Photo Appendix

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Appendix B Mitigation Ratio Setting Checklist

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Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

#							
1	Date:	Corps File No.:	SPL-2013-NNN	Project Manager:	Bonnie Rogers		
	Impact Site Name:	Wet-1	ORM Resource Type:	Seasonally Flooded		Hydrology:	Reservoir
	Impact Cowardin or HGM type:	Palustrine	Impact area :	6.51	acres	Impact distance:	linear feet

#	Item	Column A	Column B	Column C	Column D
		Mitigation Site Name: DG off-site at PRMB Mitigation Type: Wetland Riparian Enhancement ORM Resource Type: Non-Tidal Wetland Cowardin/HGM type: Palustrine Hydrology: Seasonally Flooded	Mitigation Site Name: DG off-site at PRMB Mitigation Type: Riparian Buffer Enhancement ORM Resource Type: Other Cowardin/HGM type: Riparian Hydrology: Saturated	Mitigation Site Name: DG off-site at PRMB Mitigation Type: Riparian Buffer Preservation ORM Resource Type: Other Cowardin/HGM type: Riparian Hydrology: Saturated	Mitigation Site Name: DG off-site at PRMB Mitigation Type: Upland Buffer Preservation ORM Resource Type: Other Cowardin/HGM type: Uplands Hydrology: dry to seasonal
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see Table	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see Table	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see Table 1	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: : 1.00	Baseline ratio: : 1.00	Baseline ratio: 1.00 : 1.00	Baseline ratio: 1.00 : 1.00
3	**Preservation (Table 2, step E)**	Ratio adjustment:	Ratio adjustment:	Ratio adjustment: 9.0	Ratio adjustment: 11.0
4	**Mitigation site location**:	Ratio adjustment: 1 Mitigation in different watershed than impact site. Similar ecoregion setting. Impact site is within approved tertiary service area for PRMB.	Ratio adjustment: 1 Mitigation in different watershed than impact site. Similar ecoregion setting. Impact site is within approved tertiary service area for PRMB.	Ratio adjustment: 1 Mitigation in different watershed than impact site. Similar ecoregion setting. Impact site is within approved tertiary service area for PRMB.	Ratio adjustment: 1 Mitigation in different watershed than impact site. Similar ecoregion setting. Impact site is within approved tertiary service area for PRMB.
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: 1 Enhancement	Ratio adjustment: 1 Enhancement	Ratio adjustment: 1 Preservation	Ratio adjustment: 1 Preservation
6	**Type conversion:**	Ratio adjustment: -1 The lost values of the impact site are less than those of the mitigation site. The mitigation site provides important, rare willow/mulefat and surface water in the Southern California Mountains Ecoregion.	Ratio adjustment: -1 The lost values of the impact site are less than those of the mitigation site. The mitigation site provides important, rare willow/mulefat and surface water in the Southern California Mountains Ecoregion.	Ratio adjustment: -1 The lost values of the impact site are less than those of the mitigation site. The mitigation site provides important, rare parish's sagebrush alluvial scrub habitat.	Ratio adjustment: 0 The mitigation site provides california buckwheat alluvial scrub habitat. This habitat is not more or less rare than the habitats at the impact site.
7	**Risk and uncertainty**:	Ratio adjustment: 0 Though PRM this work is being provided by an experienced mitigation bank, enhancement credits were to be awarded through cattle exclusion alone, and supplemental planting within existing habitats with existing hydrology offers little to no risk.	Ratio adjustment: 1 Supplemental plantings in riparian buffer areas are somewhat drier and pose a slightly higher risk. PRM +0.1 (conducted by an qualified Mitigation Banki), Long-term use of supplemental irrigation on as-needed basis +0.3, maintenance of irrigation infrastructure +0.3	Ratio adjustment: 0 Preservation with Conservation Easement, no risk.	Ratio adjustment: 0 Preservation with Conservation Easement, no risk.
8	**Temporal loss**:	Ratio adjustment: 3 Planting trees/shrubs in fall /winter 2018	Ratio adjustment: 3 Planting trees/shrubs in fall /winter 2018	Ratio adjustment: 0 PM justification: Preservation prior to or simultaneous to impacts	Ratio adjustment: 0 PM justification: Preservation prior to or simultaneous to impacts
9	**Final mitigation ratio(s)**:	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 4.00 **Final ratio: 4.00 : 1.00** Proposed impact (total): 6.51 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Reservoir Required Mitigation*: 26.040 acres 0.0 linear feet of Resource type: Non-Tidal Wetland Cowardin or HGM: Palustrine Hydrology: Seasonally Flooded Proposed Mitigation**: 17.410 acres linear feet Impact Unmitigated: 33 % 2.16 acres This takes up a portion of the DG-W-2 Wetland Mitigaiton area (total acreage of 2.13). See Additional Checklists for more details	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 5.00 Final ratio: **5.00 : 1.00** Remaining impact: 2.16 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Reservoir Required Mitigation*: 10.79 acres 0.0 linear feet of Resource type: Other Cowardin or HGM: Riparian Hydrology: Saturated Proposed Mitigation**: 8.19 acres linear feet Impact Unmitigated: 24 % 0.52 acres Additional PM comments:	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 10.00 Final ratio: **11.00 : 1.00** Remaining impact (acres): 0.52 acres Remaining impact (linear feet): 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Reservoir Required Mitigation: 5.71 acres 0.0 linear feet of Resource type: Other Cowardin or HGM: Riparian Hydrology: Saturated Proposed Mitigation**: 2.75 acres linear feet Impact Unmitigated: 52 % 0.27 acres Additional PM comments:	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 13.00 Final ratio: **14.00 : 1.00** Remaining impact (acres): 0.27 acres Remaining impact (linear feet): 0 linear feet to Resource type: Reservoir Cowardin or HGM: 6.51 Hydrology: 0 Required Mitigation: 3.77 acres 0.0 linear feet of Resource type: Other Cowardin or HGM: Uplands Hydrology: dry to seasonal Proposed Mitigation**: 3.83 acres linear feet Impact Unmitigated: -2 % 0.00 acres Additional PM comments:
10	**Final compensatory mitigation requirements:**	Final requirement is for			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

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Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	+	0
Subsurface water storage	0	0
Moderation of groundwater flow or discharge	0	0
Dissipation of energy	0	+
Cycling of nutrients	-	++
Removal of elements and compounds	0	+
Retention of particulates	0	+
Export of organic carbon	-	++
Maintenance of plant and animal communities	--	++

Adjustment:	-0.1

PM Justification: The increased cover and biomass of native riparian species, as well as the exclusion of cattle from the wetland habitats at the mitigation site will improve habitat quality, nutrient and carbon cycling as well as reduce downstream elements and compounds. The functions provided by this increase are likely slightly higher than those lost by the DG impacts due to the nature of the DG reservoir.

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	+	0
Subsurface water storage	0	0
Moderation of groundwater flow or discharge	0	0
Dissipation of energy	0	+
Cycling of nutrients	-	+
Removal of elements and compounds	0	+
Retention of particulates	0	+
Export of organic carbon	-	+
Maintenance of plant and animal communities	--	++

Adjustment:	0

PM Justification: The increased cover and biomass of native riparian species, as well as the exclusion of cattle from the riparian buffer habitats at the mitigation site will improve habitat quality, nutrient and carbon cycling as well as reduce downstream elements and compounds. Though nutrient cycling and carbon export will be less than the wetlands due to reduced periods of saturation.

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage	+	0
Subsurface water storage	0	0
Moderation of groundwater flow or discharge	0	0
Dissipation of energy	0	0
Cycling of nutrients	-	0
Removal of elements and compounds	0	0
Retention of particulates	0	0
Export of organic carbon	-	0
Maintenance of plant and animal communities	--	0

Adjustment:	0

PM Justification: Preservation yields no increase in function, by definition. However, preserved habitats are providing habitat, sediment and particulate removal, and dissipation of energy functions.

Function (Column D)	Impact site	Mitigation site
Short- or long-term surface water storage	+	0
Subsurface water storage	0	0
Moderation of groundwater flow or discharge	0	0
Dissipation of energy	0	0
Cycling of nutrients	-	0
Removal of elements and compounds	0	0
Retention of particulates	0	0
Export of organic carbon	-	0
Maintenance of plant and animal communities	--	0

Adjustment:	0

PM Justification: Preservation yields no increase in function, by definition. However, preserved habitats are providing habitat, sediment and particulate removal, and dissipation of energy functions.

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example,
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		NA
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		NA
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):	1:1	Functional loss at DG reservoir is low
B.	Functions adjustment (5, 3, or 1):	3	Intact Riparian Buffer consisting of locally rare Parish's Sagebrush scrub
C.	Threat adjustment (5, 3, or 1):	5	Continued risk of residential and agricultural development
D.	Degree of protection adjustment (5, 3, or 1):	1	Conservation Easement
E. (for step 3)	Total adjustment (add steps B-D):	9	Conservation Easement
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column D)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):	1:1	functional loss at DG reservoir is low
B.	Functions adjustment (5, 3, or 1):	5	Upland Buffer consisting of Alluvial Scrub habitat dominated by California Buckwheat on alluvial fan
C.	Threat adjustment (5, 3, or 1):	5	Continued risk of residential and agricultural development
D.	Degree of protection adjustment (5, 3, or 1):	1	Conservation Easement
E. (for step 3)	Total adjustment (add steps B-D):	11	
Supporting information:			
	Impacted aquatic resource(s):	Resevoir	
	Preserved aquatic resource(s)/site(s):	Riparian Buffers-Parish's Sagebrush Scrub/Alluvial Scrub, Upland Buffers-California Buckwheat Scrub/Alluvial Scrub	
	Threat:	Continued risk of residential and agricultural development in area	
	Protection type:	Conservation Easement	

Appendix C Long-term Management Plan

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Long-term Management Plan

PETERSEN RANCH MITIGATION BANK
LEONA VALLEY, LOS ANGELES COUNTY, CALIFORNIA

Prepared For:
Interagency Review Team

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Date:
March 2016

ENVIRONMENTAL CONSULTANTS

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1.0 INTRODUCTION

1.1 Purpose of Establishment

The Petersen Ranch Mitigation Bank (Bank) was established by the Bank Enabling Instrument (BEI) to compensate for unavoidable impacts to, and to conserve and to protect Waters of the U.S., Waters of the State, covered species and covered habitats. The Bank Properties (Figure 1) are located near Leona Valley, in Los Angeles County, California and consist of the Elizabeth Lake Bank Property (314 acres; Figure 2) and the Petersen Ranch Bank Property (3,789 acres; Figure 3). The BEI Signatory Agencies are the Los Angeles District of the U.S. Army Corps of Engineers ("USACE"), Region 9 of the U.S. Environmental Protection Agency ("EPA"), the Lahontan Regional Boards ("Lahontan RWQCB"), and the California Department of Fish and Wildlife ("CDFW"). These agencies comprise and are referred to jointly as the Interagency Review Team ("IRT"). Terms used in this Long-term Management Plan have the same meaning as defined in the BEI.

After complete implementation of the Development Plan (Exhibit C-1 of the BEI), the Bank Properties will include aquatic resources that are considered waters of the U.S., and/or Waters of the State which have been preserved, enhanced, rehabilitated, re-established, and established as described in the Development Plan. The Bank Properties will also support habitat for covered species including Swainson's hawk (*Buteo swainsoni*) foraging habitat and nesting habitat. In addition, the Bank Properties will support numerous sensitive vegetation communities which are detailed in the Biological Resources Inventory (BRI) reports for each Bank property (WRA 2012a; WRA 2013a).

1.2 Purpose of this Long-term Management Plan

The purpose of this Long-term Management Plan is to ensure the Bank Properties are managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities and tasks to monitor, manage, maintain and report on the Waters of the U.S., Waters of the State, covered species and covered habitat on the Bank Properties. This management plan is a binding and enforceable instrument, implemented by the Conservation Easements (CE) covering the Bank Properties.

The Bank will be established in Phases overtime with each subsequent Phase being incorporated into the Bank through recordation of separate CEs and approval from the IRT, as outlined in the BEI. Initially, the BEI includes the approval and recordation of conservation easements over Area E of the Elizabeth Lake Property (160 Acres) and Area A of the Petersen Ranch Property (1,386 acres), including the previously recorded Southern California Edison (SCE) easement (see Section 3.1.6 below), which will comprise Phase 1. For the purposes of this Long-term Management Plan "Bank Properties" refers to only those Areas for which the CEs have been recorded.

1.3 Land Manager and Responsibilities

The Land Manager will be determined by the Property Owners, LV Lake Elizabeth, LLC (Elizabeth Lake Bank Property) and LV-BP Investors Ranch, LLC (Petersen Ranch Bank Property). The Land Manager, and subsequent Land Managers upon transfer, shall implement this Long-term Management Plan, managing and monitoring the Bank Property in perpetuity to preserve its habitat and conservation values in accordance with the BEI, and the conservation easement. Long-term management tasks shall be funded through the Endowment Fund. The Land Manager shall be responsible for providing an annual report to the IRT detailing the time period covered, an itemized account of the management tasks and total amount expended.

2.0 ELIZABETH LAKE BANK PROPERTY

2.1 Property Description

2.1.1 Setting and Location

The Elizabeth Lake Bank Property is approximately 314 acres, is located adjacent to the Angeles National Forest (ANF) on the western shores of Elizabeth Lake, and is depicted on the United States Geologic Survey (USGS) Lake Hughes 7.5-minute quadrangle (Figure 2). The Elizabeth Lake Bank Property is composed of designated Assessor's Parcel No. 3235-005-020, 3235-005-015, 3235-005-026, 3235-005-027, 3235-006-003, 3235-006-001, 3235-006-002, 3235-008-002, 3235-008-003, and 3235-008-017.

A large portion of the Elizabeth Lake Bank Property consists of historic alluvial fans in the flat valley bottoms. The southern portions of the Elizabeth Lake Bank Property contain steep slopes and narrow side canyons. Several earthen berms and surface water control structures had been constructed in these southern canyons that resulted in altered drainage patterns, incised stream channels and a substantial reduction of the active alluvial floodplain. Implementation of the Bank Development Plan will restore flows to these historic floodplains and will re-establish alluvial floodplain communities.

In 2013 a large wildfire, the Powerhouse Fire, burned through the Elizabeth Lake Bank Property and the surrounding National Forest lands. This fire resulted in a nearly complete burn of the Elizabeth Lake Bank Property, removing almost all surface vegetation and structures.

2.1.2 History and Land Use

The Elizabeth Lake Bank Property has historically been used for agriculture, rural residential, and recreation.

2.1.3 Cultural Resources

A cultural resources investigation has been completed by Michael Brandman Associates (Exhibit J of the BEI). During the investigation, remnants of building foundations and old residences were observed on the Elizabeth Lake Bank Property along with an historic era family burial plot. The identified burial plot is located in a separate parcel that is not a component of the Bank Property. The cultural resources consultant recommended measures to ensure protection of the burial site. While the burial plot is not a part of the Bank Property, the family of the interred has the right to access the burial plot through the Bank Property using the existing access routes established for the exclusion area. This feature will be preserved and no restoration or active management activities are planned in the parcel that contains the burial site. More information on cultural resources in both Bank Properties is included in Section 8.0 below.

2.1.4 Hydrology and Topography

The Elizabeth Lake Bank Property is located along the boundary between the San Gabriel Mountains and the Antelope Valley and is situated within the San Andreas Fault Zone. This area consists of northwest-to-southeast-aligned trough-like valleys, linear hills, and closed depressions that contain sag ponds and natural lakes including Elizabeth Lake, Munz Lakes, and Lake Hughes. The San Andreas and Hitchbrook faults both occur within the valley floor of the Elizabeth Lake Bank Property (Dibblee 1961).

<u>Hydrology</u>
The primary source of hydrology for the Elizabeth Lake Bank Property is surface water runoff, groundwater infiltration from adjacent lands, and direct precipitation. Generally, water movement within the Elizabeth Lake Bank Property is to the north and west. Flows originating in the steep hillsides, drain north via surface water or groundwater movement to the valley floor. Flows move east to west along the valley floor via groundwater movement, and discontinuous seasonal surface water flow. Water from Elizabeth Lake drains through the Elizabeth Lake Bank Property via groundwater infiltration and occasional surface water flows during wet years.

The hydrological regime within the Elizabeth Lake Bank Property has been greatly influenced by prior development and agricultural activities. Three USGS blue-line streams and several unnamed streams drain the steep canyons in the southern portion of the Elizabeth Lake Bank Property. Almost every stream feature mapped within the Elizabeth Lake Bank Property was at one time dammed or altered for agricultural purposes. Dam installation resulted in destruction of historic dry wash and stream features, creation of new features as some dams failed and re-directed flows, and modification of the groundwater regime within portions of the Elizabeth Lake Bank Property. Implementation of the Bank Development Plan will restore flows to historic features.

Several seasonal seep wetlands are located directly on fault lines mapped within the Elizabeth Lake Bank Property (Hernandez 2011). These faults may facilitate the passage of groundwater to the surface in these areas and supply seasonal hydrology for seasonal wetlands.

Topography

Elevations within the Elizabeth Lake Bank Property range from approximately 3,245 to 3,600 feet. Ridges with rounded shoulders and summits and deep, U-shaped canyons characterize the southern portions of the Elizabeth Lake Bank Property. The terrain transitions to gently-sloping alluvial fans and rolling to flat topography on the lower slopes and in the bottom of the San Andreas Fault Zone. The lowest elevations of the Elizabeth Lake Bank Property are located in the northern portion of the property, just south of Elizabeth Lake Road.

2.1.5 Soils and Geology

The Soil Survey of Angeles National Forest Area, California (USDA 1980) indicates that the Elizabeth Lake Bank Property has four native soil map units containing eight soil series. These map units include: Tujunga-Capistrano families association, 2 to 20 percent slopes, Caperton-San Andreas-Modesto families complex, 15 to 60 percent slopes, Trigo, granitic substratum-Pismo families complex, 20 to 60 percent slopes, Hanford family, 3 to 25 percent slopes, and open water. Soils within the Elizabeth Lake Bank Property consist primarily of deep, well drained alluvium derived from sedimentary and granitic parent materials, although hill sides and slopes consist of weathered sedimentary and granitic parent materials. These coarse soils are well to excessively well drained, and have low structural stability. As a result, substantial movements of surface soils are expected to occur within alluvial floodplains during storm events, but risk of erosion from wind or surface runoff is low. Detailed descriptions of soils are included in the Delineation Report (Exhibit I of the BEI).

2.1.6 Existing Easements and Encumbrances

A Preliminary Title Report has been obtained and reviewed by the Bank Sponsor, and is included in Exhibit E-1 of the BEI. The title report identified several easements which encumber the Elizabeth Lake Bank Property (Figure 4). Elizabeth Lake Road is a public road that forms the northern border of the Elizabeth Lake Bank Property. This road is managed by Los Angeles County and the right-of-way for this road has been excluded from the Elizabeth Lake Bank Property.

Three utility easements are recorded on the eastern region of the Bank. One runs parallel to the shore of Elizabeth Lake and is a 1971 telephone easement to General Telephone Company and the two others are utility line easements for Southern California Edison. These easements were likely intended to convey electricity and telephone service to the structures that previously existed on the Elizabeth Lake Bank Property and ongoing maintenance or activity within these easements is not expected.

Additionally there is an easement that grants access to an area just south of Elizabeth Lake Road, for a well that provides water to two single-family homes near the Bank Property. The easement includes restrictions that prevent new facilities or transfer of water rights.

Finally, there is a right of access granted in the deed which allows for ingress and egress from the burial plot. The burial plot is located on a parcel which is surrounded by, but is not a part of, the Elizabeth Lake Bank Property. All existing easements and the burial plot are depicted on the map included in Figure 4, and are described in the Property Assessment and Warranty (Exhibit E-2 of the BEI).

2.1.7 Adjacent Land Uses

The Elizabeth Lake Bank Property borders the ANF to the north and south, a residential development to the east and the Painted Turtle, a camp for children with serious illnesses, to the west. The northern shores of Elizabeth Lake are managed as a day use area by the ANF and the lake itself is used for non-motorized boating, fishing, swimming, nature observation and picnics.

2.2 Habitat and Species Descriptions

2.2.1 Documented Biological Resources

Biological studies documenting the resources observed within the Elizabeth Lake Bank Property have been conducted and are included in Exhibit H and Exhibit I of the BEI. These include:

- Biological Resources Inventory (BRI; WRA 2012a)
- Wetland Delineation Report (WRA 2012b)

2.2.2 Biological Community Descriptions

Five major biological communities were observed during 2011 within the Elizabeth Lake Bank Property: wetlands, non-wetland waters, woodlands, scrublands, and grasslands; however, in June 2013 a catastrophic fire, known as the Powerhouse Fire, burned the entirety of the Lake Elizabeth Lake Bank Property. The five biological communities originally mapped were significantly altered by the fire. Though it may take many years to fully recover, WRA expects the same five biological communities to return post recovery and to consist of the same vegetation alliances observed pre-fire.

The five biological communities observed were composed of 25 vegetation alliances containing 30 vegetation associations. Wetlands, non-wetland waters, and seven additional vegetation alliances were considered to be sensitive, for a total of 14 sensitive vegetation alliances (including non-wetland waters). Eleven vegetation alliances were not considered sensitive. The corresponding Holland (1986) community type was assigned to each vegetation alliance to aid in reference. All the biological communities are mapped and described in detail in the Biological Resources Inventory (BRI) in Exhibit H of the BEI. In addition, implementation of the Development Plan includes planting of one new vegetation alliance, Big Sagebrush Scrub dominated by *Artemisia tridentate ssp. parishii*. This will be the dominant plant community on the re-established alluvial floodplains.

2.2.3 Special-Status Species

<u>Special Status Plant Species</u>

Special-status plant species determined to have a high or moderate potential to occur in the Elizabeth Lake Bank Property, as well as the two special-status plant species observed in the Elizabeth Lake Bank Property, are discussed in the BRI (Exhibit H of the BEI). Two special-status plant species have been observed in the Elizabeth Lake Bank Property during site visits: Peirson's morning-glory (*Calystegia peirsonii*, CNPS List 4) and adobe yampah (*Perideridia pringlei,* CNPS List 4). Additionally, the Development Plan identifies planting of Parish's sagebrush (locally rare) on restored alluvial floodplains.

<u>Special Status Wildlife Species</u>

Four special-status wildlife species were observed in the Elizabeth Lake Bank Property by WRA during site visits: Nuttall's woodpecker (*Picoides nuttallii*), Lawrence's goldfinch (*Spinus lawrencei*), pacific pond turtle (*Actinemys marmorata*), and Coast Horned Lizard (*Phrynosoma blainvillii*). Special-status wildlife species observed or which have a moderate or high potential to occur in the Elizabeth Lake Bank Property are discussed in the BRI (Exhibit H of the BEI). Several special-status species have not been observed, but have the potential to occur within the Elizabeth Lake Bank Property including Swainson's hawk. A brief discussion of habitat conditions required to sustain populations of Swainson's hawk is included below.

<u>Swainson's hawk</u>

Swainson's hawk is a summer (breeding) resident and migrant in California's Central Valley and scattered portions of the southern California interior. Foraging habitat consists of a mosaic of grassland and scrub with an abundant and diverse prey base, including insects, rodents, and small birds. Stands of cottonwoods, willows, junipers, and exotic mature trees within the Property provide suitable nesting substrates.

2.2.4 Invasive Plant Species

Twenty-one invasive plant species listed by the California Invasive Plant Council (Cal-IPC, (2006) were observed prior to the Powerhouse Fire within the Elizabeth Lake Bank Property, with eleven posing a potential threat (generally Cal-IPC Moderate or High rated species) and are discussed below. For practical reasons, non-native annual grasses have been excluded from the list to focus management efforts on species that can be feasibly controlled given the available resources. Invasive species can alter the fire regime and intensity, contribute to erosion, alter soil moisture regimes, and compete with native plant species, particularly in disturbed habitats. Observed invasive species, their Cal-IPC rating, and bloom periods are included in Table 1.

<u>Mediterranean mustard (*Hirschfeldia incana)* Cal-IPC Moderate</u>

Mediterranean mustard is a biennial or short-lived perennial in the mustard (Brassicaceae) family which blooms year round (CalFlora 2013) particularly on recently disturbed soils. Mediterranean mustard generally reproduces by producing prodigious amounts of seed, generally very close to the parent plant. While the volume of seed dropped is very high, the seeds generally do not disperse very far from the host plant, this often leads to large monotypic stands of Mediterranean mustard. Manual removal can be an effective means of control provided it is completed before viable seeds develop (Weed Research & Information Center 2013). Grazing has not been shown to be an effective means of control. There are a limited number of chemicals that have been shown to be effective, including Glyphosate. Unfortunately, Mediterranean mustard seeds can remain viable in the soil for several years, so all control methods must be repeated until the seed bank is fully exhausted.

Whitetop (*Lepidium chalapense* [*Cardaria chalepensis*]) Cal-IPC Moderate
Whitetop is an erect perennial in the mustard (Brassicaceae) family which blooms May through June and thrives in recently disturbed sunny mesic habitats. Any fragment of whitetop's roots can resprout and grow into a new plant and often grow longer than 10 feet long, making mechanical removal impractical. Additionally, a single whitetop plant is capable of producing up to 4,800 viable seeds making the timing of any control measure very important to the success of the effort. Herbicide application can be an effective means of control, however, it is important that all herbicides are handled and applied carefully to ensure they do not affect desirable species or habitats.

Himalayan blackberry (*Rubus armeniacus* [*R. discolor*]) Cal-IPC High
Himalayan blackberry is an evergreen perennial shrub in the rose (Rosaceae) with climbing, mounded, and trailing stalks which flowers April through August and thrives in mesic open fields, ditches, roadsides, and riparian habitats. Himalayan blackberry has an extensive perennial root system from which new above ground stalks, which are protected by large claw shaped thorns, readily sprout. Cattle grazing does not provide an effective means of control due to Himalayan blackberry's thorns and ability to quickly resprout above ground biomass. Mechanical removal presents the same hurdles, and is only effective on small populations. Herbicide application, particularly 'cut stump treatment', can be an effective means of control, however, it is important that all herbicides are handled and applied carefully to ensure they do not affect desirable species or habitats.

Sheep Sorrel (*Rumex acetosella)* Cal-IPC Moderate
Sheep sorrel is an erect perennial in the buckwheat family (Polygonaceae) which grows in clonal patches with a large perennial root network. New vegetative growth readily sprouts from the underground root network, and buried seeds have been shown to be viable for more than 25 years. Small infestations can be controlled with mechanical removal, however, care must be taken to remove the entire root system or the plant will likely resprout. Grazing can be an effective means of control; however, due to a concentration of oxalates, most ungulates avoid sheep sorrel. Herbicide application can be an effective means of control, however, it is important that all herbicides are handled and applied carefully to ensure they do not affect desirable species or habitats.

The Powerhouse fire of 2013 burned all above ground vegetation within the Lake Elizabeth Bank Property. The fire has presented both an opportunity and challenge as vegetation becomes reestablished. As previously noted, most invasive species thrive in disturbed conditions, such as the conditions created by the Powerhouse Fire; however, the fire also eliminated the invasive species populations from the Lake Elizabeth Bank Property. This dynamic makes invasive species management particularly important as vegetation becomes reestablished because while the community structure will change and develop as the property recovers from the fire, any vegetation which is established immediately after recovery will likely remain as the vegetation community develops. Post fire management guidelines for invasive plant species should consider the following:

- Ensure eradication of Himalayan blackberry within seasonal seep wetlands to allow recolonization by native species.
- Maintain eradication of invasive annual and perennial forb species to reduce competitive pressure and erosion, especially in sensitive terrestrial vegetation alliances.
- Encourage recolonization by native plant species.

2.2.5 Summary of Bank Development Plan

The Development Plan (Exhibit C of the BEI) includes restoration of alluvial floodplain, riparian wetland, non-wetland riparian, marsh, seasonal wetland, sensitive natural community and special status species habitats. Desert wash and alluvial fan creation will primarily occur through removal of the earthen berms and restoring natural flows to the historic floodplains in the valley bottom (Figure 5). Seasonal wetlands and riparian areas will also be enhanced through planting, weeding and improved management practices.

Alluvial Floodplain Restoration

Restoration plans have been designed to remove the dams and surface water diversions within the Elizabeth Lake Bank Property and redirect flows to the historic alluvial fans on the valley floor. Alluvial floodplains will be planted with big sagebrush, native grasses and other species appropriate for this habitat type. After restoration, the active alluvial fan surfaces will be exposed to periodic flooding and sediment transport associated with flood events. Active channels will form naturally on the fan surface and are expected to migrate across the surface with subsequent flood events. This regular pattern of hydrologic influence and disturbance will create suitable habitat for alluvial fan species.

Table 1. Invasive plant species observed in the Elizabeth Lake Bank Property during visits in 2011-2012.

Family	Scientific Name*	Common Name	Origin	Form	Invasive Status[2]	Blooming Period
Asteraceae	*Lactuca serriola*	prickly lettuce	non-native	annual forb	assessed	May-September
Asteraceae	*Sonchus asper*	spiny sow thistle	non-native	annual forb	assessed	February-October
Asteraceae	*Tragopogon dubius*	yellow salsify	non-native	perennial forb	assessed	April-May
Brassicaceae	*Descurainia sophia*	flix weed	non-native	annual forb	limited	March-August
Brassicaceae	*Hirschfeldia incana*	Mediterranean mustard	non-native	biennial or perennial forb	moderate	January-December
Brassicaceae	*Lepidium chalapense* [*Cardaria chalepensis*]	lens-podded hoary cress	non-native	perennial forb	moderate	May-June
Convolvulaceae	*Convolvulus arvensis*	field bindweed	non-native	perennial forb	assessed	April-September
Fabaceae	*Medicago polymorpha*	burweed	non-native	annual forb	limited	February-June
Geraniaceae	*Erodium cicutarium*	redstem filaree	non-native	annual forb	limited	February-June
Lamiaceae	*Marrubium vulgare*	horehound	non-native	perennial forb	limited	May-August
Plantaginaceae	*Plantago lanceolata*	English plantain	non-native	perennial forb	limited	March-August
Poaceae	*Avena fatua*	oat grass	non-native	annual graminoid	moderate	April-May
Poaceae	*Bromus diandrus*	ripgut brome	non-native	annual graminoid	moderate	April-June
Poaceae	*Bromus hordeaceus*	soft chess	non-native	annual graminoid	limited	April-May
Poaceae	*Bromus tectorum*	cheatgrass	non-native	annual graminoid	high	May-June
Poaceae	*Festuca* [*Vulpia*] *myuros*	rattail fescue	non-native	annual graminoid	moderate	February-May
Poaceae	*Festuca perennis* [*Lolium multiflorum*]	Italian ryegrass	non-native	annual or biennial graminoid	moderate	May-September
Poaceae	*Hordeum murinum*	mouse barley	non-native	annual graminoid	moderate	April-May
Poaceae	*Polypogon monspeliensis*	rabbit's-foot grass	non-native	annual graminoid	limited	May-June
Polygonaceae	*Rumex acetosella*	sheep sorrel	non-native	perennial forb	moderate	March-November
Polygonaceae	*Rumex crispus*	curly dock	non-native	perennial forb	limited	January-December
Rosaceae	*Rubus armeniacus* [*R. discolor*]	Himalayan blackberry	non-native	deciduous to evergreen shrub	high	April-August

All species identified using the *Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012); nomenclature follows Baldwin et al. 2012
[1]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)
[2]Blooming Period : CalFlora (CalFlora 2013)

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Riparian Woodland and Wetland Enhancement and Rehabilitation
Existing wetland and riparian communities within the Elizabeth Lake Bank Property will be monitored during post-fire recovery and will be managed to maintain and improve the functions and values that these habitats provide. These habitats will be managed to control invasive species and may be replanted if native species are not found to be recolonizing naturally.

Sensitive Natural Communities Enhancement and Rehabilitation
The terrestrial habitats will be monitored during post-fire recovery and will be managed to maintain or improve habitat quality. These habitats will be managed to control invasive species and may be replanted if native species are not found to be recolonizing naturally.

Special Status Species Preservation
The Bank supports habitat for numerous special status species (see section 5.3 above and the BRI in Appendix, C). These habitats will be preserved in perpetuity and managed for the benefit of the species. The proposed restoration actions discussed above will also increase the amount and quality of habitat available for special status species, particularly Swainsons Hawk, within the Elizabeth Lake Bank Property.

3.0 PETERSEN RANCH PROPERTY

3.1 Property Description

3.1.1 Setting and Location

The Petersen Ranch Bank Property is located in unincorporated Los Angeles County, California, approximately 4 miles southeast of the town of Lake Hughes. The Bank Property is approximately 3,789 acres located in the Del Sur USGS quadrangle (Figure 3), near the northern boundary of the Angeles National Forest (ANF), west of the City of Palmdale and South of Antelope Valley. The Bank Property is in the State of California, designated Assessor's Parcel Numbers: 3205-022-019, 3215-004-003, 3215-018-005, 3215-018-006, 3215-018-007, 3215-018-013, 3215-018-017, 3215-018-018, 3215-018-019, 3215-018-020, 3215-018-021, 3215-018-022, 3215-018-023, 3215-018-024, 3215-018-025, 3215-018-026, 3215-018-027, 3215-018-028, 3215-018-033, 3215-018-034, 3215-019-006, 3215-019-007, 3215-019-008, 3215-019-013, 3215-019-021, 3215-019-022, 3215-019-023, 3224-001-016, 3224-001-017, 3224-001-018, 3224-001-019, 3224-001-020, 3224-001-021, 3224-001-022, 3224-001-023, 3224-001-024, 3224-001-025, 3224-001-026, 3224-001-027, 3224-001-028, 3224-001-029, 3224-001-030, 3224-001-031, 3224-035-001, 3224-035-002, 3224-035-003, 3224-035-004, 3224-035-005, 3224-035-006, 3224-035-007, 3224-035-008, 3224-035-009, 3224-035-010, 3224-035-011, 3224-035-012, 3224-035-013, 3224-035-014, 3224-035-015, 3224-035-016, 3224-035-017, 3224-035-018, 3224-035-019, 3224-035-020, 3224-035-021, 3224-035-022, 3224-035-023, 3224-035-024, 3224-035-025, 3224-035-026, 3224-035-027, 3224-035-028, 3225-023-004, 3225-023-005, 3225-023-006, 3225-023-011, 3225-023-032, 3225-023-033, 3225-023-054, 3225-023-061, 3225-024-001, 3225-024-008, 3225-024-009, 3225-024-010, 3225-024-013, 3225-024-016, 3225-024-020, 3225-024-021, 3225-024-022, 3225-024-024, 3225-024-035, 3225-025-001, 3225-025-006, 3225-025-012. The Petersen Ranch Bank Property is shown on the General Vicinity Map (Figure 1) and the Petersen Ranch Bank Property Map (Figure 3).

The Petersen Ranch Bank Property is adjacent to the ANF to the southwest. Ranches and agricultural fields with small, individual houses separate the ANF (Angeles National Forest) from the Petersen Ranch Bank Property. A residential development is located southeast, the residential and recreational areas in and near the community of Elizabeth Lake are located to the west, and the California Aqueduct borders the Petersen Ranch Bank Property to the north.

3.1.2 History and Land Use

Historically, the primary land uses within the Petersen Ranch Bank Property have been cattle ranching, hay farming and hunting. Evidence of past uses still remain, including numerous buildings, dirt roads, wire fencing, ponds, and water tanks. A review of historic aerial photographs from 1948 indicate early land uses included wide-spread manipulation of natural habitats through clearing brush to create and maintain open pasture and hay fields, alteration of natural drainages to create ponds or to redirect flows, and the pumping of water to irrigate fields and fill constructed ponds (WRA 2013). The lasting effects of these land use practices can still be observed on the Property, however many of these practices have been reduced considerably compared to past uses.

3.1.3 Cultural Resources

A cultural resources investigation has been completed within the Petersen Ranch Bank Property and was completed by Duke Cultural Resources Management (Exhibit J of the BEI). More information on cultural resources in both Bank Properties can be seen in Section 8.0 below.

3.1.4 Hydrology and Topography

The Petersen Ranch Bank Property is in Leona Valley along the San Andreas Rift Zone and encompasses portions of Portal Ridge, which contains the highest elevation points within the Petersen Ranch Bank Property. Due to its location on the San Andreas Rift Zone, the Petersen Ranch Bank Property includes many fault lines.

The primary source of hydrology for the Petersen Ranch Property is surface water runoff and groundwater infiltration from adjacent lands, as well as direct precipitation. The largest aquatic feature is a complex of freshwater marshes, ponds and meadows along the rift valley. These areas are fed by runoff and groundwater and historically received additional inputs of water through pumping of municipal and well water. Historic aerials show areas of saturation and discontinuous channels through this wetland complex prior to the construction of the numerous ponds and presumably prior to the commencement of pumping water into this system. Historic USGS topographic maps show a dashed blue-line stream through this valley. Implementation of the Development Plan will result in restoration of many of the ponds in this valley back to wet meadow.

Several other drainages originate within the Petersen Ranch Property. These ephemeral drainages convey surface and subsurface flows during heavy rainfall through steep sided canyons to either Leona Valley to the southeast, Antelope Valley to the north, or to Elizabeth Lake to the west.

Several seasonal seep wetlands are located in complexes consisting of depressions, swales and slope seeps along the south facing slopes of the ridge adjacent to Elizabeth Lake Road. Many of these wetlands appear to be associated with mapped fault lines within the Petersen Ranch Property (Hernandez 2010). These faults may facilitate the passage of groundwater to the surface in and supply seasonal hydrology for these features.

3.1.5 Soils and Geology

The Los Angeles County Soil Series (USDA 1969), Lancaster Area Soil Series (USDA 1922), Angeles National Forest Area (USDA 1980), and Soilweb (CSRL 2013) indicates that the Petersen Ranch Bank Property is composed of 23 different types of soil within 9 soil series: the Armargosa series, Castaic-Balcom series, Gaviota series, Greenfield series, Hanford series, Millsholm series, Ramona series, Vista series, and Yolo series. These soil series are described in detail in the Delineation Report (Exhibit I of the BEI). The soils on the Petersen Ranch Bank Property exhibit diverse properties, with most being well to excessively well drained soils with low structural stability, however poorly drained soils are found in and around the wetland complexes and some rock outcrops are present in higher slope areas.

3.1.6 Existing Easements

Preliminary Title Reports have been obtained and reviewed by the Bank Sponsor. According to title records, the Bank Property has a number of easements established on site (Figure 6). Elizabeth Lake Road is a public road that primarily delineates the southern boundary, and the western edge of Petersen Ranch Bank Property. Johnson Road runs through the north-central region of the Petersen Ranch Bank Property. These roads are not a part of the Petersen Ranch Bank Property and are managed by Los Angeles County.

A number of easements for future street and utility improvements are recorded in the northern portion of the Petersen Ranch Bank Property (Parcel 13), associated with previously planned residential development. However, no residential development is currently planned in this area. Other dirt roads and right of way easements exist in a variety of locations.

Utility easements exist within the Petersen Ranch Bank Property in a number of locations. The Tehachapi Renewable Transmission Project bisects the central portion of the Petersen Ranch Bank Property from the north to the south, and includes a combination of easements for unpaved access roads, utility poles, and high voltage power lines. Another transmission line owned and maintained by the Los Angeles Department of Water and Power crosses the western portion of the Bank Property. Maintenance of these utility lines may occur periodically, including modification of vegetation, and the holders of these easements have legal access rights to these portions of the Bank Property.

In addition to the easements outlined in the Title Report, a 320-acre portion of Petersen Ranch Area A, has been used previously as mitigation for SCE and has a separate Conservation Easement. This SCE easement will be managed as part of the Bank, and the annual monitoring reports will cover the Bank easements as well as the SCE easement, but Credits will not be requested for the Petersen Ranch Mitigation Bank for land located under the SCE easement. This easement will be monitored and maintained pursuant to the requirements of the BEI.

3.1.7 Adjacent Land Uses

There are exclusion areas that are controlled by (and under ownership of) the Property Owner but that will not be a part of the Petersen Ranch Bank Property. These areas are located primarily around the main lodge. In addition, there is a utility line parcel owned by Los Angeles Department of Water and Power (LADWP) and several parcels along Johnson Road that are not owned by the Property Owner. The LADWP parcel bisects the rift valley wetland complex. Pursuant to an agreement with LADWP, wetland restoration will be conducted underneath its utility lines, but credits will not be requested for this area. However, LADWP may use the wetlands generated on its parcel for permittee-responsible mitigation.

Within the Petersen Ranch Property,there are six small exclusion areas that are not part of the Bank Property. The conservation easement will not be established over these “Not a Part” areas and these “Not a Part” areas will not be subject to the restrictions within the conservation easement. Monitoring and management actions will be conducted in lands immediately adjacent to these “Not a Part” areas to ensure activities within these areas do not result in deleterious effects to the Bank’s resources. See Section 4.6 below for more information on monitoring around these “Not a Part” areas.

3.2 Habitat and Species Descriptions

3.2.1 Documented Biological Resources

Several biological studies have been conducted within the Petersen Ranch Bank Property and are included in Exhibit H and Exhibit I of the BEI. These include:

- Biological Resources Inventory (BRI; WRA 2013a);
- Wetland Delineation Report (WRA 2013b);
- Swainson’s Hawk Habitat Assessment (Bloom 2013);

3.2.2 Biological Communities

Five major biological communities were observed during 2013 within the Petersen Ranch Bank Property: wetlands, non-wetland waters, woodlands, scrublands, and grasslands. These five biological communities were composed of 32 vegetation alliances containing 36 vegetation associations. Wetlands, non-wetland waters, associated aquatic vegetation communities, and 10 terrestrial vegetation alliances were considered to be sensitive. A total of 22 sensitive vegetation alliances (including wetlands and non-wetland waters) have been mapped within the Petersen Ranch Bank Property. These vegetation alliances and associations are described in the BRI (Exhibit H of the BEI).

3.2.3 Special Status Species

Special-status plant species determined to have a high or moderate potential to occur in the Petersen Ranch Bank Property, as well as the special-status plant species observed in the Petersen Ranch Bank Property, are discussed in the BRI (Exhibit H of the BEI). One list 4 special status plant species and one locally rare species that is of management interest have been observed within the Petersen Ranch Bank Property, Pierson’s morning glory and Parish’s sagebrush.

Special-Status Wildlife Species

Ten special-status wildlife species were observed in the Petersen Ranch Bank Property by WRA during site visits: American white pelican (*Pelecanus erythrorhynchos*), Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis*), prairie falcon (*Falco mexicanus*), Nuttall's woodpecker (*Picoides nuttallii*), loggerhead shrike (*Lanius ludovicianus*), oak titmouse (*Baeolophus inornatus*), tricolored blackbird (*Agelaius tricolor*), Pacific pond turtle (*Actinemys marmorata*), and coast horned lizard (*Phrynosoma blainvillii*). Special-status wildlife species observed or which have a moderate or high potential to occur in the Petersen Ranch Bank Property are discussed described in detail in the BRI (Exhibit H of the BEI). A brief discussion of habitat conditions required to sustain populations of the special-status species for which the Petersen Ranch Bank has been established is included below.

Swainson's hawk

Swainson's hawk is a summer (breeding) resident and migrant in California's Central Valley and scattered portions of the southern California interior. Foraging habitat consists of a mosaic of grassland and scrub with an abundant and diverse prey base, including insects, rodents, and small birds. Stands of cottonwoods, willows, junipers, and exotic mature trees within the Property provide suitable nesting substrates.

3.2.4 Invasive Plant Species

Twenty-seven invasive plant species listed by Cal-IPC (2006) have been documented to occur within the Petersen Ranch Bank Property, with nine posing a potential threat (generally Cal-IPC Moderate or High rated species) and are discussed below. For practical reasons, non-native annual grasses have been excluded from the list to focus management efforts on species that can be feasibly controlled given the available resources. Invasive species can alter the fire regime and intensity, contribute to erosion, alter soil moisture regimes, and compete with native plant species, particularly in disturbed habitats. Those species of highest concern for the Petersen Ranch Bank Property are summarized in Table 2. Mechanical or chemical treatments may be used and should be timed to take advantage of the phenology of the target species. Management guidelines for invasive species Cal-IPC rated High are discussed in greater detail below. Specific management tasks are discussed in greater detail in the Management and Monitoring guidelines below.

Russian knapweed (*Acroptilon repens)* Cal-IPC Moderate

Russian knapweed is a long-lived perennial forb in the sunflower (Asteraceae) family which blooms between March and September (CalFlora 2013) and thrives in a wide variety of recently disturbed mesic habitats. Over time Russian knapweed is capable of forming large monotypic stands with a deep root network from which vegetation can easily spread and resprout. Due to the extensive root-network hand removal is only effective on seedlings (Weed Research & Information Center 2013). Russian knapweed is toxic to horses and is often avoided by cattle making grazing an infeasible form of control. Chemical control can be effective; however it is important that any herbicides are handled and applied carefully to ensure they do not affect desirable species or habitats.

Bull thistle (*Cirsium vulgare*) Cal-IPC Moderate

Bull thistle is a biennial, or annual forb in the sunflower (Asteraceae) family which blooms between June and September (CalFlora 2013) and thrives many habitats, particularly on recently disturbed soils. Bull thistle reproduces and spreads entirely from seed which is carried by the wind, though most seeds fall within a few feet of the parent plant (Weed Research & Information Center 2013). Most seeds will germinate or die after the first year, but seeds which have been buried more than 6 inches may survive several years. Goats and sheep grazing can be an effective control method for immature plants, however cattle will avoid bull thistle completely. Other forms of mechanical control(e.g. hoeing and tilling) can be very effective provided the tap root is damaged below the soil surface. If the tap root is not sufficiently damaged the plant can easily recover and flower. Herbicide application can be an effective means of control, however, it is important that all herbicides are handled and applied carefully to ensure they do not affect desirable species or habitats.

Table 2. Invasive plant species observed in the Petersen Ranch Bank Property during visits on January 28 through February 6, 2013 and May 20 through 21, 2013.

Family	***Scientific Name***	**Common Name**	**Origin**	**Life-Form**	**Invasive Status**[1]	**Blooming Period**[2]
Asteraceae	*Acroptilon repens*	Russian knapweed	non-native	perennial forb	moderate	March-September
Asteraceae	*Cirsium vulgare*	bull thistle	non-native	annual or biennial forb	moderate	June-September
Asteraceae	*Helminthotheca [Picris] echioides*	bristly ox--tongue	non-native	perennial forb	limited	June-December
Asteraceae	*Hypochaeris glabra*	smooth catsear	non-native	annual forb	limited	March-June
Asteraceae	*Lactuca serriola*	prickly lettuce	non-native	annual forb	assessed	May-September
Asteraceae	*Sonchus asper ssp. asper*	prickly sow thistle	non-native	annual forb	assessed	February-October
Asteraceae	*Taraxacum officinale*	common dandelion	non-native	perennial forb	assessed	February-March
Asteraceae	*Tragopogon dubius*	yellow salsify	non-native	perennial forb	assessed	April-May
Brassicaceae	*Descurainia sophia*	flix weed	non-native	annual forb	limited	March-August
Brassicaceae	*Hirschfeldia incana*	Mediterranean mustard	non-native	biennial or perennial forb	moderate	January-December
Brassicaceae	*Lepidium appelianum*	Hairy whitetop	non-native	perennial forb	limited	April-Sep
Convolvulaceae	*Convolvulus arvensis*	field bindweed	non-native	perennial forb	assessed	April-September
Fabaceae	*Lotus corniculatus*	bird's-foot trefoil	non-native	perennial forb	assessed	March-July
Fabaceae	*Medicago polymorpha*	burweed	non-native	annual forb	limited	February-June
Fabaceae	*Robinia pseudoacacia*	black locust	non-native	deciduous tree	limited	March-June
Geraniaceae	*Erodium cicutarium*	redstem filaree	non-native	annual forb	limited	February-June
Lamiaceae	*Marrubium vulgare*	horehound	non-native	perennial forb	limited	May-August
Plantaginaceae	*Plantago lanceolata*	English plantain	non-native	perennial forb	limited	March-August
Poaceae	*Avena barbata*	slender oat	non-native	annual graminoid	moderate	March-June
Poaceae	*Avena fatua*	oat grass	non-native	annual graminoid	moderate	April-May

Family	*Scientific Name*	Common Name	Origin	Life-Form	Invasive Status[1]	Blooming Period[2]
Poaceae	*Bromus diandrus*	ripgut brome	non-native	annual graminoid	moderate	April-June
Poaceae	*Bromus hordeaceus*	soft chess	non-native	annual graminoid	limited	April-May
Poaceae	*Bromus tectorum*	cheatgrass	non-native	annual graminoid	high	May-June
Poaceae	*Festuca [Vulpia] myuros*	rattail fescue	non-native	annual graminoid	moderate	February-May
Poaceae	*Festuca perennis [Lolium multiflorum]*	Italian ryegrass	non-native	annual or biennial graminoid	moderate	May-September
Poaceae	*Hordeum murinum*	mouse barley	non-native	annual graminoid	moderate	April-May
Poaceae	*Polypogon monspeliensis*	rabbit's--foot grass	non-native	annual graminoid	limited	May-June
Polygonaceae	*Rumex crispus*	curly dock	non-native	perennial forb	limited	January-December

All species identified using the *Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012); nomenclature follows Baldwin et al. 2012
[1]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)
[2]Blooming Period : CalFlora (CalFlora 2013)

Mediterranean mustard (*Hirschfeldia incana)* Cal-IPC Moderate

Mediterranean mustard is a biennial or short-lived perennial in the mustard (Brassicaceae) family which blooms year round (CalFlora 2013) and thrives in a variety of habitats, particularly on recently disturbed soils. Mediterranean mustard generally reproduces by producing prodigious amounts of seed, generally very close to the parent plant. While the volume of seed dropped is very high, the seeds generally do not disperse very far from the host plant, this often leads to large monotypic stands of Mediterranean mustard (Weed Research & Information Center 2013). Manual removal can be an effective means of control provided it is completed before viable seeds develop (Weed Research & Information Center 2013). Grazing has not been shown to be an effective means of control. There are a limited number of chemicals that have been shown to be effective, including Glyphosate. Unfortunately, Mediterranean mustard seeds can remain viable in the soil for several years, so all control methods must be repeated until the seed bank is fully exhausted.

3.2.5 Summary of Bank Development Plan

The Development Plan (Exhibit C-1 of the BEI) identifies restoration activities that will result in increased area, condition and functions of aquatic resources and habitats for special-status species. Prior to implementation of the Development Plan, the Petersen Ranch Bank Property contained many man-made stock ponds within the central wetland system. Historically, water was pumped into these ponds to create waterfowl hunting ponds and allowing them to support open water and freshwater marsh habitat dominated by cattail and tule. Pumping was ceased and the ponds became unable to support the same habitat with natural hydrology. These ponds became degraded, and likely reduced the hydrology of surrounding wetlands, while unable to support wetland hydrology themselves. The Development Plan (Figure 7) focuses on grading and planting to provide connectivity of habitats and hydrologic flows and also include micro-topographic variations that will allow for structural and habitat complexity within this wetland complex.

Wetland Re-establishment

Re-establishment of wetland/riparian habitats will occur in areas that are currently characterized by berms exhibiting upland vegetation that were built within the historic boundary of the wetland complex. Wetland re-establishment will return the landscape to its natural topography and historic wetland condition. This will increase the area of wetland habitats but will also increase the function of surrounding wetland habitats.

Wetland Rehabilitation

Wetland rehabilitation will include restoration of degraded ponds to wetland habitats that create more natural topography, water storage, and increased flow, thereby restoring the historic functions of habitat, nutrient filtering, habitat complexity, and hydrologic connectivity. Habitat complexity will include areas of varying inundation and soil saturation depths, and may include smaller areas of open water or freshwater marsh habitat. Once the ponds have been regraded, they will be replanted with native, hydrophytic vegetation which will stabilize the soil, prevent the establishment of weedy, non-native species, and create habitat for native plants and animals. Additionally, the vegetation will increase nutrient filtration and slow runoff. By eliminating the berms and restoring the ponds as part of the rehabilitation and reestablishment activities discussed above, displaced water will be available to the surrounding wetlands. This will improve hydrologic connectivity, and improve the habitat for wetland dependent plant and wildlife species throughout adjoining wetlands. With time, the increase in hydrology from displaced pond water may also expand the extent of wetlands in this area.

To alleviate nutrient inputs into the watershed, 35 foot grazing setbacks around wetlands in the rift valley and more mesic wetland and riparian areas (Appendix B - Figure 1 and Figure 2) will be fenced to exclude cattle. By excluding cattle, fenced wetlands will have increased filtering of nutrients by allowing the buildup of non-compacted silt and healthy stands of vegetation which trap nutrients and other contaminants, thereby preventing their transport into downstream watersources. Ultimately, the establishment of abundant vegetation and trapping of additional silt/sediment will reduce nutrient stress for the entire watershed. These restoration measures will increase the functionality of the system as a whole and will aid in the repair of degraded wetland habitats to pre-disturbance conditions.

Wetland Riparian Rehabilitation

Riparian rehabilitation will integrate with wetland rehabilitation activities discussed above to encourage and sustain the long-term survival of mature riparian habitats that exist adjacent to, or within, the man-made ponds.

Some of the riparian habitats in the Petersen Ranch Bank Property were located within, or adjacent to, large, deep, man-made ponds excavated in what was historically a wetland. Water was pumped into these ponds until 2010. Since pumping was ceased, the ponds had dried and became unlikely to continue supporting riparian habitat due to the decreased water levels resulting in smaller ponded areas that are often well beyond the dripline, and root zone, of riparian trees.

As part of wetland restoration plans, the pond bottom elevations will be raised, but small deep depressions will be left providing small open water areas beneath the drip-line of riparian species. These depressions, though deep, will not cover the wide area of the original pond. Because of this, natural hydrologic processes are expected to fill the small ponds and sustain them without pumping. Water will be able to concentrate in the ponds and will be stored there for a duration long enough to sustain the mature riparian habitat. By eliminating berms and restoring the ponds as part of the rehabilitation and reestablishment of wetland and riparian habitats, displaced water is expected to increase the hydrologic inputs to adjacent riparian habitats. With time, the increase in hydrologic inputs from displaced pond water may also result in expanded riparian habitats. This will improve the hydrologic function and health of the riparian system in areas outside of the footprint of the restoration activities. Implementation of these design elements will result in the rehabilitation of wetland riparian habitat.

To alleviate nutrient inputs into the watershed and excessive grazing pressure on riparian vegetation, 35 foot grazing setbacks around wetland riparian areas in the rift valley will be fenced to exclude cattle. By excluding cattle, fenced riparian wetlands will have the ability to perform increased filtering of nutrients by allowing the establishment of healthy stands of vegetation which trap nutrients and other contaminants, thereby preventing their transport into downstream water sources. Ultimately, the establishment of healthy wetland vegetation and trapping of additional silt/sediment will reduce nutrient stress for the entire watershed. These restoration measures will increase the functionality of the system as a whole and will aid in the repair of degraded wetland riparian habitats to pre-disturbance conditions.

Non-Wetland Riparian Establishment

Non-wetland riparian establishment is occurring in areas that have suitable soils and topographic position and are located adjacent to existing, or proposed, aquatic resources. This will primarily include planting Parish's sagebrush (*Artemisia tridentata ssp. parishii*), a locally rare and genetically unique sub-species found in the Petersen Ranch Bank Property (WRA 2013a).

Non-Wetland Riparian Rehabilitation
Non-wetland riparian rehabilitation will occur in upland areas containing woody, riparian species that abut aquatic resources. Non-wetland riparian rehabilitation will be achieved through the wetland and riparian rehabilitation and reestablishment activities described above. By eliminating the berms and restoring the ponds as part of the wetland and riparian rehabilitation and reestablishment, displaced water is expected to be redistributed to the root zones of surrounding non-wetland riparian communities. This will enhance the hydrologic function and health of the non-wetland riparian system in areas outside of the footprint of restoration activities.

To alleviate nutrient inputs into the watershed and excessive grazing pressure on riparian vegetation, 35 foot grazing setbacks around wetland riparian areas in the rift valley will be fenced to exclude cattle. By excluding cattle, fenced riparian areas will have the capacity to perform increased filtering of nutrients, and ungrazed habitats will allow for more robust understory growth and tree seedling development. These restoration measures will increase the functionality of the system as a whole and will aid in repairing degraded riparian habitats to pre-disturbance conditions.

Stream Rehabilitation
Stream rehabilitation will be implemented along the stream at the western boundary of the Petersen Ranch Bank Property. This stream conveys flows from off-site residential areas, beneath Elizabeth Lake Road and into a channel along the western boundary. Prior to implementation of the Development Plan this stream consisted of a straightened channel and a constructed berm separating the stream from the wetland complexes within the Petersen Ranch Bank Property which hydrologically isolated this stream from its floodplain. Stream rehabilitation activities will involve removing the berm and widening the stream channel to increase habitat and allow for overbank flows onto an active floodplain. Once the stream has been rehabilitated, floodwaters from will be able to spill into the restored wetland complexes thereby reducing downstream flood pressures and improving water quality and hydrologic connectivity.

Alluvial Floodplain Re-establishment
Alluvial floodplain re-establishment will occur in the floodplain adjacent to the Stream Rehabilitation actions discussed above. High flows will be restored to the adjacent floodplain on the valley floor. After restoration, the active alluvial floodplain surfaces will be exposed to periodic flooding and sediment transport associated with flood events.

4.0 MANAGEMENT AND MONITORING

The overall goal of long-term management is to foster the long term viability of the Bank Properties' Waters of the U.S., Waters of the State, covered species, and covered habitat. Routine monitoring and minor maintenance tasks are intended to assure the quality of the Bank Properties' biological resources in perpetuity.

The approach to the long-term management of the Bank Properties' biological resources is to conduct annual site examinations and monitor selected characteristics to determine the stability and trends of the waters of the U.S., including wetlands, Waters of the State, sensitive vegetation communities, and special-status species' habitats.

Annual monitoring will assess the Bank's condition, degree of erosion, invasion of exotic or deleterious (e.g., thatch producing) species, water quality, fire hazard, and/or other aspects that may warrant management actions. The objective of this Long-term Management Plan is to conduct monitoring to identify any issues that arise, and use adaptive management to determine what actions might be appropriate. Those chosen to accomplish monitoring responsibilities will have the knowledge, training, and experience to accomplish monitoring responsibilities.

Adaptive management means an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the IRT in discussion with the Land Manager. Adaptive management includes those activities necessary to address the effects of climate change, fire, flood, or other natural events, force majeure, etc. Before considering any adaptive management changes to the Long-term Management Plan, the IRT will consider whether such actions will help ensure the continued viability of Bank Property's biological resources.

The Land Manager for the Bank site shall implement the following:

4.1 Waters of the U.S. and State

The Bank Properties' aquatic resources will be monitored and managed to ensure that the hydrologic, biotic and geomorphic functions are maintained to the extent feasible.

> Objective: Monitor, and conserve the Bank Properties' Waters of the U.S. and Waters of the State.
>
> > **Task 4.1.1**: One annual walk-through survey will be conducted each spring to qualitatively monitor the general condition of the main wetland/riparian complexes in the rift valley, and in the cattle exclusion areas. General conditions regarding presence of ponding or saturation, extent and health of wetland plant species (FAC, FACW or OBL), estimates of invasive species cover, condition of exclusion fencing and any erosion problems will be noted, with specific locations and extents mapped on a site aerial.
> >
> > **Task 4.1.2:** During the annual spring walk-through survey qualitatively monitor the general condition of the alluvial floodplains and the stream rehabilitation area. General conditions regarding extent of active flood plain showing indicators of Ordinary High Water Mark (OHWM), estimates of invasive species cover, and cover of xeric riparian species (as described in 2012 Wetland Delineation Report included in Exhibit I of BEI) will be noted, with specific locations and extents mapped on a site aerial.
> >
> > **Task 4.1.3**: One annual drive-through survey of the entire Bank Properties will be conducted each spring to qualitatively monitor the general condition of the wetlands and waters. General conditions regarding any major changes in habitat quality including presence of invasive plant species, and any erosion problems will be noted, with specific locations and extents mapped on a site aerial.
> >
> > **Task 4.1.4**: Establish representative photographic reference points in each of the aquatic resource habitat types to be monitored annually, and include photographs in each annual monitoring report.

4.2 Covered Habitat

The Bank Properties' covered habitats including non-wetland riparian and all terrestrial vegetative communities will be examined for major changes or threats to habitat quality.

> Objective: Monitor, conserve, and maintain the Bank Properties' covered habitats.
>
> > **Task 4.2.1**: As part of the spring walk-through surveys, the riparian habitats will be examined for any major changes in habitat quality. Presence of invasive plant species and erosion problems will be noted. Any potential threats to the viability of this habitat will be mapped and documented in the annual report.
> >
> > **Task 4.2.2**: As part of the annual drive-through survey, the Bank Properties' terrestrial habitats will be examined for any major changes in habitat quality including presence of invasive plant species, erosion problems or any other disturbance will be noted. Any potential threats to the viability of this habitat will be mapped and documented in the annual report.
> >
> > **Task 4.2.3**: Establish representative photographic reference points in each of the covered upland habitat types to be monitored annually, and include photographs in each annual monitoring report. These photo-points shall provide good views of expanses of upland habitats, which will provide a mechanism to monitor changes in upland habitats, including shrub encroachment into grasslands.

4.3 Covered Species Monitoring

> Objective: Monitor, manage and maintain habitat for Swainson's hawk.
>
> > **Task 4.3.1:** Annually conduct a drive-through assessment during the period best timed to observe nesting birds (typically April-May), the Bank Properties' Swainson's hawk foraging habitat will be monitored for major changes in area and quality. In particular, shrub encroachment in grasslands, changes in prey base, and observations of individuals will be noted. Any potential threats to the viability of these habitats will be noted in the annual report.
> >
> > **Task 4.3.2**: Annually during the nesting bird drive-through assessment, the Bank Properties will be examined for major changes in area and quality of Swainson's hawk nesting habitat. In particular, significant changes to riparian forest and woodland habitats will be documented along with any observed individuals or potential nest sites. Any potential threats to the viability of these habitats will be noted in the annual report

Multiple angles will be utilized to help increase the observer's chance of detecting a nest or hawk (pair), especially after trees are fully leafed-out and when surveying multiple trees in close proximity to each other. When surveying from an access road, surveys will be conducted in both directions, usually maintaining a distance of 50 to 200 meters from subject trees. This is usually optimal for observing perched and flying hawks without reducing the chance of detecting a nest or young. Once a nest is found, closer inspection may be, and usually is, necessary.

Surveys will focus on both visual observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting hawks. In addition, vocalizations of birds are extremely helpful in locating nesting territories. Vocal communication between hawks is frequent (1) during territorial displays, (2) during courtship and mating, (3) through the nesting period as mates notify each other that food is available or that a threat exists, and (4) as older chicks and fledglings beg for food.

Information collected will include all observed nest sites, including date and time of observation, location name, UTM coordinates, number of young, and any behavioral observations. The occurrence of nesting great horned owls, red-tailed hawks, red-shouldered hawks, and other potentially competitive species will also be documented. These species will infrequently nest within 100 meters of each other, so the presence of one species will not necessarily exclude another, but should be noted in the survey report.

4.4 Non-native Invasive Species Monitoring and Management

Objective: Monitor and maintain control over non-native invasive species, including but not limited to noxious weeds that diminish site quality for which the bank was established. The Land Manager shall consult the Cal-IPC list of high rated invasives in determining species of management concern.

Task 4.4.1: Annually, during the spring drive-through survey, the Bank Properties will be surveyed for infestations of noxious weeds. Observed noxious weed populations will be mapped and population estimates of perennial species will be recorded. A discussion of observed noxious weeds, the level of threat posed, and recommended management measures will be included in each monitoring report.

Task 4.4.2: As needed, weed management measures will be implemented to control infestations of noxious weeds. Recommended management measures will be prioritized, and implemented as funding is available. Actions to control invasive weed species may include prescribed grazing treatments, mowing, physical removal by hand, hand powered tools, or application of herbicides approved by the IRT and will be appropriately timed based on the biology of the target invasive species.

4.5 Vegetation Management

Objective: Analyze effects of grazing on habitat quality, and use adaptive management techniques to maintain habitat quality. For a detailed summary of the Grazing Plan refer to Appendix B.

Task 4.5.1: At the end of each growing season (October) the Bank Properties will be monitored and any deleterious effects of grazing on covered resources will be noted. In particular, vegetation height and the presence of high impact areas will be noted in the annual report.

Task 4.5.2: At the end of each year's growing season (October), the residual dry matter (RDM) will be sampled in multiple locations within each pasture.

Task 4.5.3: Each year, calculate grazing carrying capacity for each pasture based on productivity estimates using the previous years' measurements.

Task 4.5.4: Adjust stocking rates and timing based on RDM monitoring, invasive species presence, and habitat condition in accordance with the grazing plan. Manage grazing rates to maintain vegetation height and composition similar to baseline conditions or as determined likely to maintain aquatic resource function and covered species habitat.

Task 4.5.5: Monitor cattle water sources and attractants, such as salt licks, for evidence of habitat degradation, such as erosion and changes in vegetation type and cover.

4.6 Monitoring around Exclusion Areas

Habitats surrounding "Not a Part" areas will be monitored to ensure activities outside of the Bank Property are not adversely affecting the Bank's resources. If monitoring results show any negative impact on the lands surrounding the "Not a Part" areas, any identified issues will be discussed in the annual monitoring report and adaptive management actions will be taken to ameliorate the degradation caused by these activities. The monitoring and management activities will be conducted on an annual basis and will include the tasks discussed below.

Objective: Analyze and monitor the quality of habitats surrounding the "Not a Part" areas, and use adaptive management techniques to maintain habitat quality if degradations to the habitat are observed.

Task 4.6.1: Monitor for social trails, erosion, reduced vegetation cover, evidence of trampling or compaction, and other evidence of significant soil or vegetation disturbance in habitats adjacent to the "Not a Part" areas;

Task 4.6.2: Monitor for trash, vandalism, or other forms of litter and property destruction surrounding the "Not a Part" areas;

Task 4.6.3: Monitor for runoff from irrigation, septic systems, or other infrastructure that may be affecting habitats surrounding the “Not a Part” areas;

Task 4.6.4: Monitor for invasive species surrounding the “Not a Part” areas;

Task 4.6.5: Monitor for fire hazards surrounding the “Not a Part” areas; and

Task 4.6.6: Monitor for evidence of non-permitted uses in the land surrounding the “Not a Part” areas including off-highway vehicle use (OHV), out of season hunting, outdoor fires, and other potential violations to the Conservation Easement, local laws/ordinances, or state laws.

5.0 SECURITY, SAFETY, AND PUBLIC ACCESS

The Bank Properties will be fenced and shall have no general public access, nor any regular public or private use, except as allowed by the Conservation Easement. Research and/or other educational programs or efforts may be allowed on the Bank Properties as deemed appropriate by the IRT, but are not specifically funded or a part of this Long-term Management Plan.

5.1 Trash and Trespass

Objective: Monitor and minimize sources of trash and trespass.

Task 5.1.1: During each site visit, record occurrences of trash. Record type, location, and management recommendations to avoid, minimize, or rectify trash impacts.

Task 5.1.2: Replace “No Trespassing” signs which have been damaged or are otherwise illegible. Legible “No Trespassing” signs should be posted no more than 600 feet apart on all exterior fencing.

Task 5.1.3: On a monthly basis, survey for and record evidence of trespass and condition of gates, locks and “No Trespassing” signs. Record type, location, and management recommendations to avoid, minimize, or rectify trespass impacts.

Objective: Collect and remove trash, repair vandalized structures, and rectify trespass impacts.

Task 5.1.4: At least once yearly collect and remove any accumulated trash.

Task 5.1.5: Within 30-days of the identification of trespass impacts (broken or missing fences, gates, locks, or “No Trespassing” signs), impacts will be repaired. Any additional measures to prevent trespass will be prioritized and implemented as funding allows.

5.2 Fire Hazard Reduction

Objective: Maintain the site as required for fire control while limiting impacts to biological values.

Task 5.2.1: Graze to reduce vegetation height and reduce fuel loads to reduce risk and intensity of future fires.

5.3 Infrastructure

Objective: Monitor condition of perimeter and exclusion fences and gates.

Task 5.3.1: During the monthly trespass monitoring visit, record the condition of fences, gates, and roads. Any necessary tasks will be identified in the annual monitoring report.

Objective: Maintain fences and gates to prevent casual trespass, allow necessary access, and facilitate grazing management.

Task 5.3.2: Maintain fences and gates as necessary by replacing posts, wire, and/or gates.

Objective: Maintain roads to allow necessary access.

Task 5.3.4: Maintain primary access roads by grading, filling gullies, and reducing encroaching vegetation, as necessary, and as funding allows.

Objective: Maintain water trough infrastructure to ensure grazing regime and management can be fully implemented.

Task 5.3.5: Maintain trough infrastructure by replacing and repairing plumbing and troughs, as necessary, and as funding allows.

Objective: Maintain engineered structures associated with the Munz Canyon, Turkey Tail Floodplain, and Joey Stream Restoration Site (Restoration Sites 1, 4, and 5).

Task 5.3.6: Maintenance of engineered structures associated with the Munz Canyon, Turkey Tail Floodplain, and Joey Stream Restoration Site (Restoration Sites 1, 4, and 5) may need to occur at infrequent intervals (every 100 years). Maintenance requirements could include riprap replacement, riprap removal, concrete replacement, and concrete removal.

6.0 REPORTING AND ADMINISTRATION

6.1 Annual Report

Objective: Provide annual report on all management tasks conducted and general site conditions to IRT and any other appropriate parties.

Task 6.1.1: Prepare annual report and any other additional documentation. Include a summary of all above mentioned monitoring and maintenance requirements. Complete and circulate to the IRT and other parties by November 15 of each year.

Task 6.1.2: Make recommendations with regard to (1) any habitat enhancement measures deemed to be warranted, (2) any problems requiring short and long-term attention (e.g., weed removal, fence repair, erosion control), and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date.

6.2 Long-Term Management Plan Updates

Objective: Provide updates to the long-term management plan to account for changes in bank conditions and changes approved by the IRT based on these new management priorities or considerations.

Task 6.2.1: Review the long-term management plan every five years and update accordingly based on any changes in the bank conditions or changes to the plan approved by the IRT. This task will include reviewing and, if necessary, updating the vegetation map based on current aerial imagery.

7.0 PERMITTED ACTIVITIES

The above listed activities represent the activities which will be required to ensure the Bank Properties continue to fulfill the requirements set forth in the BEI in perpetuity. Several additional activities which do not conflict with the successful function of the Bank will be permitted within the Bank Properties.

7.1 Permitted Uses

Limited private access will be available for out-door recreation for the Property Owner and their guests. No permitted recreation activity will conflict with the above-listed tasks, nor any requirement set forth in the BEI. The Property Owner reserves to itself and to its personal representatives, heirs, successors, and assigns the following uses:

- Hunting shall be allowed on the Property in accordance with the following restrictions: (i) hunting activities shall not adversely affect the Conservation Values; (ii) no hunting activities shall take place from March 1 through July 15 of any year, and this closure period may be extended in writing by either Grantee, in consultation with CDFW, or CDFW to accommodate early or late Swainson's Hawk presence in any given year; (iii) no hunting activities shall take place within the cattle exclusion zone along the rift valley until all final restoration performance standards associated with the original restoration or any required remediation have been met and approved by the interagency review team (IRT) as specified in the BEI; (iv) recreational or target shooting not directly associated with the lawful take of game is strictly prohibited; (v) commercial hunting shall be allowed on an annual basis with the prior, written approval of CDFW and subject to any terms and conditions set forth in that written approval.

- The Property Owner may continue to engage in non-motorized recreational activities on the Property in the same manner as Grantor currently utilizes the Property. These uses include, by way of example and not limitation, hiking, horseback riding, and hunting (subject to the restrictions described above). No motorized recreational activities (e.g., recreational off-highway vehicle activities) are permitted except on existing roads and trails.

- The infrastructure currently existing on the Property includes storage tanks, ponds and a pipeline (largely located within existing roadways) for water extraction, storage and delivery; livestock structures; agricultural equipment; and safety equipment (fire and general). Infrastructure that currently exists on the Property may continue to be used, replaced and maintained by Grantor. Grantor may not expand the use of such infrastructure (including existing ponds) or change the nature of such infrastructure if such expansion or change would have a material, adverse impact on the Conservation Values without prior written approval from the IRT.

- The Property Owner reserves the right to continue to use the Bank Properties for outdoor education events, educational tours, and school-related events.

Infrastructure may be repaired, replaced or installed if necessary for the repair and function of houses, structures, restoration activities or other permitted activities in the Bank Properties. Prior to installation, the property owner must provide evidence that new infrastructure will not negatively impact the creditable resources in the Bank Properties and such installation must be approved by the IRT.

7.2 Permitted Maintenance Activities

Existing infrastructure, such as roads, pipelines, fences, utility lines, wells, water tanks, etc., will require occasional maintenance to facilitate the permitted uses of the Bank Properties by the Property Owner. Funding and scheduling the maintenance of this infrastructure is not a component of this LTMP or of the endowment as these maintenance activities are not required to achieve the objectives of the Bank, this LTMP or the CE. Maintenance of these facilities may require limited work within the Bank Properties; however, this work will be limited to the existing infrastructure and roads.

8.0 CULTURAL RESOURCES

Although cultural sites that are older than 50 years have been observed in the Bank Properties, including a reservoir, buildings and a turkey enclosure associated with the Munz Ranch and Frakes homestead, and distribution line from 1922, none of these sites are considered to be culturally or historically significant since they do not meet the standards as determined by Criterion 4/D, which states that in order for buildings, structures, or objects to be significant, they need to “be, or must have been, the principal source of information.” Additionally, all of the building structures in the Elizabeth Lake Bank Property were destroyed in the Powerhouse fire. More information can be seen in the Cultural Report (Exhibit J of the BEI).

Despite the low quality of the cultural sites in the Bank Properties warrant further protection. These include two features in close proximity to the Bank Properties, which are Not a Part of the Bank Properties and three prehistoric items in the Petersen Ranch Bank Properties. The two features that are not a part of the Bank Properties include an old adobe structure and a gravesite known as the Frakes burial plot. The adobe structure is located near the Petersen Ranch lodge and located outside of the Petersen Ranch Bank Property, far from any development areas. This adobe structure will be completely avoided during Bank development activities. As stated previously, the Frakes burial plot is also Not a Part of the Elizabeth Lake Bank Property, it will be avoided during development since the Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery. It should be noted that this burial plot is located far from any grading or other ground-work and development activities, as they are planned, pose little to no risk of damaging this burial plot.

Three prehistoric items were located in the Petersen Ranch Bank Property. Two of these resources were isolated finds (Iso-1 and Iso-2) and are not eligible for National Register. The third resource, a lithic scatter comprised of two mano fragments and a quartzite core (S-1), may be eligible for the National Register since there may be additional artifacts that are not visible or buried in this area, but until it is excavated/evaluated this determination cannot be made. The areas where Iso-1, Iso-2, and S-1 were located are not subject to any Development Activities and are located far from roads, within preservation areas. Monitoring, weed management, and any other long-term or interim management activities in these areas will be conducted on foot. No groundbreaking activities will occur within this area and long-term management activities, as they are planned, pose no risk of damaging this site.

As recommended in the cultural resources report for Petersen Ranch, which was completed by Duke Cultural Resources Management (Exhibit J of the BEI), if maintenance work is ever required in these areas, then a monitor shall be present during any ground disturbance within 50 feet of Iso-1, Iso-2, and S-1. The archaeological monitor shall work under the direct supervision of a qualified archaeologist who meets the Secretary of the Interior professional qualifications for prehistoric archaeology. If an archaeological deposit or any artifacts are discovered the archaeological monitor shall have the authority to temporarily halt or divert construction. The monitor shall quickly assess the nature and significance of the find and in consultation with the qualified archaeologist make further recommendations to the Corps for consideration and compliance with section 106 of the National Historic Preservation Act and to the State Historic Preservation Officer (SHPO). In the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Corps' Archeology Staff will be notified within 24 hours. Work in any area(s) where potential cultural resources are discovered will be suspended, and construction will not resume in that area until authorized by the Corps.

Additionally, if human remains are encountered during any Management or Development Activities, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of the origin and disposition of the remains pursuant to State Public Resources Code Section 5097.98. The County Coroner must be notified immediately.

9.0 TRANSFER, AMENDMENTS, AND NOTICES

9.1 Transfer

The Petersen Ranch Property Owner and Elizabeth Lake Property Owner shall have the right to sell, assign, transfer or convey (each a “transfer”) its interest in the Bank Property at any time, provided, however, that any such transfer on or after the execution date of the BEI must be made in accordance with the BEI and the Conservation Easements, and shall be subject to written concurrence by the IRT. Such concurrence shall be subject to the requirement that the transferee assumes and agrees in writing to observe and perform all of the property owner’s obligations pursuant to the BEI and Conservation Easements. From and after the date of any transfer by Petersen Ranch Property Owner or Elizabeth Lake Property Owner of its interest in the Bank Property, the transferor shall have not further obligations hereunder and all references to the Petersen Ranch Property Owner or Elizabeth Lake Property Owner in the BEI shall thereafter refer to such transferee, except that the transferor’s liability for acts, omissions, or breaches occurring prior to the transfer shall survive the transfer.

9.2 Amendments

The Petersen Ranch Property Owner, Elizabeth Lake Property Owner, and the IRT may meet and confer from time to time, upon the request of any one of them, to revise the Long-term Management Plan to better meet management objectives and preserve the habitat and conservation values of the Bank Property. Any proposed changes to the Long-term Management Plan shall be discussed with the IRT. Any proposed changes will be designed with input from all parties. Amendments to the Long-term Management Plan shall be approved by the IRT in writing shall be required management components and shall be implemented by Petersen Ranch Property Owner and Elizabeth Lake Property Owner.

If the CDFW determines, in writing, that continued implementation of the Long-term Management Plan would jeopardize the continued existence of a state listed species, any written amendment to this Long-term Management Plan, determined by the CDFW as necessary to avoid jeopardy, shall be approved by the IRT in writing, shall be a required management component, and shall be implemented by the Petersen Ranch Property Owner and Elizabeth Lake Property Owner.

9.3 Notices

Any notices regarding this Long-term Management Plan shall be directed as follows:

Elizabeth Lake Property Owner:
LV Lake Elizabeth, LLC
1001 Bridgeway #246
Sausalito, CA 94965
(415) 729-3734
Contact: Tracey Brownfield

Petersen Ranch Property Owner:
LV-BP Investors Ranch, LLC
1001 Bridgeway #246
Sausalito, CA 94965
(415) 729-3734
Contact: Tracey Brownfield

IRT:

U.S. Army Corps of Engineers
Los Angeles District
915 Wilshire Boulevard
Suite 13073
Los Angeles, CA 90017
Attn: Chief, Regulatory Division

U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105
Attn: Director, Water Division
Telephone: 415-947-8707
Fax: 415-947-3549

California Regional Water Quality Control Board
Lahontan Region
14440 Civic Drive, Suite 200
Victorville, CA 92392
Attn: Executive Officer

California Department of Fish and Wildlife
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
Attn: Regional Manager

California Department of Fish and Wildlife
Habitat Conservation Branch
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
Attn: Branch Chief
Telephone: 916-653-4875
Fax: 916-653-2588

10.0 FUNDING AND TASK PRIORITIZATION

10.1 Funding

The Endowment Fund Analysis and Schedule (Exhibit D-2 of the BEI) summarizes the anticipated costs of long-term management for the Bank as outlined in this Long-term Management Plan. These costs include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, weed mowing, trash removal, fence repair, and a prorated calculation of funding needed to fully replace the fences every 20 years. The Endowment Amount will be funded for each Area, by Phase, following the schedule outlined in the BEI.

Southwest Resource Management Association (SMRA) shall hold the Endowment Fund in accordance with the Endowment Agreement (Exhibit D-3 of the BEI). These interest monies from the Endowment Fund will fund the long-term management activities on the Bank Property in a manner consistent with this Long-term Management Plan.

The Petersen Ranch Property Owner and Elizabeth Lake Property Owner shall consult with SMRA on a year to year basis to determine the amount of funding available for long-term management activities. Interest monies from the Endowment Fund will be disbursed to the Petersen Ranch Property Owner and Elizabeth Lake Property Owner as outlined in the Endowment Agreement (Exhibit D-3 of the BEI).

10.2 Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Petersen Ranch Property Owner, Elizabeth Lake Property Owner, and the IRT shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the IRT and as authorized by the IRT in writing.

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LTMP

APPENDIX A:

FIGURES

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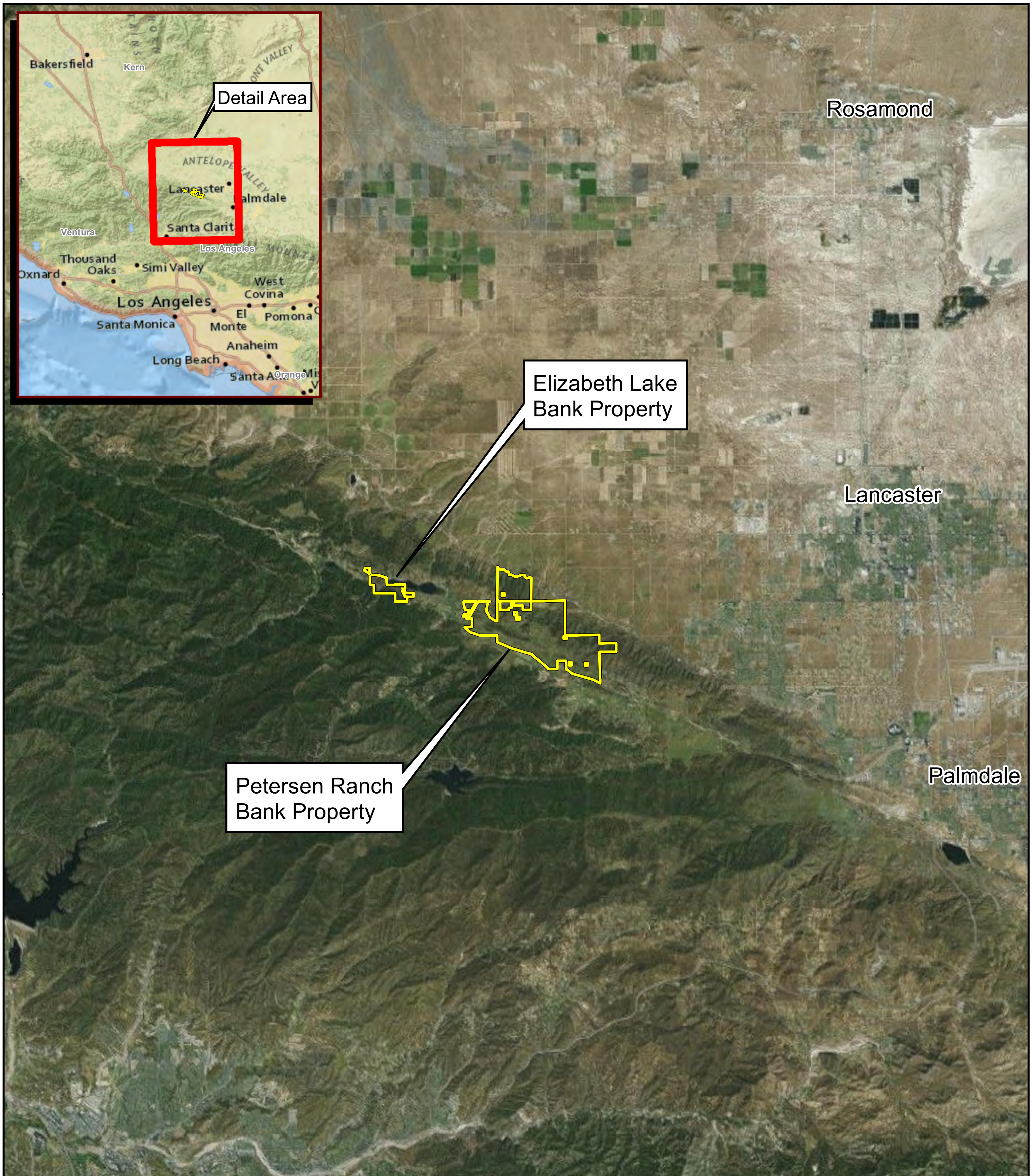

Figure 1. Location Map

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Petersen Ranch Mitigation Bank
Los Angeles County, California

ENVIRONMENTAL CONSULTANTS

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Microsoft 5/8/2010

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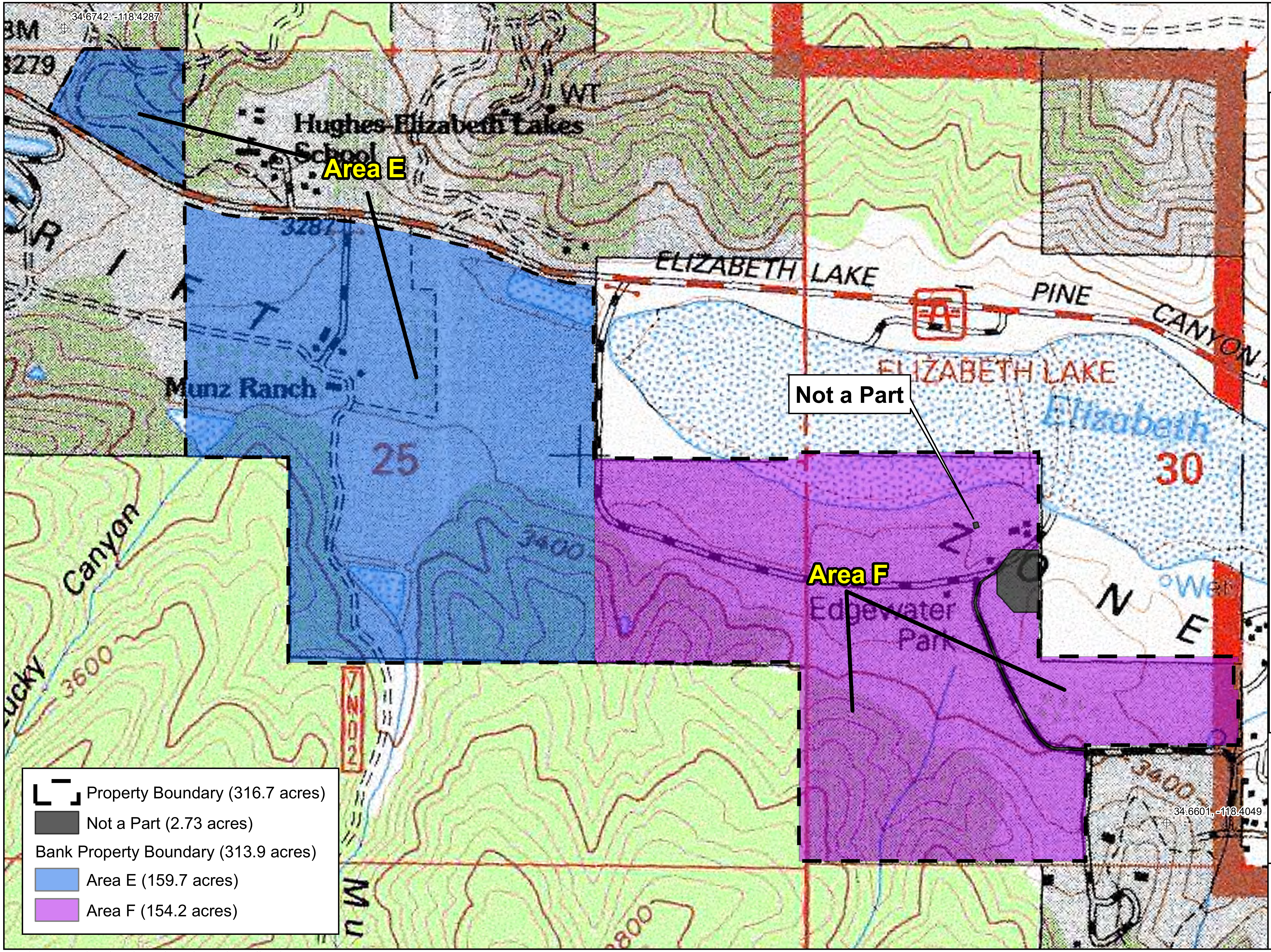

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 2.

Elizabeth Lake
Bank Property Map

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Map Date: June 2015
Map By: Chris Zumwalt
Base Source: USGS 7.5 min. quad

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WRA ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

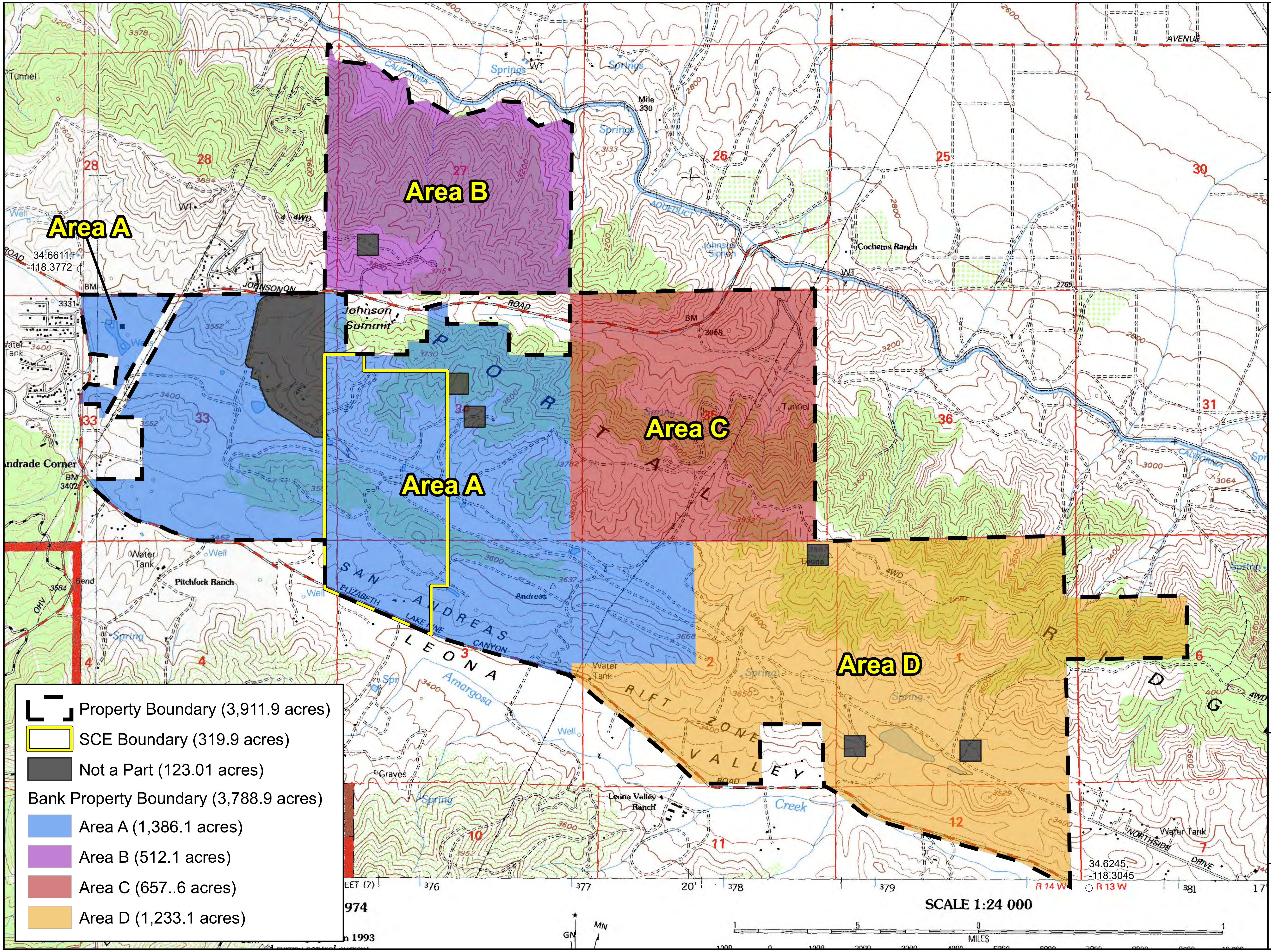

Figure 3.

Petersen Ranch Bank Property Map

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Map Date: June 2015
Map By: Chris Zumwalt
Base Source: USGS 7.5 min. quad

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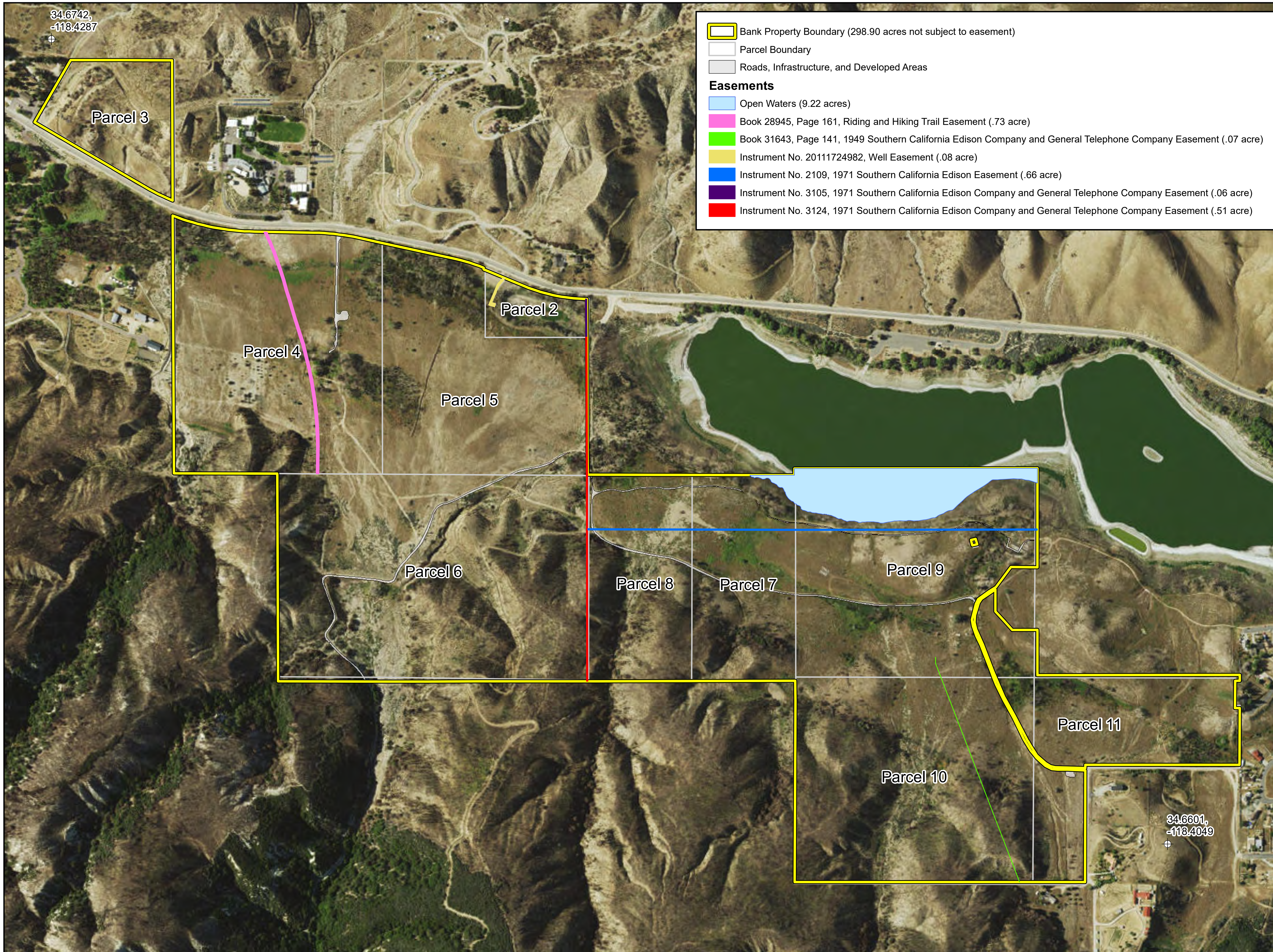

ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 4.

Plat Map for
Elizabeth Lake
Bank Property

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Map Date: March 2016
Map by: Chris Zumwalt
Base Source: ESRI Microsoft 5/8/2010

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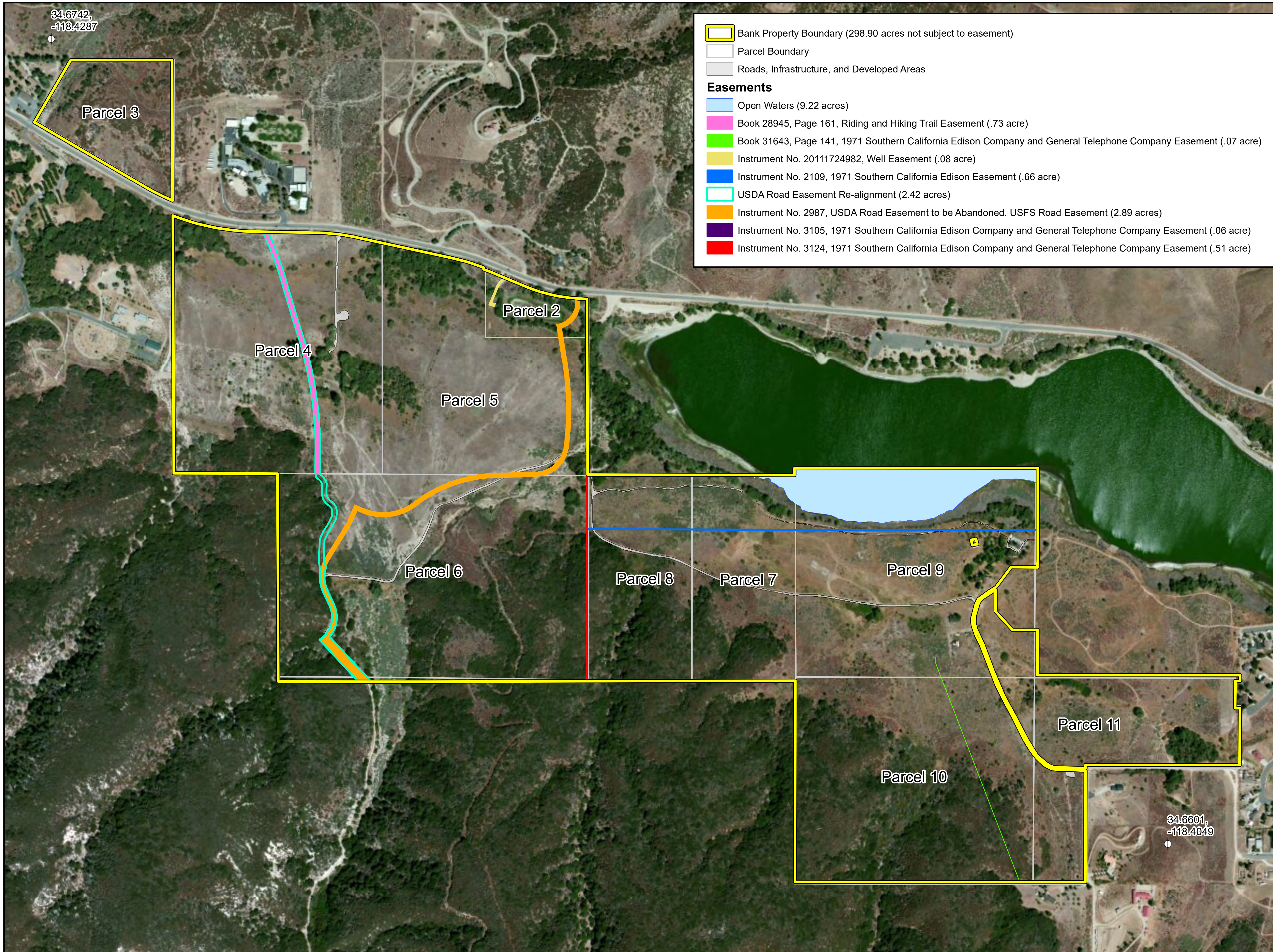

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

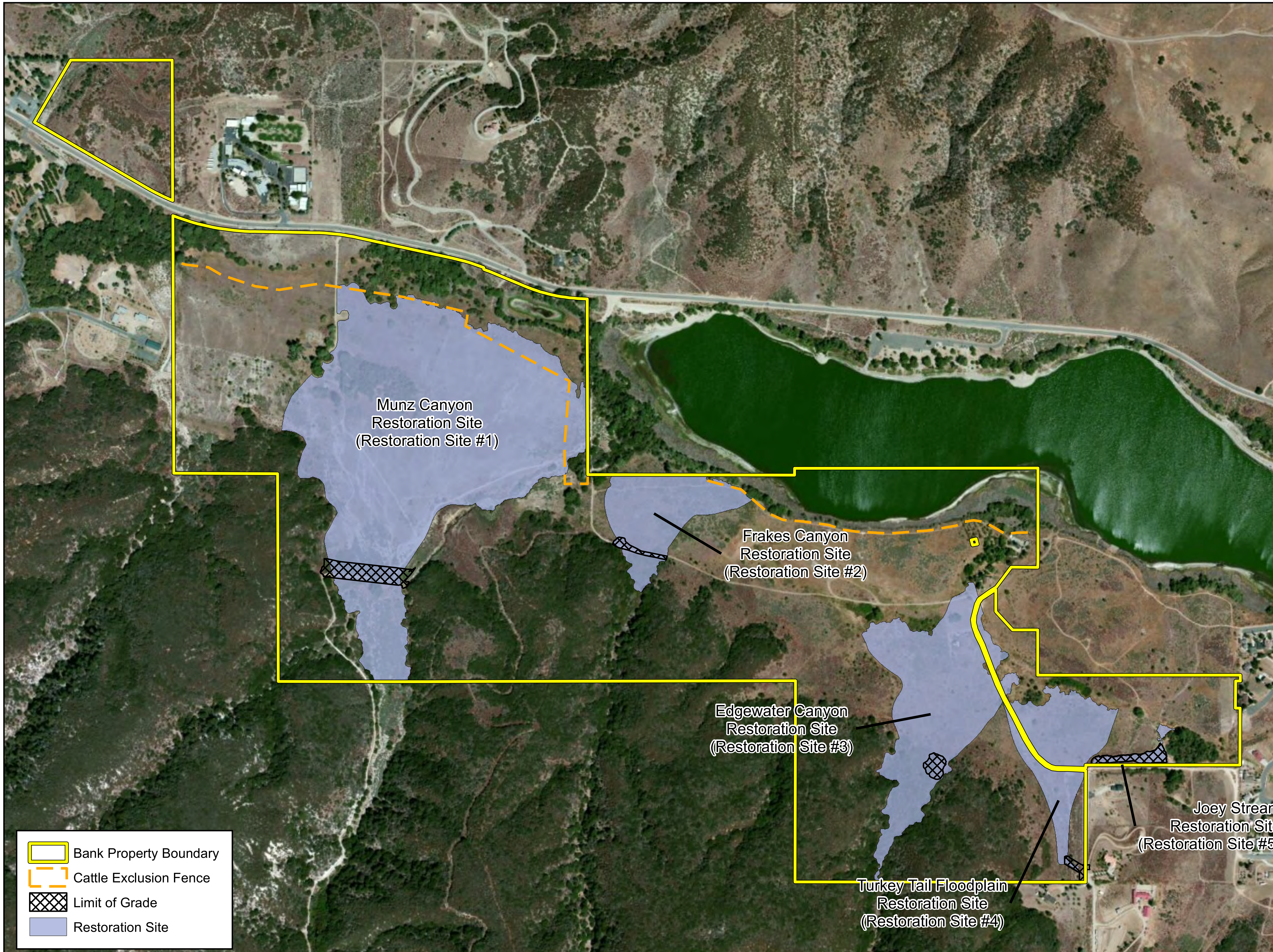
Los Angeles County, California

Figure 4.

Plat Map for Elizabeth Lake Bank Property

Map Date: June 2015
Map by: Chris Zumwalt
Base Source: ESRI Microsoft 5/8/2010

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\LTMP\Figure 4 Elizabeth Easements.mxd



wra ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 5.

Development Plan
for Elizabeth Lake
Bank Property

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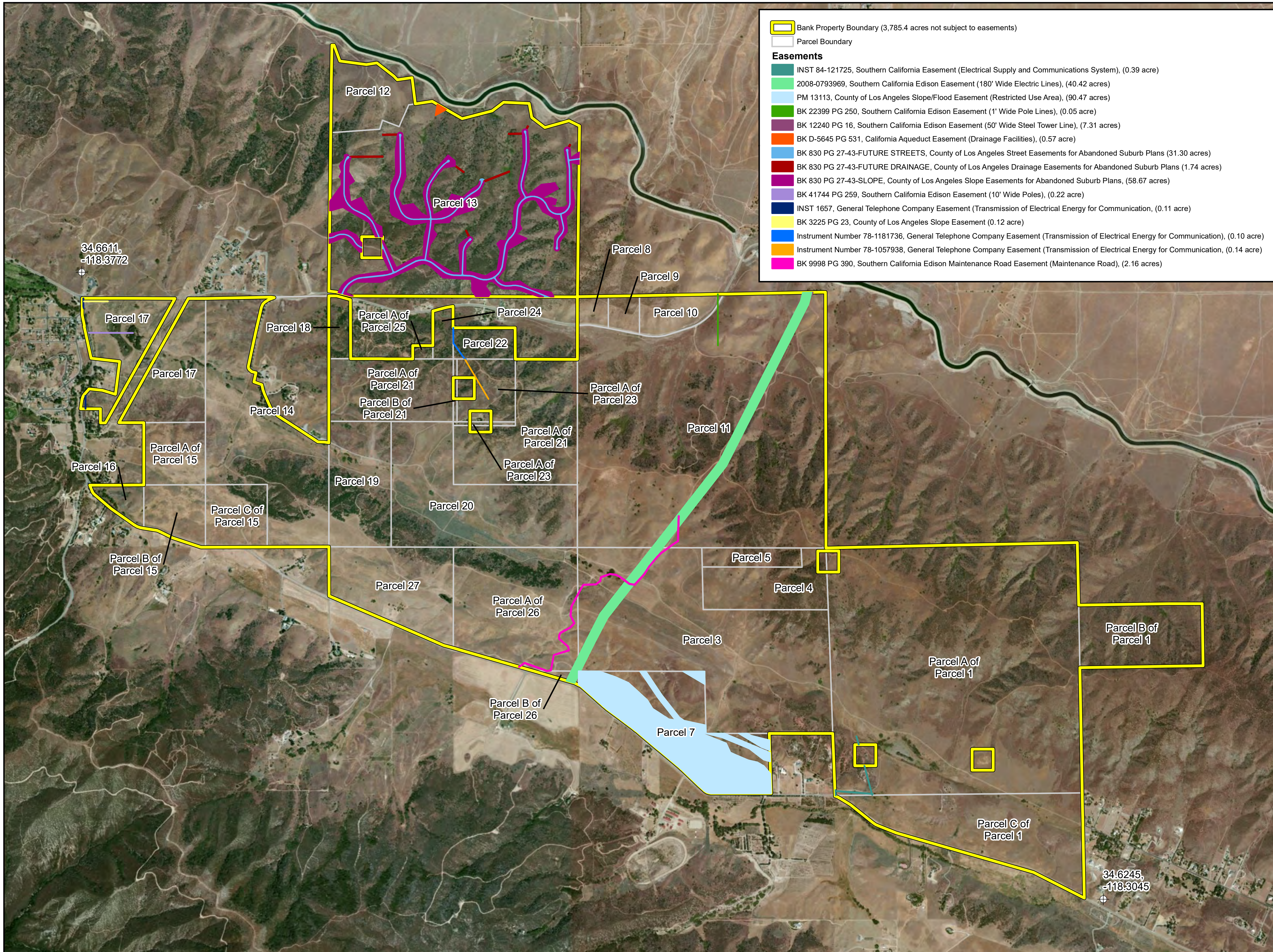
Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/2010

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\LTMP\Figure 5 Elizabeth Development.mxd



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Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 6.

Plat Map for Petersen Ranch Bank Property

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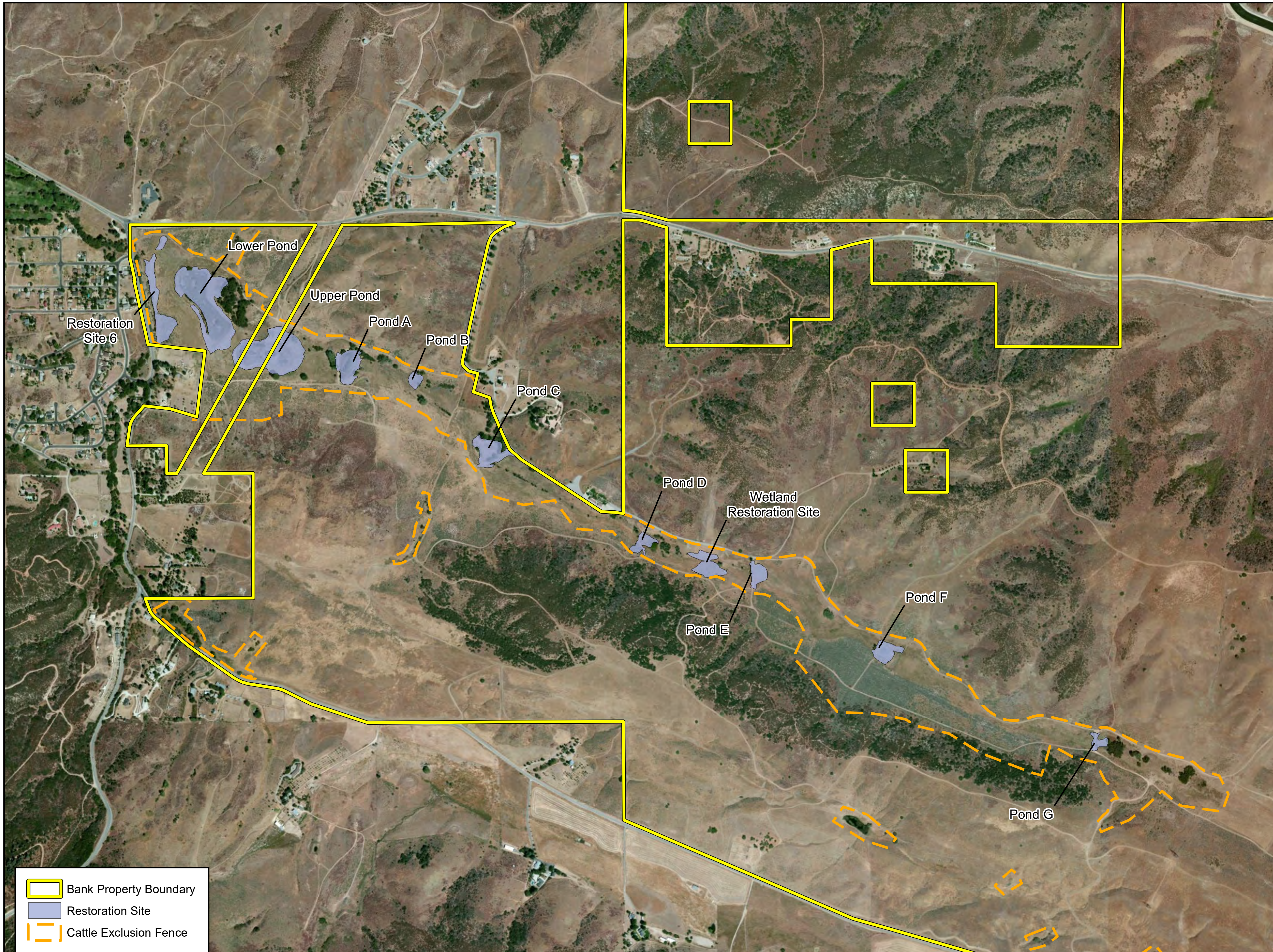
Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Microsoft 5/8/2015

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\LTMP\Figure 6 Petersen Easements.mxd



wra ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 7.

Development Plans in the Petersen Ranch Bank Property

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Map Date: June 2015
Map By: Chris Zumwalt
Base Source: USGS 7.5 min. quad

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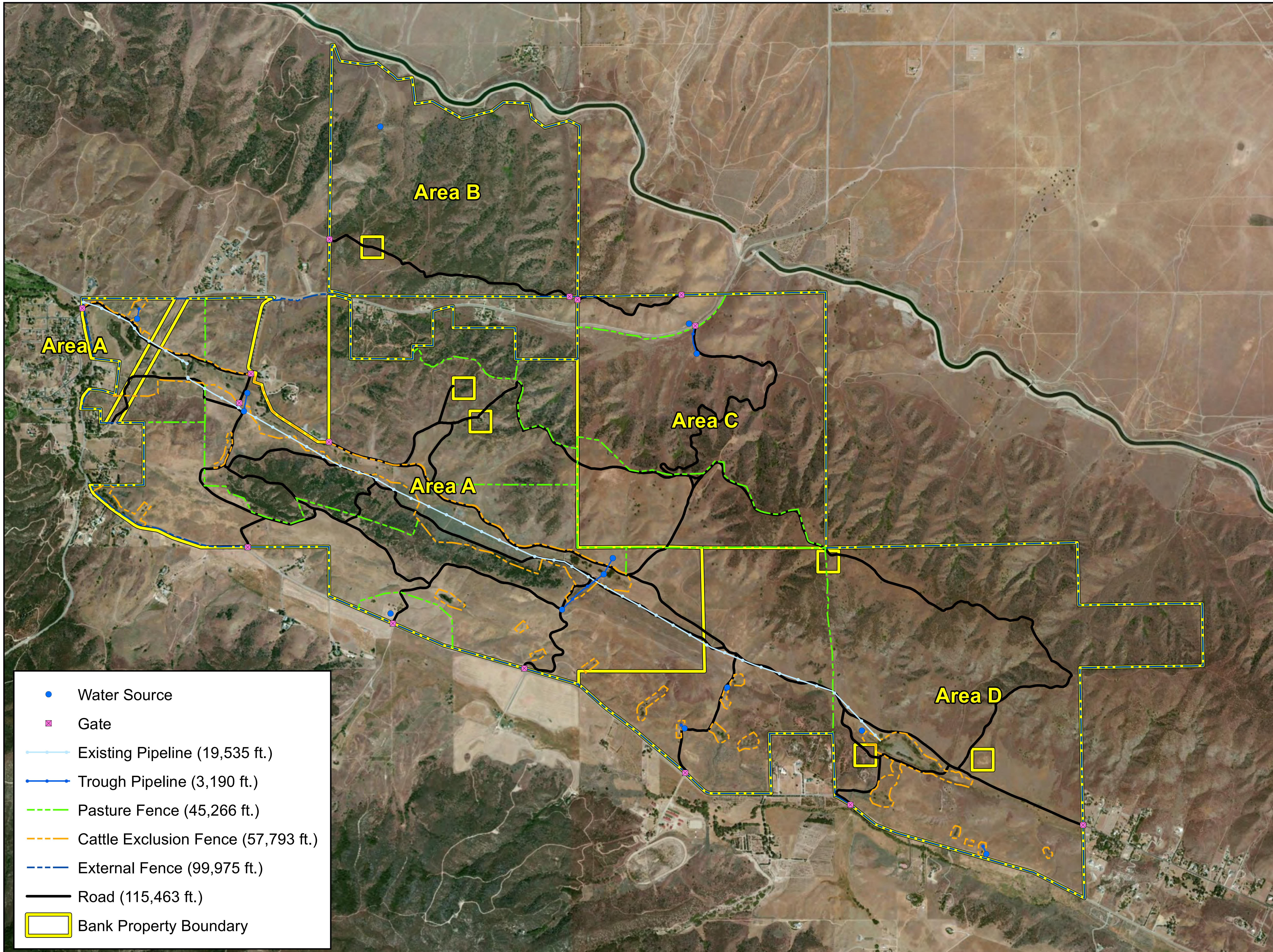

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Bank Property

Los Angeles County,
California

Figure 8.

Infrastructure Map
of the Petersen Ranch
Bank Property

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Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Exhibit D - LTMP\Figure 8 Petersen Infrastructure.mxd

ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

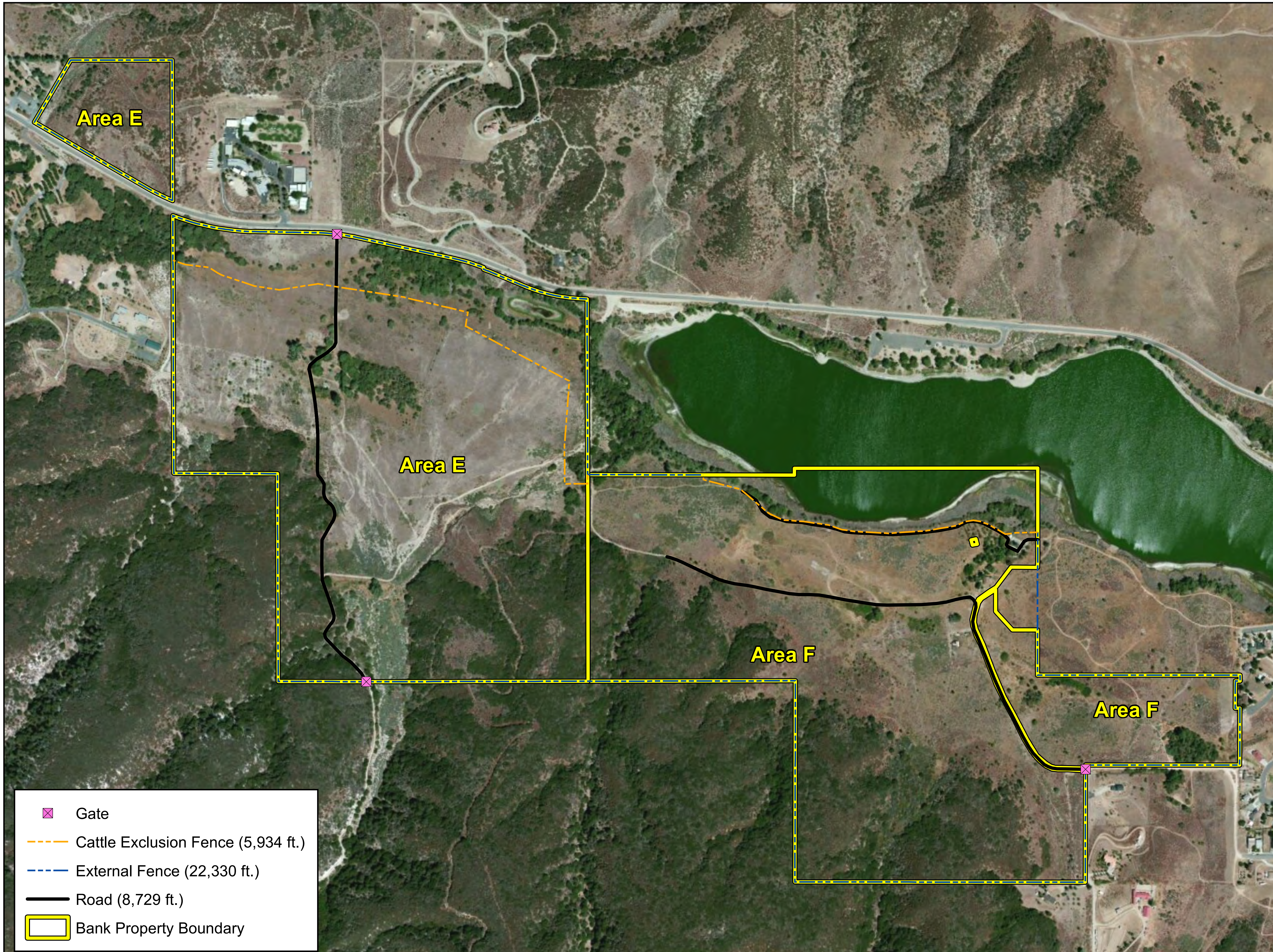
Los Angeles County,
California

Figure 9.

Infrastructure Map
of the Elizabeth Lake
Bank Property

Map Date: 3/8/2016
Map by: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Exhibit D - LTMP\Figure 9 Elizabeth Infrastructure.mxd



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ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 9.

Infrastructure Map of the Elizabeth Lake Bank Property

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Map Date: June 2015
Map by: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Exhibit D - LTMP\Figure 9 Elizabeth Infrastructure.mxd

LTMP

APPENDIX B:

GRAZING PLAN

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PURPOSE

This document outlines a plan for grazing management at the Petersen Ranch Mitigation Bank Properties (Bank Properties) and acts as an instructional document for the ranch manager. The ranch manager is the person in charge of the movement and management of livestock, and may be an employee or lessee of the Property Owner. Proper grazing management will be a key component to maintaining the condition and biological values of the Bank Properties. A preliminary analysis of the forage productivity and carrying capacity of the Bank Properties has been conducted to guide future grazing management from an ecological integrity and habitat management perspective. The purpose of this Grazing Plan is to provide the framework to determine the appropriate number of livestock the Bank Properties can support, while ensuring that all covered resources are protected and maintained through implementation of ecologically sound grazing practices. This document expands upon the associated Long-Term Management Plan (Exhibit D-5; LTMP; WRA 2014) to illuminate, and remain in compliance with, any grazing task in that document.

GOALS

Livestock grazing can play an important role in maintaining species diversity in grassland and scrub ecosystems (Barry 1996). The absence of grazing has been shown to have significant ecological effects in southwestern range and scrublands including increase in shrub cover, increase in non-native grass cover, changes to hydrology and dry matter ratios, decrease in species diversity and increased intensity of fire (Barry 1996, Manier 2007, Great Basin Restoration Initiative Workgroup (GBRIW) 2010).

The intent of this grazing plan is to achieve the goals and fulfill the requirements of the LTMP, with the primary intent being the maintenance of the covered resources within the Bank Properties. Historical grazing practices within the Bank Properties have included overgrazing and uncontrolled use by cattle. This grazing plan seeks to implement ecologically sound grazing practices to encourage a pre-settlement habitat structure, in which diverse vegetation types, heights, and moisture content are maintained in patches throughout the Bank Properties. This plan will meet these objectives through identification of appropriate stocking levels to reduce thatch, minimize fire hazards and manage invasive species.

SITE DESCRIPTION

Petersen Ranch Bank Property

The Petersen Ranch Bank Property has been historically used for cattle grazing for at least the last 100 years, and likely as far back as the Mexican Rancho period which began in 1821 (Duke 2013, Exhibit J of the BEI). Currently the Petersen Ranch Bank Property is lightly grazed during the winter and spring rainy season. Existing infrastructure includes perimeter and pasture fencing, a corral, developed springs and troughs. Additionally, exclusion fencing will be installed in the Petersen Ranch Bank Property that will exclude cattle from the rift valley wetland complex and select wetland features. This cattle exclusion fencing will include a 35-foot setback from select aquatic resources. The Petersen Ranch Bank Property consists of seven pastures totaling 3,689 acres that are available for grazing (Figure 1, Figure 2).

There are 24 soil types (USDA 2014) documented within the Petersen Ranch Bank Property Grazing Areas. The following soil information is based on the Natural Resource Conservation Service (NRCS) online soil survey data. Vista coarse sandy loam (between 9-15 percent slopes) is the largest soil unit within the Petersen Grazing Area, accounting for approximately 1,360 acres. This soil is capable of producing 1,700 pounds per acre of forage in a favorable year. Amaragosa rocky, coarse, and sandy loams compose approximately 710 acres of the soils along the northeastern boundary, and are capable of annually producing approximately 1,000 pounds of forage per acre. Hanford loams (between 15 and 30 percent slopes) are the final major soil unit, and underlays approximately 590 acres of the Petersen Grazing Area. In a favorable year, is capable of producing approximately 1,100 pounds of forage per acre per year. The remaining 1,000 acres is underlain by a further 16 soil types which are capable of producing between 500 and 2,975 pounds of forage in a favorable year (USDA 2014). The distribution of soil productivity for favorable and unfavorable years at Petersen Ranch is depicted in Figures 3 and 4.

Vegetation within the Petersen Ranch Bank Property consists of 59 different land cover types that provide various quality and quantity of forage. Four land cover types (Chamise (*Adenostoma fasciculatum*), Desert Olive (*Forestiera pubescens*), Open Water and Roads) totaling approximately 420 acres were considered not to provide suitable forage for livestock, these land cover types are concentrated primarily in pastures 2, 6 and 7. Approximately 800 acres of the Petersen Ranch Bank Property consist of open herbaceous habitats that provide relatively high quantity and quality of forage consist of non-native annual grasslands (brome (*Bromus spp.*), cheatgrass (*B. tectorum*), barley (*Hordeum spp.*)) intermixed with native perennial grasslands (deergrass (*Muhlenbergia rigens*), wild rye (*Elymus spp.*)). The remaining acreage consists of mixed scrub habitats of varying densities supporting open patches of suitable forage.

Elizabeth Lake Bank Property

The Elizabeth Lake Bank Property has not been grazed for at least the last five years. In 2013 the Powerhouse Fire burned the Elizabeth Lake Bank Property removing most of the woody vegetation, though some stump sprouting is evident and some trees in riparian areas still remain. There are no immediate plans to graze the Elizabeth Lake Bank Property; however, fencing will be put in place to allow grazing following successful re-establishment of vegetation should the Property Owner find it an appropriate and useful management tool in accordance with this grazing plan. Additionally, cattle exclusion fencing is planned in the Elizabeth Lake Bank Property surrounding select sensitive aquatic resources to prevent grazing impacts to these areas.

The Elizabeth Lake Property includes three soil types: the Tujunga-Capistrano association is the largest in the Elizabeth Lake Grazing Area accounting for 192 acres. The Caperton-San Andreas-Modesto and Hanford soils are the other two soils representing 82 and 15 acres of the Elizabeth Lake Grazing Area respectively. All of the soils present in the Elizabeth Lake Grazing Area are capable of producing 1,100 pounds of forage per acre in favorable years according to the NRCS soils data (USDA 2014). The distribution of soil productivity at Elizabeth Lake, for favorable and unfavorable years, is depicted in Figures 5 and 6.

Vegetation within the Elizabeth Lake Bank Property is recovering from the Powerhouse Fire and the resulting landcover types and suitability of forage should be assessed prior to introduction of cattle, should grazing be introduced to this property.

BENEFITS OF LOW-DENSITY GRAZING ON SEASONAL WETLANDS

It has been documented that high-intensity livestock grazing can negatively affect riparian areas, where overuse by cattle can lead to trampling damage and overbrowsing of riparian vegetation, erosion, and impacted water quality (Belsky et al. 1999). However, potential deleterious effects can be lessened through the management decisions proposed in this plan. Excluding cattle within mesic wetland and riparian areas through the use of exclusion fencing, and adjusting the timing, frequency and intensity of grazing in upland areas, will be used to minimize impacts to riparian areas and other sensitive aquatic features.

Wetland areas within the Petersen Ranch Bank Property where livestock will not be excluded include seasonal depression or swale wetlands dominated by annual grasses and forbs. Many studies have been conducted to determine the benefits of grazing on seasonal depression or swale wetlands dominated by annual grasses and forbs (Barry 1996, Marty 2004, Pyke and Marty 2005, Middleton et al. 2004, Collins et al. 1998, Hayes and Holl 2003). These studies have shown that seasonal and ephemeral wetlands dominated by annual species and surrounded by annual, non-native grasses, benefit from low- to moderate-intensity grazing. Wetlands of this type exhibited greater biodiversity and native annual forb species richness (Marty 2004, Pyke and Marty 2005, Middleton et al. 2006), longer-lasting wetland hydrology (Marty 2004), and less thatch accumulation (Barry 1996) when compared to areas which completely removed cattle from the previously-grazed wetlands. Complete removal of the cattle from these previously grazed areas led to shorter inundation of wetlands (Barry 1996, Marty 2004, Pyke and Marty 2005), accumulation of thatch (Marty 2004, Barry 1996), and reduced biodiversity (Collins et al. 1998, Middleton et al. 2006). These effects were accompanied by an increase in non-native annual forbs and grasses (Barry 1996) or encroachment of shrubs (Middleton et al. 2006) within and along the margin of the wetlands. These studies also recommend considering the effects of season of grazing and grazing intensity when creating a grazing plan as well as monitoring plant species, amount of unutilized forage (residual dry matter, RDM), and utilization (Barry 1996, Hayes and Holl 2003, Collins et al. 1998, Marty 2004, Pyke and Marty 2005).

This grazing plan and the adaptive management actions described in the LTMP were modeled in a way to account for these recommended management practices and include consideration of the amount of cattle, vegetation, dry matter, forage availability, and seasonality, among many other factors, before making the recommendations described herein. As supported by the publications listed above, these seasonal wetlands dominated by annual species can benefit from management by grazing when the grazing is managed in a way that takes these factors into consideration. Despite this, some wetlands may not benefit from grazing due to their semi-perennial nature. These wetlands have been identified and a perimeter of cattle exclusion fencing will be installed around these selected wetland features, setback 35 feet from the edge of wetland or riparian vegetation. If degradation of any of the wetlands is observed as a result of the cattle grazing in preservation areas, adjustments will be made to the management plan to correct these impacts.

GRAZING MANAGEMENT

Grazing Carrying Capacity

Grazing capacity is an estimate of the number of grazing animals that the forage produced annually on a site can support. It is based on the forage availability of a site after accounting for a desired minimum amount of unutilized forage (RDM) left in the pastures at the beginning of the growing season. This minimum RDM target is selected to minimize erosion and to maintain soil fertility within the pastures.

Many public and private preserved lands require prescribed grazing as a management tool to promote healthy habitats for protected species, control invasive weeds, or reduce fire hazards. WRA has created the carrying capacity (Cowpacity) GIS model as a tool to help quantify optimal grazing regimes to meet management objectives. The Cowpacity model takes into consideration a pasture's soils, slope, vegetation, and distance to available water sources for livestock, to map minimum RDM targets, expected productivity, expected utilization patterns and the carrying capacity of a given pasture. The Cowpacity model uses data and recommendations from Bartolome et al. 2002, Holecheck 1998, NRCS Soil Survey Geographic (SSURGO) Soils Data, and field data when available. This model outputs values in Animal Unit Months (AUM, the amount of forage consumed by a single animal unit in a 30 day period, approximately 900 lbs.) so that the results can be applied to grazing operations of any animal type and duration.

Using the Cowpacity GIS model, WRA, determined the estimated carrying capacity for each pasture (Figures 7 through 10). The analysis was conducted using both favorable and unfavorable (dry/drought) years and is summarized in Table 1 below.

Table 1: Estimated Grazing Capacity (Animal Unit Month, AUM)

Pasture	Acres	Favorable Year AUM	Unfavorable Year AUM
1	1,078	442	97
2	844	163	28
3	636	161	34
4	78	30	6
5	53	3	0
6	483	61	6
7	517	30	3
8	276	91	7
TOTAL	**3,965**	**981**	**181**

The above stocking rates are estimates, using the available soils data and assumptions of forage availability. Annual monitoring of RDM will take place at the end of each year's growing season. RDM data will be collected at sample points within each pasture and compared to the stocking rates for the year in combination with ecological data collected on-site, such as signs of erosion, or excessive weed regeneration which may be controlled by changes in grazing practices and/or herbicide application. The grazing capacity for each pasture will be calculated based on the previous year measurements. Actual stocking rates will be determined on an annual basis by the ranch manager in accordance with this grazing plan, and in conjunction with the Property Owner based on analyses of annual monitoring results. However the maximum number of cattle should not exceed 164 Animal Units (adults or cow-calf pairs) over a 6 month period, unless RDM measurements demonstrate a higher carrying capacity is warranted. Flexibility in determining annual stocking rate is necessary to accommodate annual variation in weather, which can cause large variations in forage production (e.g. favorable year AUM versus unfavorable year), however the goal of the annual stocking rate is to ensure low-impact grazing to create heterogenic habitat structure, reduce thatch, minimize fire hazards and manage invasive species. Annual field measurements of forage production and actual stocking records will be used to update and modify the estimated carrying capacity.

Residual Dry Matter

RDM data provides an indication of the previous season's forage production and consumption by grazing animals (Bartolome et al. 2002) and is useful to land managers in making stocking rate decisions that will be beneficial to overall management objectives. Maintaining target RDM levels will help protect soil from erosion and nutrient loss and can promote an increase in the forage quality and quantity of grassland vegetation. In California annual grasslands, RDM levels have been shown to correlate with plant species composition and productivity within similar sites and climate conditions. However, the driving factors of herbaceous plant species composition in California annual grasslands are climate and site conditions such as soil type, tree cover, and slope (Bartolome et al. 1980, Bentley and Talbot 1951, Frost et al. 1997, and Jackson and Bartolome 2002).

While recommended RDM levels have not been determined for rangelands in this area, target RDM levels have been set using the recommendations for dry annual grasslands (with average annual rainfall totaling less than 12 inches) from the publication *California guidelines for Residual Dry Matter (RDM*) *management on coastal and foothill annual rangelands* (Bartolome et al. 2002). To preserve soil stability and productivity, higher target RDM levels are recommended in areas with low woody cover, and steep slopes, with lower RDM levels needed on flatter, and/or more densely vegetated habitats. The Bank Property has significant variation in topography, and RDM targets will vary across the site from 100 pounds per acre in the flattest areas, to 800 pounds per acre in the steepest grassland areas (Figures 11 and 12). An average RDM of 500 pounds per acre should be maintained in most pastures throughout the Bank Properties.

Cattle Exclusion Areas

Wetlands and riparian zones are particularly sensitive to deleterious effects of cattle grazing due to nutrient inputs, sedimentation, erosion, and over utilization of riparian vegetation during the summer months. Several federal, state and regional agencies including the U.S. Forest Service (Clary and Webster 1989), U.S. Bureau of Land Management (BLM 2006), and Tahoe Regional Planning Association (TRPA 2012), encourage grazing management practices, such as exclusion, rotation, and season of rest to protect riparian resources.

Numerous studies have highlighted the benefits of grazing setbacks around wetland and riparian areas to control pollution associated with cattle operations (Borin and Bigon 2002, Osborne and Kovacic 1993, Tate et al. 2004, Tate et al. 2006, Young et al. 1980). Grazing setbacks around wetland and riparian areas encourage the development of vegetated buffer strips. Vegetated buffer strips comprised of just five meters (16.4 feet) of herbaceous vegetation and one meter (3.3 feet) of woody vegetation have been shown to significantly reduce nitrogen pollution to streams and wetlands through uptake in aboveground plant biomass (Borin and Bigon 2002). Five-meter grass buffer strips have been shown to reduce fecal bacteria pollution (Tate et al. 2004, Tate et al. 2006).

The Petersen Ranch Bank Property contains wetland and riparian habitats of varying quality and hydrology, ranging from xeric alluvial floodplain, to more mesic seasonal wetland, riparian wetland, and freshwater marsh. In order to decrease the potential deleterious effects to wetland and riparian resources, and increase colonization by hydrophytic plants, 35-foot grazing setbacks will be established around selected wetland and riparian habitats (Figure 1, Figure 2). Thirty-five foot setbacks are based on policies established by the Tahoe Regional Planning Agency (TRPA) livestock grazing standards for grazing in areas adjacent to stream channels. TRPA maintains some of the strictest water quality standards in the state and are used here in absence of any local or regional standards. Cattle grazing will be excluded within 35-foot setbacks around the entire rift valley riparian area and other mesic wetland and riparian features (Figure 1, Figure 2) through installation of exclusion fencing. This will help improve and preserve existing riparian habitat and ensure successful re-establishment of mature aquatic and riparian vegetation communities.

The 35-foot grazing setbacks within the selected wetland and riparian areas will enhance wetland and riparian habitats. The fenced grazing exclusion areas will protect aquatic resources from potential eutrophication, sedimentation, nutrient deposition, and fecal bacteria originating from upland pastures. Expansion of woody vegetation within the grazing exclusion areas will improve habitat and water quality conditions for the watershed. Low density grazing within seasonal wetland areas outside of grazing exclusion areas is expected to maintain habitat conditions through the removal of thatch and control of non-native grasses. Grazing impacts will be monitored within grazed seasonal wetland areas. If excessive soil compaction, trampling or overgrazing of wetland areas is observed, adaptive management measures such as placement of supplemental salt or hay in upland areas away from wetlands will be considered. If supplemental attractants are deemed necessary to prevent negative impacts to wetlands, supplements should be placed no closer than one-quarter mile from the impacted wetland. Occasionally, grazing within the exclusion areas may be desirable to control invasive species or a build-up of thatch or fuels. If deemed necessary for management objectives, and subject to IRT approval, grazing in these areas would be conducted after the end of season rains, but while grasses are still green. Careful timing of grazing after rains have stopped and the ground has hardened will protect soil stability around wetlands and will prevent excess nutrient inputs into the downstream waters. Grazing while grasses are still green will prevent cattle from over-utilizing riparian vegetation as cattle preferentially forage on protein rich grasses when available and will be less inclined to loaf in riparian habitats when temperatures are cool.

Thatch Removal

The primary ecological issue with allowing grasses to grow uncontrolled is the accumulation of thatch at the end of each growing season. Thatch is capable of dramatically altering an ecosystem by changing soil temperature and moisture, allowing further infestation by invasive species, and increasing fire risk. Grazing to reduce forage levels to, or near, the target RDM levels will reduce thatch build up. If patchy utilization results in observations of increased thatch build-up in specific areas of a pasture, increased stocking rates, or attractants such as salt licks or molasses may be used to encourage grazing in these target areas until thatch is reduced.

Fuels Reduction

Historically, sagebrush (*Artemisia sp.*) plant communities had shorter intervals between wildfire, and when the wildfires occurred, they were smaller and less intense. These fires lead to a many successional stages within any given area. As fire moved through those successional stages, it would reach different fuel heights and vegetation moisture content, leading to smaller localized fires (GBRIW 2010).

Since the introduction of livestock across the American West, several important factors have combined to dramatically change the historic fire regime. With the introduction of feed-grains, several species of non-native annual grasses were naturalized throughout the region. These grasses invade the interstitial space between native bunchgrasses and slowly outcompete native grasses, creating homogenous stands of non-native annual grasslands. In contrast to native perennial bunchgrasses, non-native annual grasses die completely in the summer leaving a highly flammable thatch layer spread across the habitat. As this transition was happening, the land became actively managed and a policy of zero fire was implemented across the American West. That combination of factors created large banks of fuel material leading to very large, hot fires (GBRIW 2010). Diverse microhabitats offer natural fire suppression and create a fuel environment that is less likely to result in catastrophic high-intensity fires.

To reduce fuel loads, the prescribed grazing regime within the Bank Property will focus on reducing thatch, minimizing the encroachment of shrubs into the open grassland habitats, and grazing scrub lands to create and maintain openings. Stocking rates should be set to utilize forage throughout all pastures to reduce RDM to near the target levels.

Invasive Species Management

Grazing can be an effective method to control invasive plant species when used in conjunction with other eradication methods such as physical removal or herbicide applications (DiTomaso 2000). Prescribed grazing treatments may be utilized to control invasive species within the Bank Properties. Through modifying the season of grazing within a pasture, use of attractants such as salt licks, molasses or other supplements, changing the location or availability of water sources, modifying stocking rates, or through the use of temporary electric fencing to facilitate flash grazing of a specific area. Regardless of the prescribed grazing treatment that is used, the most important consideration is that treatments are carefully timed to take advantage of the target plant's phenology. The ranch manager will work closely with the Property Owner when prescribing grazing treatments, as well as any other physical or chemical treatments allowed per the LTMP, to coordinate the timing and application of any necessary treatments to ensure they are applied in a period that avoids impacts to the native biodiversity in the area.

Maintaining Habitat for Swainson's Hawk

Grazing the Bank Properties will help maintain suitable foraging habitat for Swainson's hawk (*Buteo swainsoni*). The primary mechanism for this benefit is the effect grazing has on preventing encroachment of shrubs into open grasslands and creating openings in scrub habitats (GBRIW 2010). This will protect existing Swainson's hawk foraging habitat within the Bank. A secondary benefit is that grazing to achieve the target RDM levels will keep grasses short, improving habitat for prey, and maintaining prey visibility for Swainson's hawks. Since small rodents and grasshoppers make up a large part of the Swainson's hawk diet, attempts should not be made to control these populations.

Maintaining Habitat for Tricolored Blackbird

Grazing the Petersen Ranch Property will help maintain suitable foraging habitat for tricolored blackbird (*Agelaius tricolor*), a State species of special concern. Natural foraging habitats for the species include marshes and wetlands, vernal pools and other seasonal water features (wet and dry), grasslands, and scrublands (including riparian). Tricolored blackbird will benefit from implementation of this grazing plan in two ways. First off, the 35-foot grazing setback will be implemented around the perennial marsh on the Petersen Ranch Property and the Elizabeth Lake Property that provide tricolored blackbird breeding habitat. Grazing to meet target RDM levels in the surrounding areas outside of the setback will improve foraging conditions for the species by keeping the vegetation at an optimal height (less than 15 centimeters [6 inches]) which provides access to insect prey (Beedy and Hamilton 1999).

Bank Phasing

The Bank will be established, and conservation easements will be placed over the Bank Properties, in phases to meet the market demand for mitigation within the service area(s). The Bank will be established in phases comprised of six geographic Areas (Area A – Area F). Phase 1 includes Area A of the Petersen Ranch Bank Property and Area E of the Elizabeth Lake Bank Property. The Grazing Plan is intended to be implemented over the entire Bank Property, but it is only required to be implemented in Areas that have been incorporated into the Bank through an approved Phase.

Pastures do not always follow the boundaries of the Areas, in these cases the grazing plan will be implemented over the entirety of any pasture that is partially within an Area that has been incorporated into the Bank. For example, pastures 1, 3, and 6 are partially within Area A, therefore the entirety of pastures 1, 3 and 6 will be managed according to this Grazing Plan upon Bank Establishment. Pastures entirely outside of the conservation easement for Phase 1 (i.e. Pasture 2 and Pasture 5) are not required to be managed according to this Grazing Plan until a Conservation Easement is recorded over the phases that contain those pastures.

CONCLUSION

The primary goal of the grazing operation is low-impact grazing that complies with any task set forth in the LTMP. This document has been created to provide a framework to guide grazing management, which the Grazing Lessee will consult to maintain a grazing regime that will provide the greatest ecological benefit to the Bank Properties. This plan provides the framework to determine the appropriate number of livestock that the Bank Properties can support, while ensuring that all covered resources are protected and maintained, in compliance with the LTMP. Annual RDM monitoring data will be used to generate target RDM values and stocking rates, which should not exceed the maximum number of cattle, based on a 6-month grazing rotation, unless approved by the IRT. Cattle exclusion fencing, as well as targeted grazing for invasive species management and maintenance of special-status species habitats, will ensure that sensitive resources are protected and maintained through adherence to this plan.

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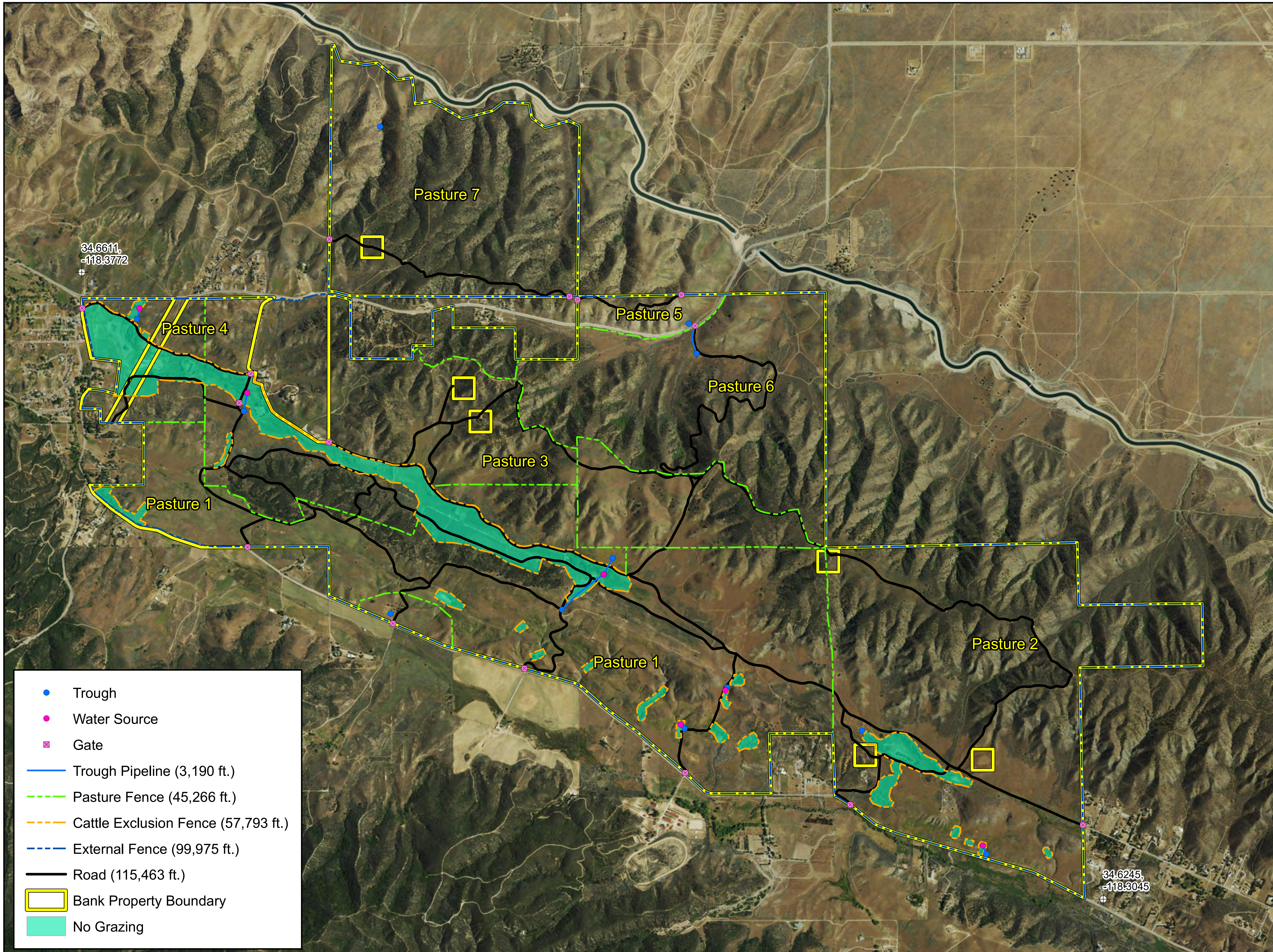

WRA ENVIRONMENTAL CONSULTANTS

Petersen Ranch Bank Property

Los Angeles County, California

Figure 1.

Infrastructure Map of the Petersen Ranch Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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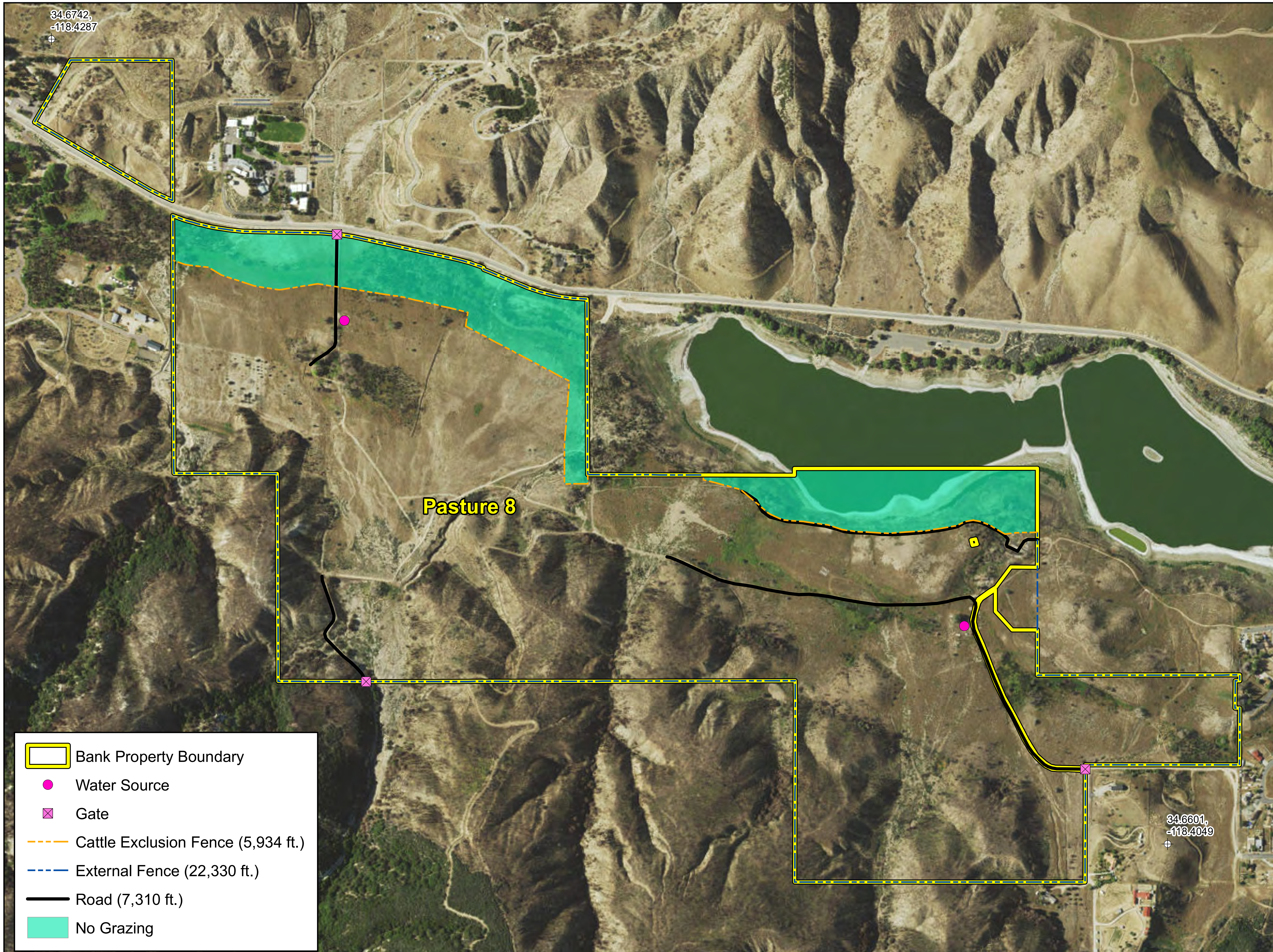


wra ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

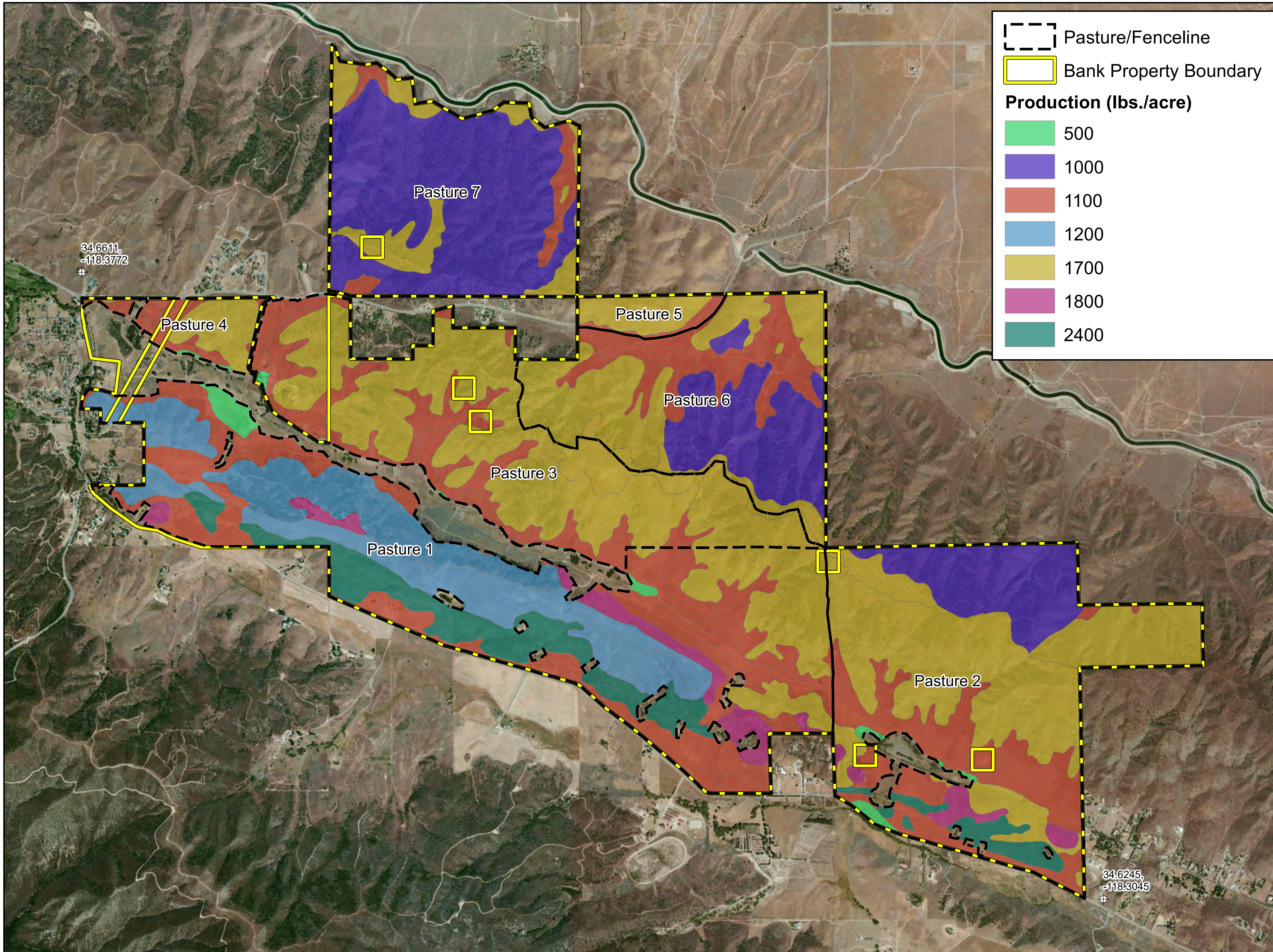
Los Angeles County, California

Figure 2.

Infrastructure Map of the Elizabeth Lake Bank Property

Map Date: 3/11/2016
Map by: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Grazing Report\Figure 2 Infrastructure Elizabeth 20160311.mxd



ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 3.

Range Production in a Favorable Year on the Petersen Ranch Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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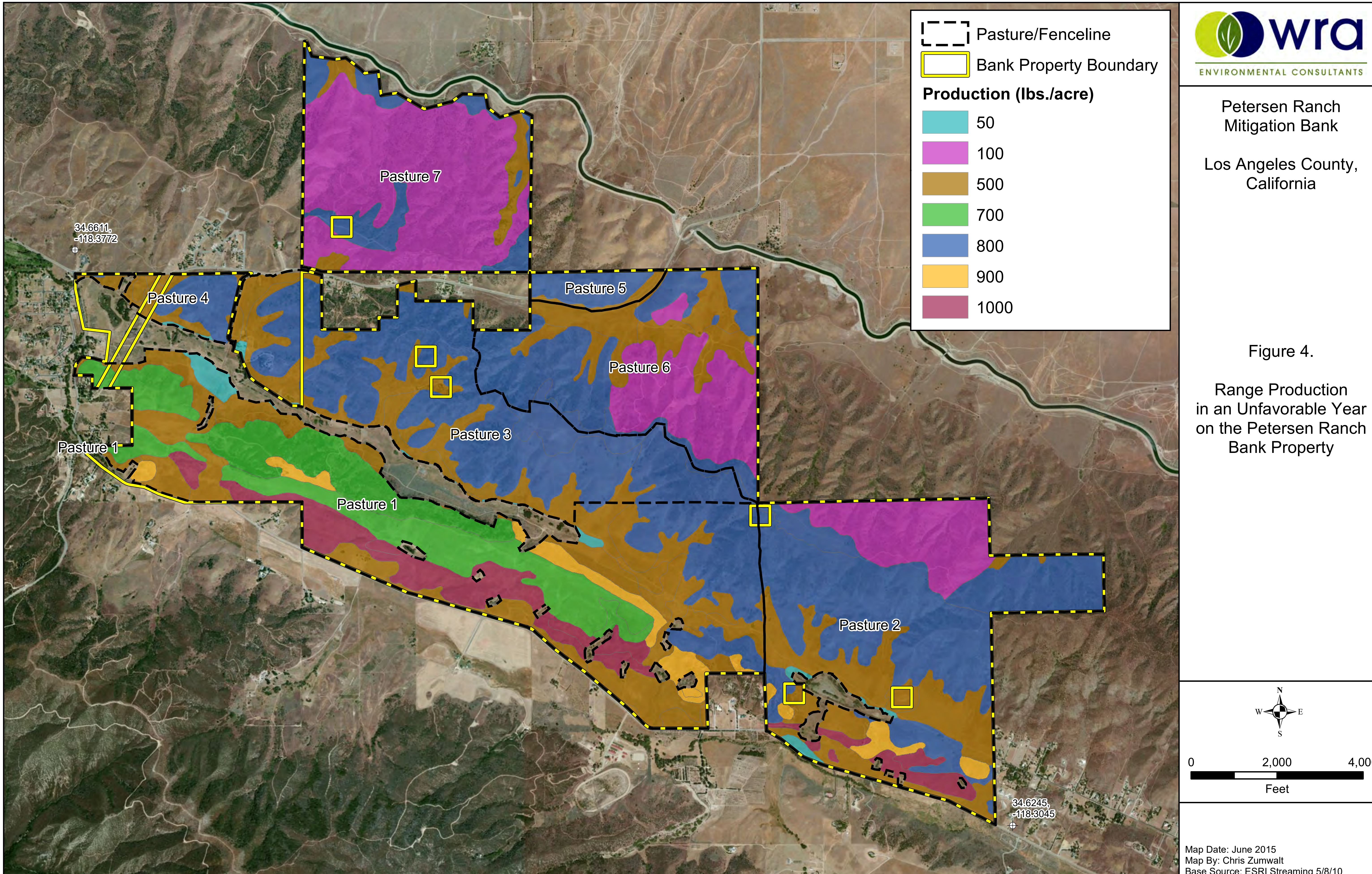

ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 4.

Range Production
in an Unfavorable Year
on the Petersen Ranch
Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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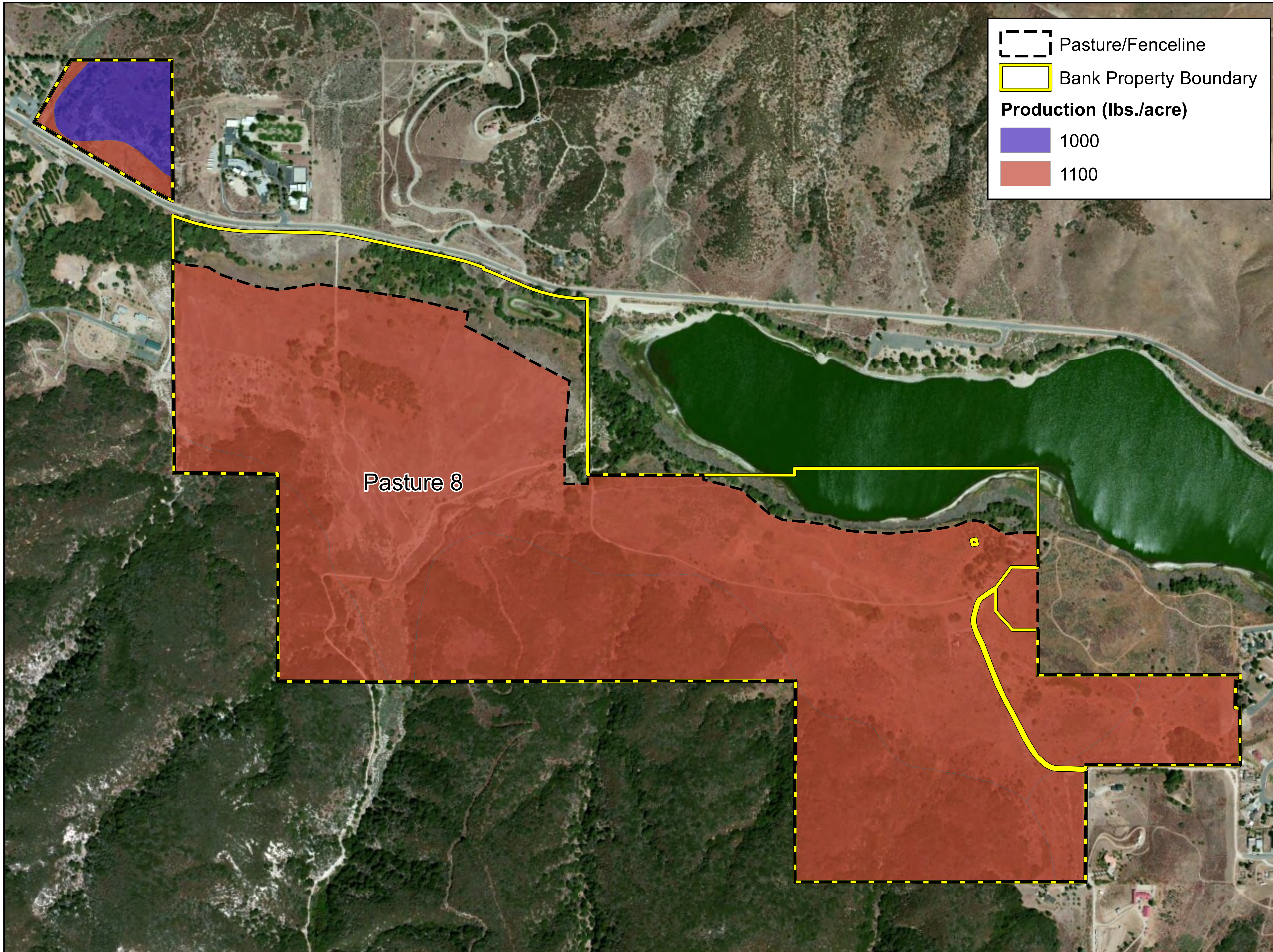

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 5.

Range Production
in a Favorable Year
on the Elizabeth Lake
Bank Property

N
W E
S

0 600 1,200

Feet

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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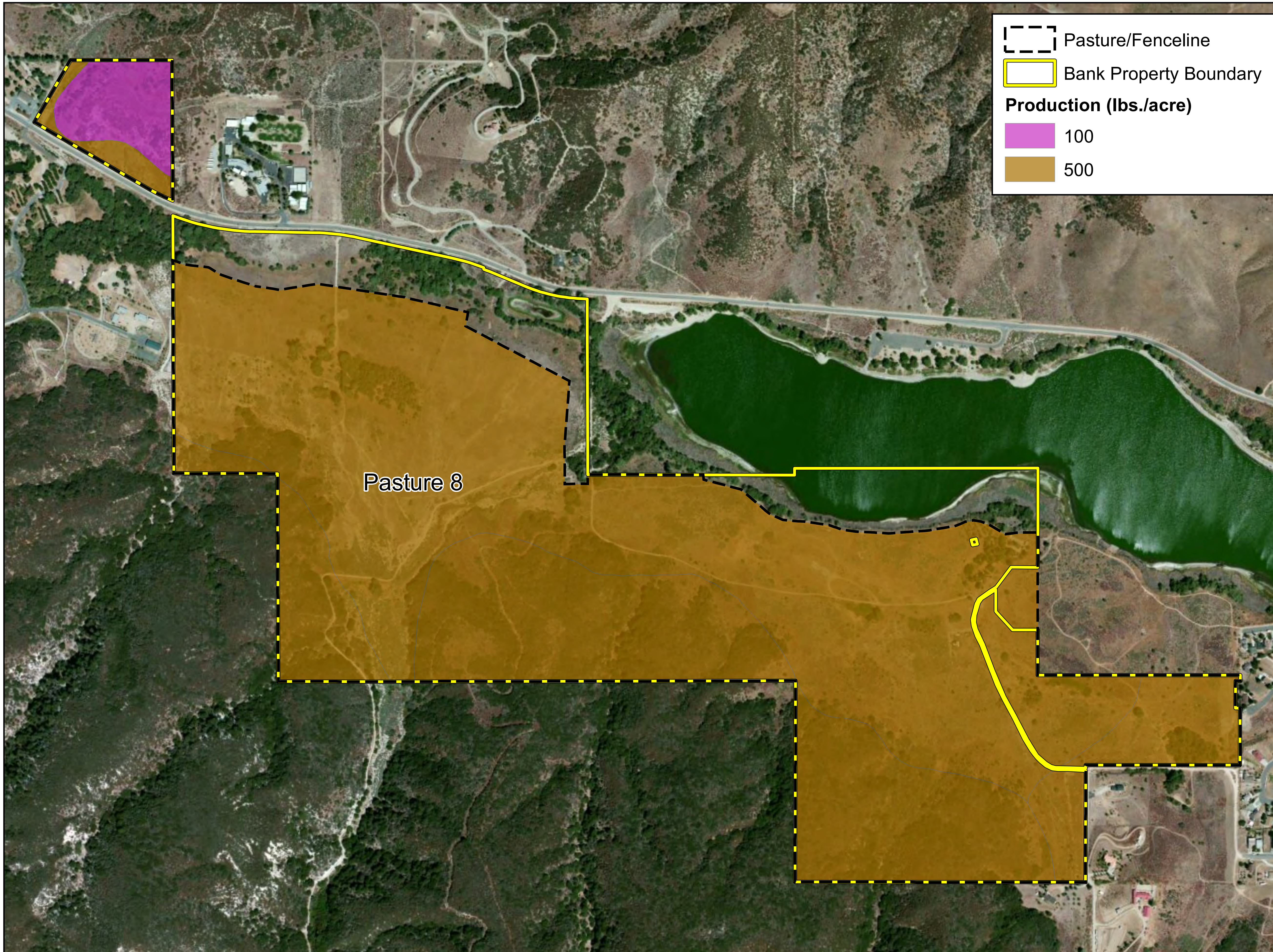

ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 6.

Range Production in an Unfavorable Year on the Elizabeth Lake Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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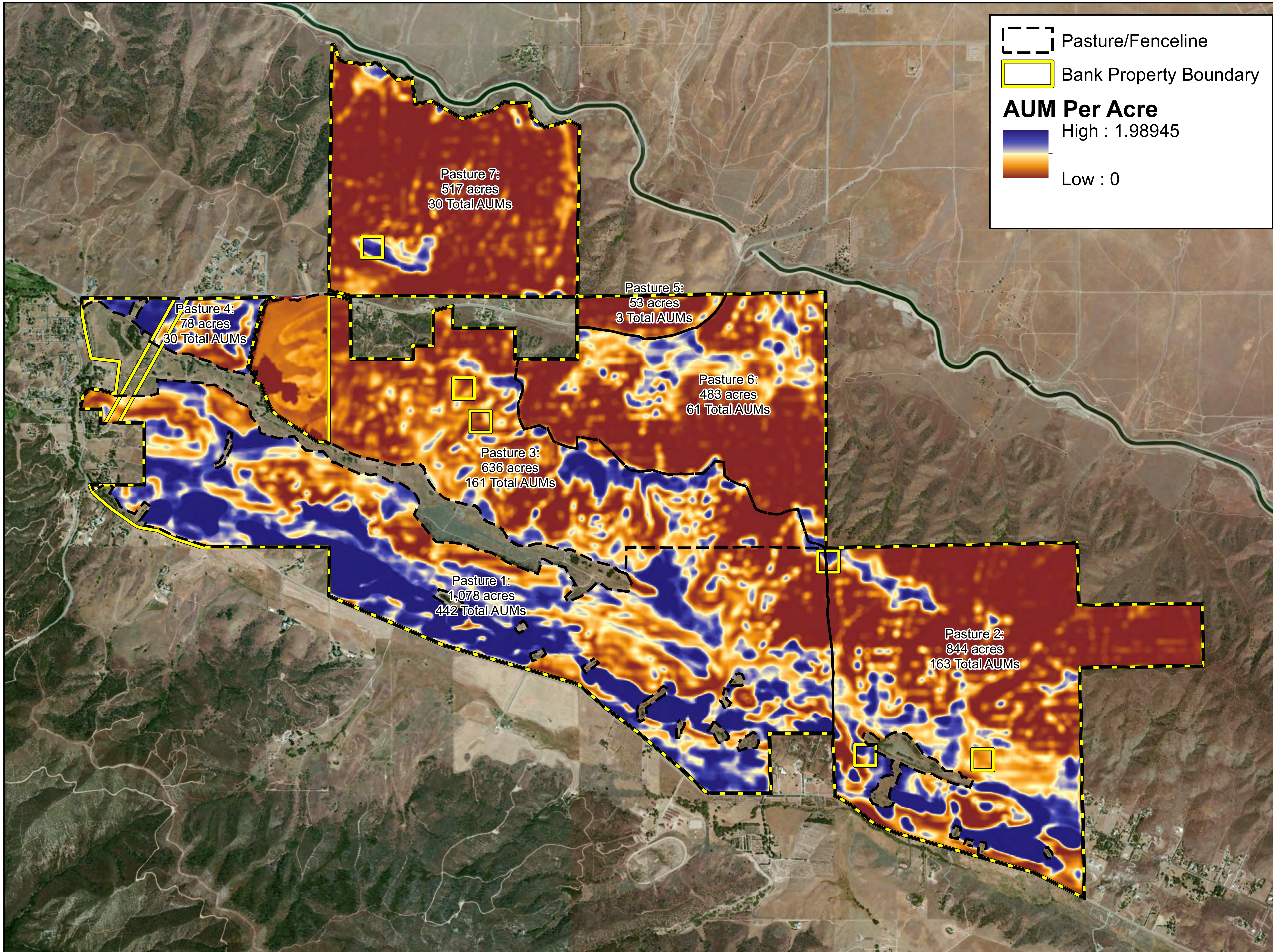

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Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 7.

Favorable Year
Carrying Capacity
on the Petersen Ranch
Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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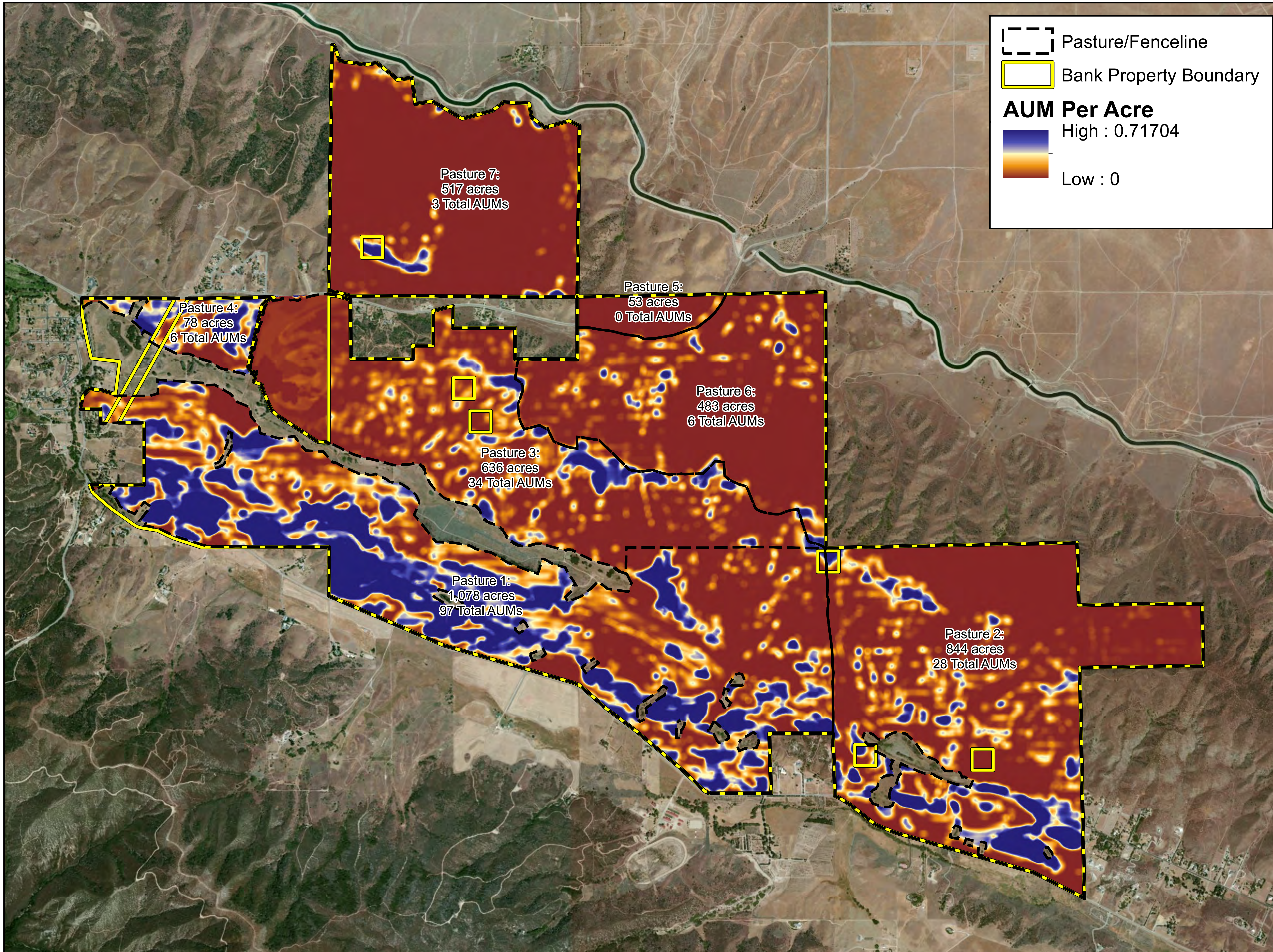

wra ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 8.

Unfavorable Year Carrying Capacity on the Petersen Ranch Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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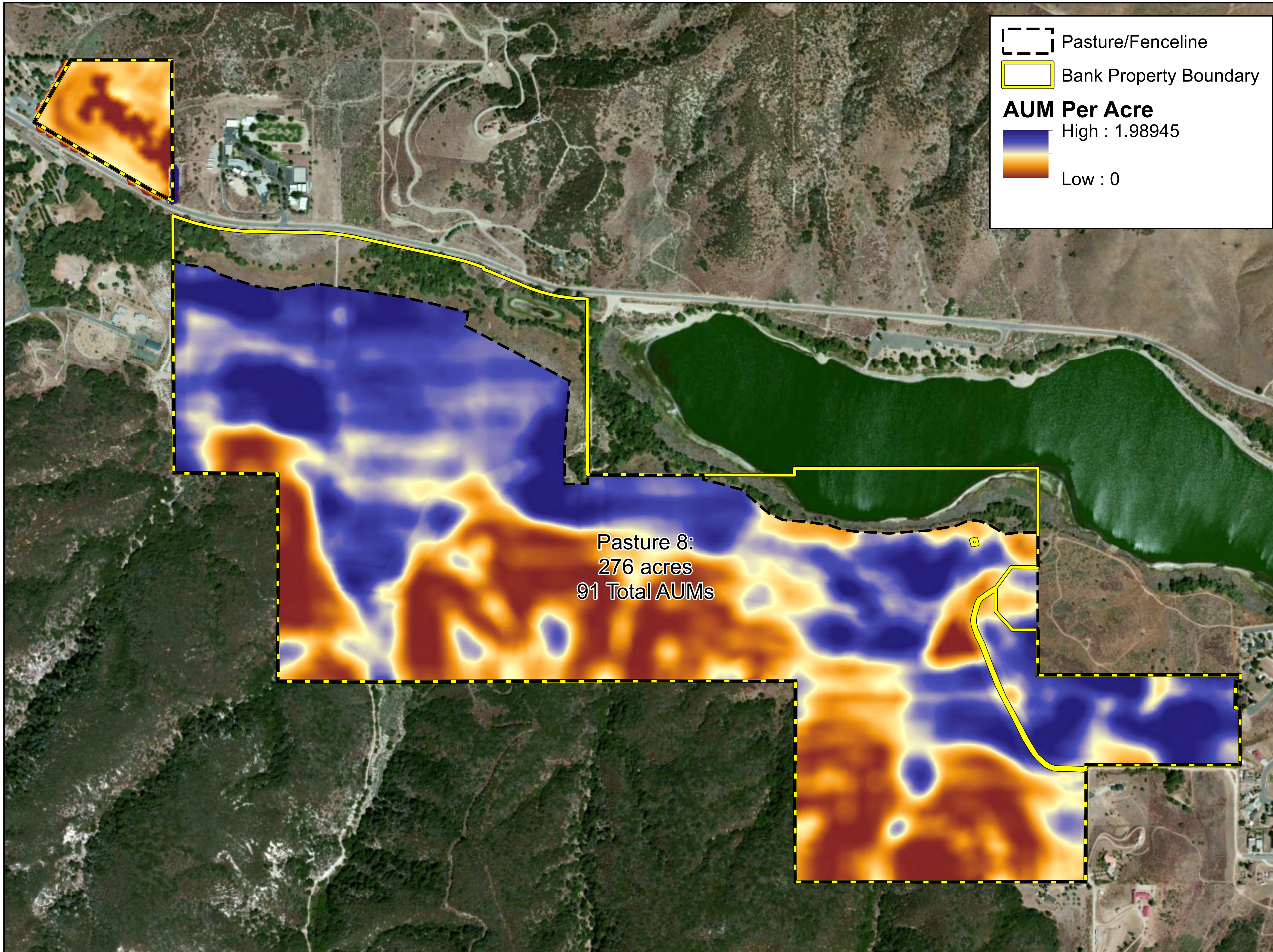

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch
Mitigation Bank

Los Angeles County,
California

Figure 9.

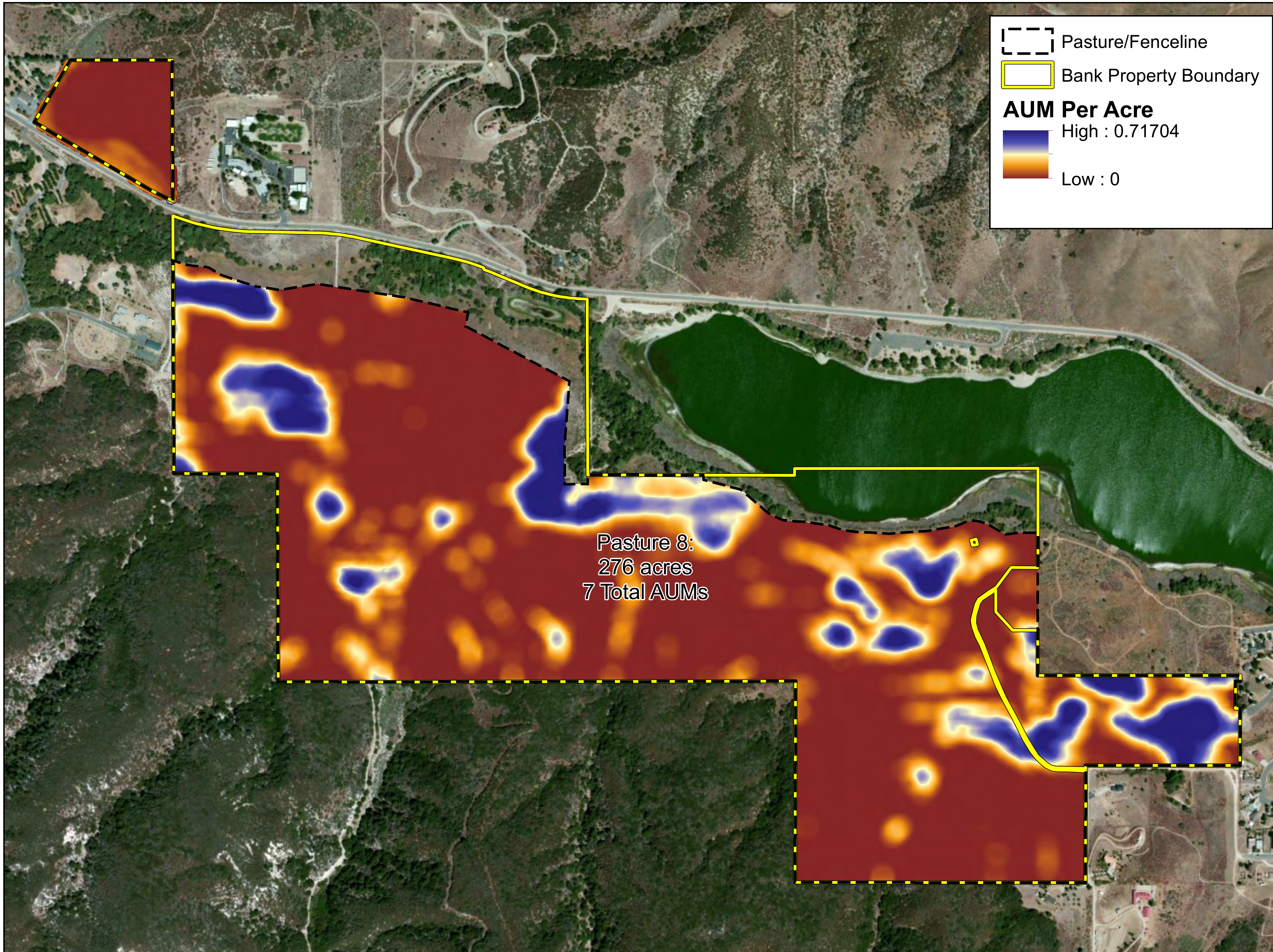
Favorable Year
Carrying Capacity
on the Elizabeth Lake
Bank Property

N
W E
S

0 600 1,200
Feet

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Grazing Report\Figure 9 Favorable AUM Elizabeth.mxd



ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

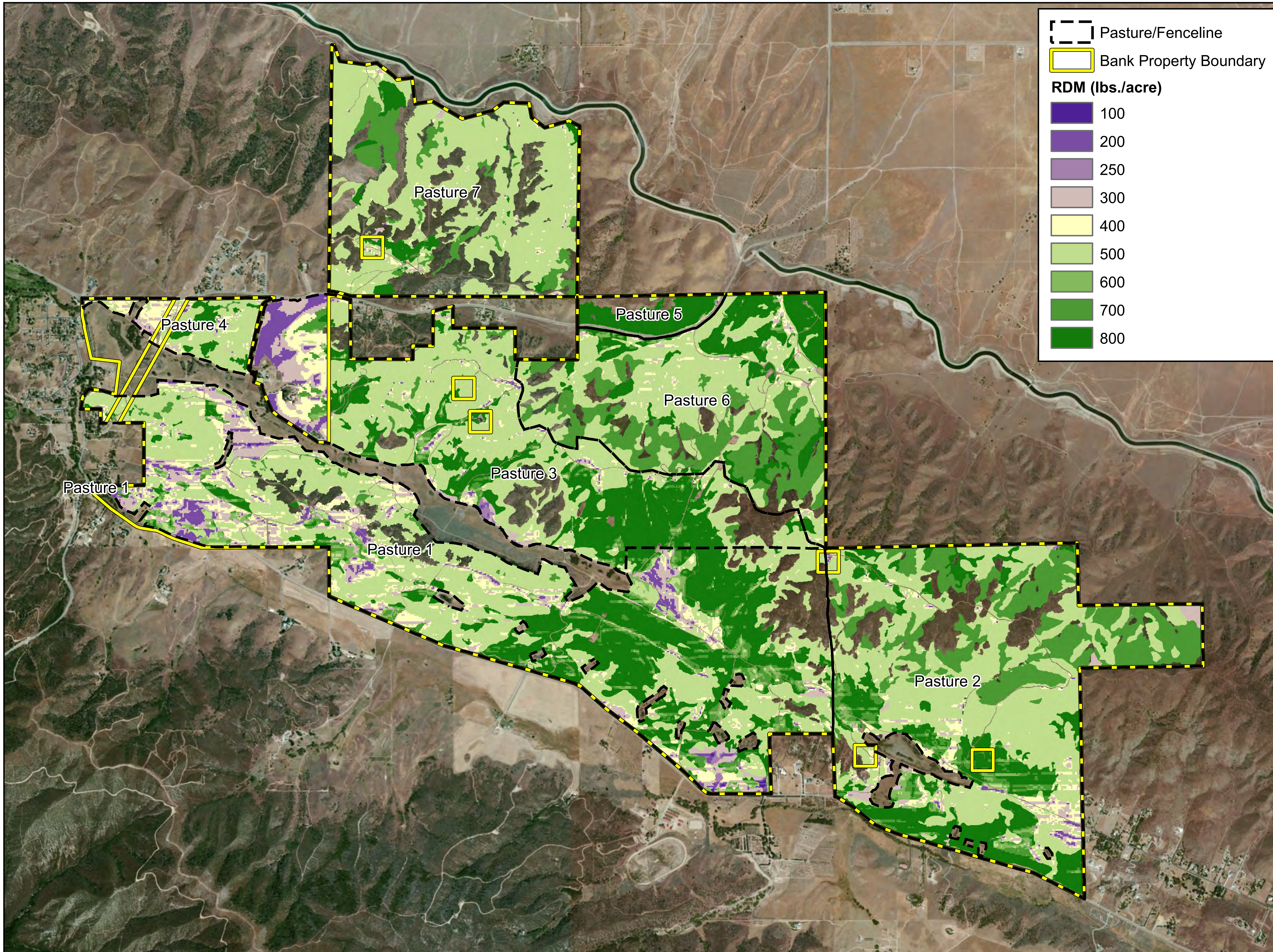
Los Angeles County, California

Figure 10.

Unfavorable Year Carrying Capacity on the Elizabeth Lake Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

Path: L:\Acad 2000 Files\21000\21065\gis 2015\ArcMap\BEI Final\Grazing Report\Figure 10 Unfavorable AUM Elizabeth.mxd



WRA ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 11.

Minimum Residual Dry Matter (RDM) on the Petersen Ranch Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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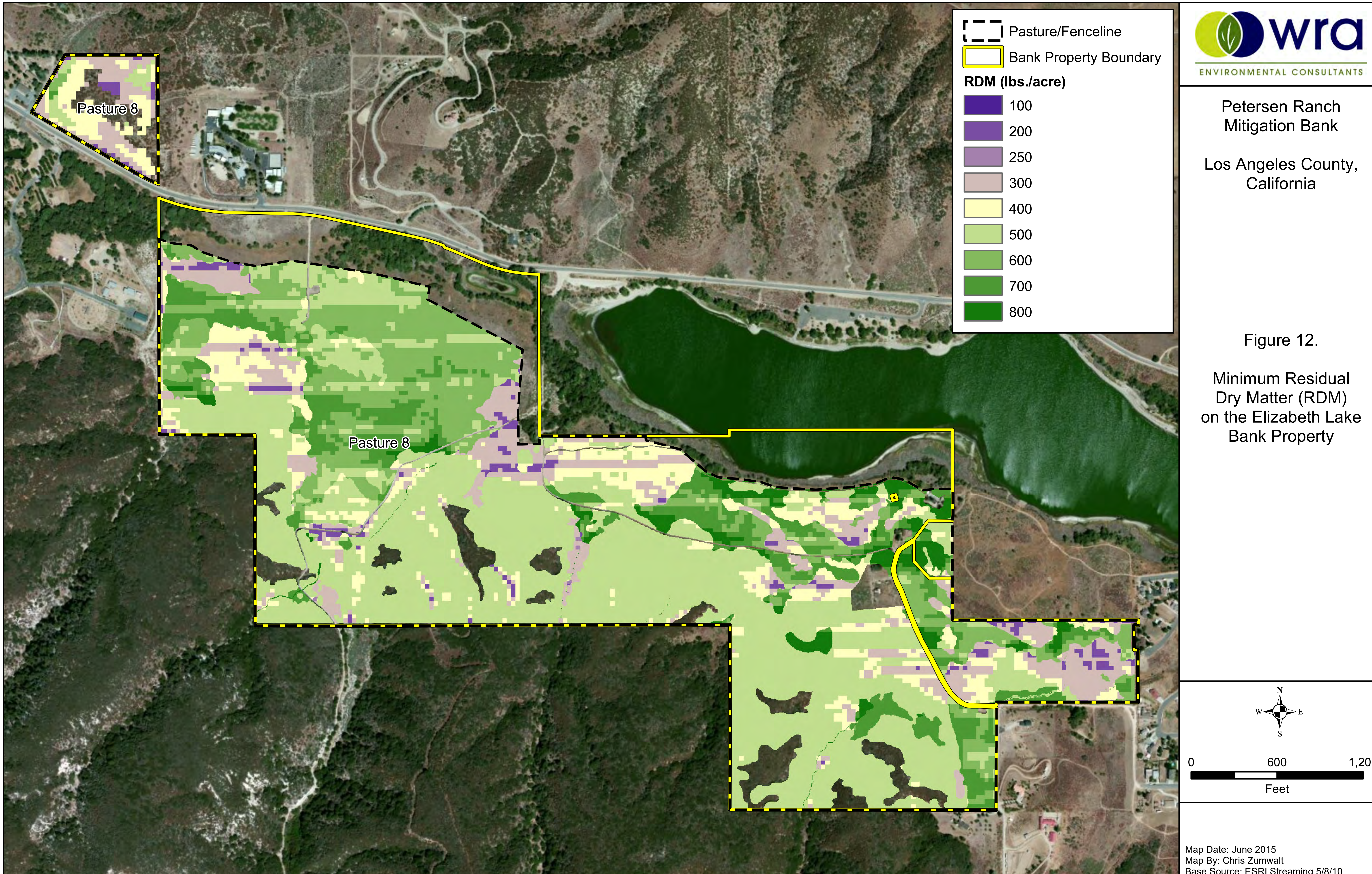

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ENVIRONMENTAL CONSULTANTS

Petersen Ranch Mitigation Bank

Los Angeles County, California

Figure 12.

Minimum Residual Dry Matter (RDM) on the Elizabeth Lake Bank Property

Map Date: June 2015
Map By: Chris Zumwalt
Base Source: ESRI Streaming 5/8/10

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LMTP APPENDIX C:

HUNTING RULES, REGULATIONS, AND IMPACT-MINIMIZATIONS MEASURES FOR STATE OF CALIFORNIA AND THE PETERSEN RANCH MITIGATION BANK

DEFINITIONS

Game Species: Animals legal to hunt with a hunting license and, depending upon species, a tag or stamp with seasonal restrictions and bag limits; generally, animals that are harvested for food, fur, or other resource purposes.

Nongame Species: Animals that may not be hunted unless expressly specified in §472 of CDFW Mammal Hunting Regulations. Species listed in §472 that may be legally hunted usually do not require hunting licenses or hunting tags and are generally animals that are harvest for conservation, financial, or other resource management purposes.

Bag Limit: The number of game or fish species allowed to be legally taken under one license and/or authorizing tag or stamp.

Possession Limit: The total number of game or fish species allowed within one season legally taken under on license and/or authorizing tag or stamp; cumulative of the bag limit.

Season / Seasonal Restriction: Is here used to mean the time limit within which game or fish species may be legally taken, typically expressed as a starting day general to the year (e.g., first Saturday of a given month) and extending for a prescribed number of days forward.

Daily Restriction / Limit: Is here used to mean the limit of hours within a 24-hour period within which game or fish species may be legally taken, typically expressed in diurnal phases (i.e., sunset, sunrise, civil dawn, civil twilight).

Take / Harvest: The legal pursuit and kill of game or fish species.

Method of Take / Harvest: The means by which a hunter or angler takes a game or fish species in the field.

Hunting / Fishing License: The legal document issued by the CDFW to a hunter or angler allowing such to hunt or fish, typically for one year. Several species require an additional document, a tag / stamp, to take prescribed game or fish (see Tag / Stamp).

Tag / Stamp: The legal document issued by the CDFW to a hunter or angler allowing such to take prescribed game or fish. Tags are specific to species, season, zone, and/or method of take, and are associated with one licensed hunter or angler.

REGULATORY BACKGROUND

The California Department of Fish and Wildlife's (CDFW) Wildlife and Fisheries Division and Law Enforcement Division are tasked with developing hunting regulation recommendations and protecting natural resources, including game, throughout the state (CDFW 2015). The California Fish and Game Commission (CFGC), a state government entity separate from the CDFW, is tasked with regulating the "taking or possession of birds, mammals, fish, amphibia, and reptiles" (California Fish and Game Code (FGC) Section 200). The CFGC has the authority to set "seasons, bag limits, and methods of take for game animals, sport fishing, and some commercial fishing" (CFGC 2015). Bag limits, seasonal restrictions, and methods of take or harvesting are determined by the CFGC through the recommendations of CDFW and other natural resource stakeholders to ensure that game and fish populations are maintained at sustainable levels throughout California, and reviews of such are conducted annually. Frequently, seasonal restrictions and/or harvest limits are modified to accommodate low or high populations of game and fish species within given regions of California. Likewise, hunters are required to validate tags post-harvest, the information of which supplies data for the CDFW to determine the next year's bag and possession limits.

The State of California has been divided into zones based around singular species of game. The CFGC determines seasonal restrictions and the annual harvest limit for the target species, based on the health of that zone's population. Zone boundaries vary by species, with some species freely harvested across zones and/or throughout the state. Generally, zones follow major topographic features (e.g., watershed breaks) or cultural features (e.g., highways, state borders). Throughout the state, hunting and angling are allowed on public lands designated as such and private property with written or witnessed permission by the property owner(s) only.

To legally hunt within the State of California, an individual must be in possession of a current (annual) hunting license. With few exceptions, each individual possessing a hunting license must have passed a hunter's safety course wherein which the prospective hunter learned harvesting ethics, the safe handling of firearms, the safe handling of taken game, and state hunting regulations. In addition to a hunting license, to hunt certain game species an additional tag or stamp is required. Licenses and tags are both issued by the CDFW and must be in possession of the hunter at all times within the field. The Law Enforcement Division of the CDFW polices the illegal possession and pursuit of game, fish, and other wildlife with game wardens, who regularly cite and arrest those taking animals beyond the bag limit, out of season, with illegal methods, within protected areas, and/or other illegal means.

Hunting and angling are highly regulated recreational pursuits that are regularly reviewed and regulated by the CDFW, CFGC, the U.S. Fish and Wildlife Service (USFWS), and other non-governmental organizations to ensure that practices are safe for the general public, conducted ethically, and without significant environmental impact.

GAME SPECIES AND HUNTING WITHIN THE BANK

As with most private properties, the Bank strictly controls hunting within its boundaries. Hunting is by permission of the Property Owner and his/her assigns with restrictions clearly designated in the Long-term Management Plan:

> "Hunting shall be allowed on the Property in accordance with the following restrictions: (i) hunting activities shall not adversely affect the Conservation Values; (ii) no hunting activities shall take place from March 1 through July 15 of any year, and this closure period may be extended in writing by either Grantee, in consultation with CDFW, or CDFW to accommodate early or late Swainson's Hawk presence in any given year; (iii) no hunting activities shall take place within the cattle exclusion zone along the rift valley until all final restoration performance standards associated with the original restoration or any required remediation have been met and approved

> by the interagency review team (IRT) as specified in the BEI; (iv) recreational or target shooting not directly associated with the lawful take of game is strictly prohibited; and (v) commercial hunting shall be allowed on an annual basis with the prior, written approval of CDFW and subject to any terms and conditions set forth in that written approval."
>
> (WRA 2014, BEI: Exhibit D-5)

And:

> "The Property Owner reserves the right to engage in non-motorized recreational activities in the Bank Properties in the same manner as the Property Owner and his/her assigns currently utilize the Bank Properties. These uses include, by way of example and not limitation, hiking, horseback riding, and hunting (subject to the restrictions described above). No motorized recreational activities (e.g., recreational off-highway vehicle activities) are permitted on the Bank Properties outside of existing trails, paths, and roadways."
>
> (WRA 2014, BEI: Exhibit D-5)

The Bank supports several species of game and nongame legal to hunt within the State of California, including but not limited to, mule deer, rabbits, coyote, bobcat, quail, doves, and waterfowl. Seasonal and zonal restrictions for these species are described and issued to the public by the CDFW. The Bank resides within the "Non-lead Ammunition" area for the protection of the California condor, and strict adherence to such is the responsibility of the hunter and is enforceable under the Ridley-Tree Condor Preservation Act of the California Fish and Game Code, Section 3004.5. Additionally, policies for hunting within the Bank will be put in place by the Property Owner to ensure that his/her assigns adhere to all hunting regulations, including forbidding the use of lead ammunition. The following summarizes the regulations and restrictions for each species or group of species that utilize the Bank:

MULE DEER (*FGC Section 360)*

The Bank is within the California Deer Zone designated D-11. Currently, the season for this zone extends from the second Saturday in October and extends for 30 consecutive days. The mule deer (*Odocoileus hemionus*) population within this zone is considered stable, with slight declines attributable to development and fire suppression. The state-wide possession limit is one deer, with a forked horn or better, per tag with a maximum of two tags; therefore, a hunter is allowed two deer from this zone at a maximum, and only if they possess two tags for the zone. The method of take is limited to archery, muzzle-loader, or center-fire firearm, and is largely limited to private lands and the designated public hunting lands. In general, deer hunting in coastal California is practiced by individuals to small groups, on foot, and preferentially in open chaparral, woodland, and grassland habitats. The use of vehicles is limited to accessible roads and trails.

Deer spend the majority of their time in habitats that provide a high amount of cover in order to avoid predators. Since aquatic features within the Bank Properties provide minimal cover, it is unlikely that deer would frequently be hunted near these features since visitation by deer to these aquatic features would occur only episodically and for short periods of time. Therefore, aquatic resources in the Bank Properties would be avoided or minimally visited when hunting deer due to the extensive sheltered areas (i.e., chaparral) in the Bank Properties which provide more suitable cover and forage for resident deer. If deer are ever harvested within or adjacent to wetlands then in accordance with state law, they will be taken with non-lead ammunition. Additionally, deer will be immediately processed away from wetlands and waterways to prevent spoilage of the carcass as well as protect the integrity of the aquatic resources within the Bank.

BLACK-TAILED JACKRABBIT (FGC Section 309)

Black-tailed jackrabbit (*Lepus californicus*) occurs within the Bank; however, currently they are a nongame animal regularly hunted for meat, fur, and resource management. Currently, the CDFW enforces neither seasonal restrictions nor bag limits on this animal, as its populations are considered stable to increasing throughout most of California. Jackrabbit hunting is typically conducted by individuals or in pairs, on foot, and preferentially in open chaparral, woodland, and grassland. The hunting for and taking of black-tailed jackrabbits in and around wetlands is the same as that of mule deer (see above).

DESERT COTTONTAIL AND BRUSH RABBIT (FGC Section 308)

Desert cottontail (*Sylvilagus audubonii*) and brush rabbit (*S. bachmanii*) potentially occur within the Bank and are subject to the seasonal restriction of July 1 through the last Sunday in January with zonal restrictions. The bag limit is five animals per day of either species for a total of ten per season. Hunting for these species would be preferentially conducted within open to dense chaparral and grassland edges, and would follow the same preferences and restrictions in and around wetland habitats within the Bank as that of mule deer and black-tailed jackrabbit (see above).

COYOTE, BOBCAT, AND CROW (FGC, Section 473)

Coyote (*Canus latrans*), bobcat (*Lynx rufus*), and crow (*Corvus brachyrhynchos*) are considered nongame by the CDFW . Coyote may be harvested with neither seasonal / daily restriction nor bag limit. Crows can only be taken from the first Saturday of December extending 124 days hence with a bag limit of 24 per day for a total 48 for the season. However, crow may be taken at any time when an individual or individuals are threatening an agricultural enterprise. Bobcats may be hunted October 15- February 28 with annual per person limit of five hunting tags and one tag per bobcat. Typically, coyote, bobcat, and/or crow are hunted for fur or resource management. Currently, these species, particularly coyote, are taken within the Bank for financial concerns by the grazing lessee. All three species are considered stable or slightly increasing according to the CDFW.

CALIFORNIA QUAIL (FGC Section 300)

California quail (*Callipepla californica*) is considered an upland game bird by the CDFW, and as such requires both a valid hunting license and stamp. The Bank is within the Quail Zone Q3 with a seasonal restriction running from the third Saturday in October to the last Sunday in January, and a bag limit of ten per day, and possession limit of 30. California quail utilize numerous habitats, but favor patchily vegetated areas where shrubs and short trees provide cover and elevated sightlines for the group (covey). Hunting is conducted on foot, and is typically conducted by individuals or very small groups often accompanied by a trained dog or dogs for sight and retrieval. Quail will frequent wetland areas to forage, but only where thick, protective cover (e.g., shrubs) is available to provide immediate refuge from predators. Within the Bank, quail are abundant in mosaicked vegetation (i.e., mix of woody plants and herbs) with infrequent visitation to the site's wetlands; therefore, the hunting of quail would typically occur away from wetlands. Similar to mule deer, the taking of quail in or adjacent to wetlands would be infrequent. Additionally, if take of California quail ever occurs near a wetland, the removal from and processing of the animal would occur immediately and away from a wetland to prevent spoilage.

DOVES (FGC 3683)

Various species of Dove are hunted in California and require a hunting license and Upland Game Bird stamp. Dove regulations are consistent across the state with a seasonal restriction for most species between September 1-15, and again from November 8-December 22. Eurasian collared dove, have no seasonal restrictions. Bag limits for mourning dove and white-winged dove are 15 birds, and for all other species there are no limits. Doves are generalists that utilize a wide variety of upland habitats from open scrub to forest dominated landscapes. They are ground foragers requiring dry ground upon which they peck for cereal grains and seeds. Taking of dove in or near wetlands would be infrequent, and like any game, processing would occur in dry areas where moisture to prevent spoilage.

WATERFOWL (FGC Section 502)

Waterfowl are any number of game birds that rely upon open, aquatic habitats for foraging and resting, with nesting and cover typically occurring near the waterbody (e.g., ducks, geese). The Bank Properties are within the Southern California waterfowl hunting zone. Waterfowl occur within the Bank and are subject to the season restrictions. The waterfowl season for both ducks and geese begins on the third Saturday in October extending for 100 days. The bag limit is seven ducks per day, and may include seven mallards (but no more than two females), two pintail of either sex, one canvasback of either sex, two redheads of either sex, and/or three scaup of either sex. The bad limit is 18 geese per day, and may include 15 white geese and three dark geese. The possession limit for ducks is 21 ducks, which is triple the daily bag limit. The possession limit for geese is 54 geese, which is triple the daily bag limit. Because the Bank is within the "Non-lead Ammunition" area of California, hunting would be conducted with non-lead ammunition in, around, and away from wetlands. Take of waterfowl near an aquatic feature will be immediately removed and processed away from a wetland to prevent spoilage.

SUMMARY

Hunting within California is highly regulated with all hunters trained to minimize impacts to natural resources, safely handle firearms and harvested game, and follow strict ethics for the harvesting of game and visiting their habitats. The CDFW and CFGC set state-wide and/or designated seasonal limits on the taking of game based on the previous year's tag / stamp issuances and required harvest reports to ensure the sustainability for populations of game animals, as well as the occasional census of animal herds and other research. With the exception of waterfowl, the vast majority of hunting occurs away from wetlands. Game and nongame species spend the majority of their life-cycle away from wetlands, frequenting them only for episodic, short-duration visits for watering and occasional foraging. In rare instances where game and non-game are harvested near a water source, they immediately will be moved away from waterbodies to upland areas where spoilage of the carcass and/or fur is less likely to occur. The use of vehicles will occur only on established roads. The use of vehicles for the active pursuit of game within the State of California is illegal and will not occur within the Bank.

REFERENCES

California Department of Fish and Game (CDFW). 2015. CDFW Website, Available at: https://www.wildlife.ca.gov/. Accessed: March 2015.

California Fish and Game Commission (CFGC). 2015. CFGC Website, Available at: http://www.fgc.ca.gov/public/information/. Accessed: March 2015.

Appendix D Petersen Ranch Mitigation Bank Endowment Analysis

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EXHIBIT D-2

ENDOWMENT FUND ANALYSIS AND SCHEDULE

The Bank Sponsor will provide an Endowment Fund to Southwest Resource Management Association (SRMA, Endowment Holder) to provide perpetual funding for Long-term Management as outlined in section VI.E of the Bank Enabling Instrument (BEI). The Endowment Fund will guarantee that the Long-term Management and Monitoring activities are implemented (Exhibit D-5 of the BEI) in perpetuity (Table 1), includes a 10% administrative multiplier and is calculated based on a 4% capitalization rate. The Bank Sponsor will provide funding for two separate endowment accounts, a long-term management (LTM) account and an easement compliance (EC) account. For the purposes of the BEI, the Endowment Amount will be equal to 100% of the LTM account plus 50% of the EC account. The EC account will be 100% funded prior to the establishment date of each bank Phase.

The Area A long-term management costs in Table 1 include funds to manage the Southern California Edison (SCE) easement area and the SCE endowment of $597,225 will be folded into the Area A accounts ($440,725 into the LTM account and $156,500 into the EC account), leaving $1,528,071 to be funded for the Area A endowment fund. These estimates use a capitalization rate of 4% and an administrative rate of 10%.

Table 1: Account Summaries and Endowment Amount Calculation

Long-term Management Acount Summary		Area A	Area B	Area C	Area D	Area E	Area F
Long-term Management (LTM) Costs	$ 116,617	$71,483	$9,551	$6,136	$11,739	$12,774	$4,933
Administrative Rate	10%	$7,148	$955	$614	$1,174	$1,277	$493
Total Annual Cost	$ 128,279	$78,632	$10,506	$6,750	$12,913	$14,051	$5,427
Total LTM Endowment (4%)	**$ 3,206,980**	**$ 1,965,796**	**$ 262,658**	**$ 168,746**	**$ 322,834**	**$ 351,279**	**$ 135,667**
SCE Contribution	**$ 440,725**	**$ 440,725**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Petersen Ranch MB Contribution	**$ 2,766,255**	**$ 1,525,071**	**$ 262,658**	**$ 168,746**	**$ 322,834**	**$ 351,279**	**$ 135,667**

Easement Compliance Account Summary		Area A	Area B	Area C	Area D	Area E	Area F
Easement Compliance (EC) Costs	$ 23,928	$5,800	$3,519	$3,519	$2,163	$5,800	$3,127
Administrative Rate	10%	$580	$352	$352	$216	$580	$313
Total Annual Cost	$ 26,321	$6,380	$3,871	$3,871	$2,379	$6,380	$3,440
Total EC Endowment (4%)	**$ 658,020**	**$ 159,500**	**$ 96,773**	**$ 96,773**	**$ 59,483**	**$ 159,500**	**$ 85,993**
SCE Contribution	**$ 156,500**	**$ 156,500**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Petersen Ranch MB Contribution	**$ 501,520**	**$ 3,000**	**$ 96,773**	**$ 96,773**	**$ 59,483**	**$ 159,500**	**$ 85,993**

Total Bank Endowment Fund		Area A	Area B	Area C	Area D	Area E	Area F
Petersen Ranch LTM Contribution (100%)	**$ 2,766,255**	$1,525,071	$262,658	$168,746	$322,834	$351,279	$135,667
EC Contribution (50%)	**$ 250,760**	$1,500	$48,386	$48,386	$29,741	$79,750	$42,996
Endowment Monies Applied to Credit Releases*	**$ 3,017,015**	$1,526,571	$311,044	$217,132	$352,576	$431,029	$178,663
Total Bank Endowment Amount	**$ 3,267,775**	**$1,528,071**	**$359,431**	**$265,518**	**$382,317**	**$510,779**	**$221,659**

*This is the portion of the Endowment Amount (100% LTM + 50% EC) that applies to credit releases as agreed upon by the Corps and provided for in Section VI.E of the BEI.

Long-term Management Costs

Table 2 was prepared by WRA, Inc. in cooperation with SRMA and includes estimated annual costs for the Long-term Management and easement compliance tasks that are required for the Bank. Table 2 includes the estimated cost for managing and monitoring the entire bank Property (including the SCE easement) following incorporation of all Phases and includes a contingency multiplier for each task in the range of 10-25% depending on risk associated with the particular task. Table 3 breaks down the annual costs by Area. . Cost estimates were based on hiring a third party to conduct all of the tasks in present day dollars. Billable rates were determined using recent numbers provided by the Bureau of Labor Statistics for the Los Angeles Metropolitan Area. The level of effort assigned to various tasks assumed that multiple tasks would be performed during a single site visit.

			Rates						Equipment/ Supply Costs					
			$ 131	$ 118	$ 121	$ 30,000	$ 15,000	$ 90						
Management Plan Task #	Task Group	Task Description	Preserve Manager	Biologist	GIS Specialist	Land/Ranch Manager	Ranch hand	Equipment Operator	Units	Rate	Frequency	Contingency	Total	Assumptions
4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 5.1.1	Bio Survey	Qualitative Monitoring of Wetlands, Alluvial Floodplains, Stream Rehabilitation Area, take photopoints	4	9	4				1	$ 110	1	15%	$ 2,507	1 person conducting walk through survey of 540 acres of habitat covering a 200' wide path can cover 75 acres per hour.
4.3.1, 4.3.2, 4.3.3, 4.3.4	Bio Survey	Spring Wildlife Monitoring	2	8	4				1	$ 110	1	15%	$ 2,070	1 person conducting drive through survey of entire property observing a 400' wide path can cover 500 acres per hour.
SCE	Bio Survey	Additional Focused Swainson's Hawk Surveys for SCE		24					1	$ 110	1	15%	$ 3,383	1 person conducting drive through survey of entire property observing a 400' wide path can cover 500 acres per hour.
4.4.1	Invasive Species	Qualitative Assessment of Noxious Weeds	4	24							1	25%	$ 4,195	1 walk through survey of open habitats (not dense chaparral) and mapping noxious weeds on aerials. 1 person covers 75 acres per hour.
4.4.2	Invasive Species	Vegetation management	4	16		30.0%	20.0%		1	$ 110	1	0%	$ 14,522	Ranch manager will mow, spray or do some hand removal of invasives. Could include mowing up to 150 ac/yr, backpack spray up to 25 ac/yr, or hand removal of up to 1 ac/yr
4.4.2	Invasive Species	Tractor Rental							1	$ 1,260	1/2	25%	$ 3,150	$1260 per week rental tractor with mower 4 weeks per year
4.4.2	Invasive Species	Herbicide Costs							25	$ 12	1	25%	$ 361	Spraying 25 acres at 6 ac/gallon.
4.4.2	Invasive Species	Backpack Sprayer							2	$ 200	5	15%	$ 92	Replacement of backpack sprayer
4.5.1, 4.5.2, 4.5.3, 4.5.4, 5.2.1	Grazing Coordination	Quantitative assessment of forage, grazing coordination, and adjustment of stocking rate	3	8	2	5.0%	5.0%				1	0%	$ 3,829	1 person measuring RDM in all pastures for 1 day, mapping utilization, and teleconference/emails with rancher
4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.5, 4.6.6	Not a Part Exclusion Area Monitoring and Maintenance	Monitor potential degradations caused within the land immediately surrounding the Not a Part Exclusion Areas		10							1	15%	$ 1,357	1 person conducting walk through survey of 540 acres of habitat covering a 200' wide path can cover 75 acres per hour.
5.1.3, 5.1.4, 5.1.5, 5.3.1	Tresspass	Rectify vandalism, repair tresspass impacts, record damage to fences gates and roads				20.0%	30.0%				1	0%	$ 10,500	Ranch manager will conduct weekly patrols of entire perimeter of Bank Property to observe, record and repair light vandalism, tresspass or gate issues.
5.1.3, 5.1.4, 5.1.5, 5.3.1	Trash	Collect and remove trash,				10.0%	25.0%				1	0%	$ 6,750	Ranch manager will conduct monthly patrols of entire perimeter of Bank Property to correct litter issues.
5.1.2	Infrastructure	Replace No Tresspassing Signs				3.0%					1	0%	$ 900	Once every five years ranch manager will replace all signs which are spaced at 600'
5.1.2	Infrastructure	Tresspassing Signs							213	$ 30	5	15%	$ 1,470	Once every five years ranch manager will replace all signs which are spaced at 600'
5.3.2	Infrastructure	Replacing and repairing gates				5.0%					1	0%	$ 1,500	The lifespan of steel pipe gates is approximately 10 years and it takes 2 hours to replace each gate.
5.3.2	Infrastructure	Gates							12	$ 350	10	15%	$ 483	
5.3.2	Infrastructure	Replace fencing							186,090	$ 4.50	30	15%	$ 32,101	Perimeter and exclusion fencing has a full replacement lifespan of 30 years
5.3.2	Infrastructure	Repair fencing as needed				15.0%					1	0%	$ 4,500	Approximately 0.5% percent of the perimeter fencing will need to be repaired annually due to vandalism, tresspass, cattle damage, etc..
5.3.2	Infrastructure	Fencing Materials							930	$ 0.75	1	15%	$ 803	Approximately 0.5% percent of the fencing will need to be repaired annually due to vandalism, tresspass, cattle damage, etc..
5.3.4	Infrastructure	Road Maintenance/ Erosion Control	3			10.0%	10.0%				1	0%	$ 4,893	Approximately 20 miles of dirt roads will need to be regraded on a 10 year cycle. An equipment operator can grade 3 miles of road per hour.
5.3.4	Infrastructure	Tractor Rental							1	$ 2,400	1	25%	$ 3,000	$2,400 per week
5.3.5	Infrastructure	Trough Maintenance				1.0%	5.0%				1	0%	$ 1,050	Concrete troughs have a lifespan of 20 years
5.3.5	Infrastructure	Troughs							10	$ 250	20	15%	$ 144	
5.3.5	Infrastructure	Trough Pipeline Maint.				1.0%	5.0%				1	0%	$ 1,050	Above ground aluminum pipeline feeding two of the troughs will have a 10 year lifespan.
5.3.5	Infrastructure	Pipeline Materials							3,190	$ 1.30	10	15%	$ 477	
5.3.6	Infrastructure	One-Half Riprap Replacement							3,445	$ 75.00	100	15%	$ 2,971	
5.3.6	Infrastructure	One-Half Degraded Riprap Removal							3,445	$ 35.00	100	15%	$ 1,387	
5.3.6	Infrastructure	Full Concrete Replacement							90	$ 700.00	100	15%	$ 725	
5.3.6	Infrastructure	Full Degraded Concrete Removal							90	$ 45.00	100	15%	$ 47	
6.1.1, 6.1.2	Reporting	Annual report	4	16	4						1	15%	$ 3,330	
NA	Travel	Travel Time		12					1	$ 100	1	15%	$ 1,743	130 miles round trip from nearest metro area 4 trips per year
NA	Travel	Travel							130	$ 0.56	0.25	25%	$ 364	130 miles round trip from nearest metro area 4 trips per year
NA	Insurance	Liability							4,100	$ 0.21	1	15%	$ 990	
NA	Easement Compliance	Enforcement/Monitoring							1	$ 6,600	1	0%	$ 6,600	Costs provided by easement/endowment holder
NA	Easement Compliance	Reporting							1	$ 5,552	1	0%	$ 5,552	Costs provided by easement/endowment holder
NA	Easement Compliance	legal							1	$ 3,000	1	0%	$ 3,000	Costs provided by easement/endowment holder
NA	Easement Compliance	accounting							1	$ 1,188	1	0%	$ 1,188	Costs provided by easement/endowment holder
NA	Easement Compliance	audit							1	$ 3,300	1	0%	$ 3,300	Costs provided by easement/endowment holder
NA	Easement Compliance	third party insurance							1	$ 950	1	0%	$ 950	Costs provided by easement/endowment holder
NA	Easement Compliance	mileage (IRS rate)							1	$ 1,868	1	0%	$ 1,868	Costs provided by easement/endowment holder
NA	Easement Compliance	equipment/supplies							1	$ 1,470	1	0%	$ 1,470	Costs provided by easement/endowment holder
Easement Compliance Subtotal			0	0	0	0%	0%	0	8	$ 23,928	8	0	$ 23,928	
Long-Term Management Subtotal			24	127	14	100%	100%	0	201,779	$ 5,904	502	3.95	$ 116,643	
Total			24	127	14	100%	100%	0	201,787	$ 29,832	510	3.95	$ 140,571	

While specific roles have been identified for third parties to conduct these tasks, responsibility for these tasks remains with the Property Owner as outlined in the BEI

Management Plan Task #	Task Group	Task Description	Total Annual Cost	PR Area A	PR Area B	PR Area C	PR Area D	PR Total	EL Area E	EL Area F	EL Total
4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 5.1.1	Bio Survey	Qualitative Monitoring of Wetlands, Alluvial Floodplains, Stream Rehabilitation Area, take photopoints	$ 2,507	$ 825.29	$ 317	$ 407	$ 763	$ 2,312.60	$ 99.06	$ 95.34	$ 194.40
4.3.1, 4.3.2, 4.3.3, 4.3.4	Bio Survey	Spring Wildlife Monitoring	$ 2,070	$ 681.43	$ 261.73	$ 336.16	$ 630.36	$ 1,909.48	$ 81.79	$ 78.72	$ 160.52
SCE	Bio Survey	Additional Focused Swainson's Hawk Surveys for SCE	$ 3,383	$ 3,383	$ -	$ -	$ -	$ 3,383.30	$ -	$ -	$ -
4.4.1	Invasive Species	Qualitative Assessment of Noxious Weeds	$ 4,195	$ 1,380.96	$ 530.42	$ 681.26	$ 1,277.47	$ 3,869.70	$ 165.76	$ 159.54	$ 325.30
4.4.2	Invasive Species	Vegetation management	$ 14,522	$ 9,218	$ 800	$ 800	$ 800	$ 11,618	$ 2,304	$ 600	$ 2,904
4.4.2	Invasive Species	Tractor Rental	$ 3,150	$ 2,520	$ -	$ -	$ -	$ 2,520	$ 630	$ -	$ 630
4.4.2	Invasive Species	Herbicide Costs	$ 361	$ 118.82	$ 45.64	$ 58.62	$ 109.91	$ 332.95	$ 14.26	$ 13.73	$ 27.99
4.4.2	Invasive Species	Backpack Sprayer	$ 92	$ 85	$ -	$ -	$ -	$ 85	$ 7	$ -	$ 7
4.5.1, 4.5.2, 4.5.3, 4.5.4, 5.2.1	Grazing Coordination	Quantitative assessment of forage, grazing coordination, and adjustment of stocking rate	$ 3,829	$ 3,079	$ 250	$ 250	$ 250	$ 3,829	$ -	$ -	$ -
4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.5, 4.6.6	Not a Part Exclusion Area Monitoring and Maintenance	Monitor potential degradations caused within the land immediately surrounding the Not a Part Exclusion Areas	$ 1,357	$ 509	$ 170	$ -	$ 509	$ 1,187	$ -	$ 170	$ 170
5.1.3, 5.1.4, 5.1.5, 5.3.1	Tresspass	Rectify vandalism, repair tresspass impacts, record damage to fences gates and roads	$ 10,500	$ 4,800	$ 1,200	$ 1,200	$ 1,200	$ 8,400	$ 1,200	$ 900	$ 2,100
5.1.3, 5.1.4, 5.1.5, 5.3.1	Trash	Collect and remove trash,	$ 6,750	$ 2,400	$ 1,000	$ 1,000	$ 1,000	$ 5,400	$ 600	$ 750	$ 1,350
5.1.2	Infrastructure	Replace No Tresspassing Signs	$ 900	$ 720	$ -	$ -	$ -	$ 720	$ 180	$ -	$ 180
5.1.2	Infrastructure	Tresspassing Signs	$ 1,470	$ 1,176	$ -	$ -	$ -	$ 1,176	$ 294	$ -	$ 294
5.3.2	Infrastructure	Replacing and repairing gates	$ 1,500	$ 1,350	$ -	$ -	$ -	$ 1,350	$ 150	$ -	$ 150
5.3.2	Infrastructure	Gates	$ 483	$ 435	$ -	$ -	$ -	$ 435	$ 48	$ -	$ 48
5.3.2	Infrastructure	Replace fencing	$ 32,101	$ 24,172	$ 3,595	$ -	$ 3,274	$ 31,041	$ 629	$ 404	$ 1,034
5.3.2	Infrastructure	Repair fencing as needed	$ 4,500	$ 3,600	$ -	$ -	$ -	$ 3,600	$ 900	$ -	$ 900
5.3.2	Infrastructure	Fencing Materials	$ 803	$ 604	$ 90	$ -	$ 82	$ 776	$ 16	$ 10	$ 26
5.3.4	Infrastructure	Road Maintenance/ Erosion Control	$ 4,893	$ 2,714	$ 400	$ 400	$ 400	$ 3,914	$ 679	$ 300	$ 979
5.3.4	Infrastructure	Tractor Rental	$ 3,000	$ 2,400	$ -	$ -	$ -	$ 2,400	$ 600	$ -	$ 600
5.3.5	Infrastructure	Trough Maintenance	$ 1,050	$ 300	$ 250	$ 250	$ 250	$ 1,050	$ -	$ -	$ -
5.3.5	Infrastructure	Troughs	$ 144	$ 144	$ -	$ -	$ -	$ 144	$ -	$ -	$ -
5.3.5	Infrastructure	Trough Pipeline Maint.	$ 1,050	$ 300	$ 250	$ 250	$ 250	$ 1,050	$ -	$ -	$ -
5.3.5	Infrastructure	Pipeline Materials	$ 477	$ 477	$ -	$ -	$ -	$ 477	$ -	$ -	$ -
5.3.6	Infrastructure	One-Half Riprap Replacement	$ 2,971	$ -	$ -	$ -	$ -	$ -	$ 2,588	$ 384	$ 2,971
5.3.6	Infrastructure	One-Half Degraded Riprap Removal	$ 1,387	$ -	$ -	$ -	$ -	$ -	$ 1,208	$ 179	$ 1,387
5.3.6	Infrastructure	Full Concrete Replacement	$ 725	$ -	$ -	$ -	$ -	$ -	$ -	$ 725	$ 725
5.3.6	Infrastructure	Full Degraded Concrete Removal	$ 47	$ -	$ -	$ -	$ -	$ -	$ -	$ 47	$ 47
6.1.1, 6.1.2	Reporting	Annual report	$ 3,330	$ 3,072				$ 3,072	$ 258		$ 258.25
NA	Travel	Travel Time	$ 1,743	$ 574	$ 220	$ 283	$ 531	$ 1,608	$ 69	$ 66	$ 135
NA	Travel	Travel	$ 364	$ 120	$ 46	$ 59	$ 111	$ 336	$ 14	$ 14	$ 28
NA	Insurance	Liability	$ 990	$ 326	$ 125	$ 161	$ 302	$ 913	$ 39	$ 38	$ 77
NA	Easement Compliance	Enforcement/Monitoring	$ 6,600	$ 1,760	$ 880	$ 880	$ 440	$ 3,960	$ 1,760	$ 880	$ 2,640
NA	Easement Compliance	Reporting	$ 5,552	$ 1,584	$ 792	$ 792	$ 400	$ 3,568	$ 1,584	$ 400	$ 1,984
NA	Easement Compliance	legal	$ 3,000	$ 550	$ 550	$ 550	$ 250	$ 1,900	$ 550	$ 550	$ 1,100
NA	Easement Compliance	accounting	$ 1,188	$ 198	$ 198	$ 198	$ 198	$ 792	$ 198	$ 198	$ 396
NA	Easement Compliance	audit	$ 3,300	$ 550	$ 550	$ 550	$ 550	$ 2,200	$ 550	$ 550	$ 1,100
NA	Easement Compliance	third party insurance	$ 950	$ 275	$ 100	$ 100	$ 100	$ 575	$ 275	$ 100	$ 375
NA	Easement Compliance	mileage (IRS rate)	$ 1,868	$ 498	$ 249	$ 249	$ 125	$ 1,121	$ 498	$ 249	$ 747
NA	Easement Compliance	equipment/supplies	$ 1,470	$ 385	$ 200	$ 200	$ 100	$ 885	$ 385	$ 200	$ 585
Easement Compliance Subtotal			$ 23,928	$ 5,800	$ 3,519	$ 3,519	$ 2,163	$ 15,001	$ 5,800	$ 3,127	$ 8,927
Long-Term Management Subtotal			$ 116,643	$ 71,483	$ 9,551	$ 6,136	$ 11,739	$ 98,909	$ 12,774	$ 4,933	$ 17,707
Total			$ 140,571	$ 77,283	$ 13,070	$ 9,655	$ 13,902	$ 113,910	$ 18,574	$ 8,060	$ 26,634

Endowment Funding Schedule

As outlined in section VI.E of the BEI, the Bank Sponsor will furnish to the Endowment Holder Endowment Deposits sufficient to build an Endowment Amount for each Area of the Bank. Endowment Deposits for each Area will begin prior to the second credit release for that Area. Subsequent credit releases for each Area will be dependent on certain percentage of the endowment being funded, as outlined in section VII.A.-D of the BEI. As described in Section VI.E.3 of the BEI, each year that the Endowment Fund for a particular Area is not fully funded, the Endowment Amount for that Area will be adjusted annually on March 1 beginning in the calendar year following execution of the BEI in accordance with any increase in the Consumer Price Index (CPI). No further Endowment Deposits for an Area shall be required once the Endowment Fund for that Area has been fully funded.

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Appendix E Devil's Gate Off-site Mitigation Supplemental Irrigation Endowment Analysis

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Task Group	Task Description	Equipment/ Supply Costs: Units	Equipment/ Supply Costs: Rate	Frequency	Contingency	Total	Assumptions
Infrastructure	**Water Supply Infrastructure**	1	$ 343,125	75	10%	$ 5,033	This is the cost to replace all components over a 75 year period, annualized. Component lifespans vary.
Infrastructure	**Irrigation Infrastructure**	1	$ 368,367	75	10%	$ 5,403	This is the cost to replace all components over a 75 year period, annualized. Component lifespans vary.
Infrastructure	**Water Delivery Costs**	1	$ 24,780.00	5	10%	$ 5,452	Includes cost of water and electricity.
Infrastructure	**Irrigation Operation, Maintenance and Repair**	1	$ 19,400.00	5	0%	$ 3,880	Annual maintenance costs to run, maintain, and repair irrigation system
		4	$ 755,672	160	0.3	$ 19,767	

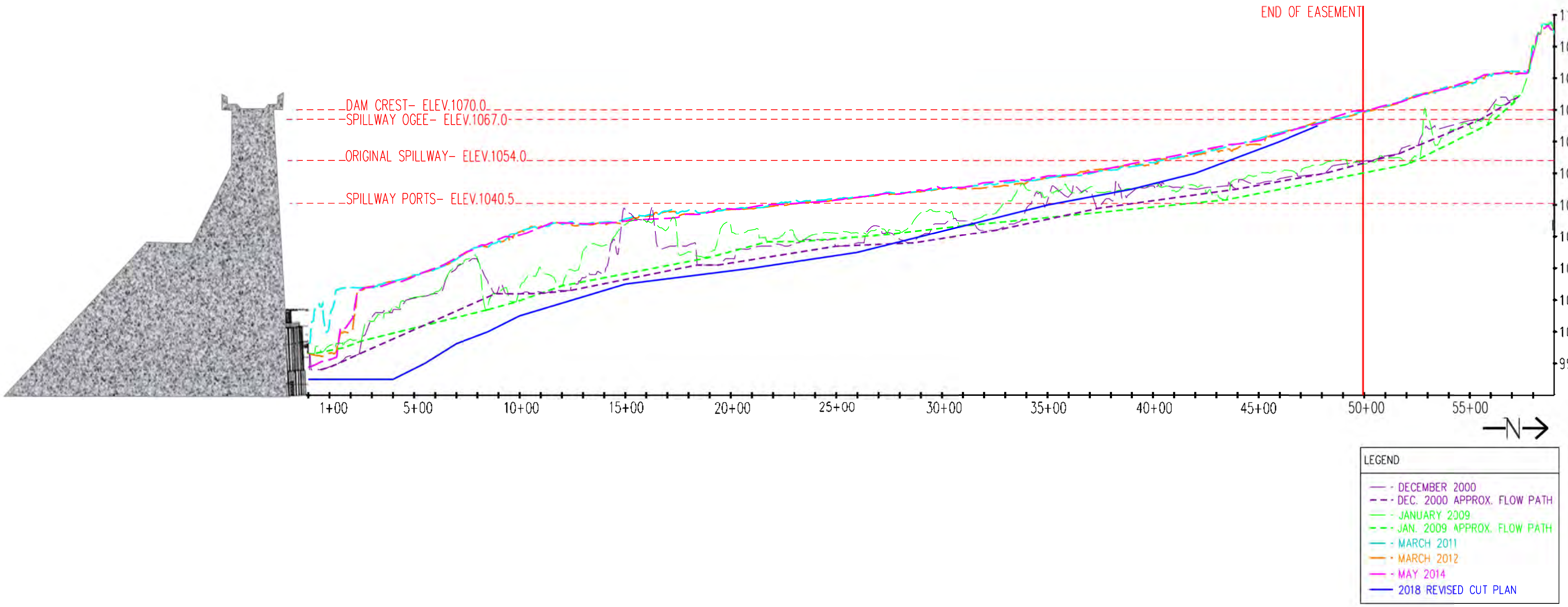
Supplemental Irrigation Endowment	
Irrigation Costs	$ 19,767
Administrative Rate	0%
Total Annual Cost	$ 19,767
Total LTM Endowment (4%)	**$ 494,170**

APPENDIX B

Historic and Existing Hydrology Attachments

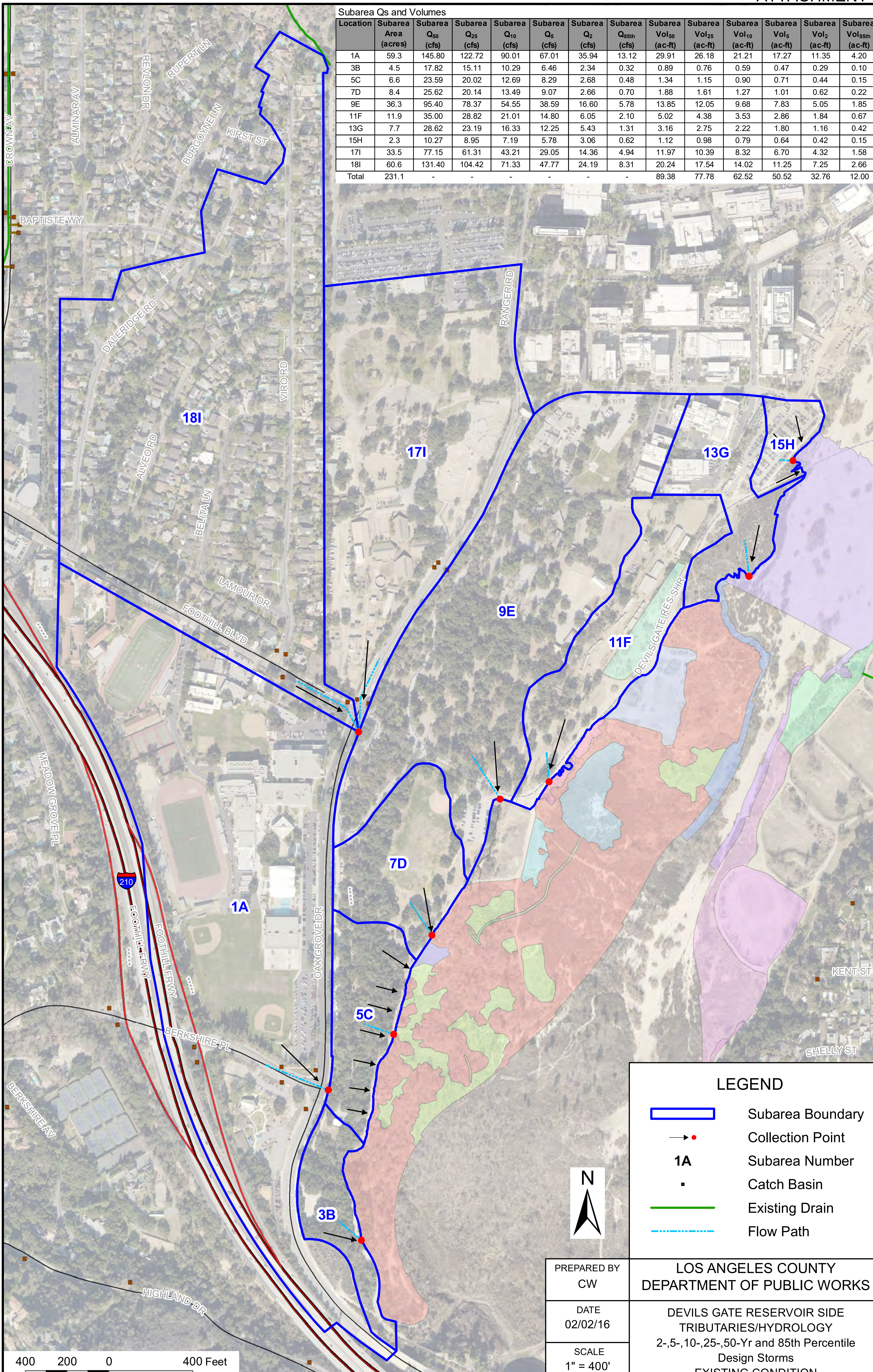
ATTACHMENT 1

DEVIL'S GATE RESERVOIR PROFILE



Subarea Qs and Volumes

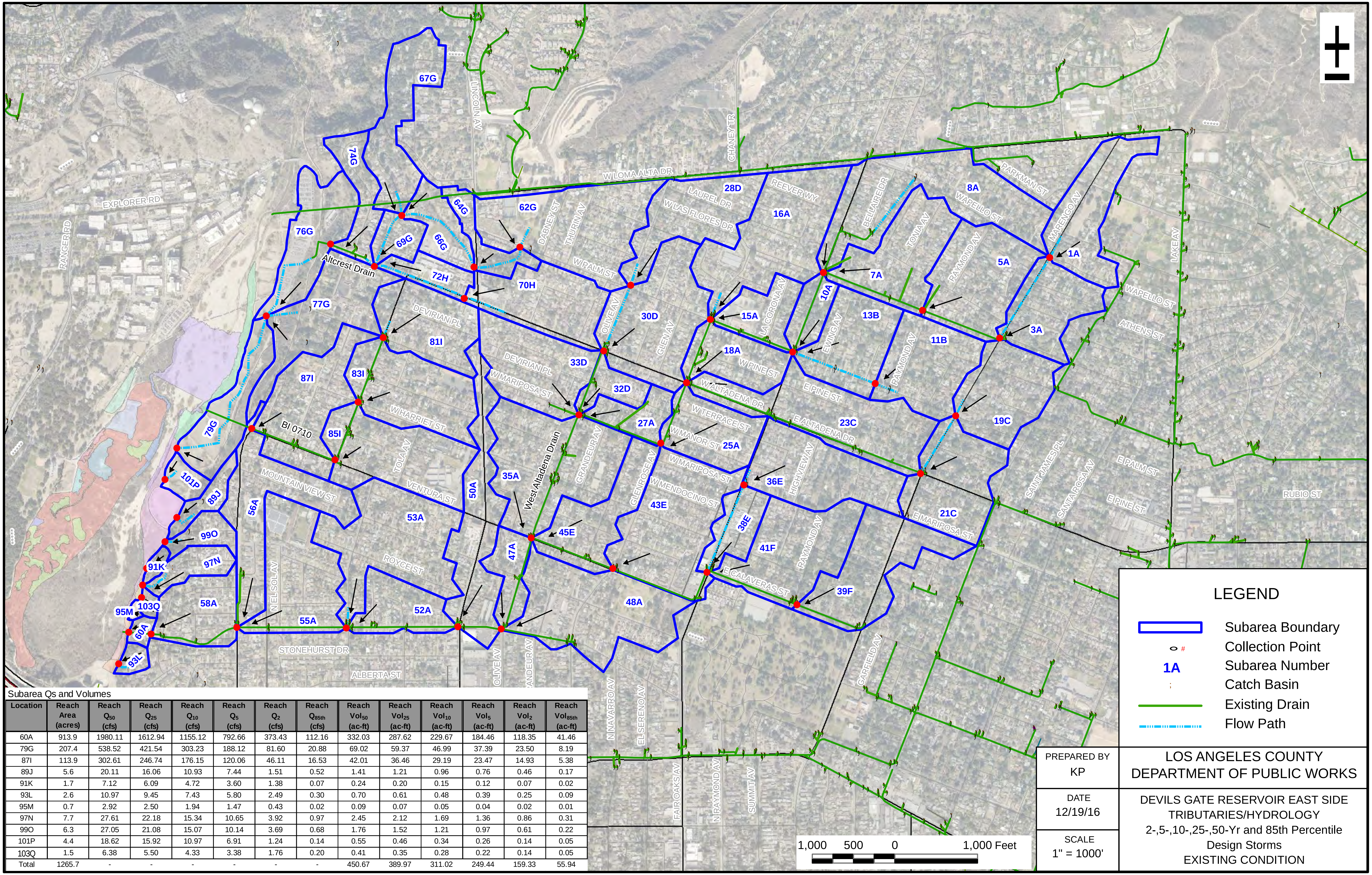
Location	Subarea Area (acres)	Subarea Q_{50} (cfs)	Subarea Q_{25} (cfs)	Subarea Q_{10} (cfs)	Subarea Q_5 (cfs)	Subarea Q_2 (cfs)	Subarea Q_{85th} (cfs)	Subarea Vol_{50} (ac-ft)	Subarea Vol_{25} (ac-ft)	Subarea Vol_{10} (ac-ft)	Subarea Vol_5 (ac-ft)	Subarea Vol_2 (ac-ft)	Subarea Vol_{85th} (ac-ft)
1A	59.3	145.80	122.72	90.01	67.01	35.94	13.12	29.91	26.18	21.21	17.27	11.35	4.20
3B	4.5	17.82	15.11	10.29	6.46	2.34	0.32	0.89	0.76	0.59	0.47	0.29	0.10
5C	6.6	23.59	20.02	12.69	8.29	2.68	0.48	1.34	1.15	0.90	0.71	0.44	0.15
7D	8.4	25.62	20.14	13.49	9.07	2.66	0.70	1.88	1.61	1.27	1.01	0.62	0.22
9E	36.3	95.40	78.37	54.55	38.59	16.60	5.78	13.85	12.05	9.68	7.83	5.05	1.85
11F	11.9	35.00	28.82	21.01	14.80	6.05	2.10	5.02	4.38	3.53	2.86	1.84	0.67
13G	7.7	28.62	23.19	16.33	12.25	5.43	1.31	3.16	2.75	2.22	1.80	1.16	0.42
15H	2.3	10.27	8.95	7.19	5.78	3.06	0.62	1.12	0.98	0.79	0.64	0.42	0.15
17I	33.5	77.15	61.31	43.21	29.05	14.36	4.94	11.97	10.39	8.32	6.70	4.32	1.58
18I	60.6	131.40	104.42	71.33	47.77	24.19	8.31	20.24	17.54	14.02	11.25	7.25	2.66
Total	231.1	-	-	-	-	-	-	89.38	77.78	62.52	50.52	32.76	12.00



LEGEND

- Subarea Boundary
- Collection Point
- 1A Subarea Number
- Catch Basin
- Existing Drain
- Flow Path

PREPARED BY	LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
CW	
DATE 02/02/16	DEVILS GATE RESERVOIR SIDE TRIBUTARIES/HYDROLOGY 2-,5-,10-,25-,50-Yr and 85th Percentile Design Storms EXISTING CONDITION
SCALE 1" = 400'	



Subarea Qs and Volumes

Location	Reach Area (acres)	Reach Q_{50} (cfs)	Reach Q_{25} (cfs)	Reach Q_{10} (cfs)	Reach Q_5 (cfs)	Reach Q_2 (cfs)	Reach Q_{85th} (cfs)	Reach Vol_{50} (ac-ft)	Reach Vol_{25} (ac-ft)	Reach Vol_{10} (ac-ft)	Reach Vol_5 (ac-ft)	Reach Vol_2 (ac-ft)	Reach Vol_{85th} (ac-ft)
60A	913.9	1980.11	1612.94	1155.12	792.66	373.43	112.16	332.03	287.62	229.67	184.46	118.35	41.46
79G	207.4	538.52	421.54	303.23	188.12	81.60	20.88	69.02	59.37	46.99	37.39	23.50	8.19
87I	113.9	302.61	246.74	176.15	120.06	46.11	16.53	42.01	36.46	29.19	23.47	14.93	5.38
89J	5.6	20.11	16.06	10.93	7.44	1.51	0.52	1.41	1.21	0.96	0.76	0.46	0.17
91K	1.7	7.12	6.09	4.72	3.60	1.38	0.07	0.24	0.20	0.15	0.12	0.07	0.02
93L	2.6	10.97	9.45	7.43	5.80	2.49	0.30	0.70	0.61	0.48	0.39	0.25	0.09
95M	0.7	2.92	2.50	1.94	1.47	0.43	0.02	0.09	0.07	0.05	0.04	0.02	0.01
97N	7.7	27.61	22.18	15.34	10.65	3.92	0.97	2.45	2.12	1.69	1.36	0.86	0.31
99O	6.3	27.05	21.08	15.07	10.14	3.69	0.68	1.76	1.52	1.21	0.97	0.61	0.22
101P	4.4	18.62	15.92	10.97	6.91	1.24	0.14	0.55	0.46	0.34	0.26	0.14	0.05
103Q	1.5	6.38	5.50	4.33	3.38	1.76	0.20	0.41	0.35	0.28	0.22	0.14	0.05
Total	1265.7	-	-	-	-	-	-	450.67	389.97	311.02	249.44	159.33	55.94

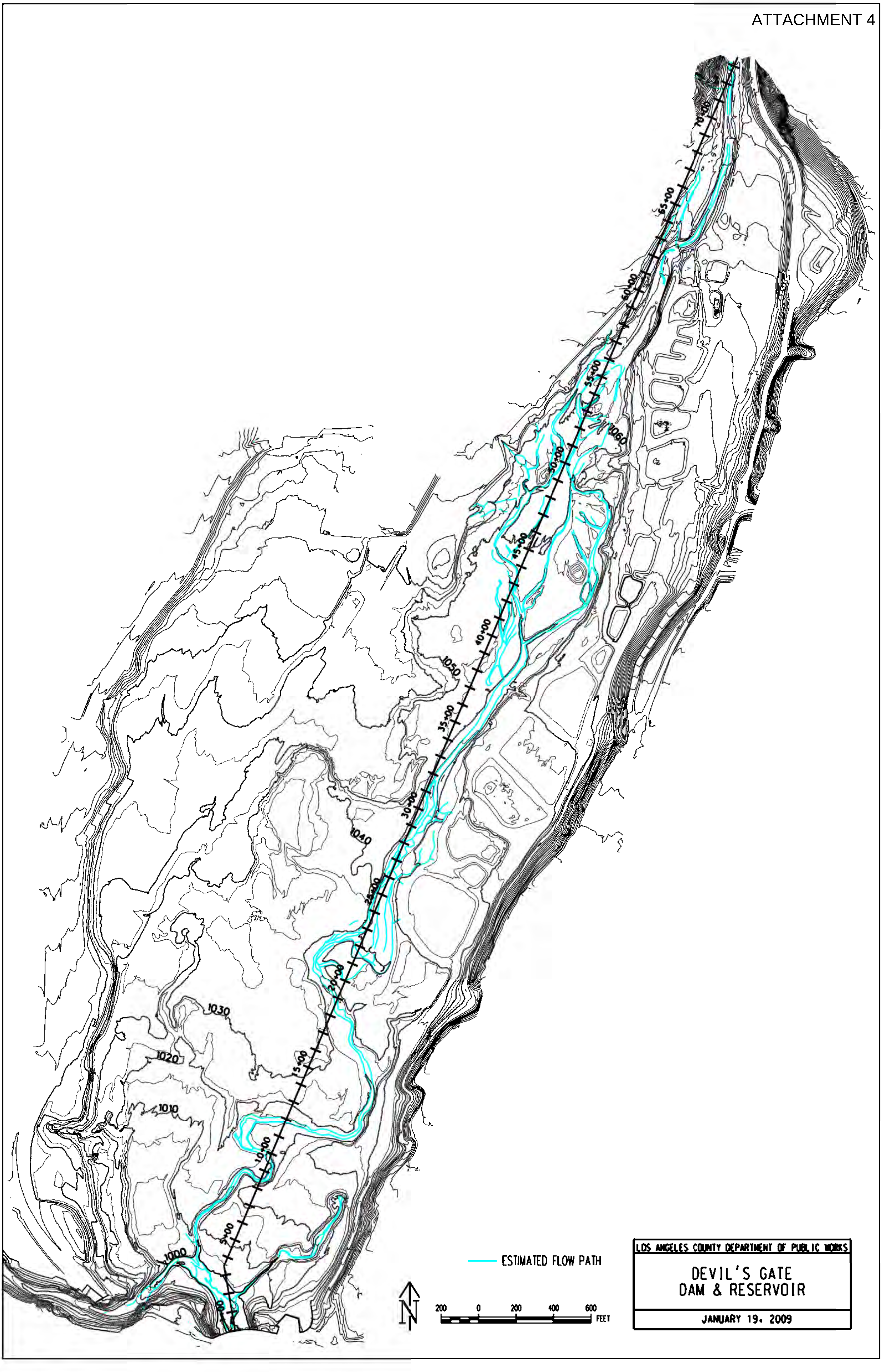
LEGEND

- Subarea Boundary
- Collection Point
- 1A Subarea Number
- Catch Basin
- Existing Drain
- Flow Path

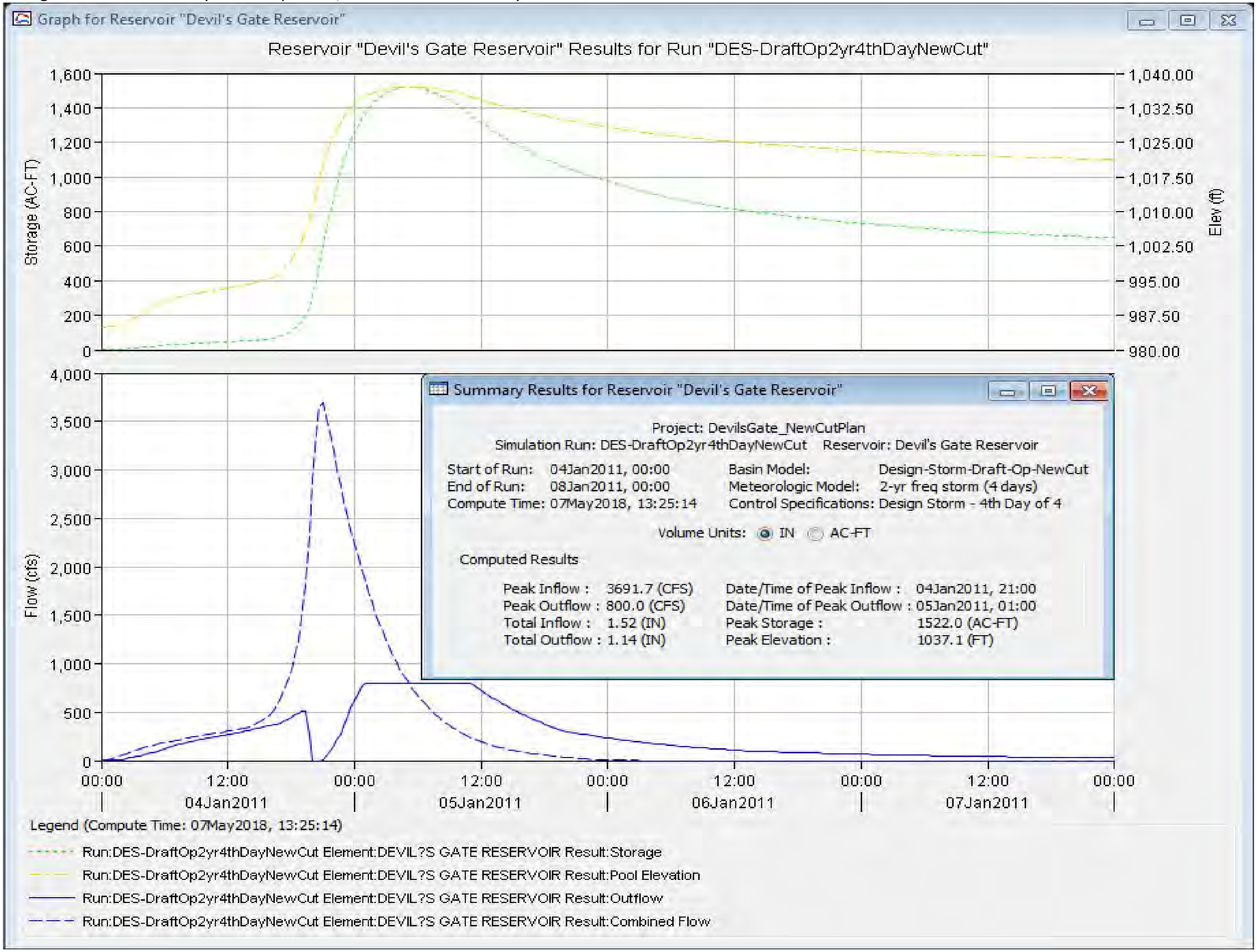
1,000 500 0 1,000 Feet

PREPARED BY KP	LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
DATE 12/19/16	DEVILS GATE RESERVOIR EAST SIDE TRIBUTARIES/HYDROLOGY 2-,5-,10-,25-,50-Yr and 85th Percentile Design Storms EXISTING CONDITION
SCALE 1" = 1000'	

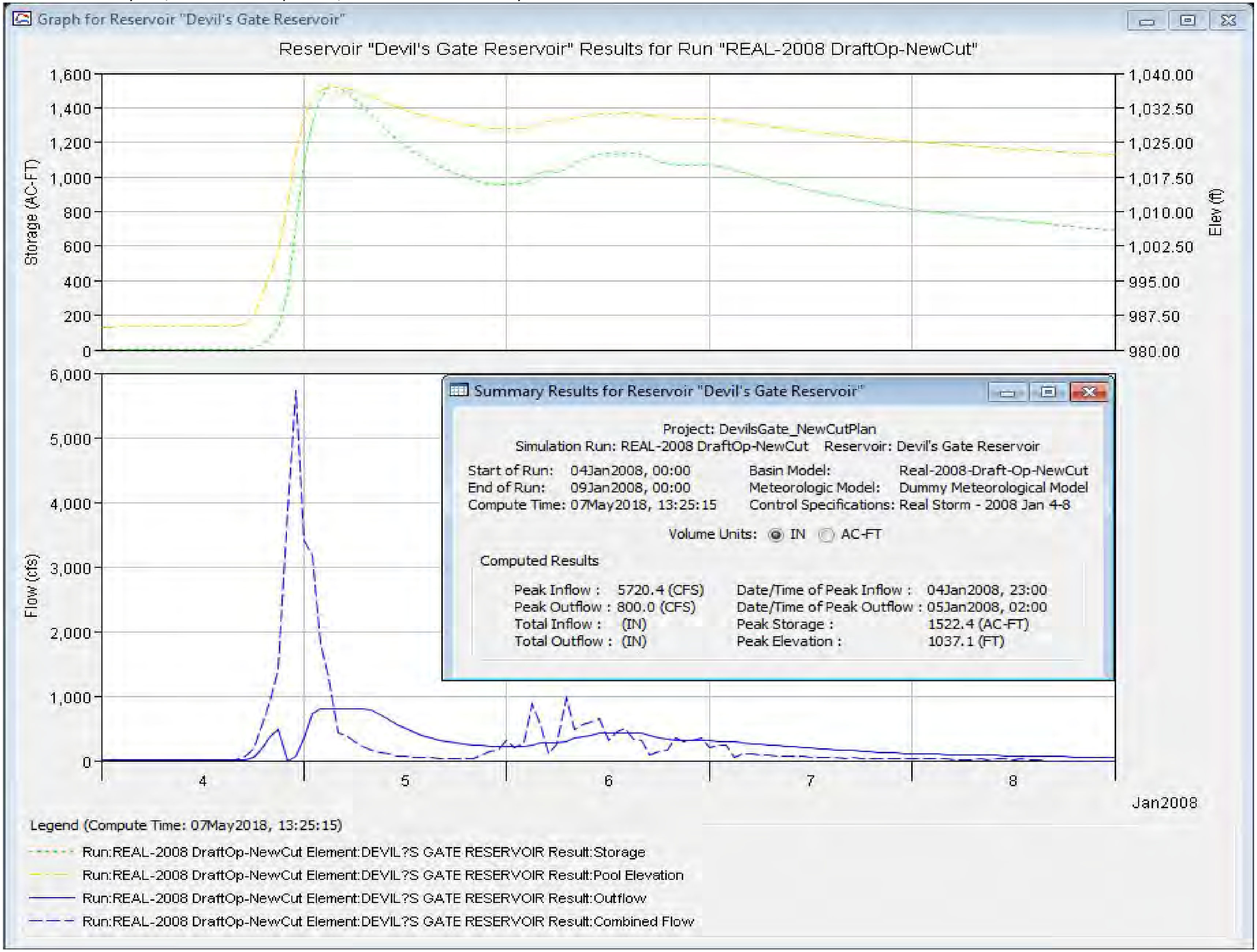
ATTACHMENT 4



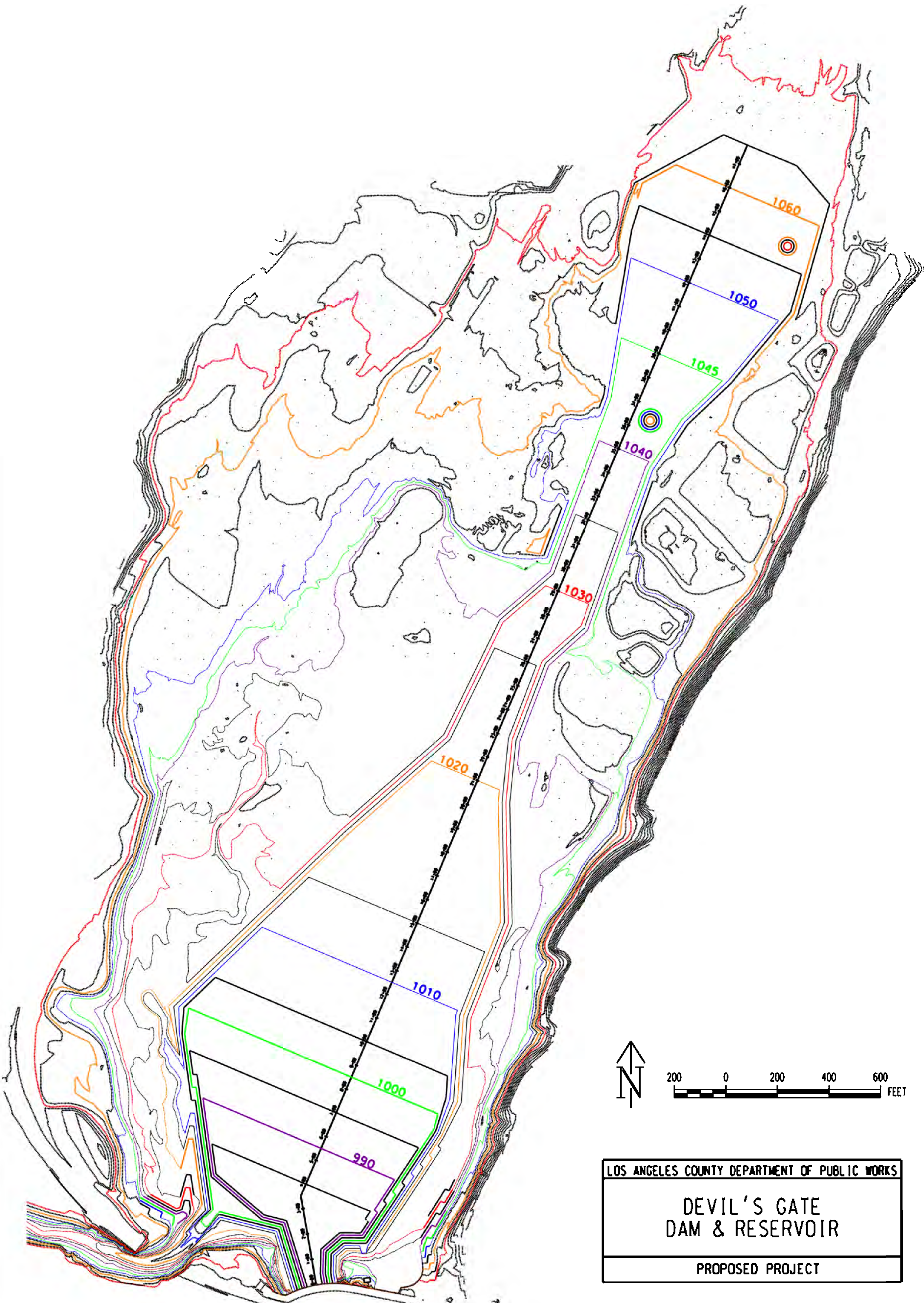
Design Storm - 2Yr 4th Day <Draft Op Plan>, new Cut Plan as of May 2018



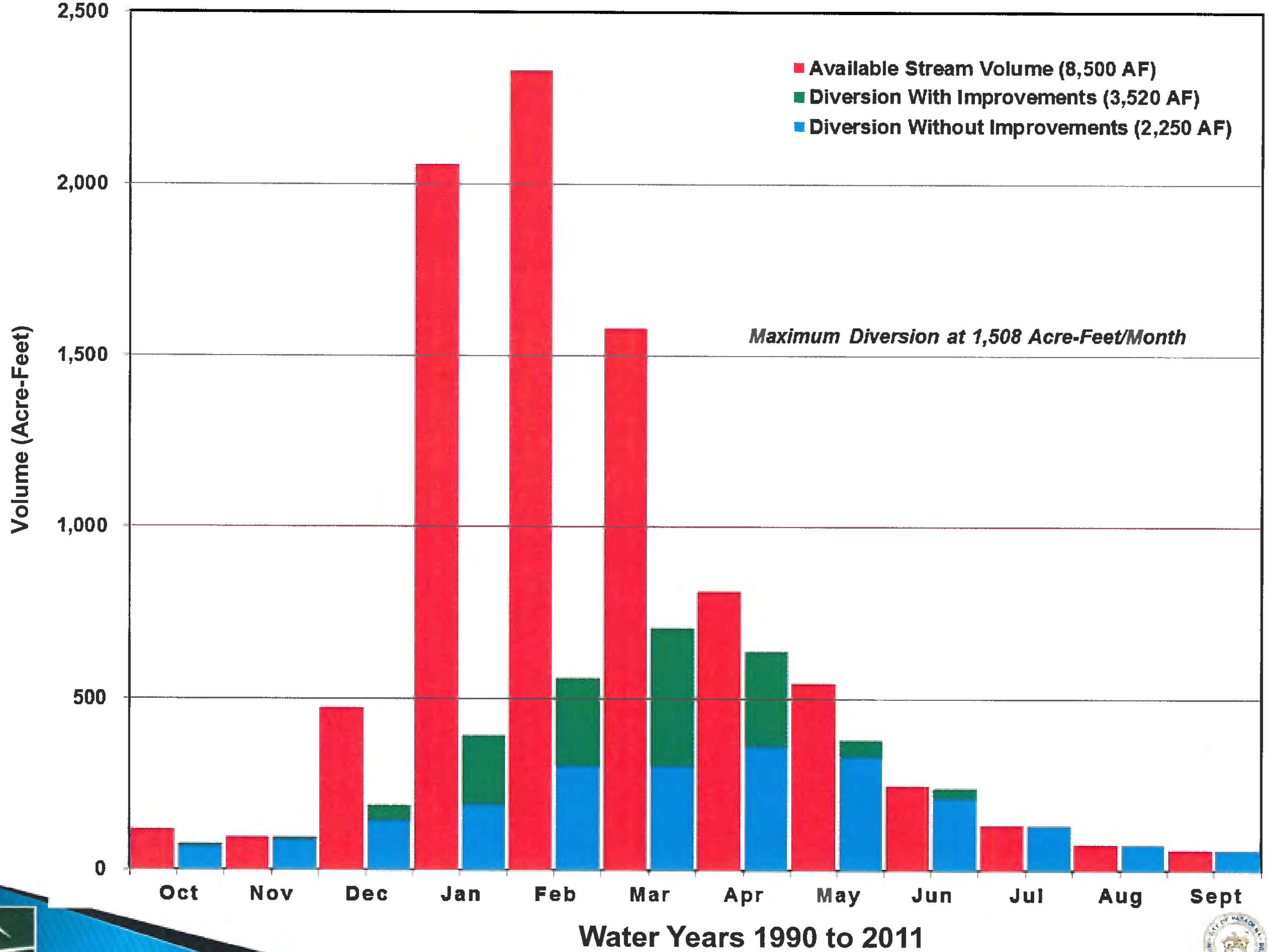
Storm of January 4-8, 2008 <Draft Op Plan>, new Cut Plan as of May 2018



ATTACHMENT 7



Average Year Stream Volume & Diversion

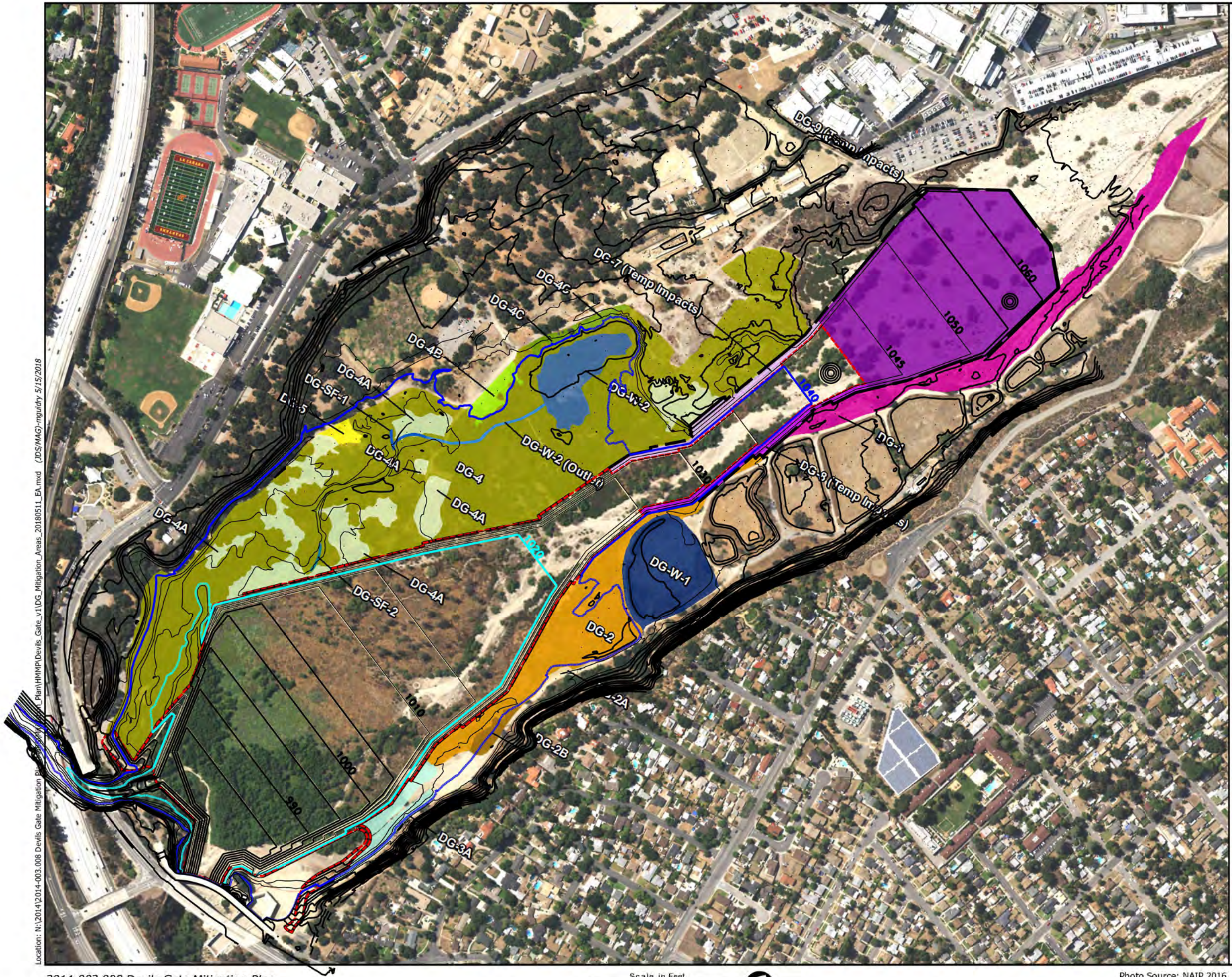


ARROYO SECO FOUNDATION

Engineers

PASADENA Water & Power

ATTACHMENT 9
Devil's Gate Mitigation Areas



Map Features

- Initial Sediment Removal Footprint [1]
- Permanent Maintenance Footprint [1]
- Sediment Removal Excavation Contours [1]

Mitigation Areas

- DG-1
- DG-2
- DG-2A
- DG-2B
- DG-3A
- DG-4
- DG-4A
- DG-4B
- DG-4C
- DG-5
- DG-7 (Temp Impacts)
- DG-8 (Temp Impacts)
- DG-9 (Temp Impacts)
- DG-SF-1
- DG-SF-2
- DG-W-1
- DG-W-2
- DG-W-2 (Outlet)

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

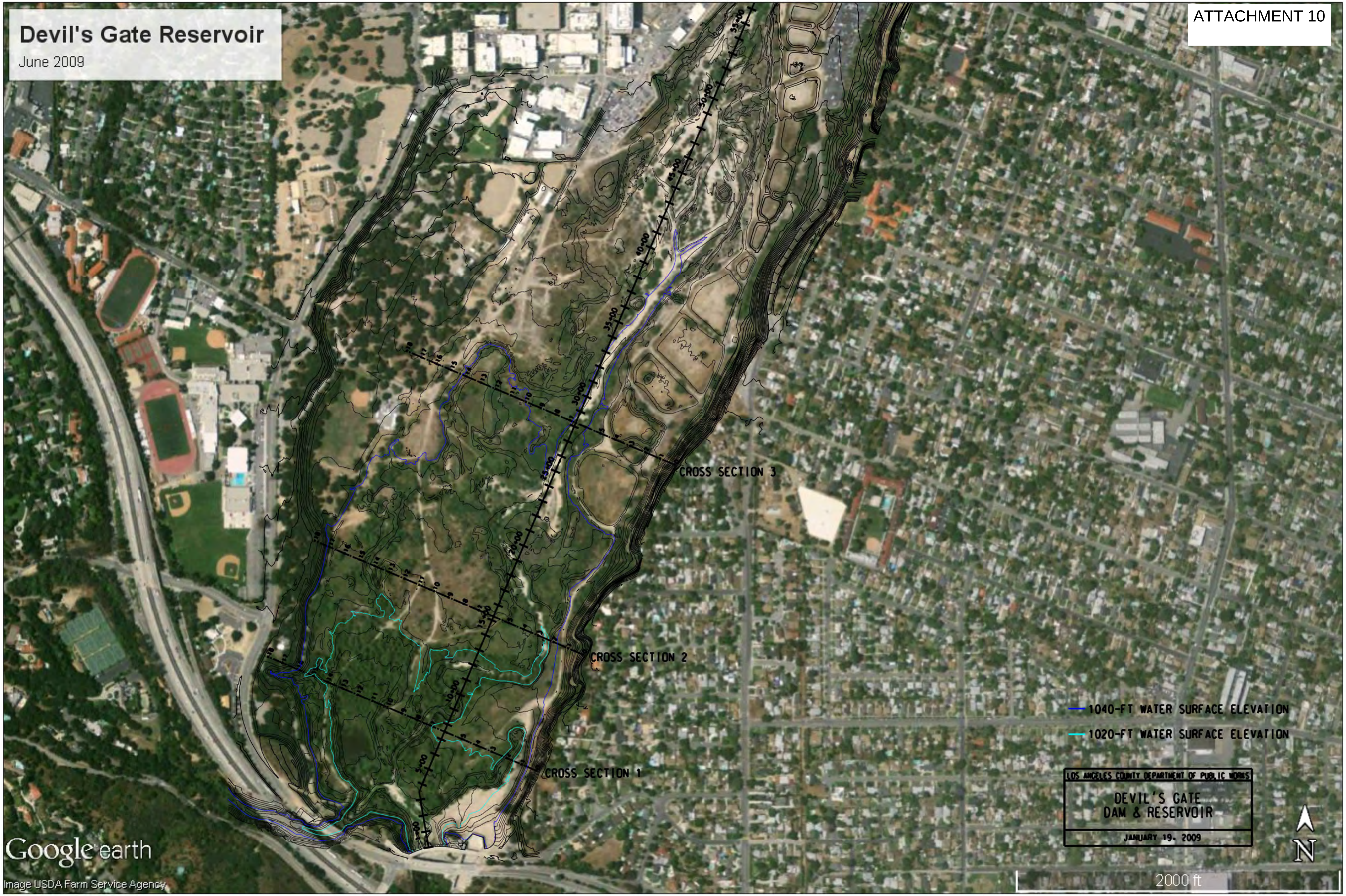
Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\HMMP\Devils_Gate_v1\DG_Mitigation_Areas_20180511_EA.mxd (JDS/MAG)-mguidry 5/15/2018

2014-003.008 Devils Gate Mitigation Plan

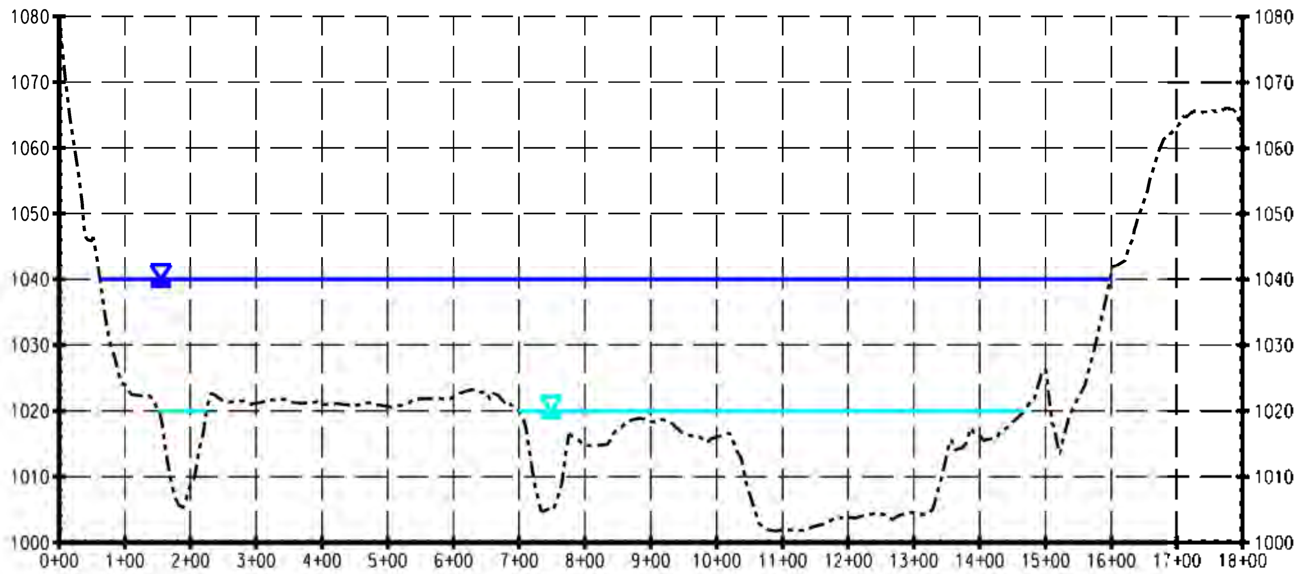
Scale in Feet
0 600

Photo Source: NAIP 2016
[1] LADPW

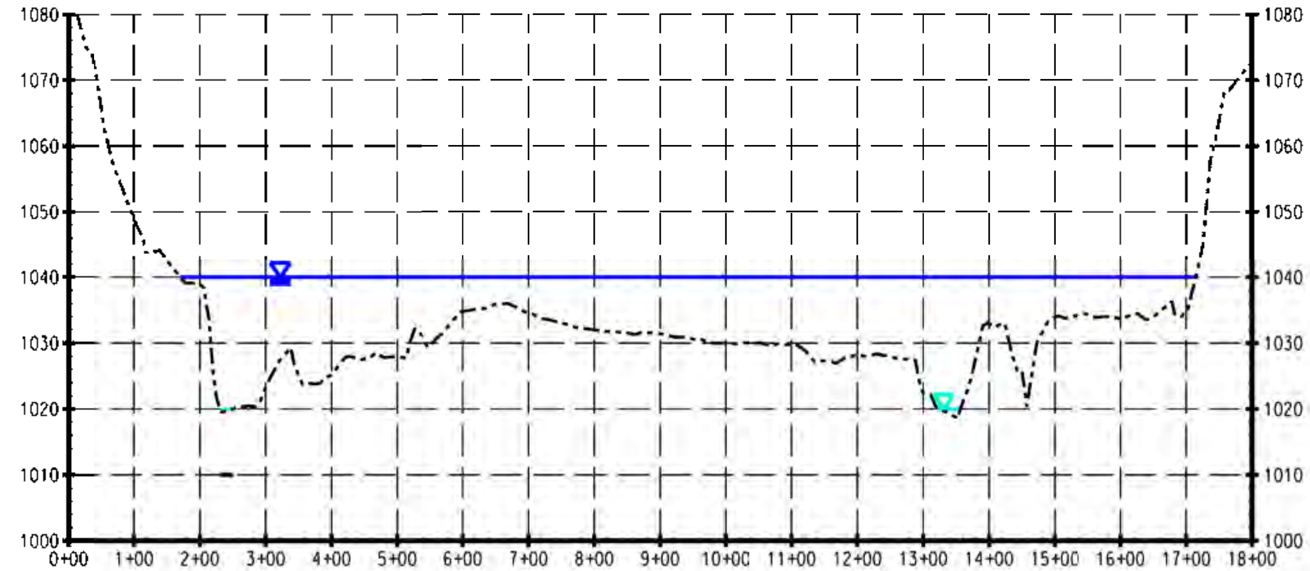
Map Date: 5/14/2018


ATTACHMENT 10
Devil's Gate Reservoir
June 2009
CROSS SECTION 3
CROSS SECTION 2
CROSS SECTION 1
1040-FT WATER SURFACE ELEVATION
1020-FT WATER SURFACE ELEVATION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
DEVIL'S GATE
DAM & RESERVOIR
JANUARY 19, 2009
N
2000 ft
Google earth
Image USDA Farm Service Agency

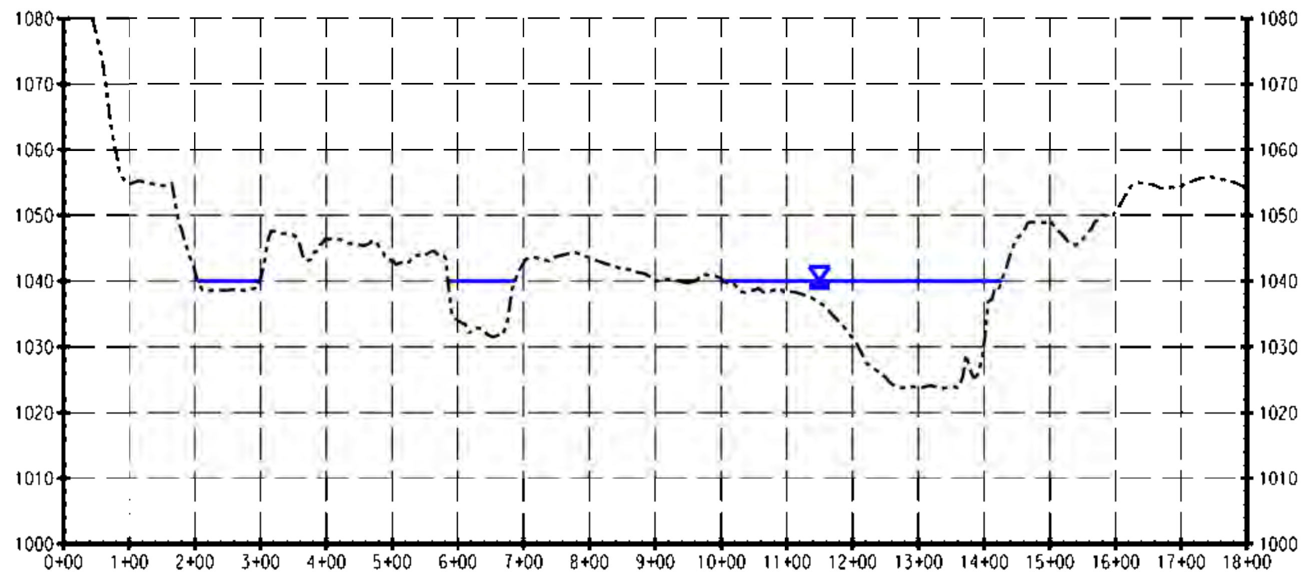
ATTACHMENT 11



CROSS SECTION 1



CROSS SECTION 2



CROSS SECTION 3

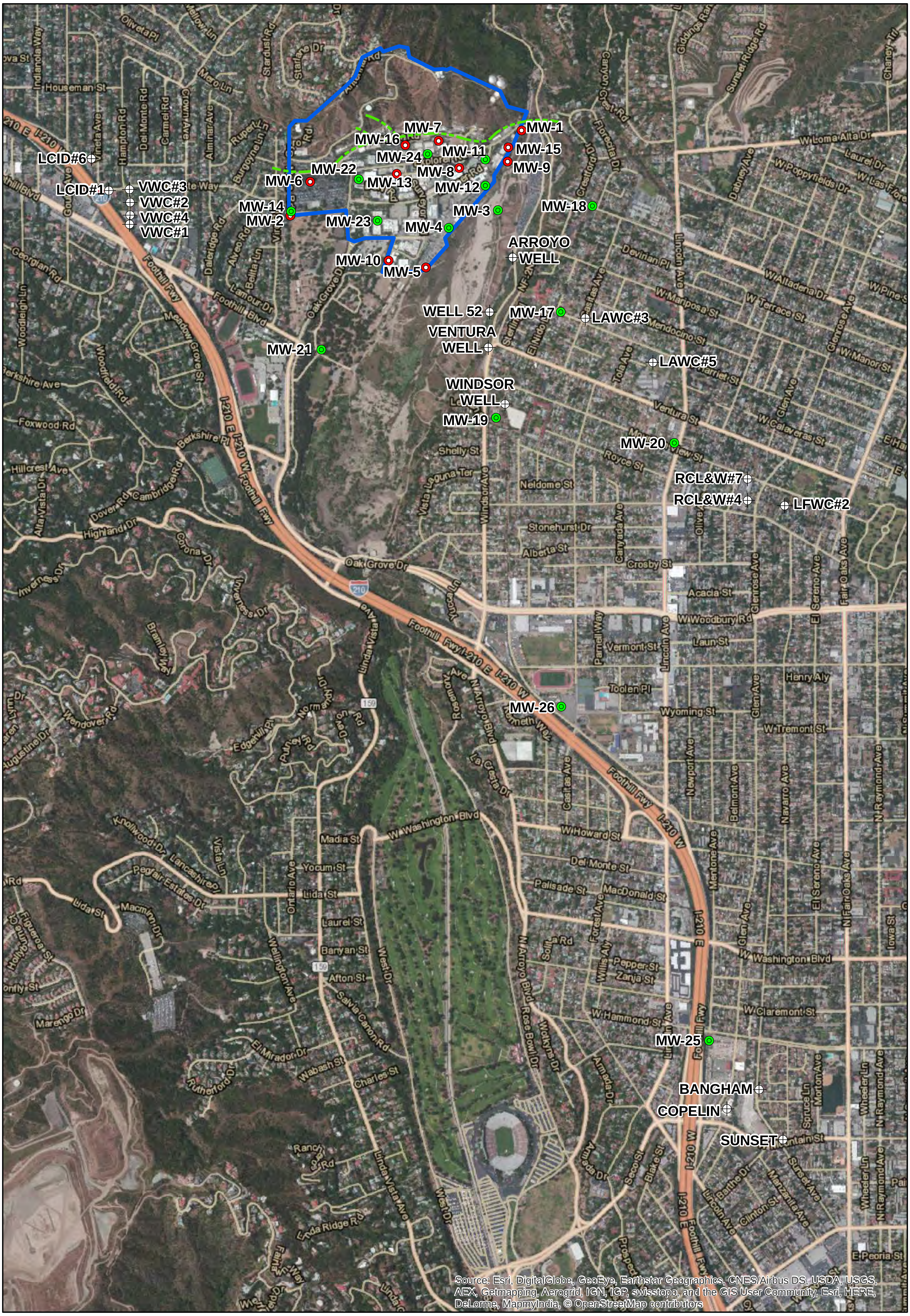
1040-FT WATER SJRFACE ELEVATION

1020-FT WATER SJFACE ELEVATION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

DEVIL'S GATE
DAM & RESERVOIR

JANUARY 19, 2009



Legend

- JPL Facility Boundary
- Approximate Location of Thrust Fault
- Deep Multi-Port Monitoring Well Location
- Shallow Monitoring Well Location
- Municipal Production Well

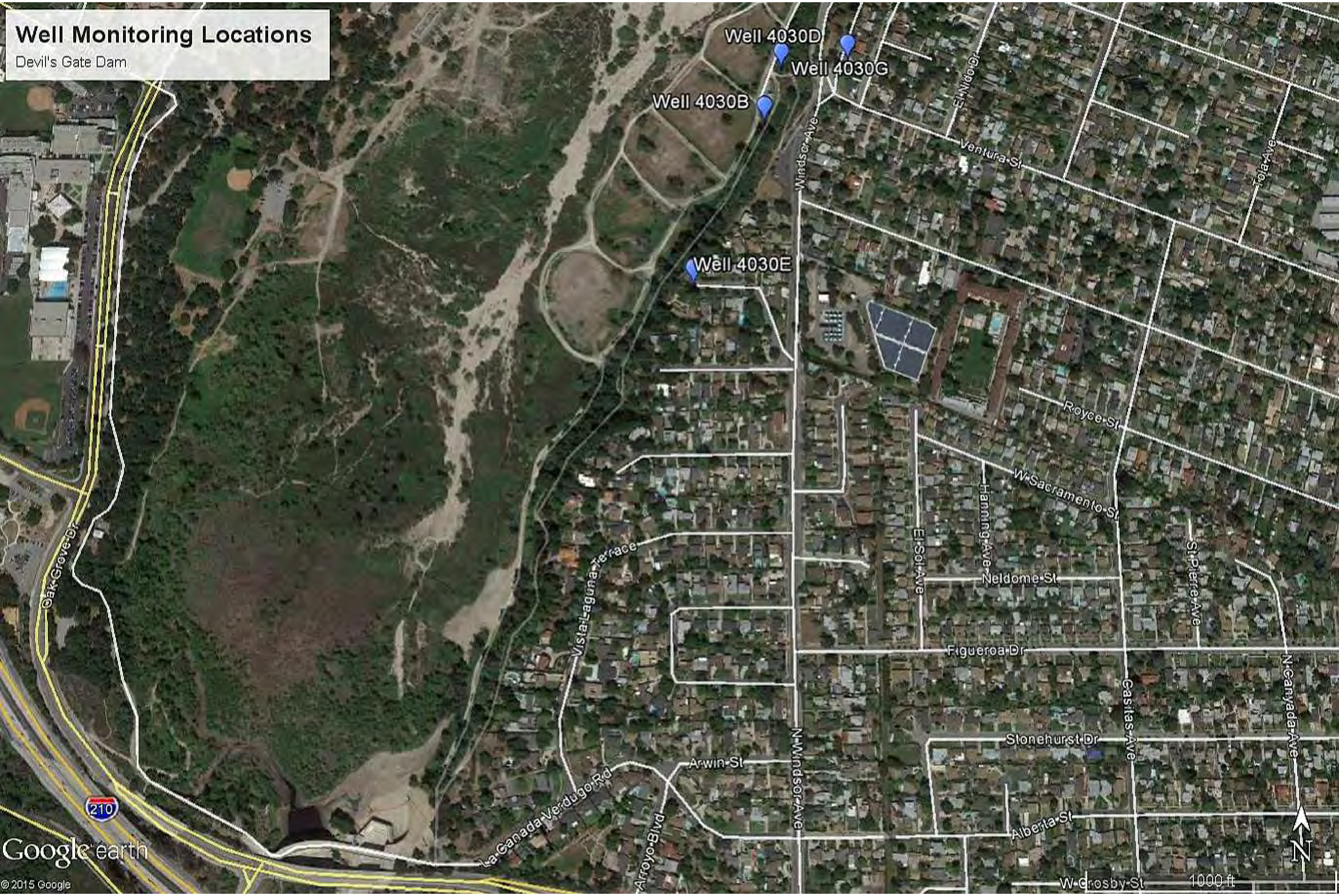
N S E W

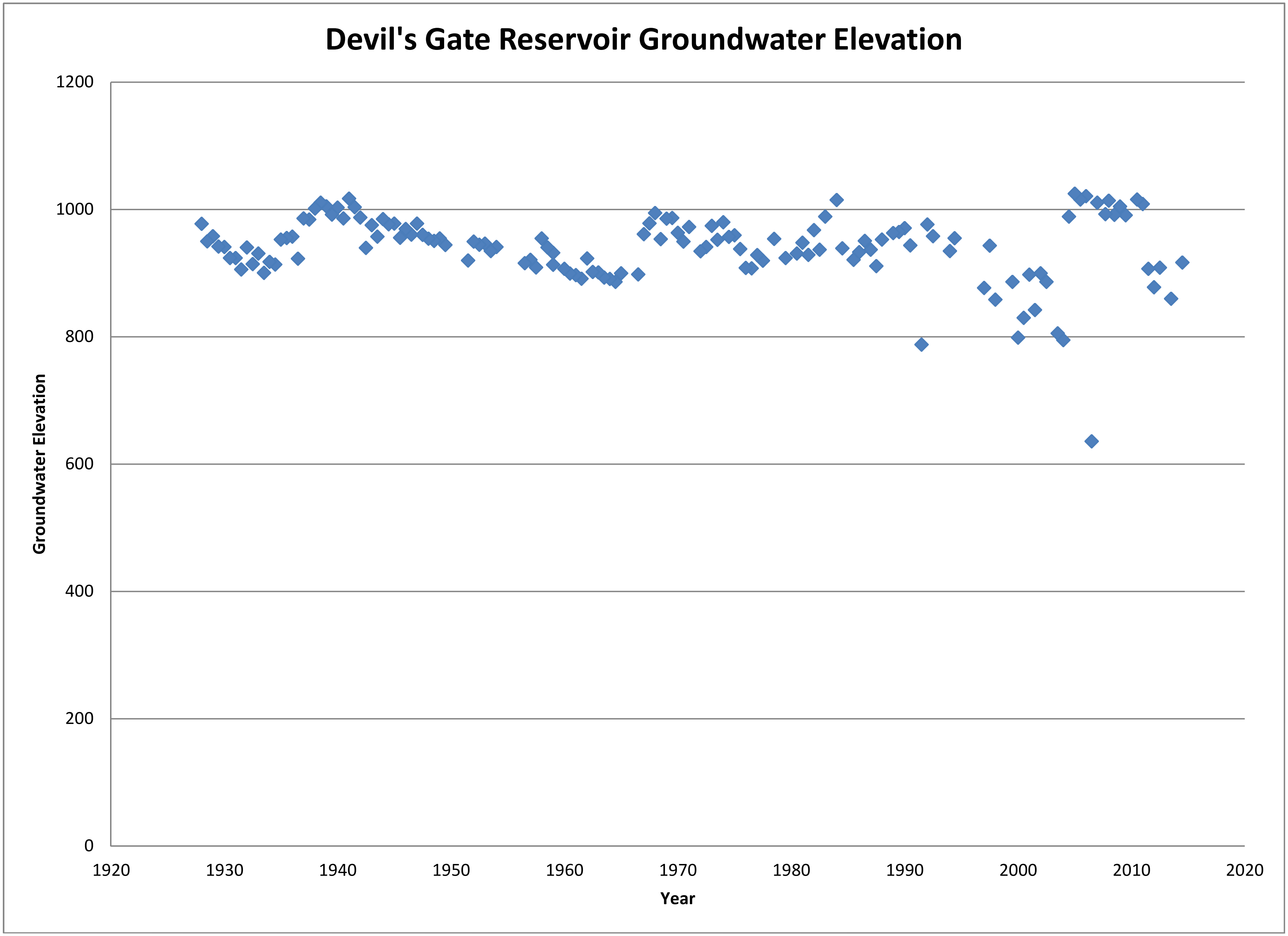
0 490 980 1,470 Feet

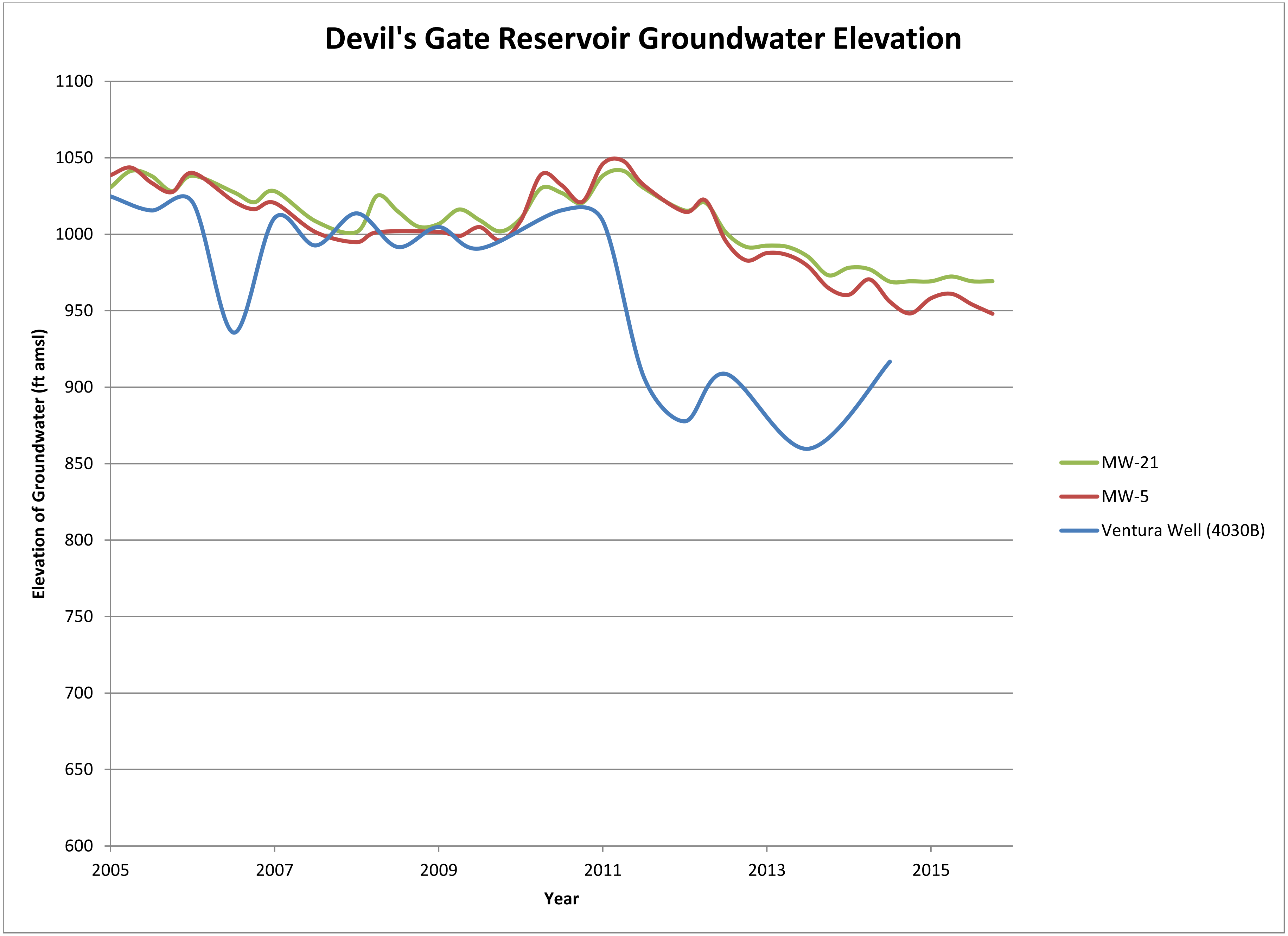
TIDEWATER INC

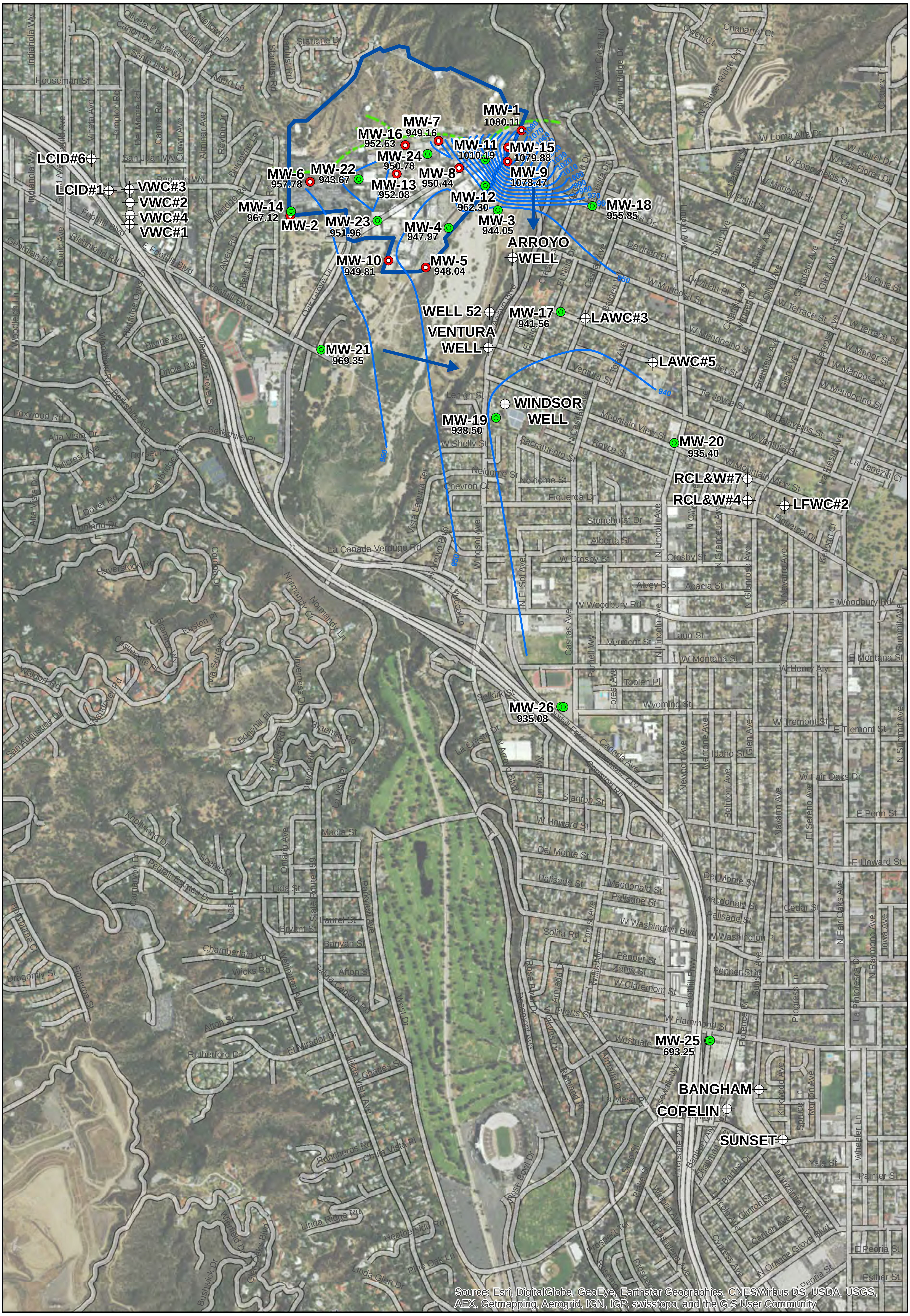
Locations of JPL Groundwater Monitoring Wells and Nearby Municipal Production Wells

DESIGNED BY JHG	JPL - Pasadena, CA	Figure 1
DRAWN BY JHG	Contract No: W912PL-13-D-0018 TO 001	June 2015
CHECKED BY DC		


Well Monitoring Locations
Devil's Gate Dam
Well 4030D
Well 4030G
Well 4030B
Well 4030E
Windsor Ave
El Nido Dr
Ventura St
Yola Ave
Royce St
W Sacramento St
Hanning Ave
El Sol Ave
Neldome St
St Pierre Ave
Figueroa Dr
N Canyada Ave
Casitas Ave
Stonehurst Dr
Alberta St
W Crosby St
N Windsor Ave
Arwin St
Arroyo Blvd
La Canada Verdugo Rd
Vista Laguna Terrace
Oak Grove Dr
210
1000 ft
N
Google earth
© 2015 Google


Devil's Gate Reservoir Groundwater Elevation
Groundwater Elevation
1200
1000
800
600
400
200
0
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
Year


Devil's Gate Reservoir Groundwater Elevation
1100
1050
1000
950
900
850
800
750
700
650
600
Elevation of Groundwater (ft amsl)
2005
2007
2009
2011
2013
2015
Year
MW-21
MW-5
Ventura Well (4030B)



N
W E
S

0 500 1,000 1,500
Feet

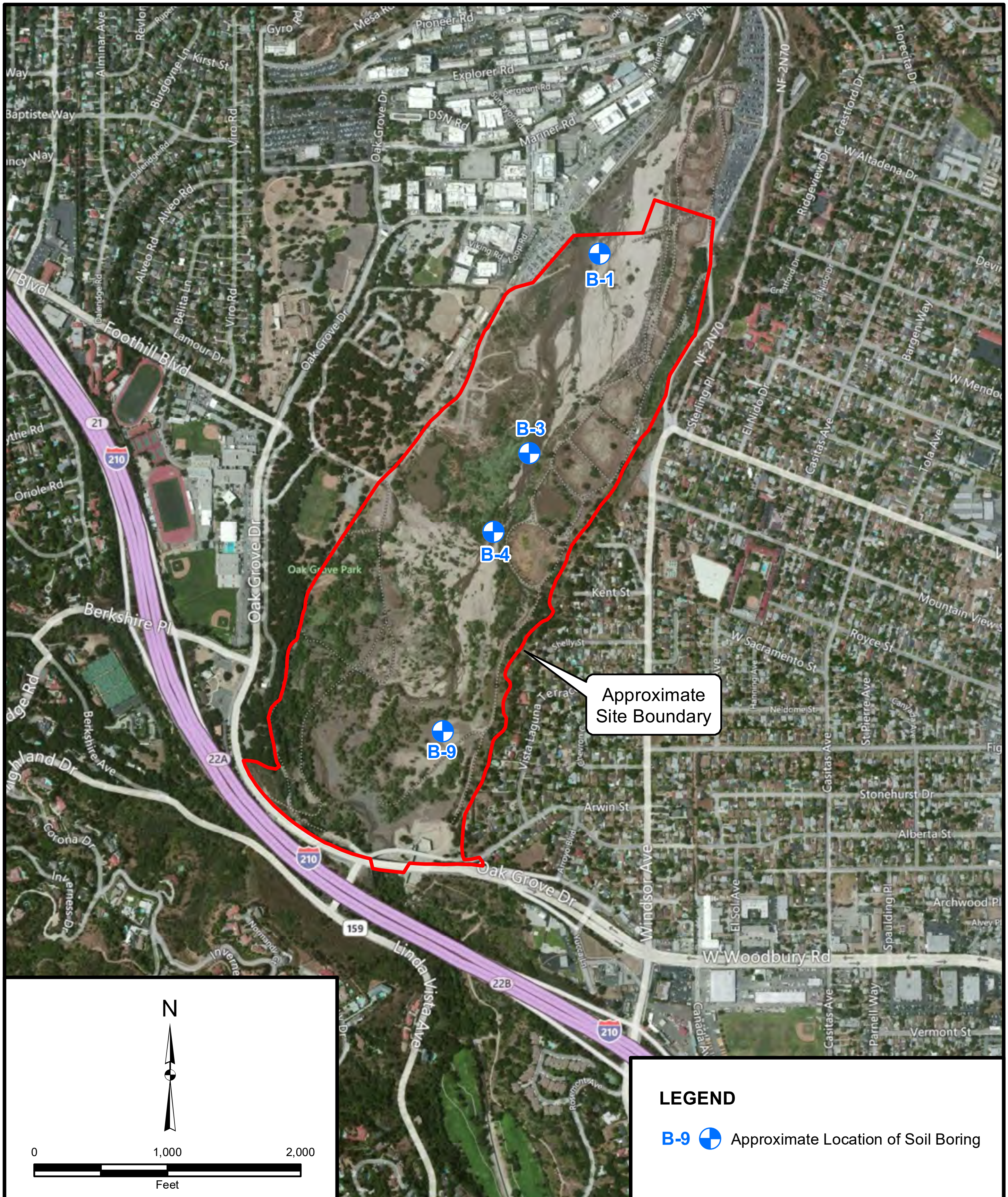
Legend

- Shallow Monitoring Well Location
- Deep Multi-Port Monitoring Well Location
- JPL Facility Boundary
- Municipal Production Well
- Approximate Location of Thrust Fault
- Groundwater Elevation Contour (ft amsl)
- Groundwater Flow Direction

TIDEWATER INC
ENGINEERS / SCIENTISTS / PROGRAM MANAGERS

Groundwater Elevation Contours
October 2015

DESIGNED BY JHG; DRAWN BY JHG	JPL - Pasadena, CA	Figure 8
CHECKED BY DC	Contract No: W912PL-13-D-0018 TO 001	February 2016



Project: 603211-001	Eng/Geol: VPI/RML
Scale: 1 " = 1,000 '	Date: October 2011

Base Map: ESRI Resource Center, 2010
Thematic Info: Leighton
Author: (cgiovando)

BORING LOCATION MAP

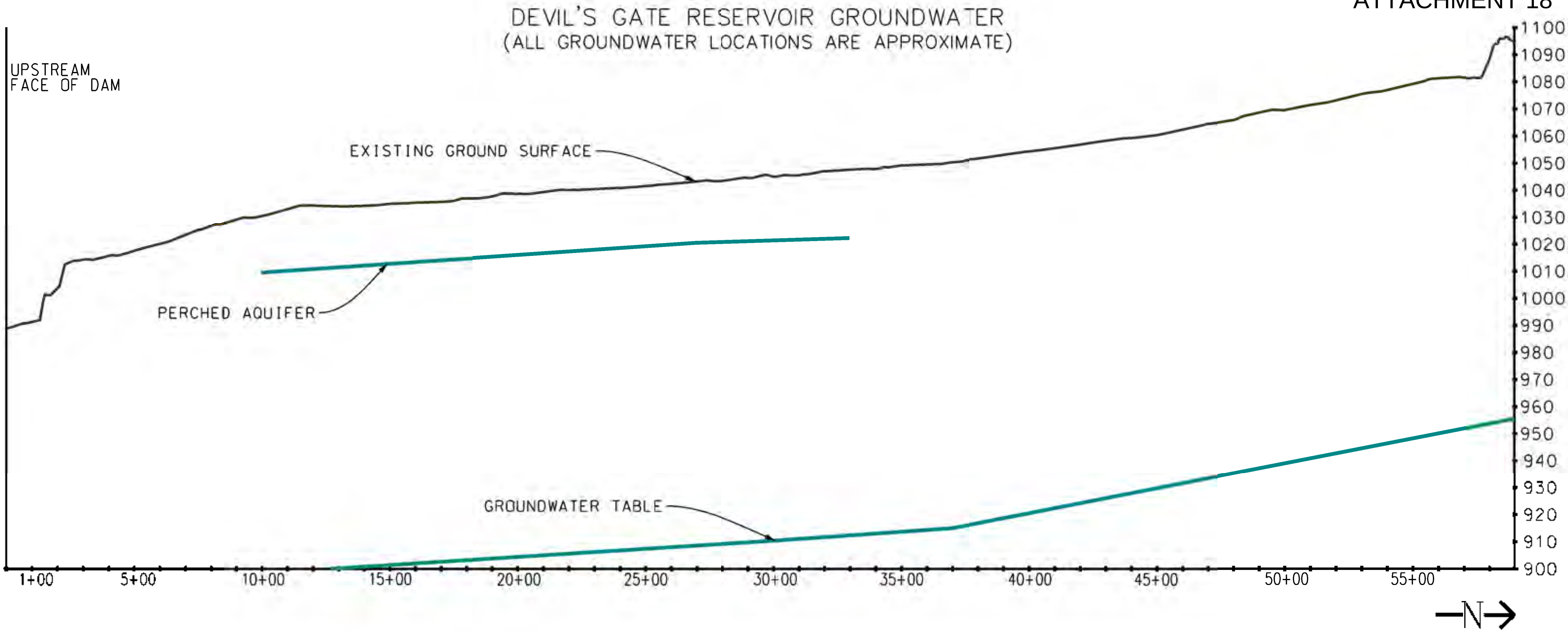
Devil's Gate Reservoir
Pasadena, California

Figure 2

Leighton

Map Saved as V:\drafting\603211\001\Maps\P603211-001_F02_BoringLocationMap_GIS_2013-01-23.mxd on 1/23/2013 3:36:43 PM

ATTACHMENT 18



APPENDIX C

2010, 2013, and 2014 Vegetation Maps and Report

January 19, 2015
(20818)

Tom Budinger
Los Angeles County Flood Control District, Water Resources Division
900 South Fremont Avenue
Alhambra, ~~C~~A 91803

SUBJECT: DEVELOPMENT OF A DETAILED VEGETATION MAP FOR THE DEVIL'S GATE SEDIMENT REMOVAL PROJECT

Dear Mr. Budinger,

At the request of the Los Angeles County Flood Control District (LACFCD), Chambers Group, Inc. (Chambers Group) has developed a detailed vegetation map for the Devil's Gate Reservoir Sediment Removal Project in Los Angeles County, California. The vegetation map was developed as part of an overall mitigation strategy to address future mitigation options for the Project. Vegetation mapping is a crucial step in the overall mitigation strategy, as it provides a subsequent baseline for the amount of credits that would be needed off-site and for existing habitat on-site that is suitable for restoration. Although the previous vegetation map provided by Chambers Group for the Environmental Impact Report (EIR) provides an accurate assessment of the habitat on-site, the scale at which the mapping effort was done represents an overestimate of the actual vegetation present, which is an accepted strategy under the California Environmental Quality Act (CEQA). Interstitial spaces between trees, for example, were not differentiated from the trees themselves because in the broad sense, gaps in the vegetation do constitute habitat. In addition, vegetation communities within the Devil's Gate Reservoir are extremely dynamic in nature and are known to change markedly from year to year. Therefore, a more current and detailed vegetation map was needed to more accurately reflect the amount and types of vegetation present as the Project moves closer toward the design phase. The overall mitigation strategy that will be developed as a result of this initial mapping effort will ultimately be incorporated into the Biological Assessment (BA) for the project and will also be used to support all final permitting requirements for the project including: U.S. Army Corps of Engineers (USACE) Section 401 and 404 requirements; and California Department of Fish and Wildlife (CDFW) Section 1600 Stream Bed Alteration Agreement(s) and Section 2081 Incidental Take permitting requirements, as appropriate.

METHODS

High resolution (one foot) LAR-IAC4 color aerial imagery from 2014 was obtained from the Los Angeles County of Regional Planning, but upon an evaluation of the imagery, it was determined that it could not be used because it had been acquired during February 2014 when the leaves were off of most of the vegetation, which made it nearly impossible to differentiate different vegetation types. Instead, 2014 color aerial imagery from the National Agriculture Imagery Program (NAIP) (one meter resolution) was used to identify the types and extent of different vegetation communities within the Project area. While lower in resolution than the LAR-IAC4 aerial imagery, the 2014 NAIP imagery was acquired in June during the active growing season and was more than adequate in identifying the boundaries and types of vegetation communities within the Project area.

Vegetation polygons were digitized using ESRI's ArcGIS software (version 10.2) at a scale of approximately 1:1000. Once the digitization process was complete, the layer was edited to ensure that all polygons had proper topology to eliminate any inadvertent gaps or overlaps between polygons that share common geometry. Polygons were attributed with plant community names according to naming conventions of the National Vegetation Classification System (Grossman et al. 1998) and the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995).

After completion of the draft vegetation map, Chambers Group botanists provided ground truthing of the data to check the accuracy of vegetation classes and associated polygons. Chambers Group botanists walked through each stand (from one boundary to the opposite boundary if possible) to characterize the vegetation. Corrections were made to the vegetation types within each polygon in the field, as appropriate and the draft vegetation map was revised to reflect those changes. Upon completion of the final vegetation map, the total acreage of each vegetation type within the Project area boundary and within the impact footprint was calculated. These numbers were then compared to those presented in the EIR for the Project and are summarized in Table 1 below.

RESULTS AND DISCUSSION

Approximately 483 individual vegetation polygons were delineated during the mapping process. The most commonly mapped types were Mulefat Thickets, Riparian Woodland (Black Willow Series), and Scoured areas which collectively comprised approximately 67 percent of all vegetation communities mapped within the Project area (Attachment 1). Approximately 28 fewer acres of Riparian Woodland and 13.2 additional acres of Mulefat Thickets were mapped in the current effort as compared to the 2013 data contained in the EIR (Table 1). These differences can be explained by the differences in the level of detail between both maps and the changes in vegetation community composition from year to year. Additional vegetation communities mapped during the 2014/2015 effort that were not mapped during the 2013 effort included Disturbed Mulefat Thickets (>25% Non-Native Cover), Early Successional Riparian Woodland (Black Willow/Mulefat Association, 3-10 yrs), Coyote Brush – Mulefat Association, Annual Bur-Sage and Mustard Patch with an Abundance of Dead Wood (Transitional from Disturbed Black Willow Series), Disturbed California Sagebrush – California Buckwheat Scrub (>25% Non-Native Cover), Disturbed Coast Live Oak Woodland, Poison Hemlock Patches (Semi-Natural Stands), and Perennial Pepper Weed Patches (Semi-Natural Stands) (Table 1).

As shown in Table 1, approximately 13.4 acres of Riparian Woodland and 10.2 acres of Mulefat and Disturbed Mulefat Thickets would be removed as a result of proposed sediment removal activities associated with the proposed Project. This represents 8.1 fewer acres of riparian habitat impacted as compared with that in the EIR. Post-construction vegetation communities are depicted in Attachment 2.

CONCLUSIONS

With regard to mitigation requirements, especially as it pertains to the U.S. Fish and Wildlife Service, a minimum of 23.6 acres of riparian vegetation including 13.4 acres of Riparian Woodland and 10.2 acres of Mulefat Thickets would need to be mitigated for. Based on a preliminary assessment of areas suitable

Table 1: Comparison Between 2013 and 2014 Vegetation Communities

Vegetation Community	Acreage in Project Area (2013 Survey from EIR)	Acreage in Project Area (From 2014 Imagery)	Acreage Impacted (From EIR)	Acreage Impacted (From 2014 Imagery)
RIPARIAN				
Mulefat Thickets	9.7	23.4	3.7	9.9
Disturbed Mulefat Thickets (>25% Non-Native Cover)	--	0.6	--	0.3
Riparian Woodland (Black Willow Series)	52.9	24.9	28.0	13.4
Early Successional Riparian Woodland (Black Willow/Mulefat Association, 3-10 yrs)	--	2.1	--	--
Riparian Herbaceous (Cocklebur-Ragweed Patches)	1.8	8.8	1.8	6.2
Coyote Brush – Mulefat Association	--	0.1	--	
Annual Bur-Sage and Mustard Patch with an Abundance of Dead Wood (Transitional from Disturbed Black Willow Series)	--	8.4	--	8.1
UPLAND				
California Sagebrush – California Buckwheat Scrub	3.3	3.1	0.9	0.6
Disturbed California Sagebrush – California Buckwheat Scrub (>25% Non-Native Cover)	--	3.1	--	--
Riversidean Alluvial Fan Sage Scrub	1.5	0.1	0.4	0.1
Coast Live Oak Woodland – Disturbed	--	0.6	--	0.4
OTHER				
Mustard and Annual Brome Semi-Natural Herbaceous Stand	23.4	4.1	12.1	1.7
Escaped Cultivars	0.5	0.6	0.2	0.3
Disturbed (Barren/Trails)	3.1	8.5	1.1	3.2
Scoured	27.2	30.6	22.6	24.0
Poison Hemlock Patches (Semi-Natural Stands)	--	2.5	--	2.1
Perennial Pepper Weed Patches (Semi-Natural Stands)	--	2.0	--	0.5
Developed (Structures, Paved Roads)	--	--	--	
TOTAL	**123.5**	**123.5**	**70.8**	**70.8**

for restoration within the Basin (Attachment 2), there does not appear that all of the 23.6 acres could be created on-site. Therefore, other options for off-site mitigation will need to be evaluated.

Please feel free to contact me at (949) 261-5414 ext. 7291 if you have any questions or require additional information regarding the results or methods employed in this effort.

Sincerely,

CHAMBERS GROUP, INC.

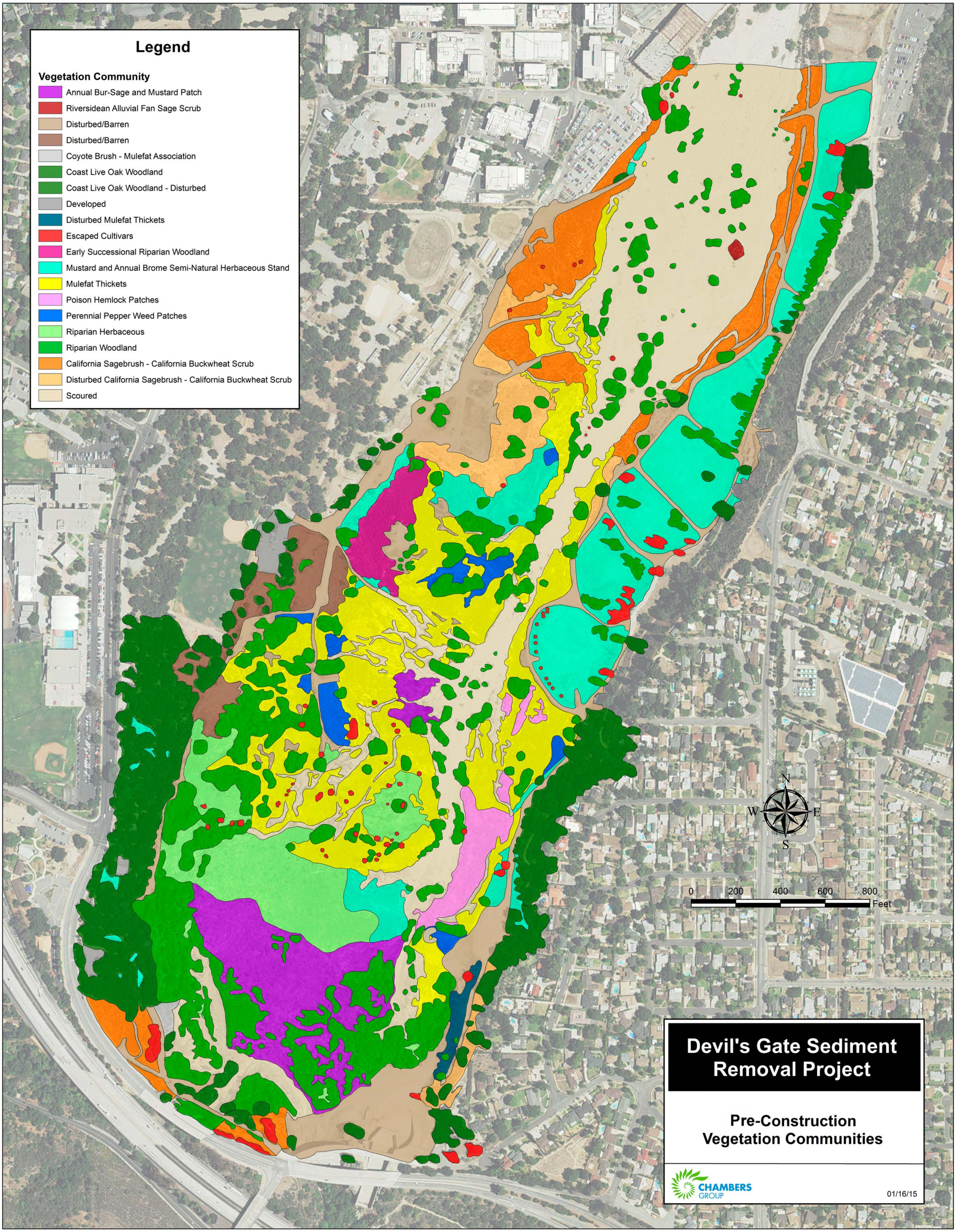
Bradley S. Norling

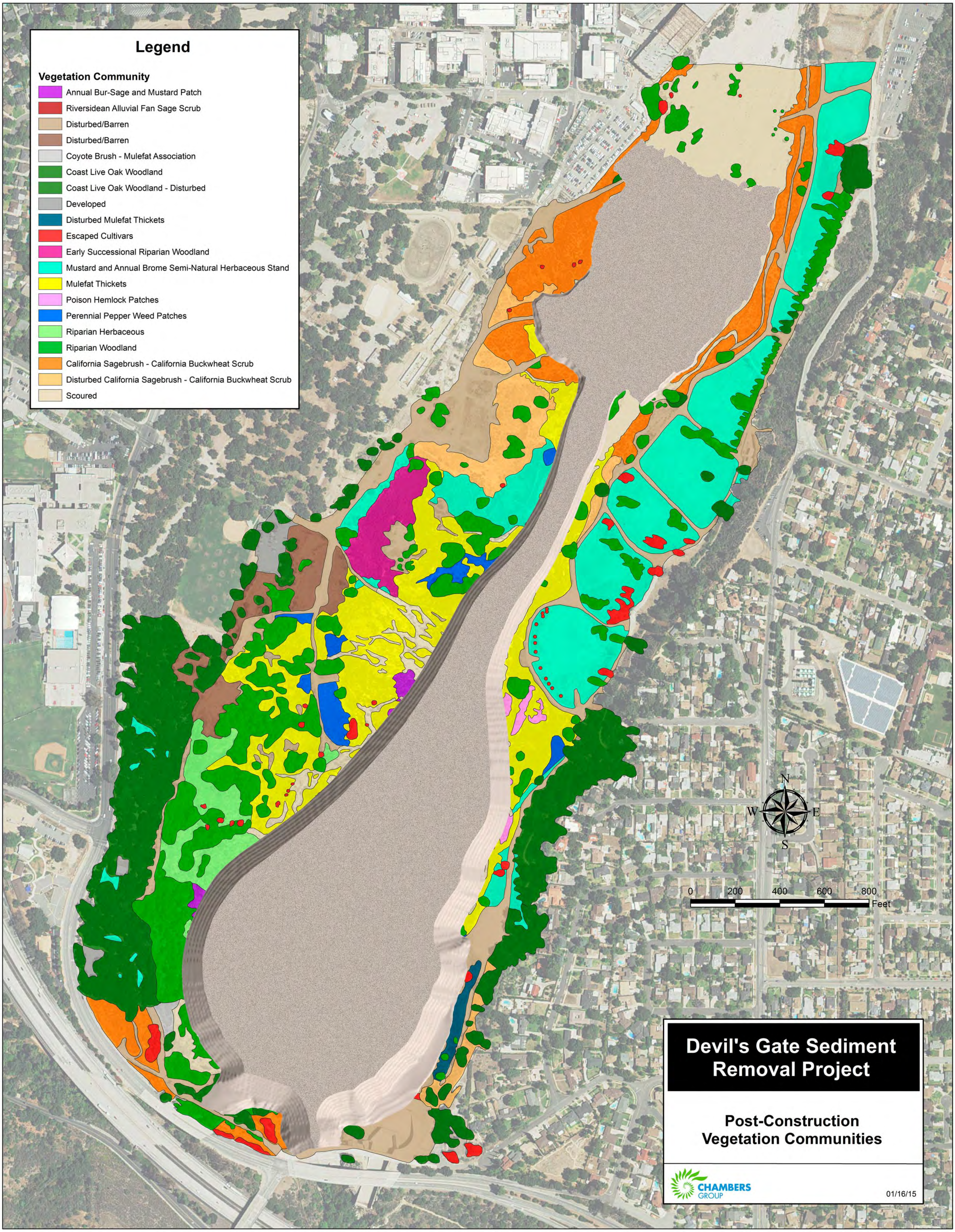
Bradley S. Norling
Senior Biologist/Project Manager

Attachment 1 – Vegetation Communities Map

Solving Environmental Challenges

CHAMBERS GROUP


Legend
Vegetation Community
Annual Bur-Sage and Mustard Patch
Riversidean Alluvial Fan Sage Scrub
Disturbed/Barren
Disturbed/Barren
Coyote Brush - Mulefat Association
Coast Live Oak Woodland
Coast Live Oak Woodland - Disturbed
Developed
Disturbed Mulefat Thickets
Escaped Cultivars
Early Successional Riparian Woodland
Mustard and Annual Brome Semi-Natural Herbaceous Stand
Mulefat Thickets
Poison Hemlock Patches
Perennial Pepper Weed Patches
Riparian Herbaceous
Riparian Woodland
California Sagebrush - California Buckwheat Scrub
Disturbed California Sagebrush - California Buckwheat Scrub
Scoured
N
W
E
S
0
200
400
600
800
Feet
Devil's Gate Sediment Removal Project
Pre-Construction Vegetation Communities
CHAMBERS GROUP
01/16/15


Legend
Vegetation Community
Annual Bur-Sage and Mustard Patch
Riversidean Alluvial Fan Sage Scrub
Disturbed/Barren
Disturbed/Barren
Coyote Brush - Mulefat Association
Coast Live Oak Woodland
Coast Live Oak Woodland - Disturbed
Developed
Disturbed Mulefat Thickets
Escaped Cultivars
Early Successional Riparian Woodland
Mustard and Annual Brome Semi-Natural Herbaceous Stand
Mulefat Thickets
Poison Hemlock Patches
Perennial Pepper Weed Patches
Riparian Herbaceous
Riparian Woodland
California Sagebrush - California Buckwheat Scrub
Disturbed California Sagebrush - California Buckwheat Scrub
Scoured
N
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E
S
0
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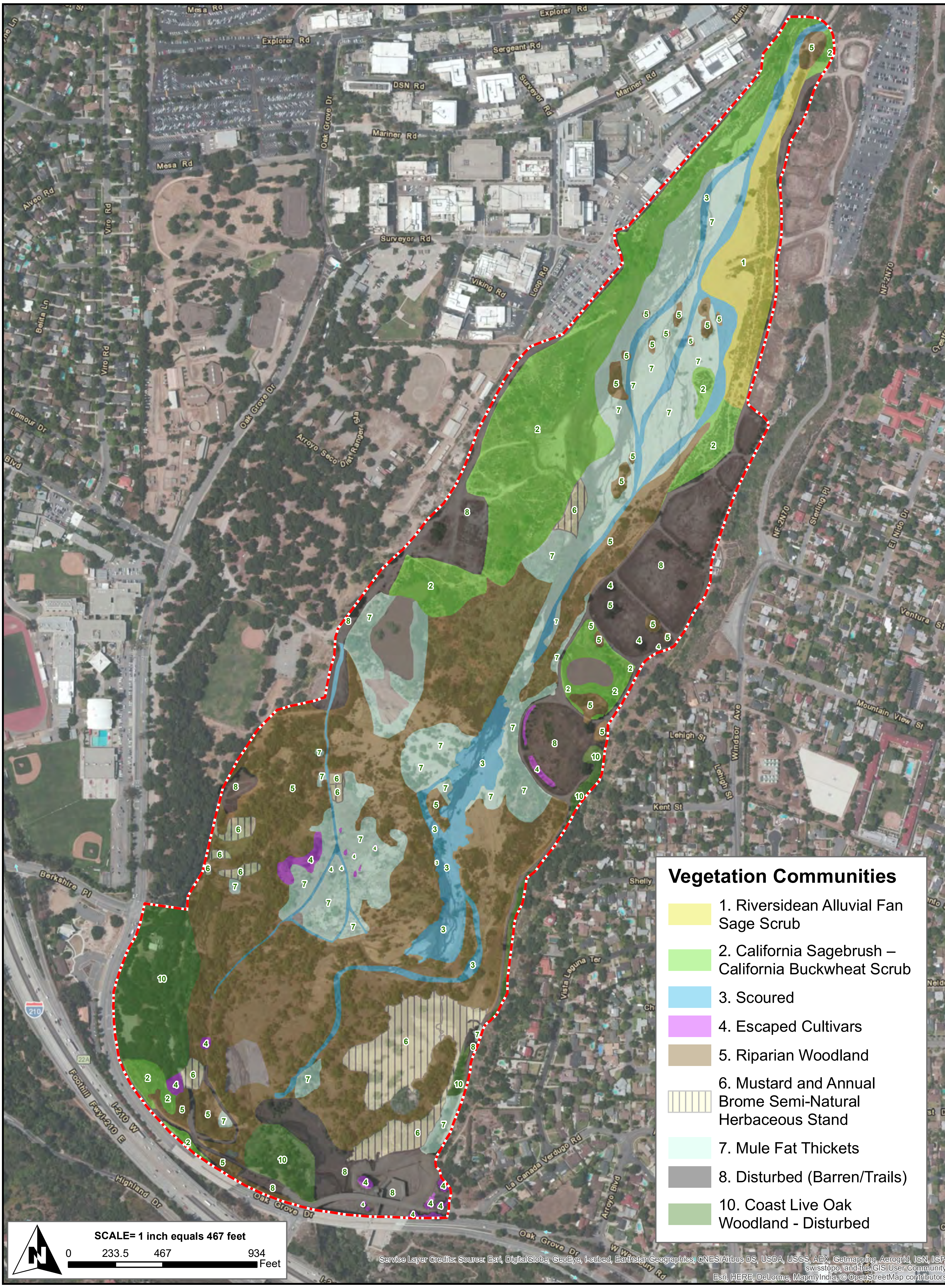
800
Feet
Devil's Gate Sediment Removal Project
Post-Construction Vegetation Communities
CHAMBERS GROUP
01/16/15



Survey Area

Figure C-1
Devil's Gate Vegetation Communities Map (2010)

Version Date: 10/16/2014

CHAMBERS GROUP

\\cgi-gisdata01\GIS_DATA\Projects\20000s\20201 - 20400\20346 Devil's Gate EIR\20346 Figure 3.6-1 Devil's Gate Vegetation Communities (2010).mxd

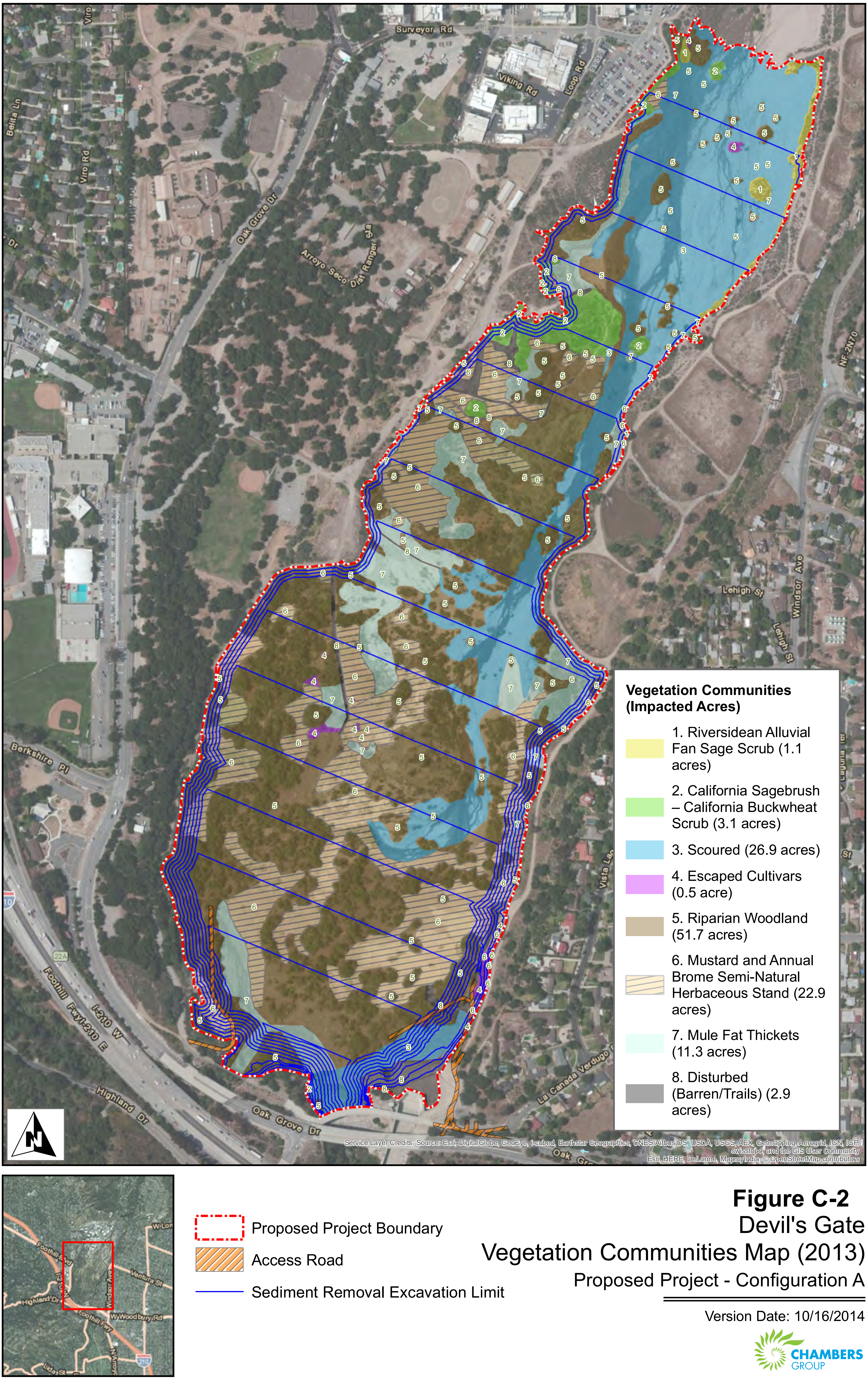


Figure C-2
Devil's Gate
Vegetation Communities Map (2013)
Proposed Project - Configuration A

Version Date: 10/16/2014

CHAMBERS GROUP

\\cgi-gisdata01\GIS_DATA\Projects\20000s\20201 - 20400\20346 Devil's Gate EIR\20346 Figure 3.6-2 Devil's Gate Vegetation Communities (2013).mxd

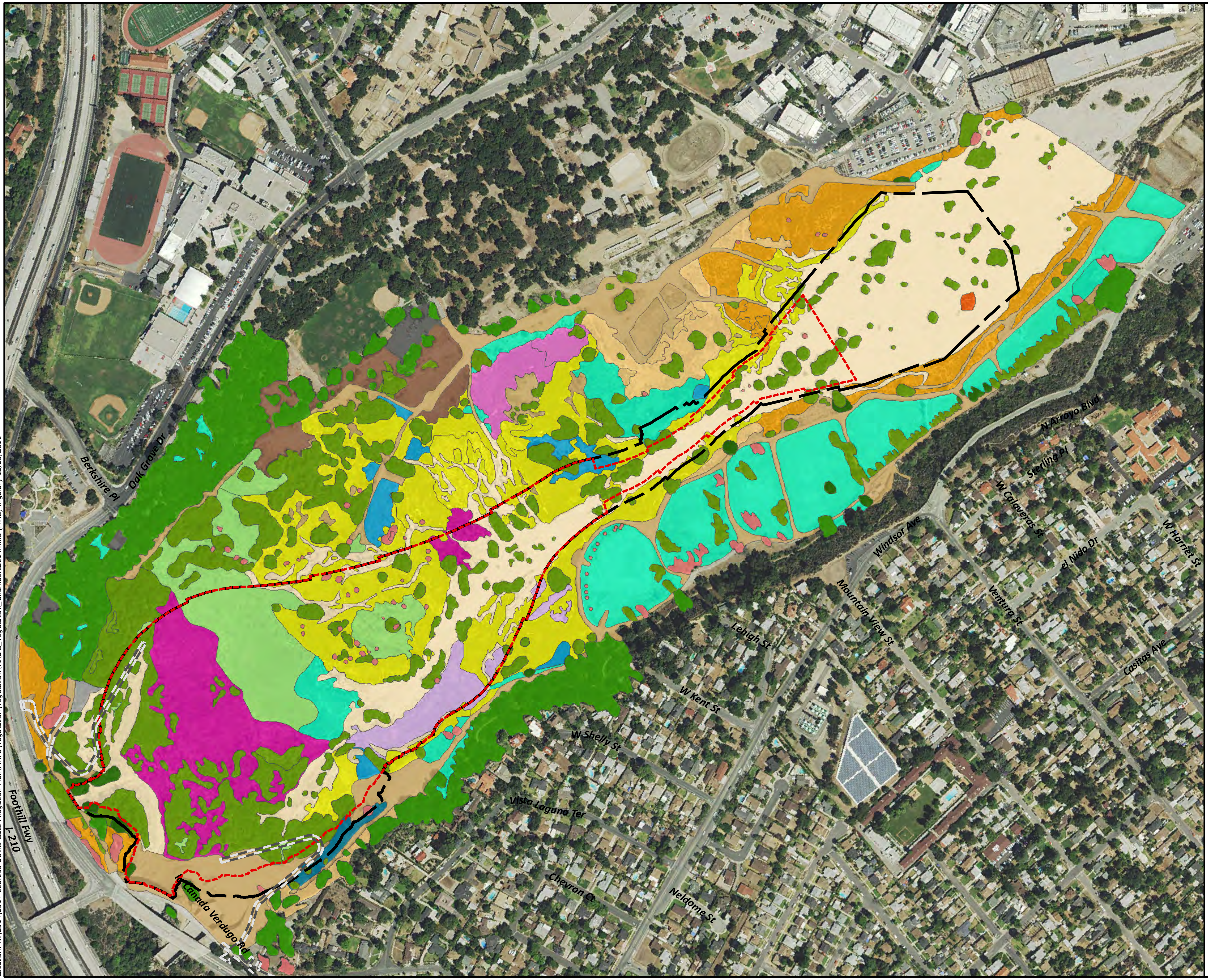


Figure C-3
Vegetation Communities Map (2014)

Map Features

- Initial Project Footprint [1]
- Annual Maintenance Footprint [1]
- Access Roads[1]

Vegetation Community [2]

- Annual Bur-Sage and Mustard Patch
- Riversidean Alluvial Fan Sage Scrub
- Disturbed/Barren
- Disturbed/Barren
- Coyote Brush - Mulefat Association
- Coast Live Oak Woodland
- Coast Live Oak Woodland-Disturbed
- Developed
- Disturbed Mulefat Thickets
- Escaped Cultivars
- Early Successional Riparian Woodland
- Mustard and Annual Brome Semi-Natural Herbaceous Stand
- Mulefat Thickets
- Poison Hemlock Patches
- Perennial Pepper Weed Patches
- Riparian Herbaceous
- Riparian Woodland
- California Sagebrush - California Buckwheat Scrub
- Disturbed California Sagebrush - California Buckwheat Scrub
- Scoured

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Vegetation\Vegetation\v1\DG_Vegetation_Chambers2014.mxd (MAG)-mguidry 12/20/2016

2014-003.008 Devil's Gate Sediment Removal Project

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW
[2] Chambers Group

Map Date: 12/13/2016

APPENDIX D

2016 Vegetation Mapping Update

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 17, 2016
(2014-003.017)

Grace Yu
Water Resources Division
County of Los Angeles, Department of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803-1331

SUBJECT: Vegetation Map Update for the Devil's Gate Reservoir Sediment Removal and Management Project, Los Angeles County, California

Dear Ms. Yu:

This purpose of this letter report is to provide the results of a vegetation mapping effort conducted for the County of Los Angeles Department of Public Works (LACDPW) Devil's Gate Reservoir Sediment Removal and Management Project (Project). The 2016 vegetation mapping effort was performed for the purpose of updating the vegetation map previously created by Chambers Group, Inc. (Chambers) in 2014 (Chambers 2014). Vegetation mapping is an important component of the overall mitigation strategy, as it provides baseline information and existing conditions that help determine the amount of credits that would be needed for off-site mitigation and to identify existing habitat on-site that is appropriate for restoration. Remapping was requested by the California Department of Fish and Game (CDFW) for the purposes of identifying the impacts to CDFW jurisdiction and to provide information to support the mitigation ratios.

The vegetation communities were mapped on May 3, 2016, by ECORP Consulting, Inc. (ECORP) biologists Kent Hughes and Ben Lardiere. Referencing aerial field maps, the biologists surveyed areas on foot to characterize and map the vegetation communities within the Project area. The boundaries of the vegetation communities were delineated in the field using a combination of Trimble Global Positioning System (GPS) units and lines drawn on the field maps by hand and digitized into a Geographic Information System (GIS) to create the updated vegetation map. Vegetation community type descriptions are described in detail below and follow the designations in *A Manual of California Vegetation,* 2nd Edition (Sawyer et al. 2009). Photographs were taken during the survey to provide visual representation of the various vegetation communities within the Project area and are included as Attachment 1.

Vegetation community mapping was conducted in 2016 to capture the expanded infestation of nonnative and invasive plant species in the Reservoir. Infestations of nonnatives and invasive species were a focus of the mapping and are reflected in the acreage calculations. The areas occupied by the various percentages of nonnatives and invasive species are not shown on the vegetation map to keep the map from becoming too complicated. The 2016 vegetation map (Figure 1) is the version used in the discussion of impacts to wetlands and non-wetland waters of the U.S. and in determining the areas where mitigation in the form of restoration can be conducted.

Figure 1
Vegetation Communities (2016)

Map Features

- Initial Project Footprint [1]
- Annual Maintenance Footprint [1]
- Side Slopes [1]
- Access Roads [1]

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Vegetation\Vegetation\v1\DG_Vegetation_Ecorp2016.mxd (MAG) -mguidry 7/7/2016

2014-003.008 Devil's Gate Sediment Removal Project

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW

Map Date: 5/19/2016

Table 1 lists total acreage of each vegetation community within the areas that were mapped for the Project as well as the anticipated impacts to each vegetation community as a result of Project activities. Descriptions of the vegetation communities follow Table 1.

Table 1 – Existing Vegetation Communities and Impacts (2016)

Vegetation Community	Total Acreage	Perm. Impacts	Temp. Impacts	Side Slopes (Temp. Impacts)	Total Impacts	Avoided Acreage
RIPARIAN						
***Salix gooddingii* Woodland Alliance TOTAL**	**42.65**	**16.27**	**1.09**	**4.75**	**22.11**	**20.54**
Salix gooddingii Woodland Alliance	7.45	2.45	0.36	0.53	3.34	4.11
Salix gooddingii Woodland Alliance - Sparse	4.20	3.50	0.01	0.64	4.15	0.05
Salix gooddingii Woodland Alliance- Understory 20% *Lepidium latifolium-Xanthium strumarium*	15.88	7.96	0.12	2.56	10.64	5.24
Salix gooddingii Woodland Alliance- Understory 30% *Lepidium latifolium-Conium maculatum*	15.12	2.36	0.60	1.02	3.98	11.14
***Baccharis salicifolia* Shrubland Alliance TOTAL**	**25.23**	**8.03**	**0.70**	**2.68**	**11.41**	**13.82**
Baccharis salicifolia Shrubland Alliance-No Understory	2.17	0.37	0.39	0.00	0.76	1.41
Baccharis salicifolia Shrubland Alliance-20% *Conium maculatum-Lepidium latifolium*	2.04	0.01	0.31	0.00	0.32	1.72
Baccharis salicifolia Shrubland Alliance-30% *Conium maculatum-Lepidium latifolium*	6.84	0.49	0.00	0.19	0.68	6.16
Baccharis salicifolia Shrubland Alliance-40% *Conium maculatum-Lepidium latifolium*	14.18	7.16	0.00	2.49	9.65	4.53
TOTAL RIPARIAN	**67.88**	**24.30**	**1.79**	**7.43**	**33.52**	**34.36**
FLOODPLAIN						
***Lepidospartum squamatum* Shrubland Alliance TOTAL**	**27.27**	**1.82**	**12.68**	**0.00**	**14.50**	**12.77**
Lepidospartum squamatum Shrubland Alliance	5.08	0.00	0.18	0.00	0.18	4.90
Lepidospartum squamatum Shrubland Alliance (Sparse)	22.19	1.82	12.50	0.00	14.32	7.87
TOTAL FLOODPLAIN	**27.27**	**1.82**	**12.68**	**0.00**	**14.50**	**12.76**
TOTAL RIPARIAN/FLOODPLAIN	**95.15**	**26.12**	**14.47**	**7.43**	**48.02**	**47.13**

Vegetation Community	Total Acreage	Perm. Impacts	Temp. Impacts	Side Slopes (Temp. Impacts)	Total Impacts	Avoided Acreage
NATIVE UPLAND						
Artemisia californica – Eriogonum fasciculatum Shrubland Alliance	1.88	0.00	0.00	0.00	0.00	1.88
Artemisia californica – Eriogonum fasciculatum Shrubland Alliance-20% *Lepidium latifolium*	4.38	0.00	0.00	0.00	0.00	4.38
Artemisia californica – Eriogonum fasciculatum Shrubland Alliance-30% *Lepidium latifolium*	2.08	0.02	0.08	0.00	0.10	1.98
Quercus agrifolia Alliance	22.80	0.03	0.27	0.00	0.30	22.50
Platanus racemosa Woodland Alliance - Disturbed	1.58	0.00	0.00	0.00	0.00	1.58
TOTAL NATIVE UPLAND	**32.72**	**0.05**	**0.35**	**0.00**	**0.40**	**32.32**
NONNATIVE/OTHER						
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance	23.09	0.00	0.00	0.00	0.00	23.09
Conium maculatum Herbaceous Semi-Natural Alliance -30% *Lepidium latifolium*	6.23	2.45	0.37	1.33	4.15	2.08
Lepidium latifolium – Conium maculatum Herbaceous Semi-Natural Alliance	13.28	9.88	0.00	1.24	11.12	2.16
Lepidium latifolium Herbaceous Semi-Natural Alliance	1.80	0.00	0.00	0.00	0.00	1.80
Rumex crispus Herbaceous Semi-Natural Alliance (Unofficial Alliance)	0.30	0.00	0.00	0.00	0.00	0.30
Xanthium strumarium Herbaceous Alliance (Unofficial Alliance)	1.50	1.00	0.00	0.50	1.50	0.00
Eucalyptus (*globulus, camaldulensis*) Woodland Semi-Natural Alliance	0.27	0.00	0.07	0.00	0.07	0.20
Fraxinus velutina Forest Alliance (Unofficial Alliance)	0.46	0.00	0.00	0.00	0.00	0.46
Landscaped	0.15	0.00	0.00	0.00	0.00	0.15
Depression/Bare Ground (Associated with Seasonally Wet Area)	0.39	0.00	0.00	0.00	0.00	0.39
Disturbed (Barren/Trails/IMP Area)	16.08	1.33	1.57	0.39	3.29	12.79
TOTAL OTHER	**63.55**	**14.66**	**2.01**	**3.46**	**20.13**	**43.42**
TOTAL	**191.42**	**40.83**	**16.83**	**10.89**	**68.55**	**122.87**

Salix gooddingii Woodland Alliance – Black Willow Thickets

A total of approximately 42.65 acres of undisturbed and disturbed *Salix gooddingii* Woodland Alliance, which is also referred to as black willow thickets, is present in the Project area. The undisturbed forms of this alliance generally exhibit an understory comprised of native plant species or exhibit a very sparse and open understory with little or no plant species present. The areas considered undisturbed comprise approximately 11.65 acres or 27 percent of all of the *Salix gooddingii* Woodland Alliances in the Project area. The disturbed forms of this alliance support an understory of native plant species but also support varying percentages of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the Salix gooddingii Woodland Alliance plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 31.00 acres or 73 percent of all of the *Salix gooddinggi* Woodland Alliances in the Project area.

Salix gooddingii Woodland Alliance

This alliance generally occurs between 0 and 500 meters (m) above mean sea level (amsl) on terraces along large rivers, in canyons, and along rocky floodplains of small, periodic streams, seeps and springs. In this alliance, black willow (*Salix gooddingii*) is dominant or co-dominant in the tree canopy with Fremont's cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), black elderberry (*Sambucus nigra*), and other trees. The shrub layer includes mulefat (*Baccharis salicifolia*), coyote bush (*B. pilularis*), and American dogwood (*Cornus sericea*). This form of *Salix gooddingii* Woodland Alliance, which is considered undisturbed, is dominated by native plant species and the distribution of nonnative plant species in the understory is low. Trees in this alliance are typically smaller than 30 m in height and form an open to continuous canopy. The shrub layer is open to continuous and the herb layer is variable. Within the project area, this alliance also variously displays an understory/sub-shrub layer co-dominated by perennial pepperweed (*Lepidium latifolium*) and poison hemlock (*Conium maculatum*), an understory seasonally dominated by rough cocklebur (*Xanthium strumarium*), a bare-ground understory on the margins of the main channel, and/or an understory of native annuals. The U.S. Fish and Wildlife Service (USFWS) Wetland Inventory (1996) national list recognizes *Salix gooddingii* as a facultative wetland plant. This alliance occupies approximately 7.45 acres within the Project area. This alliance is primarily located along the central portion of the project area generally surrounding the areas of *Baccharis salicifolia* Shrubland Alliance and *Lepidium latifolium-Conium maculatum* Herbaceous Semi-Natural Alliance.

Sparse *Salix gooddingii* Woodland Alliance – Black willow Thickets

This a variation of the *Salix gooddingii* Woodland Alliance in which the vegetation community exists as described in the unaltered description (see previous) but at a greatly diminished cover value. Within the Project area, this alliance displays a sparse understory of native annuals on the borders and within the main channel. Approximately 4.20 acres within the Project area is covered by this alliance and it is generally present along the active channel that conveys water from areas upstream through the reservoir to the dam. This vegetation community is bordered by *Baccharis salicifolia* Shrubland Alliance and *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.

Salix gooddingii **Woodland Alliance – Understory 20% *Lepidium latifolium-Xanthium strumarium***

This form of *Salix gooddingii* Woodland Alliance is considered disturbed due to the presence of nonnative and invasive plant species in the understory. The native plant composition is similar to the description above for this alliance but the understory is dominated by approximately 20 percent cover of perennial pepper weed (*Lepidium latifolium*) and rough cocklebur (*Xanthium strumarium*). Approximately 15.88 acres of *Salix gooddingii* Woodland Alliance containing approximately 20 percent cover of *Lepidium latifolium* and *Xanthium strumarium* is present in the Project area.

Salix gooddingii **Woodland Alliance – Understory 30% *Lepidium latifolium-Conium maculatum***

This form of *Salix gooddingii* Woodland Alliance is also considered disturbed due to the presence of nonnative and invasive plant species in the understory. The native plant composition is similar to the description above for the *Salix gooddinggi* Woodland Alliance but the understory is dominated by approximately 30 percent cover of *Lepidium latifolium* and poison hemlock (*Conium maculatum*). Approximately 15.12 acres of *Salix gooddingii* Woodland Alliance containing approximately 30 percent cover of *Lepidium latifolium* and *Conium maculatum* is present in the Project area.

Baccharis salicifolia **Shrubland Alliance – Mulefat Thickets**

A total of approximately 25.23 acres of undisturbed and disturbed *Baccharis salicifolia* Shrubland Alliance, which is also referred to as mulefat thickets, is present in the Project area. This alliance occurs in two general forms in the Project area, including one with little or no understory of other plant species and the other with varying percentages of nonnative and invasive plant species in the understory. The areas where the *Baccharis salicifolia* contains little to no understory comprise approximately 2.17 acres or 8 percent of all of the *Baccharis salicifolia* Shrubland Alliances in the Project area. The disturbed forms of this alliance exhibit a codominance of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the *Baccharis salicifolia* Shrubland Alliance plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 23.06 acres or 92 percent of all of the *Baccharis salicifolia* Shrubland Alliances in the Project area.

Baccharis salicifolia **Shrubland Alliance – No Understory**

This alliance generally occurs between 0 and 1,250 m amsl in mixed alluvium soils in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels. In this alliance, *Baccharis salicifolia* is dominant or may be co-dominant with other shrub species including California sagebrush (*Artemisia californica*), tree tobacco (*Nicotiana glauca*), arrow weed (*Pluchea sericea*), sandbar willow (*Salix exigua*), *S. lasiolepis,* laurel sumac (*Malosma laurina*), *and Sambucus nigra.* Additionally, emergent trees including western sycamore (*Platanus racemosa*), *Populus fremontii,* oak (*Quercus* spp.), and willow (*Salix* spp.) may also be present in low cover. Shrubs are typically less than 5 m tall and the canopy is continuous with two tiers at 2 m and 5 m. In addition, the herbaceous layer is usually thin. The USFWS Wetland Inventory national list recognizes *Baccharis salicifolia* as a facultative wetland plant. This alliance, which is present on approximately 2.17 acres of the Project area, is primarily located in the central portion of the Project area and is generally surrounded by the *Salix gooddingii* Woodland Alliance.

Baccharis salicifolia Shrubland Alliance – 20% *Conium maculatum-Lepidium latifolium*

Within the Project area, this form of the *Baccharis salicifolia* Shrubland Alliance also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 20 percent *Conium maculatum* and *Lepidium latifolium*. Approximately 2.04 acres of this form of disturbed *Baccharis salicifolia* Shrubland Alliance is present in the Project area. This is approximately 8 percent of the total *Baccharis salicifolia* Shrubland Alliances in the Project area.

Baccharis salicifolia Shrubland Alliance – 30% *Conium maculatum-Lepidium latifolium*

Within the Project area, this form of the *Baccharis salicifolia* Shrubland Alliance also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 30 percent *Conium maculatum* and *Lepidium latifolium*. Approximately 6.84 acres of this form of disturbed *Baccharis salicifolia* Shrubland Alliance is present in the Project area. This is approximately 27 percent of the total *Baccharis salicifolia* Shrubland Alliances in the Project area.

Baccharis salicifolia Shrubland Alliance – 40% *Conium maculatum-Lepidium latifolium*

Within the Project area, this form of the *Baccharis salicifolia* Shrubland Alliance also supports the native plant species discussed for the undisturbed form of the alliance, but it displays an understory/sub-shrub layer co-dominated by approximately 40 percent *Conium maculatum* and *Lepidium latifolium*. Approximately 14.18 acres of this form of disturbed *Baccharis salicifolia* Shrubland Alliance is present in the Project area. This is approximately 56 percent of the total *Baccharis salicifolia* Shrubland Alliances in the Project area.

Lepidospartum squamatum Shrubland Alliance – Scalebroom Scrub

A total of approximately 27.27 acres of *Lepidospartum squamatum* Shrubland Alliance is present in two forms in the Project area. The two forms include a dense and more mature form that is present on the banks of the upstream portion of the Project area and the other is a sparser form that occurs in the active wash. The denser form occupies approximately 5.08 acres or 18 percent of the total area covered by this alliance and the sparser form covers approximately 22.19 acres or 81 percent.

Lepidospartum squamatum Shrubland Alliance

This alliance is generally found between 50 and 1,500 m amsl in intermittently or rarely flooded, low gradient alluvial deposits along streams, washes and fans. In this alliance scalebroom (*Lepidospartum squamatum*) is dominant, or co-dominant, or conspicuous in the shrub canopy in association with burrobrush (*Ambrosia salsola*), *Artemisia californica, Baccharis saicifolia,* brittlebush (*Encelia farinosa*), yerba santa (*Eriodictyon* sp.), *Malosma laurina,* California buckwheat (*Eriogonum fasciculatum*), sugar bush (*Rhus ovata*), poison oak (*Toxicodendron* *diversilobum*), and other shrubs. The shrubs in this alliance are typically less than 2 m in height and some emergent taller plants may be present at low cover including *Platanus racemosa, Populus* spp., and *Sambucus nigra.* The herbaceous layer varies and may be grassy. This alliance within the Project area may be considered equivalent to a Riversidean Alluvial Fan Sage Scrub described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Approximately 5.08 acres of *Lepidospartum squamatum* Shrubland Alliance is present within the Project area. This denser form of the alliance makes up approximately 19 percent of the *Lepidospartum squamatum* Shrubland Alliance in the Project area. This alliance is located along the banks of the channel in the northeastern portion of the Project area and is generally surrounded by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance, *Baccharis salicifolia* Shrubland Alliance, *Salix gooddingii* Woodland Alliance, and *Artemisia californica* - *Eriogonum fasciculatum* Shrubland Alliance.

Sparse *Lepidospartum squamatum* Shrubland Alliance - Sparse Scalebroom Scrub

This a variation of the *Lepidospartum squamatum* Shrubland Alliance in which the vegetation community exists as described in the unaltered description (see previous) but at a greatly diminished cover value. This community refers to the upstream regions of the riparian corridor where the channel widens and vegetation occurs as single individuals of different taxa or small islands of associated taxa spaced throughout the corridor. The species present tend to be species associated with seasonal water channels and range from medium-sized shrubs (e.g. scale broom) to full-size cottonwoods (*Populus* spp.) and *Salix* spp. While both woodland and shrub species are present, herbaceous species are almost totally lacking. A canopy is lacking except for within the islands of cottonwoods and/or willows. Approximately 22.19 acres of Sparse *Lepidospartum squamatum* Shrubland Alliance is present in the Project area. This is approximately 81 percent of the total acres of *Lepidospartum squamatum* Shrubland Alliance in the Project area. This alliance variation occupies the open wash in the upstream portion of the Project area.

Artemisia californica-Eriogonum fasiculatum Shrubland Alliance – California Sagebrush-California Buckwheat Scrub

A total of approximately 8.34 acres of undisturbed and disturbed *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance, which is also referred to as California sagebrush-California buckwheat scrub, is present in the Project area. The undisturbed form of this alliance generally exhibits an understory comprised of native plant species. The areas considered undisturbed comprise approximately 1.88 acres or 23 percent of all of the *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliances in the Project area. The disturbed forms of this alliance support an understory of native plant species but also support varying percentages of nonnative and invasive plant species. The nonnative and invasive plants in the understory contribute to the degradation of the *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance plant community because they easily out-compete the native plant species. The disturbed forms of this alliance comprise approximately 6.46 acres or 77 percent of all of the *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliances in the Project area.

Artemisia californica-Eriogonum fasiculatum Shrubland Alliance

This alliance is generally found between 250 and 950 m amsl in alluvial or colluvial soils on slopes that are usually steep, south facing, and are rarely flooded or in low-gradient deposits along streams. *Artemisia californica* and *Eriogonum fasciculatum* are co-dominant in the shrub canopy with each species having 30 to 60 percent relative cover. Associated species include chamise (*Adenostoma fasciculatum*), *Malosma laurina,* California ephedra (*Ephedra californica*), lemonade berry (*Rhus integrifolia*), white sage (*Salvia apiana*), and other shrubs present at low cover. The canopy is intermittent to continuous and may be two-tiered with the upper layer less than 5 m and most shrubs less than 2 m. The herbaceous layer varies both seasonally and annually. This alliance, which covers approximately 1.88 acres, is primarily located along the northwestern edge of the Project area with a small patch also located in the southwest portion of the site, adjacent to Oak Grove Drive. In the northwestern areas, this alliance is generally bordered by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance, Sparse *Lepidospartum squamatum* Shrubland Alliance, and *Baccharis salicifolia* Shrubland Alliance.

Artemisia californica-Eriogonum fasiculatum Shrubland Alliance – 20% *Lepidium latifolium*

This form of *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance is considered disturbed due to the presence of invasive plant species in the understory. The native plant composition is similar to the description above for this alliance but the understory is dominated by approximately 20 percent cover of *Lepidium latifolium*. Approximately 4.38 acres of *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance containing approximately 20 percent cover of *Lepidium latifolium* is present in the Project area.

Artemisia californica-Eriogonum fasiculatum Shrubland Alliance – 30% *Lepidium latifolium*

This form of *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance is considered disturbed due to the presence of invasive plant species in the understory. The native plant composition is similar to the description above for this alliance but the understory is dominated by approximately 30 percent cover of *Lepidium latifolium*. Approximately 2.08 acres of *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance containing approximately 30 percent cover of *Lepidium latifolium* is present in the Project area.

Quercus agrifolia Woodland Alliance - Coast Live Oak Woodland

This alliance generally occurs between 0 and 1,200 m amsl in habitats with deep, loamy, or sandy soils with a high amount of organic matter and on alluvial terraces, canyon bottoms, stream banks, slopes, and flats. In this alliance, coast live oak (*Quercus agrifolia*) is dominant or may be co-dominant in association with other trees including bigleaf maple (*Acer macrophyllum*), boxelder (*A. negundo*), *Platanus racemosa, Populus fremontii,* blue oak (*Quercus douglasii*), valley oak (*Q. lobata*), black oak (*Q. kelloggii*), and *Salix lasiolepis.* The canopy is open to continuous with trees being less than 30 m tall. A sparse to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of nonnative grasses and forbs, and/or escaped horticultural cultivars. Approximately 22.80 acres of *Quercus agrifolia* Woodland Alliance is present within the Project area. This alliance is primarily located along the western side in Oak Grove Park and along the eastern side along the base of the hills below the residential development. This alliance generally occurs in the more upland portions of the Project area.

Platanus racemosa Woodland Alliance Disturbed – California Sycamore Woodlands

This alliance generally occurs between 0 and 2,400 m amsl and may be present in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. Soils are rocky or cobbly alluvium with permanent moisture at depth. In this alliance, *Platanus racemosa* is dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), southern California black walnut (*Juglans californica*), *Populus fremontii, Quercus agrifolia, Quercus lobata, Salix exigua, S. gooddingii, S. laevigata, S. lasiolepis,* yellow willow (*S. lutea*), Peruvian peppertree (*Schinus molle*), and California bay (*Umbellularia californica*). The canopy is open to intermittent with trees generally being less than 35 m tall. An open to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. The USFWS Wetland Inventory (1996) national list recognizes *Platanus racemosa* as a facultative wetland plant. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of nonnative grasses and forbs, and/or escaped horticultural cultivars. Approximately 1.58 acres of *Platanus racemosa* Woodland Alliance Disturbed is present along the edges of the percolation basins located in the northeastern portion of the Project area. This alliance is generally surrounded by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.

Brassica nigra and other mustards Herbaceous Semi-Natural Alliance – Upland mustards

This alliance generally occurs between 0 and 1,500 m amsl and may be present in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, and waste places. In this alliance, black mustard (*Brassica nigra*), common mustard (*B. rapa*), Saharan mustard (*B. tournefortii*), short podded mustard (*Hirschfeldia incana*), Dyer's woad (*Isatis tinctoria*) or wild radish (*Raphanus sativus*) are dominant or co-dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by nonnative, invasive grasses. The canopy in this alliance is open to continuous with an herb layer generally less than 3 m tall. Approximately 23.09 acres of *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance is present within the Project area. This alliance occurs throughout the Project area but is more concentrated in the percolation basins on the northeastern side of the Project Area. This alliance is the most dominant nonnative alliance cover within the Project area.

Conium maculatum Herbaceous Semi-Natural Alliance – 30 % *Lepidium latifolium*

This alliance generally occurs between 0 and 1,000 m amsl and is found in all topography types including wetlands. The USFWS Wetland Inventory (1996) national list recognizes *Conium maculatum* as a wetland indicator plant. In this alliance, *Conium maculatum,* sweet fennel (*Foeniculum vulgare*), or another nonnative invasive plant of the family *Apiaceae* is dominant or co-dominant. Other nonnative plants are also present in the herbaceous layer and emergent trees and shrubs may be present at low cover. This alliance is dominated by nonnative, invasive plants. The canopy in this alliance is open to continuous with an herb layer generally less than 2 m tall. Approximately 6.23 acres of *Conium maculatum* Herbaceous Semi-Natural Alliance is present within the Project area and approximately 30 percent of the areas covered by this alliance support an understory dominated by *Lepidium latifolium.* This alliance is present in small patches within the project area adjacent to areas containing *Baccharis salicifolia* Shrubland Alliance and *Salix gooddingii* Woodland Alliance.

Lepidium latifolium – Conium maculatum Semi-Natural Herbaceous Stand – Poison Hemlock – Perennial Pepperweed Patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. Rather, it is an amalgam of two nonnative alliances from the manual, *Lepidium latifolium* Semi-Natural Herbaceous Stands and *Conium maculatum-Foeniculum vulgare* Semi-Natural Herbaceous Stands. This unofficial alliance was identified to best describe the areas where *Lepidium latifolium* and *Conium maculatum* are co-dominant in the Project area and it refers to that site only. Both *Lepidium latifolium* and *Conium maculatum* are considered wetland indicator species by the USFWS. A low cover of emergent trees, eucalyptus trees, and shrubs also occur within this alliance, as well as other invasive annuals. Approximately 13.28 acres of this alliance is present within the Project area. This combination land cover type occurs in both the upland and riparian corridor topographies on site and is concentrated in the central and western portions of the site where it is surrounded by the *Salix gooddingii* Woodland and the *Baccharis salicifolia* Shrubland alliances.

Lepidium latifolium Herbaceous Semi-Natural Alliance – Perennial Pepper Weed Patches

This alliance generally occurs between 0 and 1,900 m amsl and is found within intermittently and seasonally flooded fresh and saltwater marshes and riparian corridors. The USFWS Wetland Inventory national list recognizes *Lepidium latifolium* as a wetland indicator plant. In this alliance, *Lepidium latifolium* is dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by nonnative, invasive plants. The canopy in this alliance is intermittent to continuous with an herb layer generally less than 2 m tall. Approximately 1.80 acres of monotypic *Lepidium latifolium* Herbaceous Semi-Natural Alliance is present in the western portion of the Project area adjacent to areas containing *Baccharis salicifolia* Shrubland Alliance and *Salix gooddingii* Woodland Alliance.

Rumex crispus Herbaceous Semi-Natural Alliance – Curly dock patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. The *Rumex crispus* Herbaceous Semi-Natural Alliance is an unofficial alliance to best describe the areas where nonnative curly dock (*Rumex crispus*) seasonally dominates and it refers to this site within the Project area only. This alliance only occurs in a 0.3 acre small, depressional area in the old mining pit in the western portion of the site. The old mining pit receives precipitation and urban run-off and may remain inundated for extended periods. As the water soaks into the ground, the curly dock begins to grow and by the time the water has dried up completely, the entire depression becomes vegetated with this nonnative plant species. The depression in the mining pit where the curly dock occurs is mostly surrounded by the *Salix gooddingii* Woodland alliance on site.

Xanthium strumarium Herbaceous Alliance – Cocklebur patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. It is a modification of the existing alliance from that reference called *Persicaria lapathifolia - Xanthium strumarium* Provisional Herbaceous Alliance. The official alliance is characterized by *Xanthium strumarium* or other knotwood species being dominant or co-dominant in the herbaceous layer with other herbaceous species including Devil's beggartick (*Bidens frondosa*), five angled dodder (*Cuscutta* *pentagona*), barnyard grass (*Echinochloa* spp.), and common spikerush (*Ecleocharis marostachya*). The unofficial *Xanthium strumarium* Herbaceous Alliance occurs in areas in the Project area where *Xanthium strumarium* seasonally dominates and it refers to this site only. This unofficial alliance occupies approximately 1.50 acres along the frequently flooded stream terraces closest to the dam where the soils are typically clay-rich or silty.

Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance – Eucalyptus groves

This alliance generally occurs between 0 and 300 m amsl and is typically planted as trees, groves, and windbreaks and may become naturalized in uplands and along stream courses. In this alliance, red gum (*Eucalyptus camaldulensis*), blue gum (*E. globulus*), or other gum tree is dominant in the tree canopy. The canopy in this alliance is intermittent to continuous with trees typically less than 50 m tall. The shrub layer and herbaceous layer are typically sparse to intermittent. Within the Project area, this alliance covers approximately 0.27-acre area near the dam. Nonnative grasses and forbs dominate the understory and the surrounding habitat is classified as disturbed. Eucalyptus trees are also common throughout the portions of the Project area but not in stands that would classify as an alliance.

Fraxinus velutina Forest Alliance - Velvet Ash Stands (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. The unofficial *Fraxinus velutina* Forest Alliance best describes areas where velvet ash (*Fraxinus velutina*) trees were dominant. This alliance was identified in a 0.46-acre area in the northwestern corner of the Project area along the edge of the existing road. The small area is otherwise surrounded by the *Salix gooddingii* Woodland alliance on site. Velvet ash also commonly occurs as individuals bordering the perimeter trail on the west side of the Project area.

Landscaped

The landscaped cover type refers to ornamental vegetation that does not exist in a natural state; rather the landscaped land cover type contains vegetation that has been planted and is regularly irrigated and maintained. A small 0.15-acre area along the southernmost edge of the Project area adjacent to Oak Grove Drive was classified as landscaped.

Depression/Bare Ground (Associated with Seasonally Wet Area)

The depression/bare ground land cover type refers to ground cover within two small areas in the central portion of the project area that are associated with the seasonally wet areas. These two small areas have a combined area of 0.39 acres. They are seasonally inundated with water and, when dry, are generally bare or are sparsely vegetated.

Disturbed

The disturbed land cover type refers to areas where human activities have altered the environmental conditions in such a way that the natural vegetation community has been extirpated and the area is now bare of vegetation or supports a community of nonnative or ruderal plant species. Approximately 16.08 acres within the Project area were classified as the disturbed land cover type. This land cover type exists in the more highly disturbed habitats, in the basins on the eastern side of the Project area, and in the paved and dirt roads and trails.

Project Impacts

The total area where the vegetation was mapped in 2016 encompassed approximately 191.42 acres and was generally consistent with the boundaries used for the 2014 vegetation mapping (Chambers 2015). The area where the temporary and permanent impacts will occur as a result of the Project are shown on Figure 1 and it includes a total of approximately 68.55 acres. Table 1 lists the acres of temporary and permanent impacts to each of the vegetation communities and land cover types in the Project area.

Approximately 40.83 acres will be permanently affected by the Project. Temporary impacts will occur to approximately 27.72 acres, which includes approximately 16.83 acres of areas that will be revegetated following the completion of the initial sediment removal and approximately 10.89 acres of side slopes along the edges of the annual maintenance footprint that will also be revegetated.

Riparian Vegetation

The total acres of riparian vegetation permanently affected by the Project is 24.30 acres, which includes 16.27 acres of areas vegetated with the various *Salix gooddingii* Woodland Alliances and 8.03 acres vegetated with the *Baccharis salicifolia* Shrubland Alliances. The permanent impacts to the *Salix gooddingii* Woodland Alliances includes approximately 5.95 acres of the undisturbed and sparse alliances and approximately 10.32 acres of the disturbed alliances containing 20 to 30 percent cover of nonnative and invasive plant species. The permanent impacts to the *Baccharis salicifolia* Shrubland Alliances includes approximately 0.37 acre of undisturbed and approximately 7.66 acres of disturbed alliances containing 20 to 40 percent cover of nonnative and invasive plant species. The permanent impact to undisturbed riparian vegetation is 6.32 acres, or 46 percent of the total undisturbed riparian vegetation and 9 percent of the total acres of riparian vegetation. The permanent impact to disturbed riparian vegetation is 17.98 acres, or 33 percent of the total disturbed riparian vegetation and 26 percent of the total acres of riparian vegetation.

The total acres of riparian vegetation temporarily affected by the Project is 1.79 acres, which includes 1.09 acres of areas vegetated with the various *Salix gooddingii* Woodland Alliances and 0.70 acre vegetated with the *Baccharis salicifolia* Shrubland Alliances. The temporary impacts to the *Salix gooddingii* Woodland Alliances includes approximately 0.37 acre of the undisturbed and sparse alliances and approximately 0.72 acre of the disturbed alliances containing 20 to 30 percent cover of nonnative and invasive plant species. The temporary impacts to the *Baccharis salicifolia* Shrubland Alliances includes approximately 0.39 acre of undisturbed and approximately 0.31 acre of disturbed alliances containing 20 to 40 percent cover of nonnative and invasive plant species. The temporary impact to undisturbed riparian vegetation is 0.76 acre, or 5 percent of the total undisturbed riparian vegetation and 1 percent of the total acres of riparian vegetation. The temporary impact to disturbed riparian vegetation is 1.03 acres, or 2 percent of the total disturbed riparian vegetation and 2 percent of the total acres of riparian vegetation.

The total acres of riparian vegetation temporarily affected on the side slopes of the annual maintenance footprint is 7.43 acres, which includes 4.75 acres of areas vegetated with the various *Salix gooddingii* Woodland Alliances and 2.68 acres vegetated with the *Baccharis salicifolia* Shrubland Alliances. The side slope temporary impacts to the *Salix gooddingii* Woodland Alliances includes approximately 1.17 acres of the undisturbed and sparse alliances and approximately 3.58 acres of the disturbed alliances containing 20 to 30 percent cover of nonnative and invasive plant species. The side slope temporary impacts to the *Baccharis salicifolia* Shrubland Alliances includes no impacts to undisturbed and approximately 2.68 acres of disturbed alliances containing 20 to 40 percent cover of nonnative and invasive plant species. The side slope temporary impact to undisturbed riparian vegetation is 1.17 acres, or 8 percent of the total undisturbed riparian vegetation and 2 percent of the total acres of riparian vegetation. The side slope temporary impact to disturbed riparian vegetation is 6.26 acres, or 12 percent of the total disturbed riparian vegetation and 9 percent of the total acres of riparian vegetation.

Floodplain Vegetation

The total acres of floodplain vegetation permanently affected by the Project is 1.82 acres, all of which are considered undisturbed and sparse *Lepidospartum squamatum* Shrubland Alliances. The permanent impact to floodplain vegetation is 7 percent of the total acres of floodplain vegetation.

The total acres of floodplain vegetation temporarily affected by the Project is 12.68 acres, all of which are considered undisturbed and sparse *Lepidospartum squamatum* Shrubland Alliances. The temporary impact to floodplain vegetation is 47 percent of the total acres of floodplain vegetation.

Native Upland

The total acres of native upland vegetation permanently affected by the Project is 0.05 acre, which includes 0.02 acre of the disturbed *Artemesia californica – Eriogonum fasiculatum* Shrubland Alliance containing 30 percent cover of nonnative and invasive plant species and 0.03 acre of the undisturbed *Quercus agrifolia* Alliance. Permanent impacts are not expected to occur to areas supporting the undisturbed *Artemesia californica – Eriogonum fasiculatum* Shrubland Alliance or the disturbed *Platanus racemosa* Woodland Alliance. The permanent impact to undisturbed native upland vegetation is 0.03 acre, or less than 1 percent of the total undisturbed native upland vegetation and less than 1 percent of the total acres of native upland vegetation. The permanent impact to disturbed native vegetation is 0.02 acre, or less than 1 percent of the total disturbed native upland vegetation and less than 1 percent of the total acres of native upland vegetation.

The total acres of native upland vegetation temporarily affected by the Project is 0.35 acre, which includes 0.08 acre of the disturbed *Artemesia californica – Eriogonum fasiculatum* Shrubland Alliance containing 30 percent cover of nonnative and invasive plant species and 0.27 acre of the undisturbed *Quercus agrifolia* Alliance. Temporary impacts are not expected to occur in the areas supporting the undisturbed *Artemesia californica – Eriogonum fasiculatum* Shrubland Alliance or the disturbed *Platanus racemosa* Woodland Alliance. The temporary impact to undisturbed native upland vegetation is 0.27 acre, or 1 percent of the total undisturbed native upland vegetation and less than 1 percent of the total acres of native upland vegetation. The temporary impact to disturbed native vegetation is 0.08 acre, or less than 1 percent of the total disturbed native upland vegetation and less than 1 percent of the total acres of native upland vegetation.

Nonnative and Other Land Cover Types

The total acres of nonnative and other land cover types permanently affected by the Project is 14.66 acres, which includes 2.45 acres within the *Conium maculatum* Herbaceous Semi-Natural Alliance, 9.88 acres within the *Lepidium latifolium – Conium maculatum* Herbacesous Semi-Natural Alliances, 1.00 acre within the *Xanthium strumarium* Herbaceous Alliance, and 1.33 acres within the Disturbed land cover type. The permanent impact to nonnative and other land cover types is 23 percent of the total nonnative vegetation and other land covers on the Project site.

The total acres of nonnative and other land cover types temporarily affected by the Project is 2.01 acres, which includes 0.37 acre within the *Conium maculatum* Herbaceous Semi-Natural Alliance, 0.07 acre within the *Eucalyptus* (*globulus camaldulensis*) Woodland Semi-Natural Alliance, and 1.57 acres within the Disturbed land cover type. The temporary impact to nonnative and other land cover types is 3 percent of the total nonnative vegetation and other land covers on the Project site.

The total acres of nonnative vegetation and other land covers temporarily affected within side slopes by the Project is 3.46 acres, which includes 1.33 acres within the *Conium maculatum* Herbaceous Semi-Natural Alliance, 1.24 acres within the *Lepidium latifolium – Conium maculatum* Herbaceous Semi-Natural Alliances, 0.50 acre within the *Xanthium strumarium* Herbaceous Alliance, and 0.39 acre within the Disturbed land cover type. The side slope temporary impact to nonnative and other land cover types is 5 percent of the total nonnative vegetation and other land covers on the Project site.

The updated vegetation mapping was completed by ECORP to provide current information regarding the locations of where the various vegetation communities are located, the relative invasion of nonnative and invasive plant species in the vegetation communities, and the acres covered by each vegetation community. If you have any questions or comments regarding the content of this letter report, please contact me at (714) 648-0630.

Sincerely,

ECORP Consulting, Inc

Mari Quillman

Mari Quillman
Principal Biological Resources Program Manager

Literature Cited

[Chambers] Chambers Group, Inc. 2014. Development of a Detailed Vegetation Map for the Devil's Gate Sediment Removal Project. Unpublished report submitted to Los Angeles County Department of Public Works Flood Control District, Water Resources Division.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. In: California Department of Fish and Game, The Resources Agency, editor. Sacramento, CA. p. 156.

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Representative Vegetation Community Photos

Photo 1. *Artemisia californica –Eriogonum fasciculatum* **Shrubland Alliance**

Photo 2. *Brassica nigra* **and other mustards Herbaceous Semi-Natural Alliance in the foreground,** *Quercus agrifolia* **Alliance in the background**

Photo 3. ***Baccharis salicifolia*** **Shrubland Alliance**

Photo 4. ***Lepidium latifolium*** **Herbaceous Semi-Natural Alliance**

Photo 5. Depression/Bare Ground (Associated with Seasonally Wet Area)

Photo 6. *Salix gooddingii* Woodland Alliance

Photo 8. ***Conium maculatum*** **Herbaceous Semi-Natural Alliance**

APPENDIX E

2015 Focused Survey Report for Western Yellow-billed Cuckoo

November 17, 2015

Stacey Love
Recovery Permit Coordination
United States Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

SUBJECT: 2015 FOCUSED SURVEY REPORT FOR WESTERN YELLOW-BILLED CUCKOO AT THE DEVIL'S GATE RESERVOIR, LOS ANGELES COUNTY, CALIFORNIA

Dear Ms. Love:

Chambers Group, Inc. (Chambers Group) biologists conducted focused surveys for western yellow-billed cuckoo (*Coccyzus americanus*, WYBC) during the breeding season of 2015 for the Devil's Gate Reservoir Sediment Removal and Management Project located in the City of Pasadena, Los Angeles County, California. The results of the surveys are presented in this letter report.

SURVEY LOCATION

The survey area is located in the Devil's Gate Reservoir in the city of Pasadena in Los Angeles County, California, on Assessor's Parcel Numbers 5823015902, 5823004900, 5823003911, 5823003910, 5823003907, 5823003909, and 5823031900. Devil's Gate Reservoir is found in the La Cañada, San Pascual-Grafias, and San Rafael special survey areas in the California United States Geological Survey (USGS) 7.5-minute *Pasadena* topographic quadrangle. A map of the survey area is provided in Attachment 1.

WESTERN YELLOW-BILLED CUCKOO NATURAL HISTORY

The western yellow-billed cuckoo (nesting) is a federally-listed threatened and a state-listed endangered species. The WYBC is found primarily in the Eastern United States, but this subspecies is an extremely rare and localized summer resident of the southwestern U.S. Historically, it was found commonly throughout the Central Valley and California coastline until the early 20th century. It is a medium-sized bird with a brown back, a yellow, decurved bill, and a long grey-brown tail with distinctive white spots on the outer retrices. This species primarily inhabits mature, open riparian woodlands along the broad, lower flood-bottoms of larger river systems. Habitat features usually include some relatively open patches and intermixed low, dense, scrubby vegetation typical of these watercourses. In the southwestern U.S., the western WYBC also occupies desert riparian woodlands composed of willows (*Salix* spp.), Fremont cottonwoods (*Populus fremontii*), and dense mesquite (*Prosopis* spp.). It typically nests in willows and forages more so among the cottonwoods and other trees. Its diet includes caterpillars, grasshoppers, other large insects, frogs, and some small lizards. Populations of the western WYBC in California were decimated before the mid-20th century by the extensive loss of riparian habitat to agriculture and development as well as by heavy pesticide use, and have not rebounded since that time (Hughes 1999).

In California, breeding populations of greater than five pairs which persist every year are currently limited to the Sacramento River from Red Bluff to Colusa, and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other sites where small populations of cuckoos (<5 pairs) breed or possibly breed (but not necessarily every year) are: The Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; the Prado Flood Control Basin, San Bernardino and Riverside counties; the Amargosa River near Tecopa, Inyo Co.; the Owens Valley near Lone Pine and Big Pine, Inyo Co.; the Santa Clara River near Santa Clarita, Los Angeles Co.; the Mojave River near Victorville, San Bernardino Co.; and the Colorado River from Needles, San Bernardino Co. to Yuma, Imperial Co. (Laymon 1998).

METHODS

Focused surveys were conducted within habitat that was determined to be suitable for WYBC by the surveying biologist in 2015 (Attachment 2).

Breeding season WYBC surveys were conducted by United States Fish and Wildlife Service (USFWS)-permitted biologist John Griffith (TE-758175). Survey methodology followed the WYBC survey protocol (Halterman et al 2015). Each survey was conducted during favorable weather conditions to maximize detection probability.

A permitted biologist was not secured until July, after the first survey pass window was closed. After consultation with LACDPW and the USFWS, it was decided to proceed with the remaining 3 survey passes, on a slightly altered schedule (2 surveys in August, 10 day periods between surveys instead of 12 to 15 days). The USFWS advised that the three surveys would not be formally accepted as determining WYBC absence; however, if the species was observed, the “present” status would be accepted/established. In addition, one survey was conducted on June 24 during the first survey pass; however, the survey was not conducted by a permitted biologist and therefore was not considered a protocol level survey.

All surveys were conducted on foot by looking and listening for the target species in all suitable riparian habitat within the survey area and a 500-foot buffer (Attachment 2).

Observations of the songs, scolds, whisper calls, flight patterns, behaviors, and plumage characteristics were used in conjunction to ascertain presence/absence of WYBC. The biologist conducted the surveys from optimal stationary locations to see and hear the target species without harming any other wildlife species in the area.

Permitted biologists used prerecorded WYBC vocalizations to elicit WYBC within and/or adjacent to all suitable habitat for 5 minutes (a short call with a 50-55 second listening period repeated 5 times) at 100 meter intervals across the length and breadth of the suitable habitat. If a WYBC was detected, the taped vocalization broadcast was ceased at that location, and the location, numbers, status, and demographic data of the target species were recorded.

All observed wildlife species were recorded for each survey day, all sensitive wildlife species incidentally observed were recorded and corresponding GPS points were mapped (Attachments 3 and 4).

RESULTS

Survey Conditions

Survey conditions are presented in Table 1.

Table 1. Survey Conditions

Date	Surveyor	Time		Temperature*		Wind**		Cloud Cover		Precipitation	
		Start	End	Start	End	Start	End	Start	End	Start	End
07/25/15	John Griffith	5:35 A.M.	11:00 A.M.	61	85	0	2	0%	0%	0	0
08/04/15	John Griffith	5:15 A.M.	11:00 A.M.	64	83	0	1	25%	95%	0	0
08/14/15	John Griffith	5:35 A.M.	11:20 A.M.	65	96	0	0	0%	0%	0	0

*All temperature readings are in Fahrenheit
**All wind readings are in miles per hour

No WYBC were detected within the survey area during the 2015 surveys.

Other Sensitive Species

Least Bell's vireo

Two least Bell's vireo (*Vireo belli pusillus*; LBVI) family groups were incidentally observed during the August 14 survey (Attachment 3). The LBVI is both a state and federally listed endangered species. The LBVI observed included one likely family group (one adult singing male with two juveniles, 3 birds total) and one family group or possibly a juvenile group (either an adult with one or more juveniles, or 2-3 juveniles).

Southwestern willow flycatcher

One southwestern willow flycatcher (*Empidonax traillii extimus*; SWFL) family group was incidentally observed during the last survey conducted on August 14 (Attachment 3). The SWFL is listed as both federally and state endangered. The family group included one or more adults and one or more young of the year (3 birds total in the group observed).

Yellow Warbler

Nine male yellow warblers (*Setophaga petechia*) were incidentally observed during all three surveys conducted (Attachments 3). The yellow warbler is a state Species of Special Concern (SSC).

Yellow-breasted Chat

Two male yellow-breasted chats (*Icteria virens*) were incidentally observed. The individuals were observed during the first two surveys conducted on July 25 and August 4 (Attachment 3). The yellow-breasted chat is a state Species of Special Concern (SSC).

CONCLUSIONS

No western yellow-billed cuckoo were found within the survey area during the 2015 focused surveys. Several least Bell's vireo, southwestern willow flycatcher, and yellow warbler individuals were observed incidentally. One yellow-breasted chat was observed incidentally.

Please contact me at (949) 261-5414 ext. 7232 if you have any questions or concerns regarding these results.

Sincerely,

CHAMBERS GROUP, INC.

Heather Franklin

Heather Franklin
Staff Biologist

ENCLOSURES

Attachment 1 – Survey Location
Attachment 2 – Suitable Habitat
Attachment 3 – Sensitive Species Locations Map
Attachment 4 – Wildlife Species Observed

REFERENCES

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2013 California Natural Diversity Database, Rarefind 4. Biogeographic Data Branch, Sacramento, CA.

Halterman, M., M.J. Johnson, J.A. Holmes and S.A. Laymon.
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1999 Yellow-billed Cuckoo (*Coccyzus americanus*). In The Birds of North America, No. 418 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

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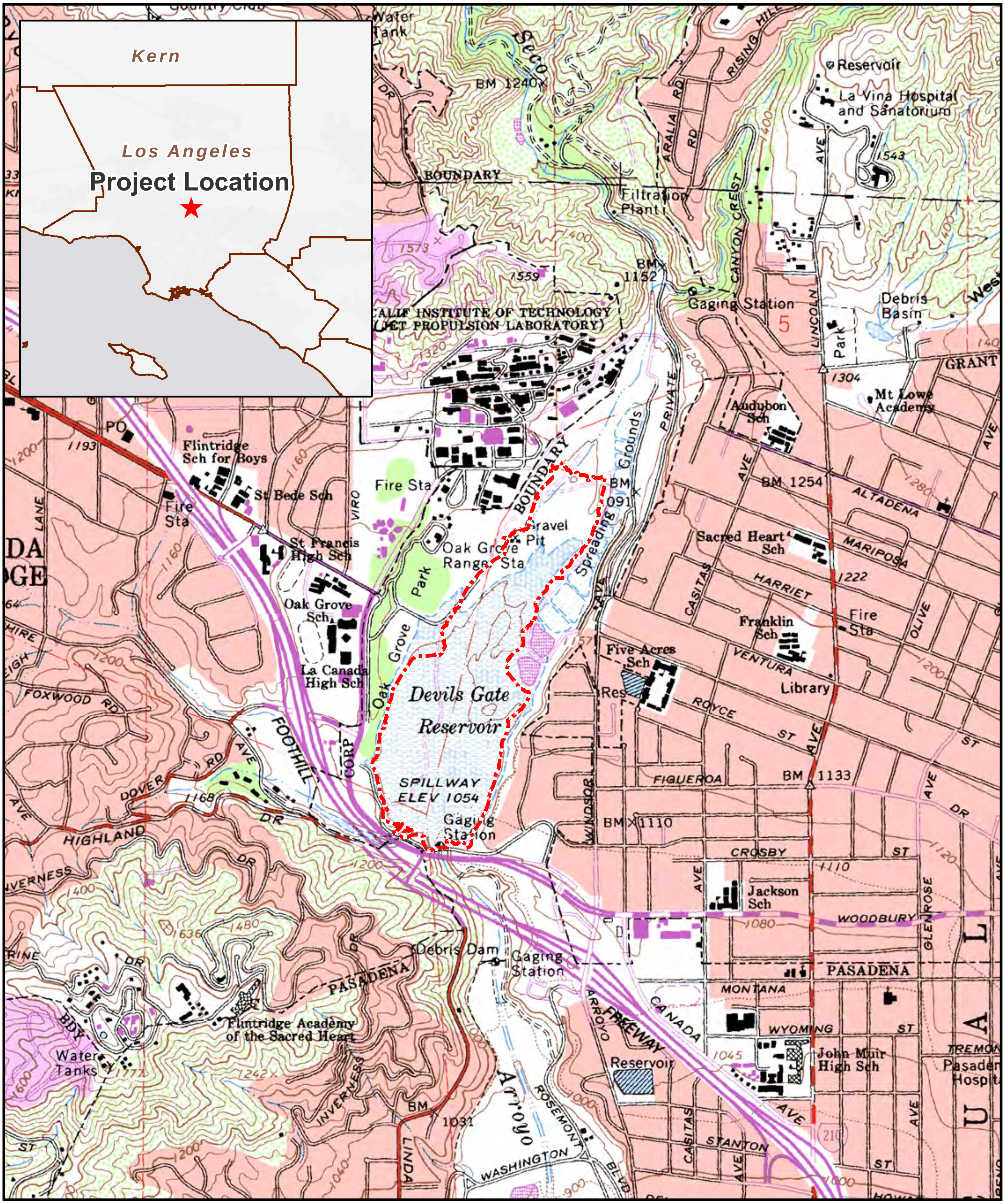
1998. Yellow-billed Cuckoo (*Coccycus americanus*). *In* The Riparian Bird Conservation Plan: A strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

ATTACHMENT 1 – SURVEY LOCATION



Legend

Survey Area

N

0 500 1,000 2,000

Feet

Attachment 1

Devil's Gate Reservoir Sediment Removal and Management Project

Survey Location

Name: 20767 Attach 1 Survey Location.Mxd
Print Date: 12/22/2014, Author: phuls

CHAMBERS GROUP

ATTACHMENT 2 – SUITABLE HABITAT

Legend

Photo Point (with direction)

Yellow-Billed Cuckoo Suitable Habitat

Survey Area

N

0 250 500 1,000

Feet

Attachment 2

Devil's Gate Reservoir Sediment Removal and Management Project

YBCU 2015 Suitable Habitat

Name: 20767 Attach 2 YBCU Suit Habitat.Mxd
Print Date: 9/16/2015, Author: msimmons

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ATTACHMENT 3 – SENSITIVE SPECIES LOCATIONS MAP

Legend

Survey Area

Yellow-Billed Cuckoo Suitable Habitat

Sensitive Species Observations

Least Bell's Vireo

Willow Flycatcher

Yellow Warbler

Yellow-breasted Chat

N

0 250 500

Feet

Attachment 3

Devil's Gate Reservoir Sediment Removal and Management Project

YBCU 2015 Survey Results

Name: 20767 Attach 3 YBCU Survey Results.Mxd
Print Date: 9/23/2015, Author: msimmons

ATTACHMENT 4 – WILDLIFE SPECIES OBSERVED

Attachment 4. Wildlife Species Observed

order	family	subfamily	*Genus*	*species*	English name
ANSERIFORMES					
		Anatinae			
			Anas	***platyrhynchos***	Mallard.
GALLIFORMES					
	ODONTOPHORIDAE				
			Callipepla	***californica***	California Quail.
CICONIIFORMES					
	ARDEIDAE				
			Ardea	***herodias***	Great Blue Heron.
			Butorides	***virescens***	Green Heron.
	CATHARTIDAE				
			Cathartes	***aura***	Turkey Vulture.
FALCONIFORMES					
	ACCIPITRIDAE				
		Accipitrinae			
		CSC-3	***Accipiter***	***cooperii***	Cooper's Hawk.
			Buteo	***lineatus***	Red-shouldered Hawk.
			Buteo	***jamaicensis***	Red-tailed Hawk.
	FALCONIDAE				
		Falconinae			
			Falco	***sparverius***	American Kestrel.
CHARADRIIFORMES					
		Charadriinae			
			Charadrius	***vociferus***	Killdeer.
	SCOLOPACIDAE				
		Scolopacinae			
			Tringa	***melanoleuca***	Greater Yellowlegs.
COLUMBIFORMES					
	COLUMBIDAE				
			Columba	***livia***	Rock Pigeon.
			Zenaida	***macroura***	Mourning Dove.
CUCULIFORMES					
	CUCULIDAE				
		Neomorphinae			
			Geococcyx	***californianus***	Greater Roadrunner.
APODIFORMES					
	APODIDAE				
		Apodinae			
			Aeronautes	***saxatalis***	White-throated Swift.
	TROCHILIDAE				
		Trochilinae			
			Archilochus	***alexandri***	Black-chinned Hummingbird.
			Calypte	***anna***	Anna's Hummingbird.
			Selasphorus	***sasin***	Allen's Hummingbird.
PICIFORMES					
	PICIDAE				
		Picinae			
			Picoides	***nuttallii***	Nuttall's Woodpecker.
			Picoides	***pubescens***	Downy Woodpecker.
			Melanerpes	***formicivorus***	Acorn Woodpecker.
PASSERIFORMES					
		Fluvicolinae			
		FE	***Empidonax***	***traillii extimus***	Southwestern Willow Flycatcher.
			Empidonax	***difficilis***	Pacific-slope Flycatcher.
			Sayornis	***nigricans***	Black Phoebe.
			Sayornis	***saya***	Say's Phoebe.
		Tyranninae			
			Myiarchus	***cinerascens***	Ash-throated Flycatcher.
			Tyrannus	***vociferans***	Cassin's Kingbird.

order	family	subfamily	Genus	species	English name
	VIREONIDAE				
		FE	***Vireo***	***bellii pusillus***	Least Bell's Vireo.
			Vireo	***huttoni***	Hutton's Vireo.
			Vireo	***gilvus***	Warbling Vireo.
	CORVIDAE				
			Aphelocoma	***californica***	Western Scrub-Jay.
			Corvus	***brachyrhynchos***	American Crow.
			Corvus	***corax***	Common Raven.
	ALAUDIDAE				
			Eremophila	***alpestris***	Horned Lark.
	HIRUNDINIDAE				
		Hirundininae			
			Tachycineta	***bicolor***	Tree Swallow.
			Stelgidopteryx	***serripennis***	Northern Rough-winged Sw.
			Petrochelidon	***pyrrhonota***	Cliff Swallow.
			Hirundo	***rustica***	Barn Swallow.
	AEGITHALIDAE				
			Psaltriparus	***minimus***	Bushtit.
	TROGLODYTIDAE				
			Thryomanes	***bewickii***	Bewick's Wren.
			Troglodytes	***aedon***	House Wren.
	TURDIDAE				
			Sialia	***mexicana***	Western Bluebird.
			Catharus	***ustulatus***	Swainson's Thrush.
			Turdus	***migratorius***	American Robin.
	TIMALIIDAE				
			Chamaea	***fasciata***	Wrentit.
	MIMIDAE				
			Mimus	***polyglottos***	Northern Mockingbird.
			Toxostoma	***redivivum***	California Thrasher.
	PTILOGONATIDAE				
			Phainopepla	***nitens***	Phainopepla.
	PARULIDAE				
			Vermivora	***celata***	Orange-crowned Warbler.
			Dendroica	***petechia***	Yellow Warbler.
			Geothlypis	***trichas***	Common Yellowthroat.
			Wilsonia	***pusilla***	Wilson's Warbler.
			Icteria	***virens***	Yellow-breasted Chat.
	EMBERIZIDAE				
			Pipilo	***maculatus***	Spotted Towhee.
			Pipilo	***crissalis***	California Towhee.
			Melospiza	***melodia***	Song Sparrow.
	CARDINALIDAE				
			Pheucticus	***melanocephalus***	Black-headed Grosbeak.
	ICTERIDAE				
			Molothrus	***ater***	Brown-headed Cowbird.
			Icterus	***cucullatus***	Hooded Oriole.
			Icterus	***bullockii***	Bullock's Oriole.
	FRINGILLIDAE				
		Carduelinae			
			Carpodacus	***purpureus***	Purple Finch.
			Carpodacus	***mexicanus***	House Finch.
			Carduelis	***psaltria***	Lesser Goldfinch.
			Carduelis	***tristis***	American Goldfinch.
				Total	64

APPENDIX F

2016 Focused Survey Reports for Least Bell's Vireo, Southwestern Willow Flycatcher, and Western Yellow-billed Cuckoo

LEATHERMAN BIOCONSULTING, INC.
Biological Surveys, Management & Monitoring

September 6, 2016

Ms. Mari Quillman
ECORP CONSULTING
1801 Park Court Place, Building B, Suite 103
Santa Ana, California 92701

Subject: Results of Focused Surveys for the Southwestern Willow Flycatcher, Western Yellow-billed Cuckoo and Least Bell's Vireo for the Devil's Gate Reservoir Sediment Removal and Management Project

Dear Mari:

This letter reports the results of focused surveys to evaluate the presence or absence of the southwestern willow flycatcher (*Empidonax traillii extimus*) and western yellow-billed cuckoo (*Coccyzus americanus*) in cottonwood/willow riparian forest habitat along Arroyo Seco for the Devil's Gate Reservoir Sediment Removal and Management Project in Los Angeles County, California. The southwestern willow flycatcher is federally and state-listed as Endangered, and the yellow-billed cuckoo is federally-listed as Threatened and state-listed as Endangered. The federally and state-listed Endangered least Bell's vireo (*Vireo pusillus bellii*) was also searched for in association with each of the five willow flycatcher surveys reported here. The project is behind the Devil's Gate Dam along Arroyo Seco Creek adjacent to Hahamonga Watershed Park, immediately east of Interstate 210 freeway, in the La Canada/Flintridge area of Pasadena (Figure 1).

The area surveyed extends from the base of the dam near Interstate 210 at the south end of the site to approximately 4,800 feet upstream (near the parking lot at the south end of Arroyo Road). The width of the survey area varies considerably from an estimated 100 feet at its narrowest point to over 1,200 feet in some areas, but most of the mature willow riparian habitat occurs in elongated patches approximately 150 feet wide. The habitat at the base of the dam occurs as the largest patch (ca. 300 x 900 feet) and is highest quality for both the willow flycatcher and the yellow-billed cuckoo. Suitable habitat that occurs adjacent to the project area within the basin was also surveyed.

BACKGROUND

The willow flycatcher (*Empidonax traillii*) is a state-listed Endangered species (CDFG 1991), whereas only the southwestern subspecies (*E.t. extimus*) is federally-listed as Endangered

(USFWS 1995). This survey focused on the southwestern willow flycatcher because it is the only subspecies that nests in southern California. However, migrants of all the subspecies may occur in the area during spring and fall migration, so multiple visits to the survey area are required to determine if individuals observed during the first surveys are nesting birds.

The willow flycatcher was formerly a common summer resident in suitable habitat throughout California (Grinnell and Miller 1944). It has now been extirpated as a breeding bird from most of its California range, and is seriously threatened in southern California primarily because of habitat loss and degradation and brood parasitism by brown-headed cowbirds (*Molothrus ater*) (Garrett and Dunn 1981; USFWS 1995). Critical habitat for the southwestern willow flycatcher was revised in 2013 (USFWS 2013).

The willow flycatcher closely resembles other Empidonax flycatcher species in California, but the indistinct (or completely lacking) eye ring, broader and longer bill, and generally lighter appearance through the breast and throat help to distinguish it from other species. The species' vocalizations are the best form of identification in the field (but can't be used to identify subspecies). The southwestern willow flycatcher is a migratory bird, occurring in this region only during the breeding season (late May to early August). The male arrives later in the spring than most migrants, usually in mid to late May or early June. Nests are constructed in thickets of trees and shrubs in a fork or horizontal branch between three and 15 feet above the ground.

The southwestern willow flycatcher breeds in riparian habitats along rivers, streams, or other wetlands in floodplains and broader canyons, preferring dense riparian thickets near surface water (Sogge et al. 2010), often with adjacent open areas for foraging. Vegetation structure, composition, and extent vary widely but generally include extensive areas dominated by dense stands of willows (*Salix* spp.), mule fat (*Baccharis salicifolia*), or other tree species (including tamarisk [*Tamarix* sp.] in some areas), usually with scattered cottonwood (*Populus* spp.) overstory (USFWS 1995). These riparian areas provide both nesting and foraging habitat. Southwestern willow flycatchers will nest in areas with suitable habitat regardless of the elevation (from sea level to high mountains).

The yellow-billed cuckoo (*Coccyzus americanus*) is a federally listed Threatened species and state-listed Endangered species. The USFWS listed the western distinct population segment of the yellow-billed cuckoo in 2014 based on habitat loss and degradation associated with changes to watercourse hydrology and grazing, isolation and fragmentation of suitable habitat patches, and increased exposure to pesticides that can poison individual cuckoos and their prey base (USFWS 2014a). Critical habitat for the yellow-billed cuckoo was proposed in 2014 (USFWS 2014b).

In California, the yellow-billed cuckoo is a rare summer visitor and breeder where it requires large blocks of riparian habitat for breeding (USFWS 2001). It generally occurs from May to September (Grinnell and Miller 1944), but usually arrives and breeds in southern California from early June to late August (Garrett and Dunn 1981). It occurs almost exclusively in mature streamside gallery forest with old growth willows and scattered cottonwoods (usually of at least 25 acres), particularly with a dense tangled understory of nettles, willows, blackberry, wild grape, mesquite, and etc. (Grinnell and Miller 1944; Garrett and Dunn 1981). It is rarely seen away from suitable breeding habitat (Garrett and Dunn 1981). In California, cuckoos are most likely to be found in patches of willow-cottonwood riparian habitat greater than 20 hectares (50 acres) in size (Halterman et al. 2015). It was formerly fairly common and widespread in the broad lower flood plains of larger rivers in southern California and Central Valley (Garret and Dunn 1981). The current range of the yellow-billed cuckoo in California is estimated to be about 30 percent of its historical extent (USFWS 2001), and estimates of the loss of riparian habitat state-wide are 90-99 percent (Halterman 2015).

EXISTING HABITAT

The survey area occurs in broad floodplain consisting of a braided sandy wash and associated terraces. The upstream end of the survey has limited alluvial fan sage scrub and sage scrub elements and small patches of willow and mulefat scrub. Patches of willow riparian forest habitat begin near the upstream end and increase in size and suitability in the downstream direction. Riparian woodland habitat in the survey area can be broadly characterized as southern cottonwood-willow riparian forest (Holland 1986). Arroyo willow (*Salix lasiolepis*) and mulefat are the most common species throughout, occurring in patches throughout the wash system. Red willow (*Salix laevigata*) and black willow (*Salix goodingii*) are well represented, and occasional individuals of Fremont's cottonwood (*Populus fremontii*) form the canopy over the shrubbier arroyo willows. The understory is dominated by cocklebur (*Xanthium strumarium*), poison hemlock (*Conium maculatum*), perennial pepper weed (*Lepidium latifolium*), and annual bursage (*Ambrosia acanthocarpa*). A diverse mix of native and non-native annuals and grasses make up the herbaceous layer.

METHODS

Prior to conducting the focused survey, a search was conducted of the California Natural Diversity Data Base (CDFW 2016) for the Pasadena 7.5-minute series quadrangle map (and the surrounding 8 quadrangles) and other references to determine if and to what extent the target species are known to occur in the project region.

Focused surveys were conducted by Mr. Brian Leatherman (USFWS permit # TE 827493-6; CDFW MOU). Survey methods followed the guidelines developed by the U. S. Fish and Wildlife Service for each species as described below. Observations of any listed species were recorded in the field and waypoints were taken using GPS technology for mapping purposes. The focus of the surveys was on the detection and identification of the target species, but all wildlife incidentally observed or detected in the survey area was documented. Identifications were made with the aid of 8 X 42 Bausch & Lomb Elite binoculars. A list of the species observed during the surveys is enclosed.

The surveys for the southwestern willow flycatcher followed the mandatory protocol developed by Sogge et al. (2010) and guidance promulgated by the U. S. Fish and Wildlife Service (USFWS 2000). This protocol requires that five surveys be conducted within three certain periods between May 15 and July 17 and at least five days apart. Sogge et al. (2010) recommend that surveys be conducted between dawn and 1030 under suitable weather conditions. Surveys reported here were generally conducted between dawn and 1115 because of the two dimensional depth of suitable habitat in some areas (which takes longer to survey than linear habitats), and because suitable habitat adjacent to the project area was surveyed afterward. The habitat requirements and survey methods for the least Bell's vireo are consistent with the flycatcher's and focused surveys are usually conducted in concert when appropriate. Dates, times and weather data for the focused surveys are shown in Table 1.

The surveys for the yellow-billed cuckoo followed the mandatory protocol developed by Halterman et al. (2015). This protocol requires that four surveys be conducted within three certain periods between June 15 and August 15. Halterman et al. (2015) recommend that surveys be conducted from 12 to 15 days apart between dawn and 1100 under suitable weather conditions. Least Bell's vireos occur in similar riparian habitat but focused surveys for other endangered birds are not recommended in the protocol. However, least Bell's vireos incidentally observed during the surveys were recorded. Surveys reported here were generally conducted between dawn and 1145 because of the two dimensional depth of suitable habitat in some areas (which takes longer to survey than linear habitats) and adjacent suitable habitat was surveyed afterward. Dates, times and weather data for the focused surveys are shown in Table 1.

Table 1. Dates, Times and Weather Conditions for Focused Surveys

DATE	SURVEY No.	TIME		WEATHER CONDITIONS*					
				Temp (°F)		Winds (mph)		Cloud Cover	
		Start	End	Start	End	Start	End	Start	End
16-May	WIFL 1	600	1115	56	66	0-2	2-4	100%	100%
1-Jun	WIFL 2	600	1045	53	70	0-2	2-4	100%	10%
15-Jun	WIFL 3	545	1100	54	65	0-2	0-2	100%	100%
16-Jun	YBCU 1	545	1145	50	71	0-2	2-4	20%	clear
29-Jun	WIFL 4	530	1045	61	83	0-2	2-4	80%	clear
1-Jul	YBCU 2	530	1100	61	81	0-2	2-4	100%	clear
6-Jul	WIFL 5	600	1030	59	70	0-2	2-4	100%	10%
15-Jul	YBCU 3	500	1000	61	68	0-2	2-4	100%	10%
1-Aug	YBCU 4	545	1000	63	78	0-2	2-4	clear	clear

*Temperature and wind speed measured with Kestrel 2000

The riparian habitat in the survey area is irregularly shaped and includes a broad sandy wash with patches of willows: one area with ponded water from urban runoff, which is referred to as the Lower Alta Dena Drain, is located near the southeast end of the site. Generally, the upstream habitat is linear and patchy, and the downstream habitat is more mature and dense and very broad in some areas. Surveys were conducted by walking slowly and methodically along established trails under the canopy of the riparian habitat and along the margins. Because of the width of the habitat in some areas, side routes were often taken from the main trails to survey interior habitat areas. Surveys were conducted from along the edge of the habitat when vegetation density precluded surveys from under the canopy. Taped vocalizations were played every 50 to 100 feet for the flycatcher and every 300 feet for the cuckoo in an attempt to elicit a response from potentially present individuals. The tape was played for roughly 15 seconds for the flycatcher, stopped for one or two minutes to listen for a response, and then played again before moving to the next spot. For the cuckoo, a recording of contact calls was played five times at one minute intervals while watching and listening for a response.

RESULTS

No willow flycatchers or yellow-billed cuckoos were observed during the surveys.

Migrant willow flycatchers of the more common northern subspecies (*E.t. brewsteri* and *E.t. adastus*) are expected to occur in the area during the spring and fall migration period (Garrett and Dunn 1981, Sogge et al. 2010) and are usually observed during the first two survey periods (May 15-31 and June 1-24). Yellow-billed cuckoos are rarely observed during migration but a few observations are made annually (usually in mid-June) in southern California (Clark 2013).

One southwestern willow flycatcher record was found for the Pasadena quadrangle in the California Natural Diversity Data Base (CDFW 2016). The record is from a museum collection from 1906 in Arroyo Seco (the exact location was not given). Nine other records for willow flycatchers were found in the nine quadrangle search. No critical habitat for the southwestern willow flycatcher was designated in the Arroyo Seco watershed (USFWS 2013). The closest critical habitat is along Big Tujunga Creek to the west and the San Gabriel River to the east.

One yellow-billed cuckoo record was found in the nine quadrangle search in the California Natural Diversity Data Base (CDFW 2016). The record is from the San Gabriel River in 1951. No critical habitat was proposed for the yellow-billed cuckoo in Los Angeles County (USFWS 2014b).

One least Bell's vireo was observed during the focused survey conducted on August 1 for the yellow-billed cuckoo. The vireo appeared to be a hatch year (juvenile) male based on its relatively clean (fresh) plumage and its poor attempt at producing a song. The bird was observed briefly as it crossed a trail with a blue-gray gnatcatcher. After a very brief time the bird flew off toward the south and was not observed again. The location of the bird is shown in Figure 2.

Brown-headed cowbirds were observed in the riparian habitat in the survey area on a regular basis, although it is likely that the same individuals were observed. No attempt at a standardized count was made during the focused surveys. The most that were observed on any one survey was three males, one female and one juvenile. The number of cowbirds observed during each survey is provided in Table 2.

CONCLUSION

Focused surveys were conducted for the southwestern willow flycatcher and yellow-billed cuckoo in the Devil's Gate Sediment Removal Project survey area. No willow flycatchers or yellow-billed cuckoos were observed during the surveys. One juvenile least Bell's vireo was observed during a survey on August 1, suggesting that there may be nesting in the vicinity, but none were observed or detected during the eight other surveys reported here. Based on the lack of records for the region and the negative survey results, the southwestern willow flycatcher and yellow-billed cuckoo are likely absent as breeders at this time. No critical habitat is designated for either species in the Arroyo Seco watershed.

Table 2. Number of Brown-headed Cowbirds Observed

DATE	SURVEY No.	NUMBER OBSERVED		
		Males	Females	Juveniles
16-May	WIFL 1	1	1	0
1-Jun	WIFL 2	1	0	0
15-Jun	WIFL 3	3	0	0
16-Jun	YBCU 1	1	0	0
29-Jun	WIFL 4	1	0	0
1-Jul	YBCU 2	0	0	0
6-Jul	WIFL 5	2	1	1
15-Jul	YBCU 3	1	1	0
1-Aug	YBCU 4	0	0	0

A copy of this letter report will be sent to the USFWS and CDFW per the conditions of the 10(a)(1)(A) permit and MOU. Figures 1 and 2, the references cited, a list of the wildlife observed, and the required willow flycatcher and yellow-billed cuckoo survey forms are enclosed. Survey certification is provided below. It has been a pleasure to conduct this survey effort for ECORP Consulting. If you have any comments or questions regarding the information provided in this report you can reach me by phone at (714) 701-0863, or by email at bleathermanwlb@aol.com.

Sincerely,

LEATHERMAN BIOCONSULTING, INC.

Brian Leatherman
Principal Biologist

Enclosures

C:/…ecorp/ecorp.05/devils gate wifl_ybcu rpt Final

CERTIFICATION:

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

Brian Leatherman
Permit No. TE827493-6

9/6/2016
Date

REFERENCES

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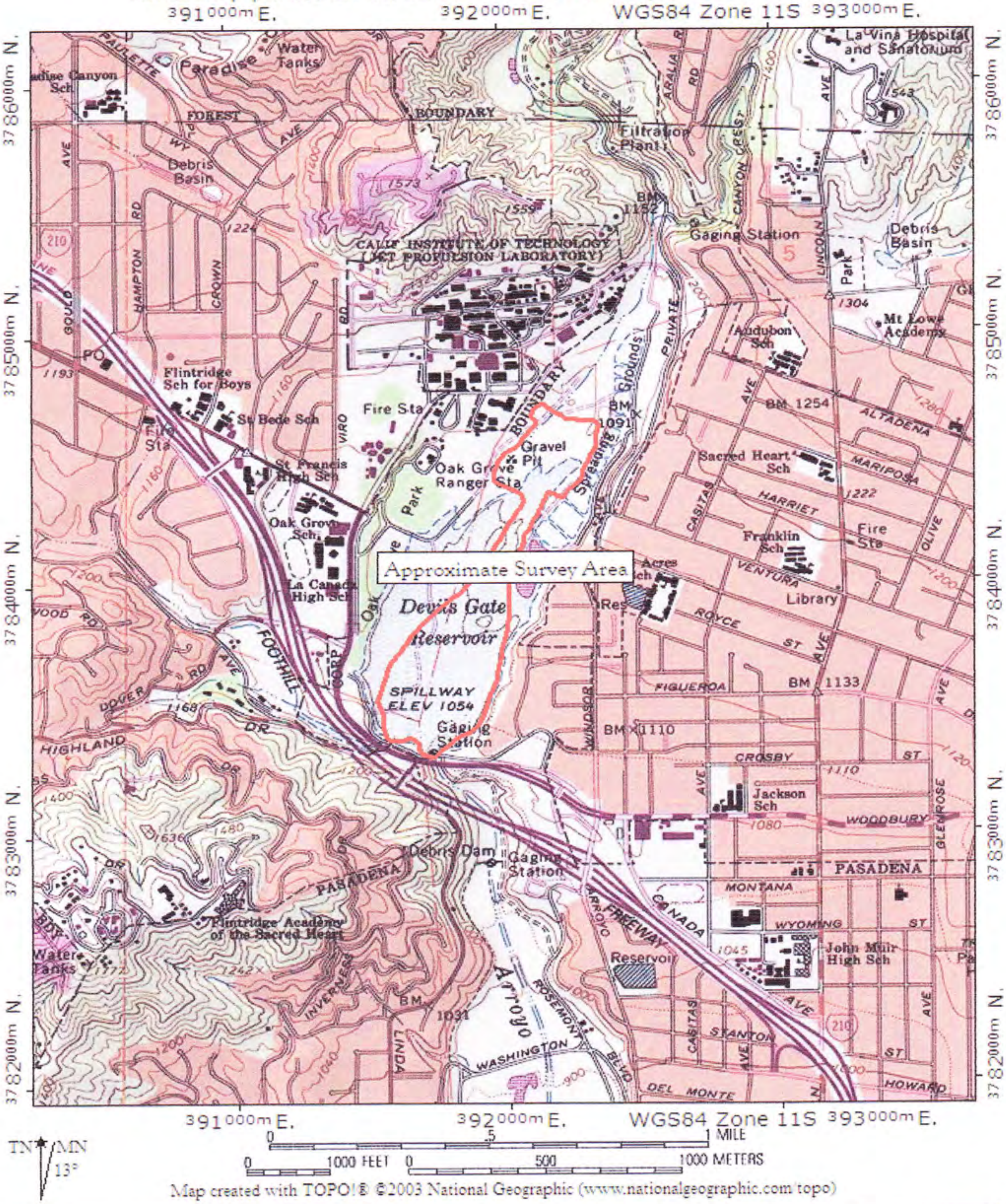
TOPO! map printed on 08/25/16 from "California.tpo" and "Untitled.tpg"



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

Devil's Gate Sediment Removal Project

Project Location
Figure 1

Leatherman BioConsulting,, Inc.
Source Map: TOPO!

↑ N

Devil's Gate Sediment Removal Project

Least Bell's Vireo Location
Figure 2

Leatherman BioConsulting,, Inc.
Source Map: Google Earth

↑ N

Non-native species are indicated by an asterisk. Species on CDFW's Special Animals list are indicated by two asterisks. Other species may have been overlooked or inactive/absent because of the season (amphibians are more active during/after rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.), or because of the time of the survey (some species are strictly nocturnal). Taxonomy and nomenclature generally follow NABA (2002) for butterflies, Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals.

COMMON NAME	SCIENTIFIC NAME
REPTILES	**REPTILIA**
Spiny Lizards, Horned Lizards, etc.	**Phrynosomatidae**
Western fence lizard	*Sceloporus occidentalis biseriatus*
Side-blotched lizard	*Uta stansburiana*
Whiptail Lizards	**Teiidae**
** Western whiptail	*Cnemidophorus tigris*
BIRDS	**AVES**
Vultures	**Cathartidae**
Turkey vulture	*Cathartes aura*
Geese and Ducks	**Anatidae**
Mallard	*Anas platyrhynchos*
Hawks, Eagles and Kites	**Accipitridae**
** Cooper's hawk	*Accipiter cooperii*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Quail	**Odontophoridae**
California quail	*Callipepla californica*
Pidgeons and Doves	**Columbidae**
* Rock dove	*Columba livia*
Band-tailed pidgeon	*Columba fasciata*
Mourning dove	*Zenaida macroura*
Swifts	**Apodidae**
White-throated swift	*Aeronautes saxatalis*
Hummingbirds	**Trochilidae**
Black-chinned hummingbird	*Archilochus alexandri*
Anna's hummingbird	*Calypte anna*
** Allen's hummingbird	*Selasphorus sasin*
Woodpeckers	**Picidae**
Acorn woodpecker	*Melanerpes formicivorus*
** Nuttall's woodpecker	*Picoides nuttallii*
Parrots	**Psittacidae**
Amazon parrot	*Amazonia sp.*
Tyrant Flycatchers	**Tyrannidae**
Western wood-pewee	*Contopus sordidulus*
Pacific-slope flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Ash-throated flycatcher	*Myiarchus cinerascens*
Cassin's kingbird	*Tyrannus vociferans*
Western kingbird	*Tyrannus verticalis*
Vireos	**Vireonidae**
** Least Bell's vireo	*Vireo bellii pusillus*

Hutton's vireo	*Vireo huttoni*
Warbling vireo	*Vireo gilvus*
Jays and Crows	**Corvidae**
Western scrub-jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Swallows	**Hirundinidae**
Tree swallow	*Tachycineta bicolor*
Violet-green swallow	*Tachycineta thalassina*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Petrochelidon pyrrhonota*
Barn swallow	*Hirundo rustica*
Titmice and Chickadees	**Paridae**
** Oak (Plain) titmouse	*Baeolophus inornatus*
Bushtits	**Aegithalidae**
Bushtit	*Psaltriparus minimus*
Wrens	**Troglodytidae**
Bewick's wren	*Thryomanes bewickii*
House wren	*Troglodytes aedon*
Gnatcatchers	**Silviidae**
Blue-gray gnatcatcher	*Polioptila caerula*
Bluebirds and Thrushes	**Turdidae**
Western bluebird	*Sialia mexicana*
Wrentits	**Timaliidae**
Wrentit	*Chamaea fasciata*
Mockingbirds and Thrashers	**Mimidae**
Northern mockingbird	*Mimus polyglottis*
California thrasher	*Toxostoma redivivum*
Starlings	**Sturnidae**
* European starling	*Sturnus vulgaris*
Wood Warblers	**Parulidae**
Orange-crowned warbler	*Vermivora celata*
** Yellow warbler	*Dendroica petechia*
Townsend's warbler	*Dendroica townsendi*
Common yellowthroat	*Geothlypis trichas*
** Yellow-breasted chat	*Icteria virens*
Towhees and Sparrows	**Emberizidae**
Spotted towhee	*Pipilo maculatus*
California towhee	*Pipilo crissalis*
Song sparrow	*Melospiza melodia*
Grosbeaks and Buntings	**Cardinalidae**
Black-headed grosbeak	*Pheucticus melanocephalus*
Blackbirds and Orioles	**Icteridae**
* Brown-headed cowbird	*Molothrus ater*
Hooded oriole	*Icterus cucullatus*
Finches	**Fringillidae**
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*
Old World Sparrows	**Passeridae**
* House sparrow	*Passer domesticus*
Estrildid Finches	**Estrildidae**
Nutmeg mannikin	*Lonchura punctulata*

MAMMALS	**MAMMALIA**
Opossoms	**Didelphidae**
Virginia opossum (tracks)	*Didelphis virginiana*
Hares and Rabbits	**Leporidae**
Desert cottontail	*Sylvilagus audubonii*
Squirrels	**Sciuridae**
California ground squirrel	*Spermophilus beecheyi*
Eastern fox squirrel	*Sciurus niger*
Pocket Gophers	**Geomyidae**
Botta's pocket gopher (burrows)	*Thomomys bottae*
Old World Rats and Mice	**Muridae**
House mouse	*Mus musculus*
Dogs, Wolves and Foxes	**Canidae**
* Domestic dog	*Canis familiarus*
Coyote (scat, tracks)	*Canis latrans*
Raccoons	**Procyonidae**
Common raccoon (tracks)	*Procyon lotor*
Cats	**Felidae**
Bobcat (tracks)	*Lynx rufus*
Horses	**Equidea**
* Domestic horse	*Equus caballus*

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

Site Name: **Devil's Gate Sediment Removal Project** State: **CA** County: **LA**

USGS Quad Name: **Pasadena** Elevation: **350** (meters)

Creek, River, or Lake Name: **Arroyo Seco**

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

Survey Coordinates: Start: E **03 92 264m** N **37 84 720m** UTM Datum: **NAD83** (See instructions)

Stop: E **3 91 582m** N **37 83 402m** UTM Zone: **11S**

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

Fill in additional site information on back of this page

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.
Survey # 1 Observer(s): Brian Leatherman	Date: 5/16/2016 Start: 600 Stop: 1115 Total hrs: 5.25	0					# Birds / Sex / UTM E / UTM N
Survey # 2 Observer(s): Brian Leatherman	Date: 6/1/2016 Start: 600 Stop: 1045 Total hrs: 4.75	0					# Birds / Sex / UTM E / UTM N
Survey # 3 Observer(s): Brian Leatherman	Date: 6/15/2016 Start: 545 Stop: 1100 Total hrs: 5.25	0					# Birds / Sex / UTM E / UTM N
Survey # 4 Observer(s): Brian Leatherman	Date: 6/29/2016 Start: 530 Stop: 1045 Total hrs: 5.25	0					# Birds / Sex / UTM E / UTM N
Survey # 5 Observer(s): Brian Leatherman	Date: 7/6/2016 Start: 600 Stop: 1030 Total hrs: 4.5	0					# Birds / Sex / UTM E / UTM N

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 25.0	0	0			Were any WIFLs color-banded? Yes ____ No ____ If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: **Brian Leatherman** Date Report Completed: **8/18/2016**

US Fish & Wildlife Service Permit #: **TE827493-9** State Wildlife Agency Permit #: **SC-001562**

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

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

Reporting Individual **Brian Leatherman** Phone # **(714) 701-0863**
Affiliation **Leatherman BioConsulting Inc.** E-mail bleathermanwlb@aol.com
Site Name **Devil's Gate Sediment Removal Project** Date report Completed **8/18/2016**

Was this site surveyed in a previous year? Yes____ No____ Unknown____

Did you verify that this site name is consistent with that used in previous yrs? Yes____ No____ Not Applicable X

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

If site was surveyed last year, did you survey the same general area this year? Yes____ No____ If no, summarize below.

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

Management Authority for Survey Area: Federal X Municipal/County X State____ Tribal____ Private____

Name of Management Entity or Owner (e.g., Tonto National Forest) **LADPW, ANF**

Length of area surveyed: **2.2** (km)

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

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

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

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

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

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

Alnus rhombifolia, Salix spp

Average height of canopy (Do not include a range): **4.5** (meters)

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

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

Habitat consists of broad sandy wash upstream with patches of mulefat and willow and mature willow riparian forest downstream. Occassional cottonwoods and sycamores. Generally considered marginal habitat for WIFL.

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

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

Attach additional sheets if necessary

Yellow Billed Cuckoo Survey Summary Form

Site Name: Devil's Gate Sediment Removal County: Los Angeles State: CA
USGS Quad Name: Pasadena Elevation: 350 m
Creek, River, Wetland, or Lake Name: Arroyo Seco
Site Coordinates: Start: E 392264 N 3784720 UTM Zone: 11S
Stop: E 391582 N 3783402 Datum: NAD 83
Ownership: BLM Reclamation NPS USFWS USFS Tribal State Private Other (Municipal/County)
Was site surveyed in previous year? Yes No Unknown If yes, what site name was used?

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected.	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates UTM E	Surveyor Detection Coordinates UTM N	Distance (m)	Bearing	Cuckoo #	Corrected Coordinates UTM E	Corrected Coordinates UTM N
Survey Period #1 Observer(s): Brian Leatherman	Date: 6/16 Start: 0545 Stop: 1145 Total hrs: 6	0 Total:												
Survey Period #2 Observer(s): Brian Leatherman	Date: 7/1 Start: 0530 Stop: 1100 Total hrs: 5.5	0 Total:												
Survey Period #3 Observer(s): Brian Leatherman	Date: 7/15 Start: 0500 Stop: 1000 Total hrs: 5	0 Total:												
Survey Period #4 Observer(s): Brian Leatherman	Date: 8/1 Start: 0545 Stop: 1000 Total hrs: 4.25	0 Total:												
Survey Period #5 Observer(s):	Date: Start: Stop: Total hrs:	Total:												

Survey Summary: Total YBCUs*	# Det	#PO	#PR	#CO	#Nests found	Total Survey Hours:

Notes (refer to Cuckoo # associated with individual detections)

*Include justification for these designations.

VOCALIZATION	CODE	BEHAVIOR	CODE	BEHAVIOR	CODE	BREEDING	CODE
Contact	CON	No visual	NV	Catches Prey	CP	Copulation	COP
Coo	COO	Sitting	ST	Carry Food	CF	Feeds Mate	FM
Knock/Alarm	ALA	Foraging	FO	Eats Food	EF	Carry Nest Material	CN
Juvenile Calls	JUVC	Preening	PRE	At Nest	AN	Brooding/Incubating	BI
Other Vocalization	OV	Flying	FLY	Juvenile	JUV	Feeds Nestling	FN
		Distraction Display	DD	Vocal Exchange	VEX	Feeds Fledgling	FF

NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, US = used, inactive nest with blue-green eggshells.

Yellow-Billed Cuckoo Survey Site Description Form

This form is intended to provide a general descrition of the habitat surveyed at a site. More detailed vegetation analysis requires precise measurements, and is outside the scope of this survey protocol. Please check your permit for additional requirements.

Fill in the following information completely	**Date Report completed:**	
Site Name: Devil's Gate Sediment Removal	State: California	County: Los Angeles
Name of Reporting Individual Brian Leatherman	Affiliation Leatherman Bio Consulting, Inc.	
Phone # 714 779-7077	Email: bleathermanwlb@aol.com	
USFWS Permit # TE-827493-9	State Permit # SC-001562	

Site Coordinates:	Start: E 392 264	N 3784 720	UTM Zone: 11S
	Stop: E 391 582	N 3783 402	NAD: 83
USGS Quad Name(s): Pasadena		Length of area surveyed (in kilometers) 2.2	Elevation: 350 m
Name of nearest Creek, River, Wetland, or Lake: Arroyo Seco			
Ownership: BLM Reclamation NPS USFWS USFS Tribal State Private Other (Municipal/County)			
Was site surveyed in previous year? Yes No Unknown		If yes, what site name was used?	
Did you survey the same general area during each visit this year?		Yes / No	If no, summarize in comments below
If "Yes", was the same general area surveyed this year?		Yes / No	If no, summarize in comments below

Native/Exotic: The species in tree/shrub layer at this site are comprised predominantly of (check one):			
Native broadleaf plants (>75% native)	✓	Mixed native and exotic plants (mostly native 51%-75%)	
Exotic/introduced plants (>75% exotic)		Mixed native and exotic plants (mostly exotic 51%-75%)	

List up to 5 species of overstory vegetation and percent canopy cover of each species. Use scientific names. For percent cover, please use <1%; 10%, 25%, 50%, 75%, 90%, 100%.

1. Salix laevigata	% cover:	2. Salix lasiolepis	% cover:	3. Salix goodingii	% cover:
4.	% cover:	5.	% cover:		
Average height of overstory (m)(do not include a range)			Estimated Overall Canopy Cover (percent)		

List up to 5 species of understory/shrub vegetation (not all sites will have a separate understory) and estimate percent understory cover of each species. Use scientific names. For percent cover, please use <1%; 10%, 25%, 50%, 75%, 90%, 100%.

1. B. salicifolia	% cover:	2. Salix exigua	% cover:	3. Conium maculatum	% cover:
4. Xanthium sp	% cover:	5.	% cover:		
Average height of understory (m)(do not include a range)			Estimated Overall Cover (percent)		

Describe adjacent habitat (e.g. upland vegetation; desert scrub; urban/residential; agriculture/orchard; oak woodland)

Regional park, open space, residential development

List up to five categories of adjacent habitat, and estimate percent cover. Use <1%; 10%, 25%, 50%, 75%, 90%, 100%.

1.	% cover:	2.	% cover:	3.	% cover:
4.	% cover:	5.	% cover:		

Was surface water or saturated soil present at or adjacent to site within 300 meters?	Yes No (circle one)
Was surface water or saturated soil present at or adjacent to all patches surveyed?	Yes No (circle one)

Comments. Please provide comments regarding differences between the survey patches within the site. For example, if the average canopy for this site is 30% cover, but within one patch it is 60% cover - please note. Also, please note significant differences between dominant overstory and understory vegetation among the patches. Document these differences with photographs whenever possible. Make sure to reference comments to photo number whenever available.

Upstream area consists of smaller patches of willows & mulefat. Downstream are increasingly has larger denser patches of willow riparian forest.

Coastal California Gnatcatcher Survey Report 2016 for the Devil's Gate Reservoir Sediment Removal and Management Project
Los Angeles County, California

Prepared for:
Los Angeles County
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

Prepared by:
ECORP Consulting, Inc.
1801 E. Park Court Place
Building B, Suite 103
Santa Ana, CA 92701

October 5, 2016

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1.0 INTRODUCTION

ECORP Consulting, Inc. (ECORP) conducted focused surveys for the purpose of evaluating the presence or absence of coastal California gnatcatcher (*Polioptila californica californica*) within the Devil's Gate Reservoir Sediment Removal and Management Project (Project) site in Los Angeles County, California. The coastal California gnatcatcher is federally listed as threatened and a California Department of Fish and Wildlife (CDFW) Species of Special Concern. This report summarizes the results of six breeding season focused surveys conducted in 2016 for coastal California gnatcatchers at the Project site.

2.0 SITE LOCATION

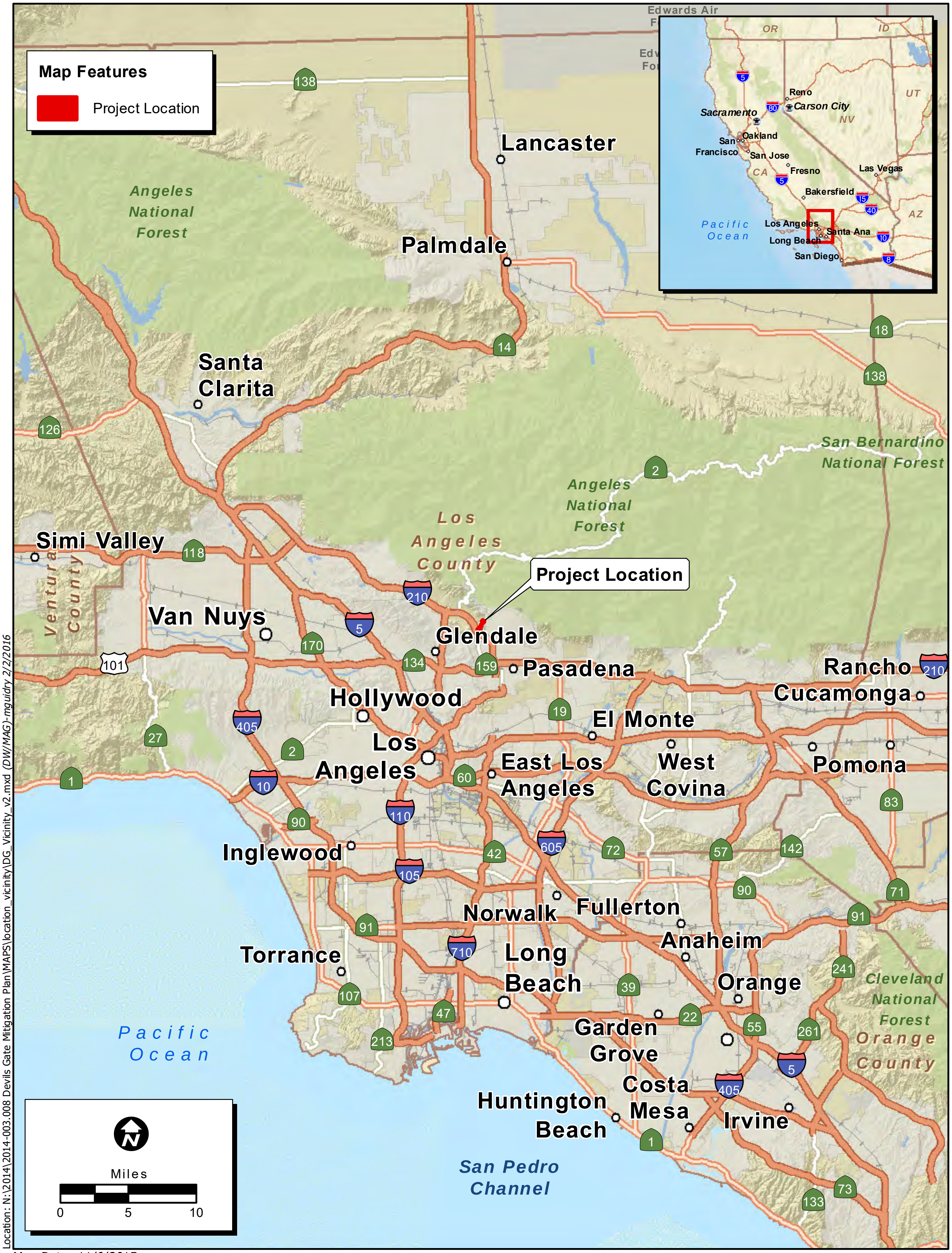
The Project is located northeast of Interstate 210 and south of the Angeles National Forest in the City of Pasadena in Los Angeles County (Figure 1). The Project site is within the upper portion of the Arroyo Seco Watershed within the Hahamongna Watershed Park (Figure 2).

2.1 Survey Area Description

Vegetation communities within the Project site were mapped and described by ECORP Botanists in 2016 using the designations in A Manual of California Vegetation, Second Edition (Sawyer et al. 2009). Limited amounts of California Sagebrush-California Buckwheat Scrub (*Artemisea californica - Eriogonum fasciculatum* Shrubland Alliance), which provides suitable nesting and foraging habitat for coastal California gnatcatcher, was mapped in and adjacent to the Project areas (Figure 3). The majority of this habitat is located along the northwest edge of the Project site and a smaller patch is located at the southern end of the site, adjacent to Oak Grove Drive. All suitable habitat, both in and adjacent to the Project area, was surveyed.

3.0 BACKGROUND

The coastal California gnatcatcher was listed as threatened by the federal government in March 1993 (USFWS 1993) and is a California Species of Special Concern (CDFW 2016a). This small gray-blue non-migratory bird is endemic to coastal Southern California. Its known geographic range includes portions of Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties and extends south into northwestern Baja California. This species is associated with low-growing, drought-tolerant sage scrub habitat. Dominant plant types within these sage scrub communities include California sagebrush (*Artemisia californica*), buckwheats (*Eriogonum fasciculatum* and *E. cinereum*), encelias (*Encelia californica* and *E. farinosa*), and various sages (*Salvia mellifera, S. apiana,* and *S. leucophylla*). Coastal California gnatcatchers have also been documented within chaparral, grassland, and riparian habitats where they occur in proximity to sage scrub. These non-sage scrub habitats are used for dispersal and foraging (Atwood *et. al.* 1998; Campbell *et al.* 1998). The breeding season of the coastal California gnatcatcher extends from late February through July with the peak of nest initiations occurring from mid-March through mid-May. Nests are often located in California sagebrush about 1 meter (3 feet) above the ground with an average clutch size of four eggs. The incubation and nestling periods encompass about 14 and 16 days, respectively. Both sexes participate in all phases of the nesting cycle. Contributing factors in the decline of this species include overly frequent fire cycles, non-native plant invasions, brown-headed cowbird (*Molothrus ater*) nest parasitism, predation, and chronic reduction in habitat carrying capacity due to development (Mock 2004).



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Map Date: 11/6/2015

Service Layer Credits: Sources: USGS, ESRI, TANA, AND

Figure 1. Project Vicinity

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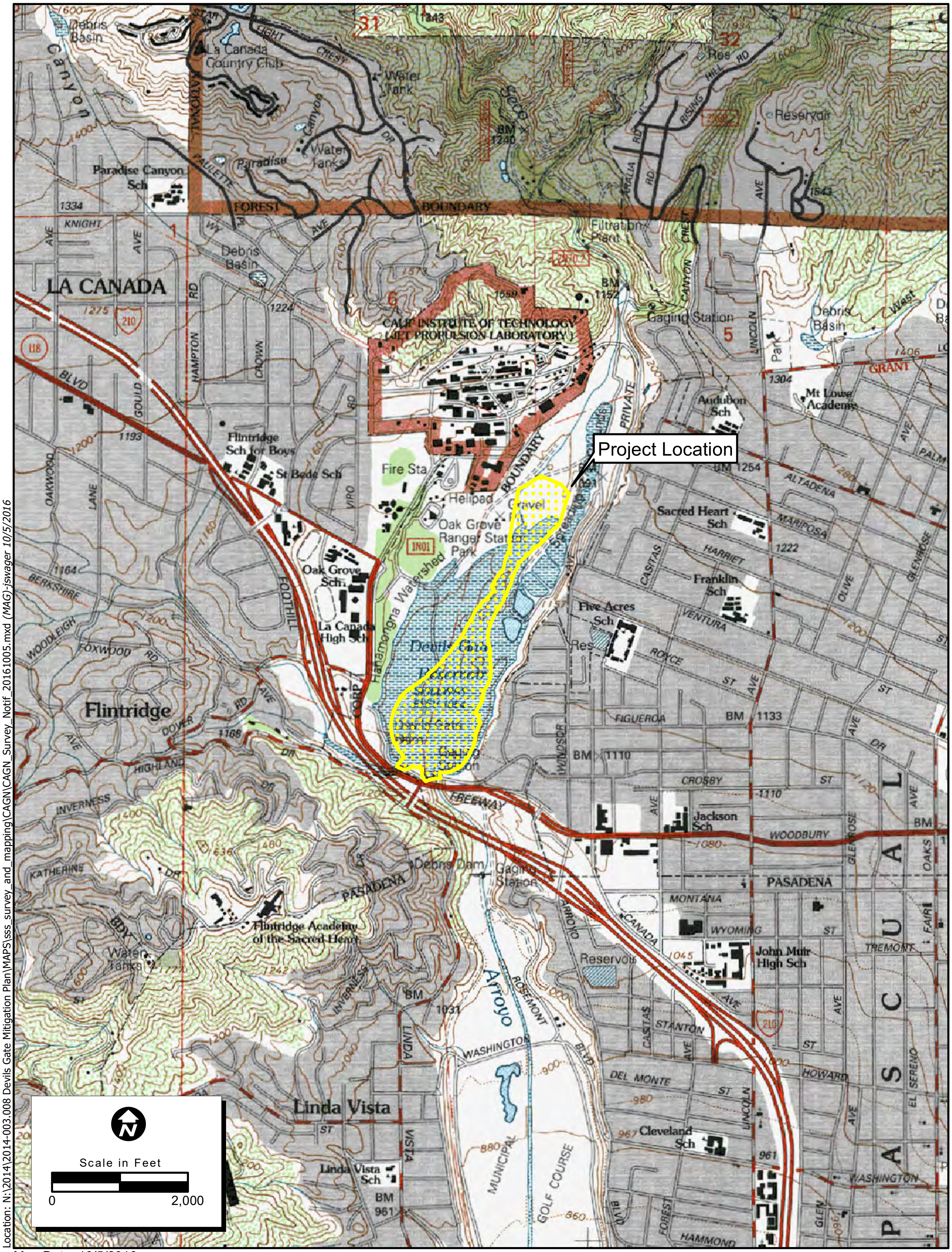

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\sss_survey_and_mapping\CAGN\CAGN_Survey_Notif_20161005.mxd (MAG)-jswager 10/5/2016

Map Date: 10/5/2016
Photo Source: USGS 2009

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Project Location

2014-003.008 Devils Gate Mitigation Plan

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Vegetation\Vegetation\v1\DG_Vegetation_Ecorp2016.mxd (MAG) -mguidry 7/7/2016

Figure 3.
Vegetation Communities (2016)

Map Features

- Initial Project Footprint [1]
- Annual Maintenance Footprint [1]
- Side Slopes [1]
- Access Roads [1]

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

ECORP Consulting, Inc.
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2014-003.008 Devil's Gate Sediment Removal Project

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW

Map Date: 5/19/2016

4.0 SURVEY METHODOLOGY

Prior to conducting the focused survey, a search was conducted of the California Natural Diversity Data Base (CDFW 2016b) for the Pasadena 7.5-minute series quadrangle map (and the surrounding 8 quadrangles) and other references to determine if and to what extent coastal California gnatcatchers are known to occur in the project region.

Focused surveys were conducted by federal 10(a)(1)(A) permitted ECORP biologist Shannon Shaffer (TE67555A-0) during the 2016 breeding season. Focused gnatcatcher surveys were conducted in accordance with 1997 U.S. Fish and Wildlife Service (USFWS) protocol guidelines (USFWS 1997). A total of six surveys, at least 7 days apart, were conducted between March 15 and June 30, 2016. Surveys were conducted between dawn and 1200, when weather conditions were favorable (no excessive fog, wind, rain, cold, heat). Survey dates, times, and weather conditions are listed in Table 1.

Table 1. Survey Dates, Times, and Weather Conditions

Survey	Date	Time		Temperature (°F)		% Cloud Cover		Wind Speed (mph)	
		Start	End	Start	End	Start	End	Start	End
1	04/26/16	0555	1200	54	66	100	25	0-3	2-5
2	05/09/16	0600	1200	57	66	40	10	0-3	2-4
3	05/16/26	0550	1200	58	66	10	0	0-3	0-3
4	05/24/16	0550	1200	58	71	40	0	2-4	2-4
5	05/31/16	0550	1200	56	72	60	30	0-2	0-2
6	06/07/16	0545	1200	60	82	0	0	0-3	0-3

Surveys consisted of slowly walking various survey routes and playing a taped recording of gnatcatcher vocalizations while scanning all potential habitat with binoculars for the presence of gnatcatchers and listening for vocal responses to the recording. All wildlife species detected during the surveys were documented. A complete list of all wildlife species observed during the surveys is included in Appendix A.

5.0 SURVEY RESULTS

Coastal California gnatcatchers were not detected within or adjacent to the Project site during any of the 2016 focused surveys.

Records of coastal California gnatcatcher were not present in the Pasadena quadrangle in the California Natural Diversity Data Base search (CDFW 2016b). The closest record for California gnatcatcher was documented more than 7 miles southeast of the Project in the Mt. Wilson quadrangle in 1928. Eight other records for coastal California gnatcatchers were found in the nine quadrangle search but they were located even further away.

5.1 Coastal California Gnatcatcher Critical Habitat

Critical habitat was designated by USFWS in 2000 (USFWS 2000) and was re-designated in 2007 (USFWS 2007). The Project site is not located within designated critical habitat for the coastal California gnatcatcher (USFWS 2007).

5.2 Other Sensitive Wildlife

Other federal and/or state endangered species were not observed during the surveys.

6.0 CONCLUSIONS

Coastal California gnatcatchers were not detected at the site over the course of the six breeding season surveys. Based on the lack of records for the region and the negative survey results, the coastal California gnatcatcher is likely absent as a breeder at this time. The Project site does not occur within designated critical habitat for this species.

7.0 CERTIFICATION STATEMENT

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or the applicant's representative and that I have no financial interest in the project.

SIGNED: Shannan Shaffer **DATE:** **October 5, 2016**
Shannan Shaffer (TE67555A-0)

8.0 LITERATURE CITED

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Appendix A

Wildlife Compendium

SCIENTIFIC NAME	COMMON NAME
Birds	
Accipitridae	**Hawks, Kites, & Eagles**
Buteo jamaicensis	Red-tailed hawk
Buteo lineatus	Red-shouldered hawk
Aegithalidae	**Bushtits**
Psaltriparus minimus	Bushtit
Columbidae	**Pigeons and Doves**
Zenaida macroura	Mourning dove
Corvidae	**Jays and Crows**
Aphelocoma californica	Western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Emberizidae	**Towhees and Sparrows**
Melospiza melodia	Song sparrow
Pipilo crissalis	California towhee
Pipilo maculatus	Spotted towhee
Zonotrichia leucophrys	White-crowned sparrow
Fringillidae	**Finches**
Spinus psaltria	Lesser goldfinch
Haemorhous mexicanus	House finch
Hirundinidae	**Swallows**
Stelgidopteryx serripennis	Northern rough-winged swallow
Icteridae	**Blackbirds & Orioles**
Eupahngus cyanocephalus	Brewer's blackbird
Mimidae	**Mockingbirds and Thrashers**
Mimus polyglottos	Northern mockingbird
Odontophoridae	**New World Quail**
Callipepla californica	California quail
Parulidae	**Wood warblers**
Geothlypis trichas	Common yellowthroat
Sturnidae	**Starlings**
*Sturnus vulgaris**	European starling
Sylviidae	**Wrentits**
Chamaea fasciata	Wrentit
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black Phoebe
Mammals	
Canidae	**Dogs, Wolves, & Foxes**
Canis latrans	Coyote

* Nonnative species

Least Bell's Vireo Survey Report 2016 for the Devil's Gate Reservoir Sediment Removal and Management Project Los Angeles County, California

Prepared for:
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October 5, 2016

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1.0 INTRODUCTION

ECORP Consulting, Inc. (ECORP) conducted focused surveys to determine presence or absence of least Bell's vireo (*Vireo bellii pusillus*) within Devil's Gate Reservoir (study area) in Los Angeles County, California. The least Bell's vireo is both federally and state-listed as endangered. The Los Angeles County Department of Public Works (LACDPW) is planning to implement the Devil's Gate Reservoir Sediment Removal and Management Project that will require the removal of vegetation and accumulated sediment in a portion of the reservoir. A portion of the vegetation removed by the Project will include undisturbed and disturbed riparian plant communities that could potentially support the nesting, foraging, and migratory activities of least Bell's vireos. This report summarizes the results of eight focused surveys and two additional surveys conducted in 2016 for least Bell's vireo at the Project site.

2.0 SITE LOCATION

The study area is located northeast of Interstate 210 and south of the Angeles National Forest in the City of Pasadena in Los Angeles County (Figure 1). The study area is within the upper portion of the Arroyo Seco Watershed within the Hahamongna Watershed Park (Figure 2).

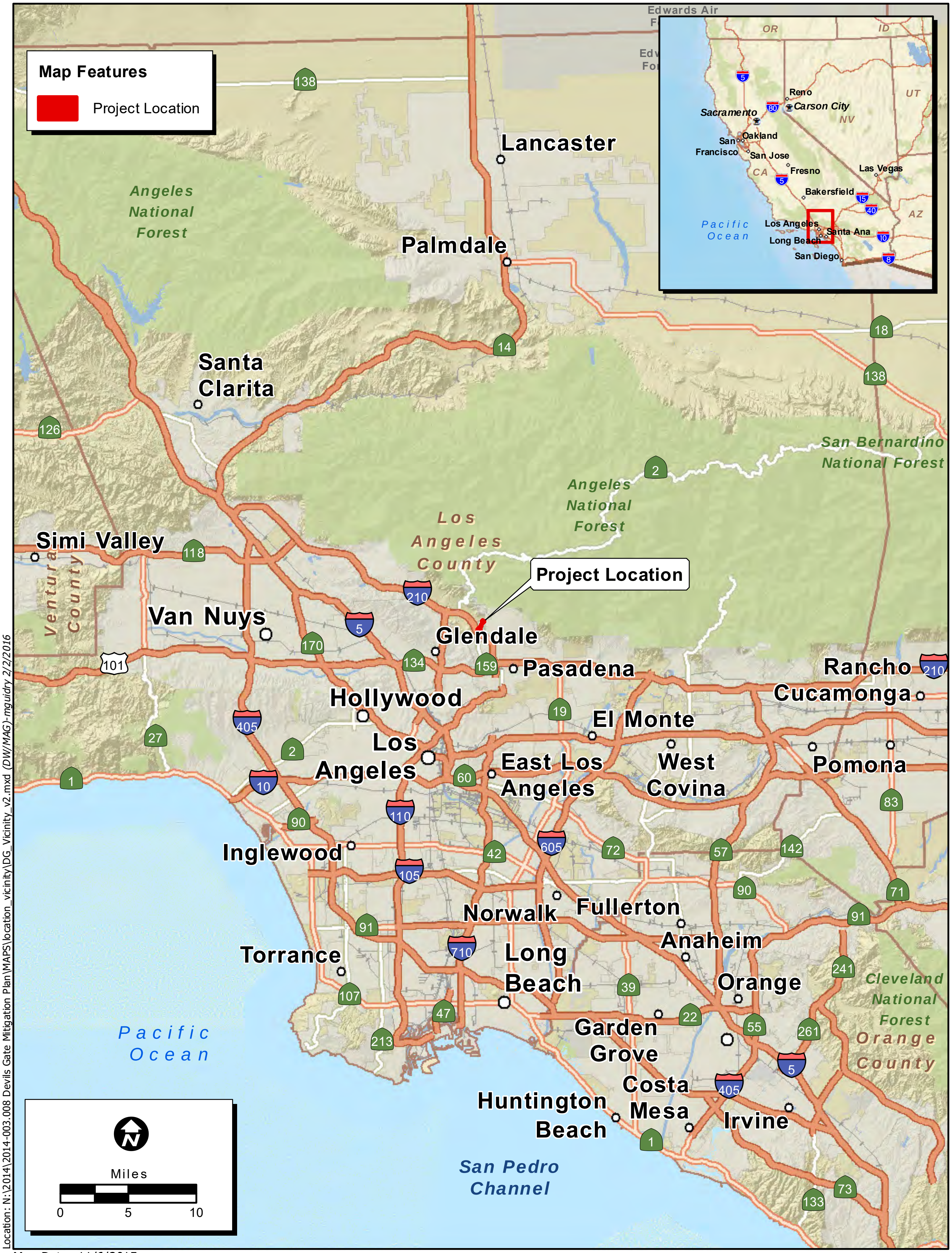
2.1 Vegetation Communities

In 2016, ECORP conducted vegetation community mapping in the Devil's Gate Reservoir and the adjacent areas (Project area) for the purposes of updating the vegetation map to reflect current conditions and to update the vegetation community descriptions to follow the designations in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Table 1 lists the vegetation community and land cover types and the acres of each that were mapped in 2016 and Figure 3 shows the 2016 vegetation map. Descriptions of the vegetation communities are provided following the table.

Table 1. Existing Vegetation Communities (2016)

Vegetation Community	Total Acreage
RIPARIAN	
***Salix gooddingii* Woodland Alliance TOTAL**	**42.67**
Salix gooddingii Woodland Alliance	7.46
Salix gooddingii Woodland Alliance - Sparse	4.20
Salix gooddingii Woodland Alliance- Understory 20% *Lepidium latifolium-Xanthium strumarium*	15.88
Salix gooddingii Woodland Alliance- Understory 30% *Lepidium latifolium-Conium maculatum*	15.13
***Baccharis salicifolia* Shrubland Alliance TOTAL**	**25.23**
Baccharis salicifolia Shrubland Alliance-No Understory	2.17

Vegetation Community	Total Acreage
Baccharis salicifolia Shrubland Alliance-20% *Conium maculatum-Lepidium latifolium*	2.04
Baccharis salicifolia Shrubland Alliance-30% *Conium maculatum-Lepidium latifolium*	6.84
Baccharis salicifolia Shrubland Alliance-40% *Conium maculatum-Lepidium latifolium*	14.18
Total Riparian	**67.90**
FLOODPLAIN	
Lepidospartum squamatum **Shrubland Alliance TOTAL**	**27.28**
Lepidospartum squamatum Shrubland Alliance	5.09
Lepidospartum squamatum Shrubland Alliance (Sparse)	22.19
Total Floodplain	**27.28**
NATIVE UPLAND	
Artemisia californica –Eriogonum fasciculatum Shrubland Alliance	1.88
Artemisia californica –Eriogonum fasciculatum Shrubland Alliance-20% *Lepidium latifolium*	4.38
Artemisia californica –Eriogonum fasciculatum Shrubland Alliance-30% *Lepidium latifolium*	2.08
Quercus agrifolia Alliance	22.80
Platanus racemosa Woodland Alliance - Disturbed	1.58
Total Native Upland	**32.72**
NONNATIVE/OTHER	
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance	23.09
Conium maculatum Herbaceous Semi-Natural Alliance -30% *Lepidium latifolium*	6.24
Lepidium latifolium – Conium maculatum Herbaceous Semi-Natural Alliance	13.28
Lepidium latifolium Herbaceous Semi-Natural Alliance	1.80
Rumex crispus Herbaceous Semi-Natural Alliance (Unofficial Alliance)	0.30
Xanthium strumarium Herbaceous Alliance (Unofficial Alliance)	1.50
Eucalyptus (*globulus, camaldulensis*) Woodland Semi-Natural Alliance	0.27
Fraxinus velutina Forest Alliance (Unofficial Alliance)	0.46
Landscaped	0.15
Depression/Bare Ground (Associated with Seasonally Wet Area)	0.39
Disturbed (Barren/Trails/IMP Area)	16.08
Total Other	**63.56**
TOTAL	**191.46**



Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Vicinity_v2.mxd (DW/MAG)-mguidry 2/2/2016

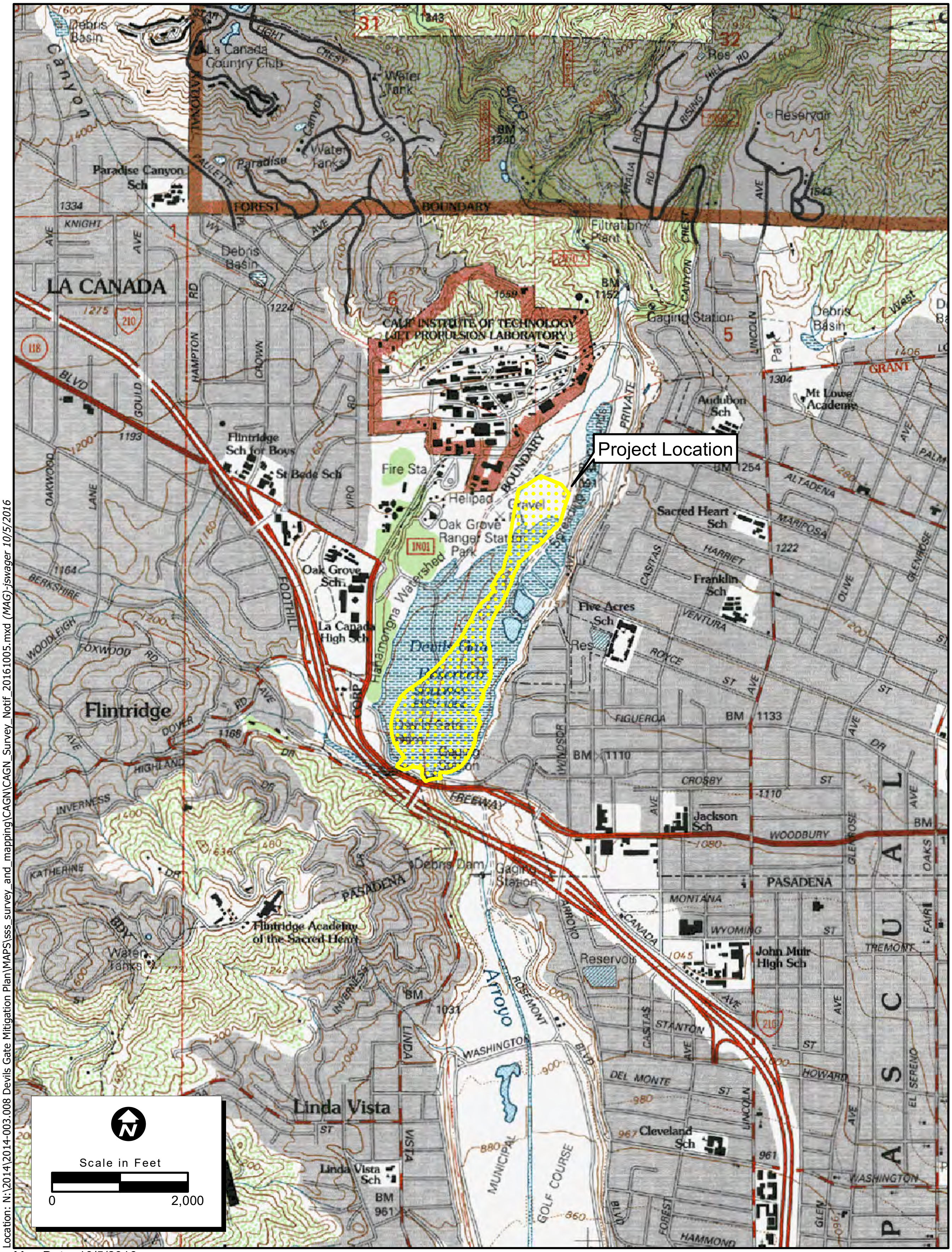
Map Date: 11/6/2015

Service Layer Credits: Sources: USGS, ESRI, TANA, AND

Figure 1. Project Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\sss_survey_and_mapping\CAGN\CAGN_Survey_Notif_20161005.mxd (MAG)-jswager 10/5/2016



Map Date: 10/5/2016
Photo Source: USGS 2009

Figure 2. Project Location

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 3.
Vegetation Communities (2016)

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Vegetation\Vegetation\v1\DG_Vegetation_Ecorp2016.mxd (MAG) mguidry 7/7/2016

Map Features

- Initial Project Footprint [1]
- Annual Maintenance Footprint [1]
- Side Slopes [1]
- Access Roads [1]

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2014-003.008 Devil's Gate Sediment Removal Project

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW

Map Date: 5/19/2016

Salix gooddingii Woodland Alliance – Black Willow Thickets

This alliance generally occurs between 0 and 500 meters (m) above mean sea level (amsl) on terraces along large rivers, in canyons, and along rocky floodplains of small, periodic streams, seeps and springs. In this alliance black willow (*Salix gooddingii*) is dominant or co-dominant in the tree canopy with Fremont's cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), red willow (*S. laevigata*), black elderberry (*Sambucus nigra*), and other trees. The shrub layer includes mulefat (*Baccharis salicifolia*), coyote bush (*B. pilularis*), and American dogwood (*Cornus sericea*). Trees in this alliance are typically smaller than 30 m in height and form an open to continuous canopy. The shrub layer is open to continuous and the herb layer is variable. Within the project area, this alliance also variously displays an understory/sub-shrub layer co-dominated by perennial pepperweed (*Lepidium latifolium*) and poison hemlock (*Conium maculatum*), an understory seasonally dominated by rough cocklebur (*Xanthium strumarium*), a bare-ground understory on the margins of the main channel, and/or an understory of native annuals. The U.S. Fish and Wildlife Service (USFWS) Wetland Inventory (1996) national list recognizes *Salix gooddingii* as a facultative wetland plant. The percentage of nonnatives and invasive plant species in the understory varies from 20 to 30 percent. Approximately 42.67 acres of *Salix gooddingii* Woodland Alliance present within the Project area; This vegetation community is the most dominant native alliance in the Project area; however, approximately 72 percent of this community is considered disturbed due to the presence of nonnative and invasive plants in the understory. This alliance is primarily located along the central portion of the Project area generally surrounding the areas of *Baccharis salicifolia* Shrubland Alliance and *Lepidium latifolium-Conium maculatum* Herbaceous Semi-Natural Alliance.

Sparse *Salix gooddingii* Woodland Alliance – Black willow Thickets

This a variation of the *Salix gooddingii* Woodland Alliance in which the vegetation community exists as described in the unaltered description (see previous) but at a greatly diminished cover value. Within the Project area, this alliance displays a sparse understory of native annuals on the borders and within the main channel. Approximately 4.20 acres within the Project area is covered by this alliance and it is generally present along the active channel that conveys water from areas upstream through the reservoir to the dam. This vegetation community is bordered by *Baccharis salicifolia* Shrubland Alliance and *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.

Baccharis salicifolia Shrubland Alliance – Mulefat Thickets

This alliance generally occurs between 0 and 1,250 m amsl in mixed alluvium soils in canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels. In this alliance, *Baccharis salicifolia* is dominant or may be co-dominant with other shrub species including California sagebrush (*Artemisia californica*), tree tobacco (*Nicotiana glauca*), Arrow weed (*Pluchea sericea*), sandbar willow (*Salix exigua*), *S. lasiolepis,* laurel sumac (*Malosma laurina*), *and Sambucus nigra*. Additionally, emergent trees including western sycamore (*Platanus racemosa*), *Populus fremontii,* oak (*Quercus* spp.), and willow (*Salix* spp.) may also be present in low cover. Shrubs are typically less than 5 m tall and the canopy is continuous with two tiers at 2 m and 5

m. The herbaceous layer is usually thin. The USFWS Wetland Inventory national list recognizes *Baccharis salicifolia* as a facultative wetland plant. Within the project area, this alliance also variously displays an understory/sub-shrub layer co-dominated by *Lepidium latifolium* and *Conium maculatum*, a bare-ground understory on the margins of the main channel, and/or an understory of native annuals. The percentage of nonnatives and invasive plant species in the understory varies from 20 to 40 percent. Approximately 25.23 acres of *Baccharis salicifolia* Shrubland Alliance is present within the Project area; however, approximately 91 percent of this vegetation community is considered disturbed due to the presence of nonnative and invasive plants. This alliance is primarily located in the central portion of the Project area and is generally surrounded by the *Salix gooddingii* Woodland Alliance.

Lepidospartum squamatum Shrubland Alliance – Scalebroom Scrub

This alliance is generally found between 50 and 1,500 m amsl in intermittently or rarely flooded, low gradient alluvial deposits along streams, washes and fans. In this alliance, scalebroom (*Lepidospartum squamatum*) is dominant, co-dominant, or conspicuous in the shrub canopy in association with burrobrush (*Ambrosia salsola*), *Artemisia californica*, *Baccharis saicifolia,* brittlebush (*Encelia farinosa*), yerba santa (*Eriodictyon* sp.), *Malosma laurina*, California buckwheat (*Eriogonum fasciculatum*), sugar bush (*Rhus ovata*), poison oak (*Toxicodendron diversilobum*), and other shrubs. The shrubs in this alliance are typically less than 2 m in height and some emergent taller plants may be present at low cover including *Platanus racemosa, Populus* spp., and *Sambucus nigra.* The herbaceous layer varies and may be grassy. This alliance within the Project area may be considered equivalent to a Riversidean Alluvial Fan Sage Scrub described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Approximately 5.09 acres of *Lepidospartum squamatum* Shrubland Alliance is present within the Project area. This denser variation of the alliance makes up approximately 19 percent of the total acres of the *Lepidospartum squamatum* Shrubland Alliances in the Project area. This alliance is located along the banks of the channel in the northeastern portion of the Project area and is generally surrounded by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance, *Baccharis salicifolia* Shrubland Alliance, *Salix gooddingii* Woodland Alliance, and *Artemisia californica* - *Eriogonum fasciculatum* Shrubland Alliance.

Sparse *Lepidospartum squamatum* Shrubland Alliance – Sparse Scalebroom Scrub

This a variation of the *Lepidospartum squamatum* Shrubland Alliance in which the vegetation community exists as described in the unaltered description (see previous) but at a greatly diminished cover value. This community refers to the upstream regions of the riparian corridor where the channel widens and vegetation occurs as single individuals of different taxa or small islands of associated taxa spaced throughout the corridor. The species present tend to be species associated with seasonal water channels and range from medium-sized shrubs (e.g. scalebroom) to full-size cottonwoods (*Populus* spp.) and *Salix* spp. While both woodland and shrub species are present, herbaceous species are almost totally lacking. A canopy is lacking except for within the islands of cottonwoods and/or willows. Approximately 22.19 acres of Sparse *Lepidospartum squamatum* Shrubland Alliance is present in the Project area, and represents approximately 81 percent of the total acres of *Lepidospartum squamatum* Shrubland Alliance in the Project area. This alliance variation occupies the open wash in the upstream portion of the Project area.

Artemisia californica-Eriogonum fasiculatum Shrubland Alliance – California Sagebrush-California Buckwheat Scrub

This alliance is generally found between 250 and 950 m amsl in alluvial or colluvial soils on slopes that are usually steep, south facing, and are rarely flooded or in low-gradient deposits along streams. *Artemisia californica* and *Eriogonum fasciculatum* are co-dominant in the shrub canopy with each species having 30 to 60 percent relative cover. Associated species include chamise (*Adenostoma fasciculatum*), *Malosma laurina,* California ephedra (*Ephedra californica*), lemonade berry (*Rhus integrifolia*), white sage (*Salvia apiana*), and other shrubs present at low cover. The canopy is intermittent to continuous and may be two-tiered with the upper layer less than 5 m and most shrubs less than 2 m. The herbaceous layer varies both seasonally and annually. Within the Project area, this alliance also variously displays an understory of non-native grasses and forbs and occasionally an understory/sub-shrub layer co-dominated by *Lepidium latifolium* and *Conium maculatum*. The percentage of nonnatives and invasive plant species in the understory varies from 20 to 30 percent. Approximately 8.34 acres of *Artemisia californica-Eriogonum fasiculatum* Shrubland Alliance is present within the Project area; however approximately 77 percent of this alliance is considered disturbed due to the presence of nonnative and invasive plants. This alliance is primarily located along the northwestern edge of the Project area with a small patch also located in the southwest adjacent to Oak Grove Drive. In the northwestern areas, this alliance is generally bordered by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance, Sparse *Lepidospartum squamatum* Shrubland Alliance, and *Baccharis salicifolia* Shrubland Alliance.

Quercus agrifolia Woodland Alliance – Coast Live Oak Woodland

This alliance generally occurs between 0 and 1,200 m amsl in habitats with deep, loamy, or sandy soils with a high amount of organic matter and on alluvial terraces, canyon bottoms, stream banks, slopes, and flats. In this alliance, Coast live oak (*Quercus agrifolia*) is dominant, or may be co-dominant in association with other trees, including bigleaf maple (*Acer macrophyllum*), box elder (*A. negundo*), *Platanus racemosa*, *Populus fremontii*, blue oak (*Quercus douglasii*), valley oak (*Q. lobata*), black oak (*Q. kelloggii*), and *Salix lasiolepis.* The canopy is open to continuous with trees being less than 30 m tall. A sparse to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of non-native grasses and forbs, and/or escaped horticultural cultivars. Approximately 22.80 acres of *Quercus agrifolia* Woodland Alliance is present within the Project area. This alliance is primarily located along the western side in Oak Grove Park and along the eastern side along the base of the hills below the residential development. This alliance generally occurs in the more upland portions of the Project area.

Platanus racemosa Woodland Alliance Disturbed – California Sycamore Woodlands

This alliance generally occurs between 0 and 2,400 m amsl and may be present in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. Soils are rocky or cobbly alluvium with permanent moisture at depth. In this alliance, *Platanus racemosa* is dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), southern California black walnut (*Juglans californica*), *Populus fremontii*, *Quercus agrifolia*, *Quercus lobata*, *Salix exigua*, *S. gooddingii*, *S. laevigata*, *S. lasiolepis*, yellow willow (*S. lutea*), Peruvian peppertree (*Schinus molle*), and California bay (*Umbellularia californica*). The canopy is open to intermittent with trees generally being less than 35 m tall. An open to intermittent shrub layer may be present as well as a sparse to grassy herbaceous layer. The USFWS Wetland Inventory (1996) national list recognizes *Platanus racemosa* as a facultative wetland plant. Within the Project area, this alliance also variously displays a disturbed bare-ground understory associated with recreational use within the Park, an understory of non-native grasses and forbs, and/or escaped horticultural cultivars. Approximately 1.58 acres of *Platanus racemosa* Woodland Alliance Disturbed is present along the edges of the percolation basins located in the northeastern portion of the Project area. This alliance is generally surrounded by the *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.

Brassica nigra and other mustards Herbaceous Semi-Natural Alliance – Upland mustards

This alliance generally occurs between 0 and 1,500 m amsl and may be present in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, and waste places. In this alliance, black mustard (*Brassica nigra*), common mustard (*B. rapa*), Saharan mustard (*B. tournefortii*), short podded mustard (*Hirschfeldia incana*), Dyer's woad (*Isatis tinctoria*), or wild radish (*Raphanus sativus*) are dominant or co-dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by non-native, invasive grasses. The canopy in this alliance is open to continuous with an herb layer generally less than 3 m tall. Approximately 23.09 acres of *Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance is present within the Project area. This alliance occurs throughout the Project area but is more concentrated in the percolation basins on the northeastern side. This alliance is the most dominant non-native alliance cover within the Project area.

Conium maculatum Herbaceous Semi-Natural Alliance – Poison Hemlock Patches

This alliance generally occurs between 0 and 1,000 m amsl and is found in all topography types including wetlands. The USFWS Wetland Inventory (1996) national list recognizes *Conium maculatum* as a wetland indicator plant. In this alliance, *Conium maculatum*, sweet fennel (*Foeniculum vulgare*), or another non-native invasive plant of the family *Apiaceae* is dominant or co-dominant. Other non-native plants are also present in the herbaceous layer and emergent trees and shrubs may be present at low cover. This alliance is dominated by non-native, invasive plants. The canopy in this alliance is open to continuous with an herb layer generally less than 2 m tall. Approximately 6.24 acres of *Conium maculatum* Herbaceous Semi-Natural Alliance is present within the Project area and approximately 30 percent of the areas covered by this alliance support an understory dominated by *Lepidium latifolium.* This alliance is present in small patches within the project area adjacent to areas containing *Baccharis salicifolia* Shrubland Alliance and *Salix gooddingii* Woodland Alliance.

Lepidium latifolium – Conium maculatum Semi-Natural Herbaceous Stand – Poison Hemlock – Perennial Pepperweed Patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd. Edition. Rather, it is an amalgam of two non-native alliances from the manual, *Lepidium latifolium* Semi-Natural Herbaceous Stands and *Conium maculatum – Foeniculum vulgare* Semi-Natural Herbaceous Stands. This unofficial alliance was identified to best describe the areas where *Lepidium latifolium* and *Conium maculatum* are co-dominant in the Project area and it refers to that site only. Both *Lepidium latifolium* and *Conium maculatum* are considered wetland indicator species by the USFWS. A low cover of emergent trees, eucalyptus trees, and shrubs also occur within this alliance, as well as other invasive annuals. Approximately 13.28 acres of this alliance is present within the Project area. This combination land cover type occurs in both the upland and riparian corridor topographies on site and is concentrated in the central and western portions of the site where it is surrounded by the *Salix gooddingii* Woodland and the *Baccharis salicifolia* Shrubland alliances.

Lepidium latifolium Herbaceous Semi-Natural Alliance – Perennial Pepper Weed Patches

This alliance generally occurs between 0 and 1,900 m amsl and is found within intermittently and seasonally flooded fresh and saltwater marshes and riparian corridors. The USFWS Wetland Inventory national list recognizes *Lepidium latifolium* as a wetland indicator plant. In this alliance, *Lepidium latifolium* is dominant in the herbaceous layer with emergent trees and shrubs that may be present at low cover. This alliance is dominated by non-native, invasive plants. The canopy in this alliance is intermittent to continuous with an herb layer generally less than 2 m tall. Approximately 1.80 acres of monotypic *Lepidium latifolium* Herbaceous Semi-Natural Alliance is present in the western portion of the Project area adjacent to areas containing *Baccharis salicifolia* Shrubland Alliance and *Salix gooddingii* Woodland Alliance.

Rumex crispus Herbaceous Semi-Natural Alliance – Curly dock patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. The *Rumex crispus* Herbaceous Semi-Natural Alliance is an unofficial alliance to best describe the areas where non-native curly dock (*Rumex crispus*) seasonally dominates and it refers to this site within the Project area only. This alliance only occurs in a 0.3 acre small, depressional area in the old mining pit in the western portion of the site. The old mining pit receives precipitation and urban run-off and may remain inundated for extended periods. As the water soaks into the ground, the curly dock begins to grow and by the time the water has dried up completely, the entire depression becomes vegetated with this nonnative plant species. The depression in the mining pit where the curly dock occurs is mostly surrounded by the *Salix gooddingii* Woodland alliance on site.

Xanthium strumarium Herbaceous Alliance – Cocklebur patches (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. It is a modification of the existing alliance from that reference called *Persicaria lapathifolia* - *Xanthium strumarium* Provisional Herbaceous Alliance. The official alliance is characterized by *Xantium strumarium* or other knotwood species being dominant or co-dominant in the herbaceous layer with other herbaceous species including Devil's beggartick (*Bidens frondosa*), five angled dodder (*Cuscutta pentagona*), barnyard grass (*Echinochloa* spp.), and common spikerush (*Ecleocharis marostachya*). The unofficial *Xanthium strumarium* Herbaceous Alliance occurs in areas in the Project area where *Xanthium strumarium* seasonally dominates and it refers to this site only. This unofficial alliance occupies approximately 1.50 acres along the frequently flooded stream terraces closest to the dam where the soils are typically clay-rich or silty.

Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance – Eucalyptus groves

This alliance generally occurs between 0 and 300 m amsl and is typically planted as trees, groves, and windbreaks and may become naturalized in uplands and along stream courses. In this alliance, red gum (*Eucalyptus camaldulensis*), blue gum (*E. globulus*), or other gum tree is dominant in the tree canopy. The canopy in this alliance is intermittent to continuous with trees typically less than 50 m tall. The shrub layer and herbaceous layer are typically sparse to intermittent. Within the Project area, this alliance covers approximately 0.27-acre area near the dam. Non-native grasses and forbs dominate the understory and the surrounding habitat is classified as disturbed. Eucalyptus trees are also common throughout the portions of the Project area but not in stands that would classify as an alliance.

Fraxinus velutina Forest Alliance - Velvet Ash Stands (Unofficial Alliance)

This alliance is not listed in *A Manual of California Vegetation,* 2nd Edition. The unofficial *Fraxinus velutina* Forest Alliance best describes areas where velvet ash (*Fraxinus velutina*) trees were dominant. This alliance was identified in a 0.46-acre area in the northwestern corner of the Project area along the edge of the existing road. The small area is otherwise surrounded by the *Salix gooddingii* Woodland alliance on site. Velvet ash also commonly occur as individuals bordering the perimeter trail on the west side of the Project area.

Landscaped

The landscaped cover type refers to ornamental vegetation that does not exist in a natural state; rather the landscaped land cover type contains vegetation that has been planted and is regularly irrigated and maintained. A small 0.15-acre area along the southernmost edge of the Project area adjacent to Oak Grove Drive was classified as landscaped.

Depression/Bare Ground (Associated with Seasonally Wet Area)

The depression/bare ground land cover type refers to ground cover within two small areas in the central portion of the project area that are associated with the seasonally wet areas. These two small areas have a combined area of 0.39 acres. They are seasonally inundated with water and, when dry, are generally bare or are sparsely vegetated.

Disturbed

The disturbed land cover type refers to areas where human activities have altered the environmental conditions in such a way that the natural vegetation community has been extirpated and the area is now bare of vegetation or supports a community of non-native or ruderal plant species. Approximately 16.08 acres within the Project area were classified as the disturbed land cover type. This land cover type exists in the more highly disturbed habitats, in the basins on the eastern side of the Project area, and in the paved and dirt roads and trails.

2.2 Survey Area Description

The survey area extends from the base of the dam near Interstate 210 at the south end of the site to approximately 4,800 feet upstream (near the parking lot at the south end of Arroyo Road). Suitable habitat within Devil's Gate Reservoir and in adjacent areas was surveyed for least Bell's vireos. The width of the survey area varies considerably from an estimated 100 feet at its narrowest point to over 1,200 feet in some areas. Potentially suitable habitat is scattered throughout the reservoir, including areas with undisturbed willow and mule fat habitats and other areas with disturbed willow and mule fat habitat. The disturbed willow and mule fat habitats are considered disturbed because of varying infestations of nonnative and invasive plant species in the understories. The willow habitats where nonnative and invasive plant species dominate the understory represent lower quality vireo habitat. The structure of the potentially suitable habitats in the reservoir also varies with some areas supporting mature willows with little to no understory and other areas supporting dense mule fat thickets with very few or no willows in the overstory.

3.0 SURVEY METHODOLOGY

3.1 Least Bell's Vireo

Prior to conducting the focused survey, a search was conducted of the California Natural Diversity Data Base (CDFW 2016a) for the Pasadena 7.5-minute series quadrangle map (and the surrounding 8 quadrangles) and other references to determine if and to what extent least Bell's vireo are known to occur in the project region.

Focused least Bell's vireo surveys were conducted in accordance with the 2001 USFWS protocol guidelines (USFWS 2001). Eight surveys spaced a minimum of 10 days apart were conducted between April 10 and July 31, and 2 additional surveys were conducted in August. Surveys three through seven for least Bell's vireo were conducted concurrently with southwestern willow flycatcher surveys. The locations of least Bell's vireo detections were recorded using a handheld GPS unit capable of 1 to 3 m accuracy.

3.2 Survey Dates, Personnel, and Conditions

Surveys were conducted by Shannan Shaffer of ECORP and Brian Leatherman of Leatherman Bioconsulting, Inc. Table 2 lists the dates, surveyors, times, and weather conditions for each survey.

Table 2. Survey Dates, Personnel, and Conditions

Date	Surveyors	Survey	Time		Temperature (°F)		Cloud Cover (%)		Wind Speed (mph)	
			start	end	start	end	start	end	start	end
4/20/16	Shannan Shaffer	LBVI 1	0545	1100	66	81	0	0	0-3	0-3
5/4/16	Shannan Shaffer	LBVI 2	0545	1100	58	67	0	0	1-4	1-4
5/16/16	Brian Leatherman	LBVI 3	0600	1115	56	66	100	100	0-2	2-4
6/1/16	Brian Leatherman	LBVI 4	0600	1045	53	70	100	100	0-2	2-4
6/15/16	Brian Leatherman	LBVI 5	0545	1100	54	65	100	100	0-2	0-2
6/29/16	Brian Leatherman	LBVI 6	0530	1045	61	83	80	0	0-2	2-4
7/6/16	Brian Leatherman	LBVI 7	0600	1030	59	70	100	10	0-2	2-4
7/25/16	Shannan Shaffer	LBVI 8	0530	1100	67	86	0	0	0-2	0-2
8/17/16	Shannan Shaffer	LBVI 9	0615	1100	67	85	0	0	0-6	0-6
8/29/16	Shannan Shaffer	LBVI 10	0625	1100	67	83	0	0	0-4	0-4

4.0 RESULTS AND DISCUSSION

Least Bell's vireos were only detected within the study area during the early and late season surveys. Table 3 lists the dates, coordinates, and details of each of the observations of least Bell's vireos in the study area during 2016. Figure 4 shows the locations where each of these observations occurred. For reference, the map also shows the boundaries of the areas where impacts will occur as a result of the Devil's Gate Reservoir Sediment Removal and Management Project.

On April 20, an adult male vireo was observed singing in a mule fat patch located in the northwestern portion of the study area and an adult female was also observed nearby on the same date. This was the only potential pair of vireos observed in the study area during 2016. During the follow-up survey on May 4, the territorial male was still present in the same location but there was no longer a female vireo detected in the area. The territorial male was no longer present in the mule fat patch when the area was surveyed again on May 16. Between the May

16 and August 1, vireos were not observed or detected anywhere in the study area, which indicates that least Bell's vireos were not nesting within the study area during 2016. On August 1, a single juvenile least Bell's vireo crossed a trail in front of the surveying biologist during a yellow-billed cuckoo focused survey in the western portion of the study area. On August 17, an adult male vireo was briefly heard singing near the southeastern edge of the riparian habitat.

Table 3. Least Bell's Vireo Survey Results

Date	11N UTM Coordinates	Observation Notes
4/20/16	392069E 3784501N	One adult male least Bell's vireo was detected singing in mule fat at this location. One adult female was observed nearby.
	392054E 3784455N	One adult male least Bell's vireo was detected singing in mule fat at this location. Based on location it is likely the same male that was observed earlier in the day.
5/4/16	392057E 3784487N	One adult male least Bell's vireo was heard and observed singing in mule fat at this location.
8/1/16	391707E 3784013N	A single juvenile least Bell's vireo was observed during the focused survey for yellow-billed cuckoo.
8/17/16	391862E 3783480N	An adult male least Bell's vireo was briefly heard singing along the southeastern edge of the riparian vegetation.

4.1 Least Bell's Vireo Critical Habitat

Critical habitat for the species was designated in 1994 (USFWS 1994). The Project site is not located within designated critical habitat for the least Bell's vireo (USFWS 1994).

4.2 Incidental Special Status Species

One wildlife species included on the CDFW special animals list (CDFW 2016b) was observed within the study area. Adult yellow warblers (*Setophaga petechia*), a CDFW Species of Special Concern (SSC), were observed within the study area. A list of wildlife species observed during the surveys is included as Appendix A.

Figure 4.
Least Bell's Vireo Survey Results Map

Map Features

- Initial Project Footprint [1]
- Side Slopes [1]
- Annual Maintenance Footprint [1]

Least Bell's Vireo Survey Results

- 4/20/2016 - Two adult least Bell's vireo - 1 male/1 female
- 5/4/2016 - One adult male least Bell's vireo
- 8/17/2016 - One adult male least Bell's vireo
- 8/1/2016 - One juvenile least Bell's vireo

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\sss_survey_and_mapping\LBVI_WIFL\DG_LBVI_Vegetation_Ecorp2016.mxd (MAG)-mguidry 9/27/2016

Map Date: 9/27/2016

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW

5.0 CONCLUSIONS

The results of the eight focused protocol surveys for least Bell's vireos during the breeding season indicate that this species was not nesting within the study area during 2016. The period between April 10 and July 31 is considered the nesting season for least Bell's vireos. The vireos observed early in the season were likely individuals looking for suitable habitat to establish breeding territories and those who were for looking for mates. The male and female observed during the first and second surveys early in the season (April 20 and May 4) did not remain in the study area to establish a breeding territory or to nest. The absence of vireo sightings in the study area during the remainder of the breeding season suggests that this species did not nest in the habitats in Devil's Gate Reservoir during the breeding season of 2016. Vireos observed after July 31 are typically dispersing juveniles and adults moving through areas as they initiate their migration south to the wintering grounds. The sightings of vireos that occurred on August 1 and August 17 in 2016 indicate that the study area provided suitable habitat for juveniles and adults during dispersal and migration.

6.0 LITERATURE CITED

[CDFW] California Department of Fish and Wildlife, Natural Diversity Data Base. 2016a. Online Rarefind electronic data base of special status species locations for the Sunland, Condor Peak, Chilao Flat, Burbank, Pasadena, Mt. Wilson, Hollywood, Los Angeles, and el Monte USGS 7.5 minute series quadrangles. California Department of Fish and Wildlife, Natural Heritage Division, Sacramento.

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[USFWS] U.S. Fish and Wildlife Service 2001. Least Bell's Vireo Survey Guidelines. U.S. Department of the Interior. Carlsbad, CA, USFWS, 3 pp.

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Appendix A

Wildlife Compendium

SCIENTIFIC NAME	COMMON NAME
Birds	
Accipitridae	**Hawks, Kites, & Eagles**
Buteo jamaicensis	Red-tailed hawk
Odontophoridae	**New World Quail**
Callipepla californica	California quail
Columbidae	**Pigeons and Doves**
Zenaida macroura	Mourning dove
Cuculidae	**Cuckoos and Roadrunners**
Geococcyx californianus	Greater roadrunner
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
*Selasphorus sasin***	Allen's hummingbird
Vireonidae	**Vireos**
*Vireo bellii pusillus****	Least Bell's vireo
Corvidae	**Jays and Crows**
Aphelocoma californica	Western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Hirundinidae	**Swallows**
Petrochelidon pyrrhonota	Cliff swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Aegithalidae	**Bushtits**
Psaltriparus minimus	Bushtit
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Sylviidae	**Wrentits**
Chamaea fasciata	Wrentit
Mimidae	**Mockingbirds and Thrashers**
Mimus polyglottos	Northern mockingbird
Sturnidae	**Starlings**
Sturnus vulgaris	European starling
Parulidae	**Wood warblers**
Geothlypis trichas	Common yellowthroat
*Setophaga petechia***	Yellow warbler
Emberizidae	**Towhees and Sparrows**
Melospiza melodia	Song sparrow
Pipilo crissalis	California towhee
Pipilo maculatus	Spotted towhee
Icteridae	**Blackbirds & Orioles**
Icterus cucullatus	Hooded oriole
Molothrus ater	Brown-headed cowbird
Fringillidae	**Finches**
Spinus psaltria	Lesser goldfinch
Haemorhous mexicanus	House finch
Mammals	

SCIENTIFIC NAME	COMMON NAME
Canidae	**Dogs, Wolves, & Foxes**
Canis latrans	Coyote

*	Nonnative species
**	CDFW California Species of Special Concern/Watch List Species/FP Species
***	State and/or Federally Listed Species

October 27, 2016
(20767)

Alma Fuentes
Water Resources Division
County of Los Angeles Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

SUBJECT: 2016 FOCUSED SURVEY REPORT FOR WESTERN YELLOW-BILLED CUCKOO AT THE DEVIL'S GATE RESERVOIR, LOS ANGELES COUNTY, CALIFORNIA

Dear Ms. Fuentes:

Chambers Group, Inc. (Chambers Group) biologists conducted focused surveys for western yellow-billed cuckoo (*Coccyzus americanus*, WYBC) during the breeding season of 2016 for the Devil's Gate Reservoir Sediment Removal and Management Project located in the City of Pasadena, Los Angeles County, California. The results of the surveys are presented in this letter report.

SURVEY LOCATION

The survey area is located in the Devil's Gate Reservoir in the city of Pasadena in Los Angeles County, California, on Assessor's Parcel Numbers 5823015902, 5823004900, 5823003911, 5823003910, 5823003907, 5823003909, and 5823031900. Devil's Gate Reservoir is found in the La Cañada, San Pascual-Grafias, and San Rafael special survey areas in the California United States Geological Survey (USGS) 7.5-minute *Pasadena* topographic quadrangle. A map of the survey area is provided in Attachment 1.

WESTERN YELLOW-BILLED CUCKOO NATURAL HISTORY

The WYBC (nesting) is a federally-listed threatened and a state-listed endangered species. The WYBC is found primarily in the Eastern United States, but this subspecies is an extremely rare and localized summer resident of the southwestern U.S. Historically, it was found commonly throughout the Central Valley and California coastline until the early 20th century. It is a medium-sized bird with a brown back, a yellow, decurved bill, and a long grey-brown tail with distinctive white spots on the outer retrices. This species primarily inhabits mature, open riparian woodlands along the broad, lower flood-bottoms of larger river systems. Habitat features usually include some relatively open patches and intermixed low, dense, scrubby vegetation typical of these watercourses. In the southwestern U.S., the western WYBC also occupies desert riparian woodlands composed of willows (*Salix* spp.), Fremont cottonwoods (*Populus fremontii*), and dense mesquite (*Prosopis* spp.). It typically nests in willows and forages more so among the cottonwoods and other trees. Its diet includes caterpillars, grasshoppers, other large insects, frogs, and some small lizards. Populations of the western WYBC in California were decimated before the mid-20th century by the extensive loss of riparian habitat to agriculture and development as well as by heavy pesticide use, and have not rebounded since that time (Hughes 1999).

In California, breeding populations of greater than five pairs which persist every year are currently limited to the Sacramento River from Red Bluff to Colusa, and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other sites where small populations of cuckoos (<5 pairs) breed or possibly breed (but not necessarily every year) are: The Feather River from Oroville to Verona, Butte, Yuba and Sutter counties; the Prado Flood Control Basin, San Bernardino and Riverside counties; the Amargosa River near Tecopa, Inyo Co.; the Owens Valley near Lone Pine and Big Pine, Inyo Co.; the Santa Clara River near Santa Clarita, Los Angeles Co.; the Mojave River near Victorville, San Bernardino Co.; and the Colorado River from Needles, San Bernardino Co. to Yuma, Imperial Co. (Laymon 1998).

METHODS

Focused surveys were conducted within habitat that was determined to be suitable for WYBC by the surveying biologist in 2016 (Attachment 2).

Breeding season WYBC surveys were conducted by United States Fish and Wildlife Service (USFWS)- permitted biologist John Griffith (TE-758175). Survey methodology followed the WYBC survey protocol (Halterman et al 2015). Each survey was conducted during favorable weather conditions to maximize detection probability.

The WYBC survey protocol (Halterman et al 2015) requires four surveys conducted 12 to 15 days apart, in mild conditions, from half an hour before sunrise to 1100 hours. One survey is to be conducted between June 15 and 30, two surveys are to be conducted between June 30 and July 31, and one survey is to be conducted between August 1 and August 15.

The four 2016 surveys were conducted on June 20, July 5, July 17, and July 31 (Table 1). All surveys were conducted on foot by looking and listening for the target species in all suitable riparian habitat within the survey area and a 500-foot buffer (Attachment 2). Observations of the songs, scolds, whisper calls, flight patterns, behaviors, and plumage characteristics were used in conjunction to ascertain presence/absence of WYBC. The biologist conducted the surveys from optimal stationary locations to see and hear the target species without harming any other wildlife species in the area.

The permitted biologist used prerecorded WYBC vocalizations to elicit WYBC within and/or adjacent to all suitable habitat for 5 minutes (a short call with a 50-55 second listening period repeated 5 times) at 100 meter intervals across the length and breadth of the suitable habitat. If a WYBC was detected, the taped vocalization broadcast was ceased at that location, and the location, numbers, status, and demographic data of the target species were recorded.

All observed wildlife species were recorded for each survey day (Attachment 3).

RESULTS

<u>Survey Conditions</u>

Survey conditions are presented in Table 1.

Table 1. Survey Conditions

Date	Surveyor	Time		Temperature*		Wind**		Cloud Cover		Precipitation	
		Start	End	Start	End	Start	End	Start	End	Start	End
06/20/16	John Griffith	5:30 A.M.	10:30 A.M.	74.2	109	0	2	0%	0%	0	0
07/05/16	John Griffith	6:00 A.M.	11:00 A.M.	63.2	78.5	1	2	100%	0%	0	0
07/17/16	John Griffith	5:30 A.M.	10:30 A.M.	57.4	79.7	0	2	0%	0%	0	0
07/31/16	John Griffith	6:00 A.M.	10:30 A.M.	67.6	92.2	0	1	0%	100%	0	0

*All temperature readings are in Fahrenheit
**All wind readings are in miles per hour

No WYBC were detected within the survey area during the 2016 surveys. The WYBC Survey Summary forms are provided in Attachment 4.

CONCLUSIONS

No WYBC were found within the survey area during the 2016 focused surveys. The Devil's Gate Reservoir contains moderate quality habitat and no WYBC individuals have been recorded within five miles of the reservoir. One individual was recorded in 2011 within the San Gabriel River, approximately 14 miles southeast of the reservoir; however, no other observations have been recorded in the surrounding area and the individual is thought to be extirpated from the area. Thus, the WYBC is not anticipated to occur in the Devil's Gate Reservoir.

Please contact me at (949) 261-5414 ext. 7232 if you have any questions or concerns regarding these results.

Sincerely,

CHAMBERS GROUP, INC.

Heather Franklin
Staff Biologist

ENCLOSURES

Attachment 1 – Survey Location
Attachment 2 – Suitable Habitat
Attachment 3 – Wildlife Species Observed

Attachment 4 – Yellow-Billed Cuckoo Survey Summary Form

REFERENCES

California Department of Fish and Wildlife (CDFW)
2016 California Natural Diversity Database, Rarefind 4. Biogeographic Data Branch, Sacramento, CA.

Halterman, M., M.J. Johnson, J.A. Holmes and S.A. Laymon.
2015 A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo: U.S. Fish and Wildlife Techniques and Methods, 45 p.

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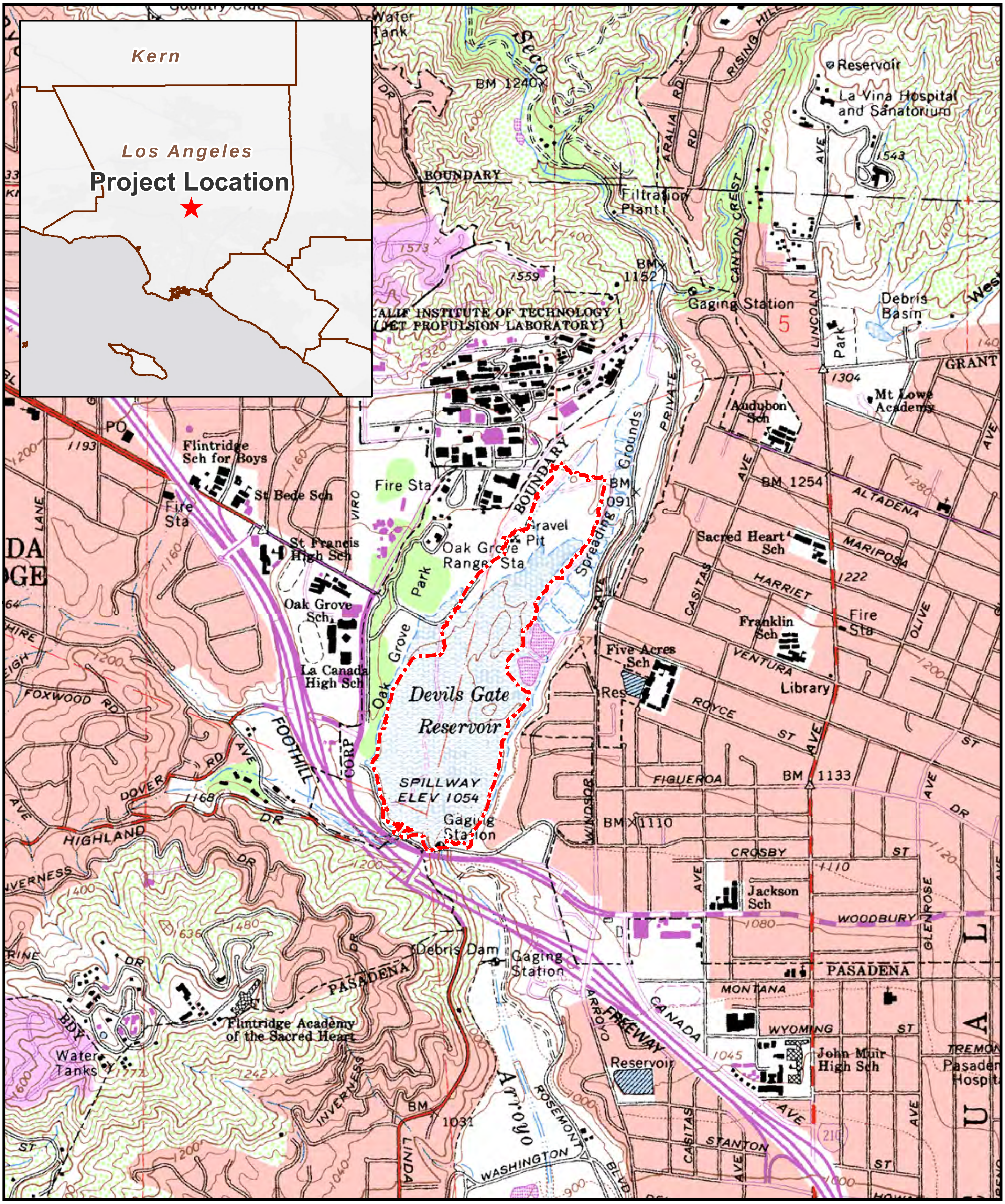
1999 Yellow-billed Cuckoo (*Coccyzus americanus*). In The Birds of North America, No. 418 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Laymon, S. A.
1998. Yellow-billed Cuckoo (*Coccycus americanus*). *In* The Riparian Bird Conservation Plan: A strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

ATTACHMENT 1 – SURVEY LOCATION



Legend

Survey Area

N

0 500 1,000 2,000

Feet

Attachment 1

Devil's Gate Reservoir Sediment Removal and Management Project

Survey Location

Name: 20767 Attach 1 Survey Location.Mxd

Print Date: 12/22/2014, Author: phuls

CHAMBERS GROUP

ATTACHMENT 2 – SUITABLE HABITAT

Legend

Photo Point (with direction)

Yellow-Billed Cuckoo Suitable Habitat

Survey Area

N

0 250 500 1,000

Feet

Attachment 2

Devil's Gate Reservoir Sediment Removal and Management Project

YBCU 2015 Suitable Habitat

Name: 20767 Attach 2 YBCU Suit Habitat.Mxd
Print Date: 9/16/2015, Author: msimmons

CHAMBERS GROUP

ATTACHMENT 3 – WILDLIFE SPECIES OBSERVED

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
CLASS AVES	**BIRDS**
ARDEIDAE	**HERONS, BITTERNS**
Ardea herodias	great blue heron
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
Accipiter cooperii	Cooper's hawk
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
CHARADRIIDAE	**PLOVERS**
Charadrius vociferus	killdeer
COLUMBIDAE	**PIGEONS & DOVES**
Columba livia	rock pigeon
Zenaida macroura	mourning dove
Zenaida asiatica	white-winged dove
CUCULIDAE	**CUCKOOS & ROADRUNNERS**
Geococcyx californianus	greater roadrunner
APODIDAE	**SWIFTS**
Aeronautes saxatalis	white-throated swift
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
Archilochus alexandri	black-chinned hummingbird
PICIDAE	**WOODPECKERS**
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	downy woodpecker
Melanerpes formicivorus	acorn woodpecker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Empidonax difficilis	Pacific-slope flycatcher
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird
ALAUDIDAE	**LARKS**
Eremophila alpestris	horned lark

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
HIRUNDINIDAE	**SWALLOWS**
Petrochelidon pyrrhonota	cliff swallow
Stelgidopteryx serripennis	northern rough-winged swallow
Tachycineta bicolor	tree swallow
Hirundo rustica	barn swallow
CORVIDAE	**JAYS & CROWS**
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Aphelocoma californica	California scrub jay
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
TROGLODYTIDAE	**WRENS**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
SYLVIIDAE	**OLD WORLD WARBLERS**
Chamaea fasciata	wrentit
TURDIDAE	**THRUSHES**
Sialia mexicana	western bluebird
Catharus ustulatus	Swainson's thrush
Turdus migratorius	American robin
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
PTILOGONATIDAE	**SILKY-FLYCATCHERS**
Phainopepla nitens	phainopepla
VIREONIDAE	**VIREOS**
Vireo gilvus	warbling vireo
Vireo huttoni	Hutton's vireo
PARULIDAE	**WOOD WARBLERS**
Oreothlypis celata	orange-crowned warbler
Setophaga petechia	yellow warbler
Geothlypis trichas	common yellowthroat
Cardellina pusilla	Wilson's warbler
Icteria virens	yellow-breasted chat
ICTERIDAE	**BLACKBIRDS**
Agelaius phoeniceus	red-winged blackbird

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
Molothrus ater	brown-headed cowbird
Icterus cucullatus	hooded oriole
Icterus bullockii	Bullock's oriole
EMBERIZIDAE	**EMBERIZIDS**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
Chondestes grammacus	lark sparrow
Junco hyemalis	dark-eyed junco
CARDINALIDAE	**CARDINALS**
Pheucticus melanocephalus	black-headed grosbeak
Passerina caerulea	blue grosbeak
Passerina amoena	lazuli bunting
FRINGILLIDAE	**FINCHES**
Spinus psaltria	lesser goldfinch
Haemorhous mexicanus	house finch
Spinus tristis	American goldfinch
Carpodacus purpureus	purple finch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow

ATTACHMENT 4 – YELLOW-BILLED CUCKOO SURVEY SUMMARY FORM

Yellow Billed Cuckoo Survey Summary Form 2016

Site Name: Devil's Gate Res.

USGS Quad Name: 7.5' PASADENA

County: Los Angeles

State: CA

Creek, River, Wetland, or Lake Name: Arroyo Seco

Elevation: 1,030 ft

Site Coordinates: Start: 34° 11.136N 118° 10.572 W

Stop: 34° 11.899 N 118° 10.162 W

UTM Zone: 11S

Datum: NAD

Ownership: BLM Reclamation NPS USFWS USFS Tribal State Private Other (Municipal/County)

Was site surveyed in previous year? **(Yes)** No Unknown

If yes, what site name was used? Pasadena Samp ∅ in 2015

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected.	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates UTM E	Surveyor Detection Coordinates UTM N	Distance (m)	Bearing	Cuckoo #	Corrected Coordinates UTM E	Corrected Coordinates UTM N
Survey Period #1 Observer(s): JT GRIFFITH	Date: 6/20 Start: 0530 Stop: 1030 Total hrs: 5	∅ Total:												
Survey Period #2 Observer(s): "	Date: 7/5 Start: 0600 Stop: 1100 Total hrs: 5	∅ Total:												
Survey Period #3 Observer(s): "	Date: 7/17 Start: 0530 Stop: 1030 Total hrs: 5	∅ Total:												
Survey Period #4 Observer(s): "	Date: 7/31 Start: 0600 Stop: 1030 Total hrs: 4.5	∅ Total:												
Survey Period #5 Observer(s):	Date: Start: Stop: Total hrs:	Total:												

Survey Summary: Total YBCUs*	# Det	#PO	#PR	#CO	#Nests found	Total Survey Hours:

Notes (refer to Cuckoo # associated with individual detections): Decent/suitable hab. some yewa + YBCh

*Include justification for these designations.

VOCALIZATION	CODE	BEHAVIOR	CODE	BEHAVIOR	CODE	BREEDING	CODE
Contact	CON	No visual	NV	Catches Prey	CP	Copulation	COP
Coo	COO	Sitting	ST	Carry Food	CF	Feeds Mate	FM
Knock/Alarm	ALA	Foraging	FO	Eats Food	EF	Carry Nest Material	CN
Juvenile Calls	JUVC	Preening	PRE	At Nest	AN	Brooding/Incubating	BI
Other Vocalization	OV	Flying	FLY	Juvenile	JUV	Feeds Nestling	FN
		Distraction Display	DD	Vocal Exchange	VEX	Feeds Fledgling	FF

NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, US = used, inactive nest with blue-green eggshells.

APPENDIX G

2017 Focused Survey Report for Least Bell's Vireo and Southwestern Willow Flycatcher

Southwestern Willow Flycatcher and Least Bell's Vireo 2017 Survey Report for the Devil's Gate Reservoir Sediment Removal and Management Project Los Angeles County, California

Prepared for:
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

Prepared by:
ECORP Consulting, Inc.
1801 E. Park Court Place
Building B, Suite 103
Santa Ana, CA 92701

January, 2018

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1.0 INTRODUCTION

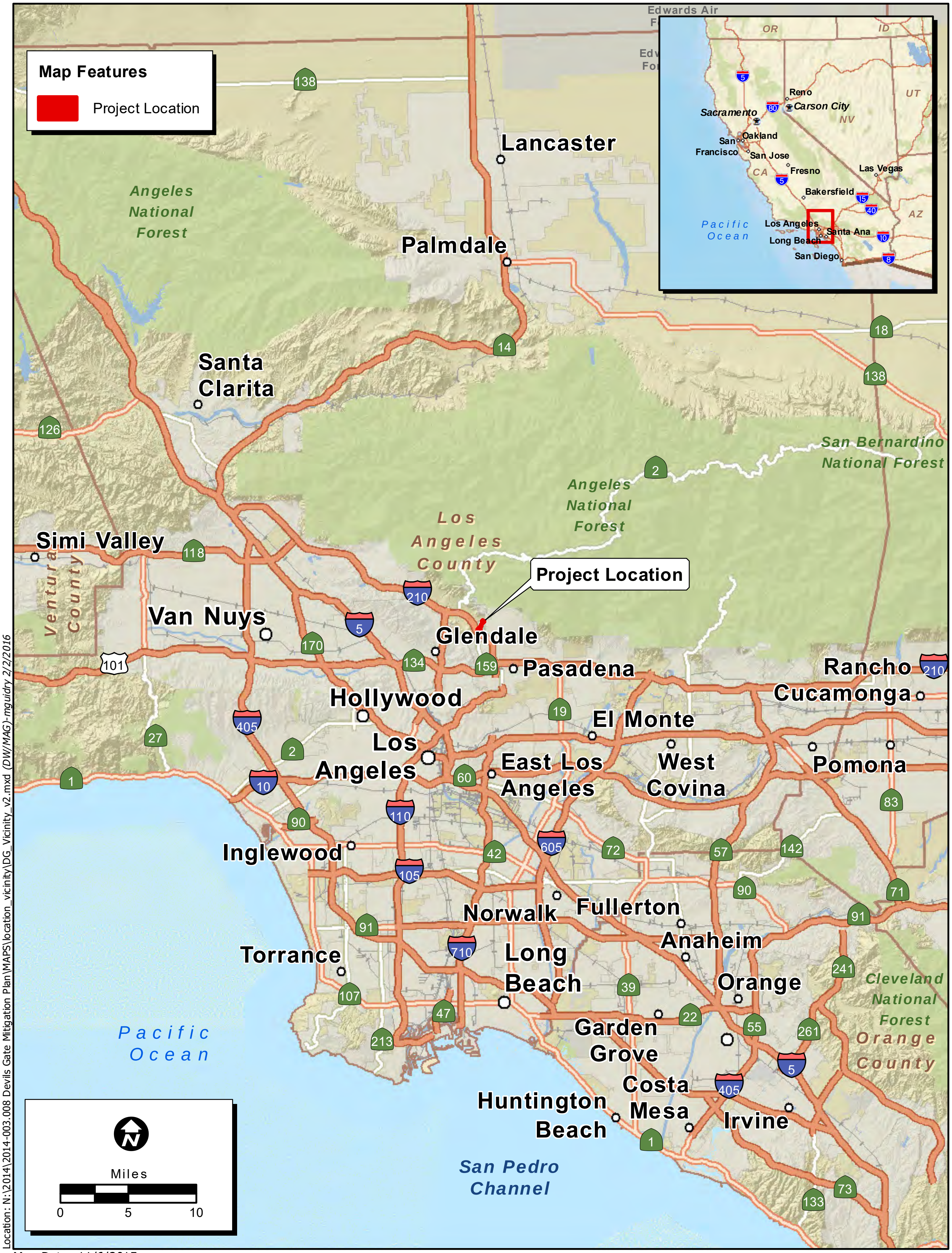
ECORP Consulting, Inc. (ECORP) conducted focused surveys to evaluate the presence or absence of southwestern willow flycatcher (*Empidonax traillii extimus*) and least Bell's vireo (*Vireo bellii pusillus*) within the proposed Devil's Gate Reservoir Sediment Removal and Management Project (Project) site in Los Angeles County, California. The least Bell's vireo and southwestern willow flycatcher are both federally and state-listed as endangered. This report summarizes the results of focused surveys conducted in 2017 for southwestern willow flycatcher and least Bell's vireo at the Project site.

1.1 Project Site Location

The Project site is located northeast of Interstate 210 and south of the Angeles National Forest in the City of Pasadena in Los Angeles County (Figure 1). The Project site is within the upper portion of the Arroyo Seco Watershed within the Hahamongna Watershed Park (Figure 2).

1.2 Survey Area Description

The survey area extends from the base of the dam near Interstate 210 at the south end of the site to approximately 4,800 feet upstream (near the parking lot at the south end of Arroyo Road). The width of the survey area varies considerably from an estimated 100 feet at its narrowest point to over 1,200 feet in some areas. Potentially suitable habitat is scattered throughout the reservoir and includes areas with disturbed and relatively undisturbed willow and mule fat habitats (Figure 3). All potentially suitable habitat, both in and adjacent to the Project site, was surveyed for willow flycatcher and least Bell's vireo.



Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Vicinity_v2.mxd (DW/MAG)-mguidry 2/2/2016

Map Date: 11/6/2015

Service Layer Credits: Sources: USGS, ESRI, TANA, AND

Figure 1. Project Vicinity

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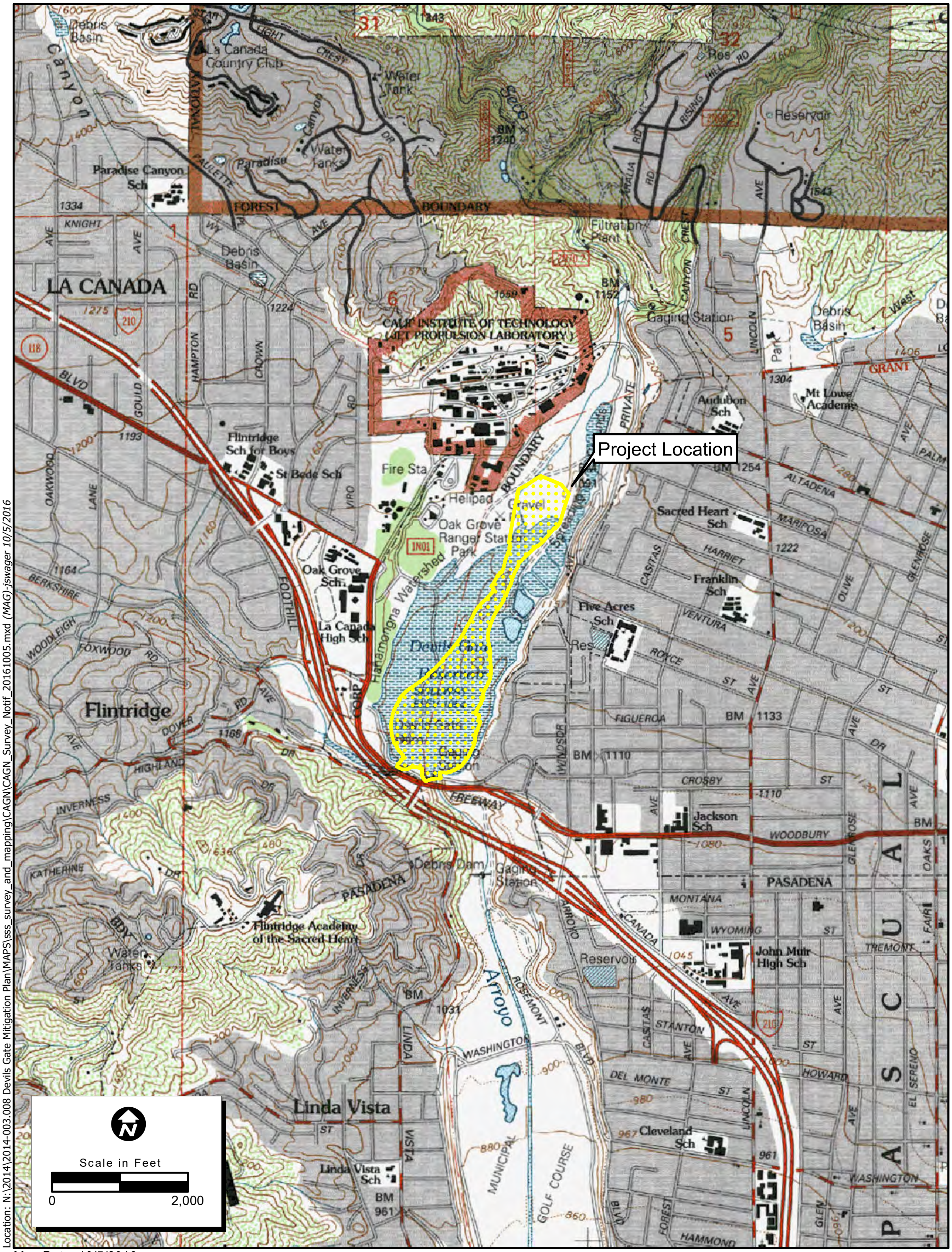

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\sss_survey_and_mapping\CAGN\CAGN_Survey_Notif_20161005.mxd (MAG)-jswager 10/5/2016

Map Date: 10/5/2016
Photo Source: USGS 2009

Figure 2. Project Location

2014-003.008 Devils Gate Mitigation Plan

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Figure 3.
Vegetation Communities (2016)

Map Features

- Initial Project Footprint [1]
- Annual Maintenance Footprint [1]
- Side Slopes [1]
- Access Roads[1]

Vegetation Name

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance
- Baccharis salicifolia Shrubland Alliance
- Brassica nigra and other mustards Herbaceous Semi-Natural Alliance
- Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium
- Depression/Bare ground
- Disturbed
- Eucalyptus (globulus, camaldulensis) Woodland Semi-Natural Alliance
- Fraxinus velutina Forest Alliance
- Landscaped
- Lepidium latifolium Herbaceous Semi-Natural Alliance
- Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance
- Lepidospartum squamatum Shrubland Alliance
- Lepidospartum squamatum Shrubland Alliance - Sparse
- Platanus racemosa Woodland Alliance Disturbed
- Quercus agrifolia Woodland Alliance
- Rumex crispus Herbaceous Semi-Natural Alliance
- Salix gooddingii Woodland Alliance
- Salix gooddingii Woodland Alliance - Sparse
- Xanthium strumarium Herbaceous Alliance

ECORP Consulting, Inc.
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Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Vegetation\Vegetation\v1\DG_Vegetation_Ecorp2016.mxd (MAG) -mguidry 7/7/2016

2014-003.008 Devil's Gate Sediment Removal Project

Scale in Feet
0 600

Photo Source: NAIP 2014
[1] LADPW

Map Date: 5/19/2016

2.0 SPECIES ACCOUNTS

2.1 Southwestern Willow Flycatcher

The willow flycatcher (*Empidonax traillii*), including the southwestern subspecies, was state-listed as endangered on January 2, 1991 (CDFW 2017) and the southwestern subspecies (*E. t. extimus*) was federally listed as endangered on February 27, 1995 (USFWS 1995). Southwestern willow flycatcher is the only subspecies that nests in southern California; however, migrants of all the subspecies may occur in the area during spring and fall migration. The southwestern willow flycatcher breeds in riparian habitats along rivers, streams, or other wetlands in floodplains and broader canyons, preferring dense riparian thickets near surface water (Sogge et al. 2010), often with adjacent open areas for foraging. Vegetation structure, composition, and extent vary widely but generally include extensive areas dominated by dense stands of willows (*Salix spp.*), mule fat (*Baccharis salicifolia*), or other tree species (including tamarisk [*Tamarix* sp.] in some areas), usually with scattered cottonwood (*Populus* spp.) overstory (USFWS 1995). These riparian areas provide both nesting and foraging habitat for the species. Critical habitat for this species was originally designated in 1997, revised in 2005, and revised yet again in 2013 (USFWS 2013).

2.2 Least Bell's Vireo

The least Bell's vireo was state-listed as endangered in 1980 and was federally-listed as endangered in 1986 (CDFW 2017, USFWS 1986). The least Bell's vireo is endemic to California and Baja California, Mexico. It is a highly migratory species that only occurs in the region during the breeding season. The males arrive sometime in late March to April and establish breeding territories, and the females arrive shortly thereafter (USFWS 1998). The least Bell's vireo usually returns to the wintering grounds sometime in August to September. The species is dependent upon riparian habitat during the breeding season and prefers willow-dominated woodland or scrub that typically exists along streams and rivers (Franzreb 1989). Other habitat types used by this species include mulefat scrub, mixed oak/willow woodland, mesquite woodland, and elderberry scrub. Habitat characteristics that appear to be essential for vireo occupation include dense cover from 3 to 6 feet in height for nesting and foraging, and a stratified canopy providing both foraging habitat and song perches for territorial advertisement. Critical habitat for the least Bell's vireo was designated on March 4, 1994 (USFWS 1994).

3.0 SURVEY METHODOLOGY

3.1 Literature Review

Prior to conducting the focused survey, a search was conducted of the California Natural Diversity Data Base (CNDDB) for the Pasadena 7.5-minute series quadrangle map (and the surrounding 8 quadrangles) and other references to determine if and to what extent the target species are known to occur in the project region.

3.2 Southwestern Willow Flycatcher

The surveys for the southwestern willow flycatcher followed the mandatory protocol developed by Sogge et al. (2010) and guidance promulgated by the U. S. Fish and Wildlife Service (USFWS 2000). This protocol requires that five surveys be conducted within three certain periods between May 15 and July 17 and at least five days apart. Sogge et al. (2010) recommend that surveys be conducted between dawn and 1030 under suitable weather conditions. Surveys were generally conducted between dawn and 1100 because of the two-dimensional depth of suitable habitat in some areas (which takes longer to survey than linear habitats) and because suitable habitat adjacent to the project area was surveyed afterward.

Surveys were conducted by walking slowly and methodically along established trails under the canopy of the riparian habitat and along the margins. Because of the width of the habitat in some areas, side routes were often taken from the main trails to survey interior habitat areas. Surveys were conducted from along the edge of the habitat when vegetation density precluded surveys from under the canopy. Taped vocalizations were played every 50 to 100 feet for the flycatcher in an attempt to elicit a response from individuals that might be present. The tape was played for roughly 15 seconds for the flycatcher, stopped for one or two minutes to listen for a response, and then played again before moving to the next spot.

3.3 Least Bell's Vireo

Surveys for least Bell's vireo were conducted in accordance with the 2001 USFWS protocol guidelines (USFWS 2001). A total of eight surveys were conducted between April 10 and July 31, 2017. The protocol recommends that surveys be conducted between dawn and 1100, when weather conditions are favorable (no excessive fog, wind, rain, cold, heat). Because the habitat requirements and survey methods for the least Bell's vireo are similar to the flycatcher's, five of the eight surveys for least Bell's vireo were conducted on the same days as southwestern willow flycatcher surveys. During those combined survey days, biologists followed recent guidance from USFWS so that surveys for both species were not conducted concurrently, but rather southwestern willow flycatchers were surveyed on the outbound portion and least Bell's vireo were surveyed on the return portion for each of the habitat segments within the survey area. All areas of suitable least Bell's vireo habitat within the survey area were traversed on foot with frequent stops to look and listen for least Bell's vireos. No recorded vocalizations were used for the least Bell's vireo surveys.

3.4 Survey Dates, Personnel, and Weather Conditions

All surveys for southwestern willow flycatcher were performed by Leatherman Bioconsulting, Inc. (Leatherman), who is authorized to conduct protocol surveys for southwestern willow flycatcher under Federal Recovery Permit TE-827493-8. Surveys one, two, and eight for least Bell's vireo were conducted by ECORP and surveys three through seven for least Bell's vireo were conducted by Leatherman. A survey summary report prepared by Leatherman is included as Appendix A. Table 1 lists the dates, surveyors, times, and weather conditions for each survey.

Table 1. Survey Dates, Personnel, and Conditions

Date	Surveyors	Survey	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
			start	end	start	end	start	end	start	end
5/3/17	Shannan Shaffer	LBVI 1	0600	1100	63	78	80	0	1-3	0-2
5/15/17	Shannan Shaffer	LBVI 2	0600	1100	57	64	100	100	0-4	2-7
5/25/17	Brian Leatherman	LBVI 3 SWFL 1	0600	1100	55	63	100	100	2-4	0-2
6/6/17	Brian Leatherman	LBVI 4 SWFL 2	0600	1100	59	75	100	20	0-2	2-4
6/19/17	Adam DeLuna	LBVI 5 SWFL 3	0600	1100	67	86	0	0	1-3	1-3
6/29/17	Brian Leatherman	LBVI 6 SWFL 4	0600	1100	60	81	100	0	0-2	2-4
7/10/17	Brian Leatherman	LBVI 7 SWFL 5	0545	1045	70	85	0	0	0-2	0-2
7/28/17	Scott Taylor	LBVI 8	0730	1100	70	82	0	0	0-5	0-5

4.0 RESULTS

4.1 Southwestern Willow Flycatcher

Neither migratory willow flycatchers nor breeding southwestern willow flycatchers were detected during any of the 2017 focused surveys.

Migrant willow flycatchers of the more common northern subspecies (*E.t. brewsteri* and *E.t. adastus*) are expected to occur in the area during the spring and fall migration period (Garrett and Dunn 1981, Sogge et al. 2010) and are usually observed during the first two survey periods (May 15-31 and June 1-24).

One southwestern willow flycatcher record was found for the Pasadena quadrangle in the CNDDB search (CNDDB 2017). The record is from a museum collection from 1906 in Arroyo Seco (the exact location was not given). Nine other records for willow flycatchers were found in the nine-quadrangle search. Incidental observations of flycatchers were recorded within the survey area on May 20, 2014 and August 14, 2015 (Chambers Group 2014, Chambers Group 2015); however, no willow flycatchers were detected during 2016 focused surveys (Leatherman 2016).

The survey area is not located within designated critical habitat for the southwestern willow flycatcher (USFWS 2013). The closest critical habitat is along Big Tujunga Creek to the west and the San Gabriel River to the east.

4.2 Least Bell's Vireo

No least Bell's vireo were detected in the survey area during the 2017 surveys.

Three records of least Bell's vireo were found for the Pasadena quadrangle in the CNDDB, and 15 other records were found in the nine-quadrangle search (CNDDB 2017). One of the records is from egg collections made in 1895 and another is from an egg collection made in Eagle Rock Valley (the exact location is unknown) in 1911. The third CNDDB record documents sightings within the Hahamongna Watershed Park, including observations of one adult and one juvenile the week of July 15, 2012, and four individual observations of a single male between April 29 and June 17, 2013. Additional observations of least Bell's vireo recorded within the survey area include two family groups observed on August 14, 2015, a single male observed on April 20 and May 4, 2016, a single juvenile on August 1, 2016, and a single adult male on August 17, 2016 (Chambers Group 2014, ECORP 2016). However, no additional vireo detections were made at the site during surveys conducted for the species between May 16 and August 1, 2016.

The survey area is not within designated critical habitat for the least Bell's vireo (USFWS 1994). The closest critical habitat is located along the Santa Clara River to the northwest and the Santa Ana River to the southeast.

4.3 Other Wildlife

During the 2017 surveys, no other state- or federally-listed threatened or endangered species were detected. Yellow warblers (*Setophaga petechia*) and yellow-breasted chats, both California Department of Fish and Wildlife (CDFW) Species of Special Concern (SSC), were observed within the riparian habitat in the southern portion of the survey area, including east of Flint Wash and near the Altadena Drain.

Brown-headed cowbirds were also observed in the riparian habitat in the survey area on a regular basis, although it is likely that the same individuals were observed. The number of cowbirds observed during each survey is provided in Table 2.

Table 2. Number of Brown-headed Cowbirds Observed

Date	Survey	Number Observed		
		Males	Females	Juveniles
5/3/17	LBVI 1	1	2	0
5/15/17	LBVI 2	1	1	0
5/25/17	LBVI 3 SWFL 1	1	0	0
6/6/17	LBVI 4 SWFL 2	0	0	0
6/19/17	LBVI 5 SWFL 3	2	1	0
6/29/17	LBVI 6 SWFL 4	1	1	0
7/10/17	LBVI 7 SWFL 5	1	1	0
7/28/17	LBVI 8	0	0	0

A complete list of wildlife species observed during the surveys is included as Appendix B.

5.0 CONCLUSIONS

Focused surveys were conducted according to agency-accepted protocols for the southwestern willow flycatcher and the least Bell's vireo in the Project survey area during the 2017 breeding season. Willow flycatchers and least Bell's vireos were not detected during the surveys. The Project survey area is not located in designated critical habitat for either species.

Incidental observations of willow flycatchers within the survey area were documented in both 2014 and 2015; however, based on the timing of the observations and the lack of additional detections during previous or subsequent surveys, these birds were considered to be migrants passing through the area.

Observations of least Bell's vireo previously documented within the Project area have been irregular, and no consistent detection of the species throughout the breeding season has been documented at the site since 2013. At that time, a single male was present but he was not paired with a female during the breeding season. Additionally, the timing of observations in the early and late periods of the breeding season during subsequent survey years coincides with the seasonal migrations of least Bell's vireos through the Project survey area.

The negative survey results in 2017 indicate that neither migratory nor breeding willow flycatchers or least Bell's vireos were present in the Project area during the established survey periods for these species.

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LEATHERMAN BIOCONSULTING, INC.
Biological Surveys, Management & Monitoring

August 29, 2017

Ms. Mari Quillman
ECORP CONSULTING
1801 Park Court Place, Building B, Suite 103
Santa Ana, California 92701

Subject: Results of Focused Surveys for the Southwestern Willow Flycatcher and Least Bell's Vireo for the Devil's Gate Reservoir Sediment Removal and Management Project

Dear Mari:

This letter reports the results of focused surveys to evaluate the presence or absence of the southwestern willow flycatcher (*Empidonax traillii extimus*) and least Bell's vireo (*Vireo pusillus bellii*) in cottonwood/willow riparian forest habitat along Arroyo Seco for the Devil's Gate Reservoir Sediment Removal and Management Project in Los Angeles County, California. The southwestern willow flycatcher and least Bell's vireo are both federally and state-listed as Endangered. The least Bell's vireo (*Vireo pusillus bellii*) was searched for in association with each of the five willow flycatcher surveys reported here, the remaining three surveys to complete the protocol for the least Bell's vireo were conducted by ECORP. The project is behind the Devil's Gate Dam along Arroyo Seco Creek adjacent to Hahamonga Watershed Park, immediately east of Interstate 210 freeway, in the La Canada/Flintridge area of Pasadena in Los Angeles County (Figure 1).

The area surveyed extends from the base of the dam near Interstate 210 at the south end of the site to approximately 4,800 feet upstream (near the parking lot at the south end of Arroyo Road). The width of the survey area varies considerably from an estimated 100 feet at its narrowest point to over 1,200 feet in some areas, but most of the mature willow riparian habitat occurs in elongated patches approximately 150 feet wide. The habitat at the base of the dam occurs as the largest patch (ca. 300 x 900 feet) and is highest quality for both the willow flycatcher and the least Bell's vireo. Suitable habitat that occurs adjacent to the project area within the basin was also surveyed.

BACKGROUND

The willow flycatcher (*Empidonax traillii*) is a state-listed Endangered species (CDFG 1991), whereas only the southwestern subspecies (*E.t. extimus*) is federally-listed as Endangered

(USFWS 1995). This survey focused on the southwestern willow flycatcher because it is the only subspecies that nests in southern California. However, migrants of all the subspecies may occur in the area during spring and fall migration, so multiple visits to the survey area are required to determine if individuals observed during the first surveys are nesting birds.

The willow flycatcher was formerly a common summer resident in suitable habitat throughout California (Grinnell and Miller 1944). It has now been extirpated as a breeding bird from most of its California range, and is seriously threatened in southern California primarily because of habitat loss and degradation and brood parasitism by brown-headed cowbirds (*Molothrus ater*) (Garrett and Dunn 1981; USFWS 1995). Critical habitat for the southwestern willow flycatcher was revised in 2013 (USFWS 2013).

The willow flycatcher closely resembles other Empidonax flycatcher species in California, but the indistinct (or completely lacking) eye ring, broader and longer bill, and generally lighter appearance through the breast and throat help to distinguish it from other species. The species' vocalizations are the best form of identification in the field (but can't be used to identify subspecies). The southwestern willow flycatcher is a migratory bird, occurring in this region only during the breeding season (late May to early August). The male arrives later in the spring than most migrants, usually in mid to late May or early June. Nests are constructed in thickets of trees and shrubs in a fork or horizontal branch between three and 15 feet above the ground.

The southwestern willow flycatcher breeds in riparian habitats along rivers, streams, or other wetlands in floodplains and broader canyons, preferring dense riparian thickets near surface water (Sogge et al. 2010), often with adjacent open areas for foraging. Vegetation structure, composition, and extent vary widely but generally include extensive areas dominated by dense stands of willows (*Salix* spp.), mule fat (*Baccharis salicifolia*), or other tree species (including tamarisk [*Tamarix* sp.] in some areas), usually with scattered cottonwood (*Populus* spp.) overstory (USFWS 1995). These riparian areas provide both nesting and foraging habitat. Southwestern willow flycatchers will nest in areas with suitable habitat regardless of the elevation (from sea level to high mountains).

The least Bell's vireo is a state and federally listed Endangered species. This subspecies was once widespread throughout the Central Valley and other low elevation riverine areas of California (Grinnell and Miller 1944). The widespread loss of riparian habitat and brood parasitism by the brown-headed cowbird are the major causes of the decline of this species (Garrett and Dunn 1981). About 76 percent of the U. S. population is found in just five localities. The breeding population in California has increased dramatically because of brown-headed cowbird (*Molothrus ater*) trapping efforts in breeding areas, and they are thought to be expanding their current range (USFWS 1998). The least Bell's vireo was federally listed in 1986 (USFWS 1986), but critical habitat was not established until 1994 (USFWS 1994).

The least Bell's vireo is a small grayish songbird with indistinct wing bars and facial markings. It is a very vocal species, and can be easily detected from some distance by its unique song, which is given repeatedly. The least Bell's vireo is migratory and only occurs in this region during the breeding season. The males arrive sometime in late March to April and establish breeding territories, and the females arrive shortly thereafter. Nests are constructed (usually in willow trees) only about three to four feet off the ground where the female will lay typically 3 to 4 eggs. The least Bell's vireo usually returns to the wintering grounds sometime in August to September. Preferred habitat is willow riparian woodland that supports dense understory thickets of scrubby willows and mule fat, especially within three to six feet of the ground (USFWS 1998).

EXISTING HABITAT

The survey area occurs in broad floodplain consisting of a braided sandy wash and associated terraces. The upstream end of the survey has limited alluvial fan sage scrub and sage scrub elements and small patches of willow and mulefat scrub. Patches of willow riparian forest habitat begin near the upstream end and increase in size and suitability in the downstream direction. Riparian woodland habitat in the survey area can be broadly characterized as southern cottonwood-willow riparian forest (Holland 1986). Arroyo willow (*Salix lasiolepis*) and mulefat are the most common species throughout, occurring in patches throughout the wash system. Red willow (*Salix laevigata*) and black willow (*Salix goodingii*) are well represented, and occasional individuals of Fremont's cottonwood (*Populus fremontii*) form the canopy over the shrubbier arroyo willows. The understory is dominated by cocklebur (*Xanthium strumarium*), poison hemlock (*Conium maculatum*), perennial pepper weed (*Lepidium latifolium*), and annual bursage (*Ambrosia acanthocarpa*). A diverse mix of native and non-native annuals and grasses make up the herbaceous layer.

METHODS

Prior to conducting the focused survey, a search was conducted of the California Natural Diversity Data Base (CDFW 2016) for the Pasadena 7.5-minute series quadrangle map (and the surrounding 8 quadrangles) and other references to determine if and to what extent the target species are known to occur in the project region.

Focused surveys were conducted by Mr. Brian Leatherman and Mr. Adam DeLuna (USFWS permit # TE 827493-8; CDFW MOU). Survey methods followed the guidelines developed by the U. S. Fish and Wildlife Service for each species as described below. Observations of any listed species were recorded in the field and waypoints were taken using GPS technology for mapping purposes. The focus of the surveys was on the detection and identification of the target species, but all wildlife incidentally observed or detected in the survey area was documented. Identifications were made with the aid of 8 X 42 Alpen Wings ED binoculars. A list of the species observed during the surveys is enclosed.

The surveys for the southwestern willow flycatcher followed the mandatory protocol developed by Sogge et al. (2010) and guidance promulgated by the U. S. Fish and Wildlife Service (USFWS 2000). This protocol requires that five surveys be conducted within three certain periods between May 15 and July 17 and at least five days apart. Sogge et al. (2010) recommend that surveys be conducted between dawn and 1030 under suitable weather conditions. Surveys reported here were generally conducted between dawn and 1100 because of the two dimensional depth of suitable habitat in some areas (which takes longer to survey than linear habitats), and because high quality suitable habitat adjacent to the project area was surveyed afterward.

The surveys for the least Bell's vireo followed the survey guidelines developed by the USFWS (2001), which requires that eight surveys be conducted at least 10 days apart between April 10 and July 31. Vireo surveys can be conducted between dawn and 1100 under suitable weather conditions, at a maximum rate of 1.5 km (0.93 miles) or 50 ha (124 acres) per day. The habitat requirements and survey methods for the least Bell's vireo are similar to the flycatcher's and focused surveys are usually conducted in concert when appropriate or as time permits. Dates, times and weather data for the focused surveys are shown in Table 1. The remaining three focused surveys for least Bell's vireo were conducted by ECORP and will be reported separately, incorporating survey related information provided here.

Table 1. Dates, Times and Weather Conditions for Focused Surveys

DATE	SURVEYOR	TIME		WEATHER CONDITIONS*					
				Temp (°F)		Winds (mph)		Cloud Cover	
		Start	End	Start	End	Start	End	Start	End
25-May	Leatherman	600	1100	55	63	2-4	0-2	100%	100%
6-Jun	Leatherman	600	1100	59	75	0-2	2-4	100%	20%
19-Jun	DeLuna	600	1100	67	86	1-3	1-3	clear	clear
29-Jun	Leatherman	600	1100	60	81	0-2	2-4	100%	clear
10-Jul	Leatherman	545	1045	70	85	0-2	0-2	clear	clear

*Temperature and wind speed measured with Kestrel 2000

The riparian habitat in the survey area is irregularly shaped and includes a broad sandy wash with patches of willows: one area with ponded water from urban runoff, which is referred to as the Lower Alta Dena Drain, is located near the southeast end of the site. Generally, the upstream habitat is linear and patchy, and the downstream habitat is more mature and dense and very broad in some areas. Surveys were conducted by walking slowly and methodically along established trails under the canopy of the riparian habitat and along the margins. Because of the width of the habitat in some areas, side routes were often taken from the main trails to survey interior habitat areas. Surveys were conducted from along the edge of the habitat when vegetation density precluded surveys from under the canopy. Taped vocalizations were played every 50 to 100 feet for the flycatcher in an attempt to elicit a response from potentially present individuals. The tape was played for roughly 15 seconds for the flycatcher, stopped for one or two minutes to listen for a response, and then played again before moving to the next spot. No recorded vocalizations were used for the least Bell's vireo surveys.

RESULTS

No willow flycatchers or least Bell's vireos were observed during the surveys.

Migrant willow flycatchers of the more common northern subspecies (*E.t. brewsteri* and *E.t. adastus*) are expected to occur in the area during the spring and fall migration period (Garrett and Dunn 1981, Sogge et al. 2010) and are usually observed during the first two survey periods (May 15-31 and June 1-24).

One southwestern willow flycatcher record was found for the Pasadena quadrangle in the California Natural Diversity Data Base (CDFW 2016). The record is from a museum collection from 1906 in Arroyo Seco (the exact location was not given). Nine other records for willow flycatchers were found in the nine quadrangle search. No critical habitat for the southwestern willow flycatcher was designated in the Arroyo Seco watershed (USFWS 2013). The closest critical habitat is along Big Tujunga Creek to the west and the San Gabriel River to the east.

One record for least Bell's vireo was found for the Pasadena quadrangle in the CNDDB and eight other records were found in the nine quadrangle search (CDFW 2017). No least Bell's vireos were observed during the focused surveys. One juvenile was observed during a survey conducted last year on August 1, 2016. Least Bell's vireo apparently occur irregularly in low densities in the region.

Brown-headed cowbirds were observed in the riparian habitat in the survey area on a regular basis, although it is likely that the same individuals were observed. No attempt at a standardized count was made during the focused surveys. The most that were observed on any one survey was two males and one female. The number of cowbirds observed during each survey is provided in Table 2.

Table 2. Number of Brown-headed Cowbirds Observed

DATE	SURVEY No.	NUMBER OBSERVED		
		Males	Females	Juveniles
25-May	WIFL 1	1	0	0
6-Jun	WIFL 2	0	0	0
19-Jun	WIFL 3	2	1	0
29-Jun	WIFL 4	1	1	0
10-Jul	WIFL 5	1	1	0

CONCLUSION

Focused surveys were conducted for the southwestern willow flycatcher and least Bell's vireo in the Devil's Gate Sediment Removal Project survey area. No willow flycatchers or least Bell's vireos were observed during the surveys, although three additional surveys were conducted by ECORP and will be reported in a separated report. Based on the lack of records for the region and the negative survey results, the southwestern willow flycatcher and least Bell's vireo appear to be absent as breeders at this time. No critical habitat is designated for either species in the Arroyo Seco watershed.

A copy of this letter report will be sent to the USFWS and CDFW per the conditions of the 10(a)(1)(A) permit and MOU. Figure 1, the references cited, a list of the wildlife observed, and the required willow flycatcher survey forms are enclosed. Survey certification is provided below. It has been a pleasure to conduct this survey effort for ECORP Consulting. If you have any comments or questions regarding the information provided in this report you can reach me by phone at (714) 701-0863, or by email at bleathermanwlb@aol.com.

Sincerely,

LEATHERMAN BIOCONSULTING, INC.

Brian Leatherman
Principal Biologist

Enclosures

s:/…ecorp/ecorp.07/devils gate rpt 2017

Devil's Gate Sediment Removal Project
Survey Certification

CERTIFICATION:

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

Brian Leatherman
Permit No. TE827493-6

8/29/2019
Date

REFERENCES

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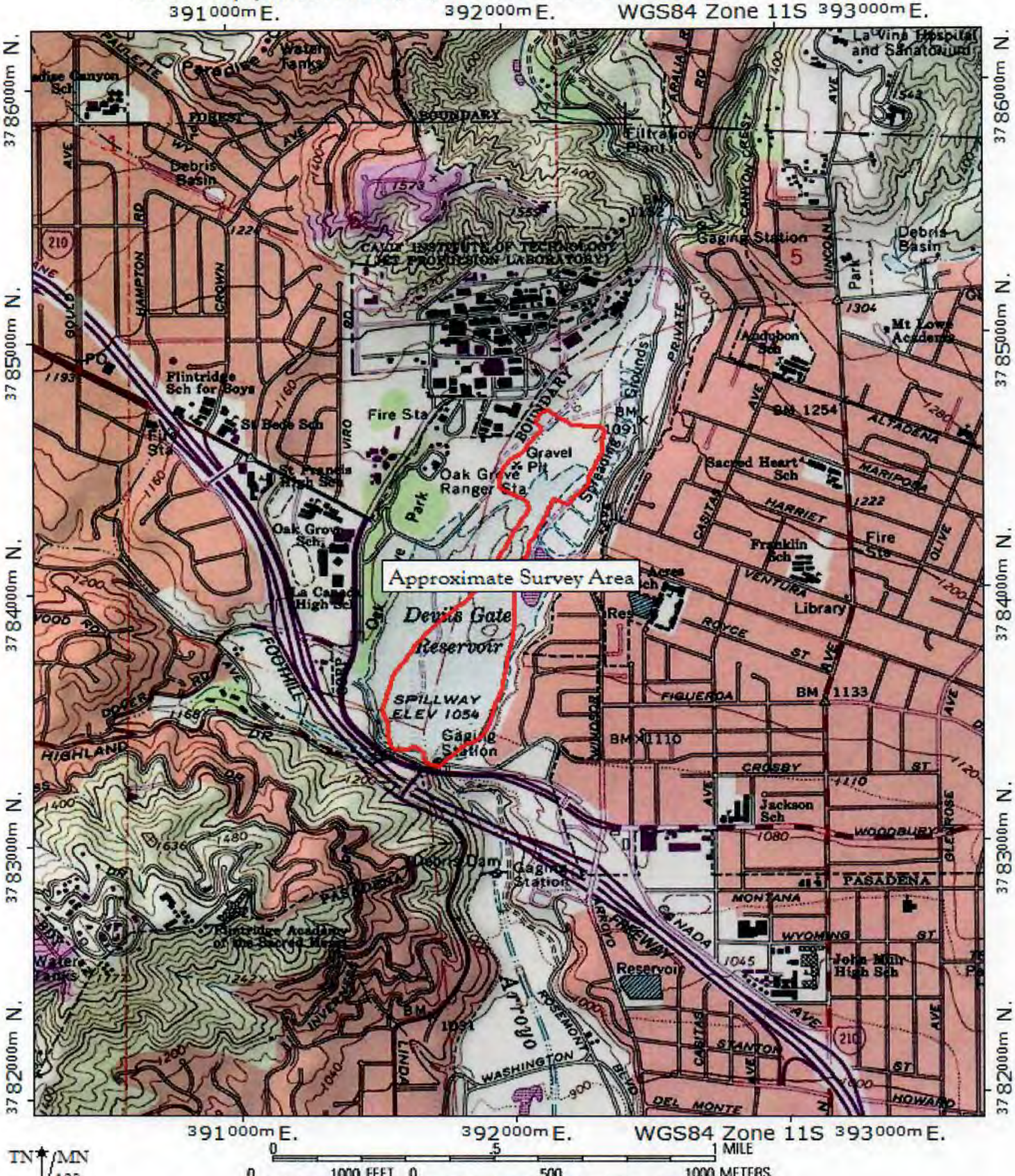
TOPO! map printed on 08/25/16 from "California.tpo" and "Untitled.tpg"



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

Devil's Gate Sediment Removal Project

Project Location

Figure 1

Leatherman BioConsulting,, Inc.
Source Map: TOPO! Pasadena Quadrangle

↑ N

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

Site Name: **Devil's Gate Sediment Removal Project** State: **CA** County: **LA**

USGS Quad Name: **Pasadena** Elevation: **350** (meters)

Creek, River, or Lake Name: **Arroyo Seco**

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

Survey Coordinates: Start: E **03 92 264m** N **37 84 720m** UTM Datum: **NAD83** (See instructions)

Stop: E **3 91 582m** N **37 83 402m** UTM Zone: **11S**

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

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

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.
Survey # 1 Observer(s): Brian Leatherman	Date: 5/25/2017 Start: 600 Stop: 1100 Total hrs: 5	0					# Birds / Sex / UTM E / UTM N
Survey # 2 Observer(s): Brian Leatherman	Date: 6/6/2017 Start: 600 Stop: 1100 Total hrs: 5	0					# Birds / Sex / UTM E / UTM N
Survey # 3 Observer(s): Brian Leatherman	Date: 6/19/2017 Start: 600 Stop: 1100 Total hrs: 5	0					# Birds / Sex / UTM E / UTM N
Survey # 4 Observer(s): Brian Leatherman	Date: 6/29/2016 Start: 600 Stop: 1100 Total hrs: 5	0					# Birds / Sex / UTM E / UTM N
Survey # 5 Observer(s): Brian Leatherman	Date: 7/10/2017 Start: 545 Stop: 1045 Total hrs: 5	0					# Birds / Sex / UTM E / UTM N

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 25.0	0	0			Were any WIFLs color-banded? Yes ____ No ____ If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: **Brian Leatherman** Date Report Completed: **8/29/2017**

US Fish & Wildlife Service Permit #: **TE827493-9** State Wildlife Agency Permit #: **SC-001562**

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

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

Reporting Individual **Brian Leatherman** Phone # **(714) 701-0863**

Affiliation **Leatherman BioConsulting Inc.** E-mail bleathermanwlb@aol.com

Site Name **Devil's Gate Sediment Removal Project** Date report Completed **8/18/2016**

Was this site surveyed in a previous year? Yes X No____ Unknown____

Did you verify that this site name is consistent with that used in previous yrs? Yes **X** No____ Not Applicable____

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

If site was surveyed last year, did you survey the same general area this year? Yes **X** No____ If no, summarize below.

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

Management Authority for Survey Area: Federal **X** Municipal/County **X** State____ Tribal____ Private____

Name of Management Entity or Owner (e.g., Tonto National Forest) **LADPW, ANF**

Length of area surveyed: **2.2** (km)

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

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

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

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

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

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

Alnus rhombifolia, Salix spp

Average height of canopy (Do not include a range): **4.5** (meters)

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

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

Habitat consists of broad sandy wash upstream with patches of mulefat and willow and mature willow riparian forest downstream. Occassional cottonwoods and sycamores. Generally considered marginal habitat for WIFL.

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

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

Attach additional sheets if necessary

Non-native species are indicated by an asterisk. Species on CDFW's Special Animals list are indicated by two asterisks. Other species may have been overlooked or inactive/absent because of the season (amphibians are more active during/after rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.), or because of the time of the survey (some species are strictly nocturnal). Taxonomy and nomenclature generally follow California Department of Fish and Wildlife (2016).

COMMON NAME	**SCIENTIFIC NAME**
AMPHIBIANS	**AMPHIBIA**
True Frogs	**Ranidae**
* Bullfrog	*Lithobates catesbeianus*
REPTILES	**REPTILIA**
Spiny Lizards, Horned Lizards, etc.	**Phrynosomatidae**
Western fence lizard	*Sceloporus occidentalis biseriatus*
Side-blotched lizard	*Uta stansburiana*
Whiptail Lizards	**Teiidae**
** Western whiptail	*Cnemidophorus tigris*
Harmless egg-laying snakes	**Colubridae**
California kingsnake	*Lampropeltis californiae*
BIRDS	**AVES**
Vultures	**Cathartidae**
Turkey vulture	*Cathartes aura*
Hawks, Eagles and Kites	**Accipitridae**
Red-tailed hawk	*Buteo jamaicensis*
Quail	**Odontophoridae**
California quail	*Callipepla californica*
Pidgeons and Doves	**Columbidae**
* Rock dove	*Columba livia*
Band-tailed pidgeon	*Columba fasciata*
* Eurasian Collared-dove	*Streptopelia decaocto*
Mourning dove	*Zenaida macroura*
Swifts	**Apodidae**
White-throated swift	*Aeronautes saxatalis*
Hummingbirds	**Trochilidae**
Anna's hummingbird	*Calypte anna*
** Allen's hummingbird	*Selasphorus sasin*
Woodpeckers	**Picidae**
Acorn woodpecker	*Melanerpes formicivorus*
Downy woodpecker	*Picoides pubescens*
** Nuttall's woodpecker	*Picoides nuttallii*
Parrots	**Psittacidae**
Amazon parrot	*Amazonia sp.*
Tyrant Flycatchers	**Tyrannidae**
Pacific-slope flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Vireos	**Vireonidae**
Hutton's vireo	*Vireo huttoni*
Jays and Crows	**Corvidae**
California scrub-jay	*Aphelocoma californica*

American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Swallows	**Hirundinidae**
Violet-green swallow	*Tachycineta thalassina*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Petrochelidon pyrrhonota*
Titmice and Chickadees	**Paridae**
** Oak (Plain) titmouse	*Baeolophus inornatus*
Bushtits	**Aegithalidae**
Bushtit	*Psaltriparus minimus*
Wrens	**Troglodytidae**
Bewick's wren	*Thryomanes bewickii*
House wren	*Troglodytes aedon*
Bluebirds and Thrushes	**Turdidae**
Western bluebird	*Sialia mexicana*
American robin	*Turdus migratorius*
Wrentits	**Timaliidae**
Wrentit	*Chamaea fasciata*
Mockingbirds and Thrashers	**Mimidae**
Northern mockingbird	*Mimus polyglottis*
California thrasher	*Toxostoma redivivum*
Starlings	**Sturnidae**
* European starling	*Sturnus vulgaris*
Wood Warblers	**Parulidae**
Orange-crowned warbler	*Vermivora celata*
** Yellow warbler	*Dendroica petechia*
Common yellowthroat	*Geothlypis trichas*
** Yellow-breasted chat	*Icteria virens*
Towhees and Sparrows	**Emberizidae**
Spotted towhee	*Pipilo maculatus*
California towhee	*Pipilo crissalis*
Song sparrow	*Melospiza melodia*
Grosbeaks and Buntings	**Cardinalidae**
Black-headed grosbeak	*Pheucticus melanocephalus*
Blackbirds and Orioles	**Icteridae**
* Brown-headed cowbird	*Molothrus ater*
Hooded oriole	*Icterus cucullatus*
Finches	**Fringillidae**
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*
Old World Sparrows	**Passeridae**
* House sparrow	*Passer domesticus*
Estrildid Finches	**Estrildidae**
Nutmeg mannikin	*Lonchura punctulata*
MAMMALS	**MAMMALIA**
Opossoms	**Didelphidae**
Virginia opossum (tracks)	*Didelphis virginiana*
Hares and Rabbits	**Leporidae**
Desert cottontail	*Sylvilagus audubonii*
Squirrels	**Sciuridae**
California ground squirrel	*Spermophilus beecheyi*

Old World Rats and Mice	**Muridae**
Dusky-footed woodrat (nest)	*Neotoma fuscipes*
Dogs, Wolves and Foxes	**Canidae**
* Domestic dog	*Canis familiarus*
Raccoons	**Procyonidae**
Common raccoon (tracks)	*Procyon lotor*
Horses	**Equidea**
* Domestic horse	*Equus caballus*

Appendix A

Leatherman Bioconsulting, Inc. Survey Report

Appendix B

Wildlife Compendium

SCIENTIFIC NAME	COMMON NAME
Insects	
Nymphalidae	**Angelwings & Checkerspots**
Adelpha bredowii	California sister
Nymphalis antiopa	Mourning cloak
Vanessa atalanta	Red admiral
Papilionidae	**Parnassians & Swallowtails**
Papilio eurymedon	Pale swallowtail
Pieridae	**Orange-Tips, Whites, & Sulfurs**
Pieris rapae	Cabbage white
Reptiles	
Iguanidae	**American Arboreal Lizards, Iguanas, & Chuckwallas**
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	Common side-blotched lizard
Birds	
Accipitridae	**Hawks, Kites, & Eagles**
Buteo jamaicensis	Red-tailed hawk
Odontophoridae	**New World Quail**
Callipepla californica	California quail
Columbidae	**Pigeons and Doves**
*Columba livia**	Rock dove (rock pigeon)
Zenaida macroura	Mourning dove
Cuculidae	**Cuckoos and Roadrunners**
Geococcyx californianus	Greater roadrunner
Apodidae	**Swifts**
Aeronautes saxatalis	White-throated swift
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
Selasphorus rufus	Rufous hummingbird
Selasphorus sasin	Allen's hummingbird
Picidae	**Woodpeckers**
Picoides nuttallii	Nuttall's woodpecker
Melanerpes formicivorus	Acorn woodpecker
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Corvidae	**Jays and Crows**
Aphelocoma californica	Western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Hirundinidae	**Swallows**
Petrochelidon pyrrhonota	Cliff swallow
Stelgidopteryx serripennis	Northern rough-winged swallow
Tachycineta bicolor	Tree swallow
Aegithalidae	**Bushtits**
Psaltriparus minimus	Bushtit

SCIENTIFIC NAME	COMMON NAME
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House wren
Sylviidae	**Wrentits**
Chamaea fasciata	Wrentit
Mimidae	**Mockingbirds and Thrashers**
Mimus polyglottos	Northern mockingbird
Toxostoma redivivum	California thrasher
Sturnidae	**Starlings**
*Sturnus vulgaris**	European starling
Parulidae	**Wood warblers**
Geothlypis trichas	Common yellowthroat
*Icteria virens***	Yellow-breasted chat
*Setophaga petechia***	Yellow warbler
Emberizidae	**Towhees and Sparrows**
Melospiza melodia	Song sparrow
Pipilo crissalis	California towhee
Pipilo maculatus	Spotted towhee
Icteridae	**Blackbirds & Orioles**
Icterus cucullatus	Hooded oriole
*Molothrus ater**	Brown-headed cowbird
Cardinalidae	**Grosbeaks, Cardinals, & Saltators**
Pheucticus melanocephalus	Black-headed grosbeak
Fringillidae	**Finches**
Spinus psaltria	Lesser goldfinch
Haemorhous mexicanus	House finch
Estrildidae	**Estrildid Finches**
*Lonchura punctulata**	Scaly-breasted munia
Psittacidae	**Cockatoos, Lories, Macaws, & Parrots**
*Amazon sp.**	Parrot
Mammals	
Leporidae	**Hares & Rabbits**
Sylvilagus audubonii	Desert cottontail
Sciuridae	**Squirrels**
Otospermophilus beecheyi	California ground squirrel
Canidae	**Dogs, Wolves, & Foxes**
Canis latrans	Coyote

* Nonnative species
** CDFW California Species of Special Concern

APPENDIX H

Devil’s Gate Project: 2016 California Rapid Assessment Method Report

Devil's Gate Reservoir Sediment Removal and Management Project:

California Rapid Assessment Method (CRAM)
For On-Site Mitigation Areas
Los Angeles County, California

Prepared for:
Los Angeles County
Flood Control District
900 S. Fremont Ave.
Alhambra, CA 91803
Contact: Veronica Mardis

Submitted by:
ECORP Consulting, Inc.
215 North 5th Street,
Redlands, CA,
Contact: Scott Taylor
(909) 307-0046

March 9, 2016

CONTENTS

California Rapid Assessment Method
for the On-Site Mitigation Areas
Devil's Gate Reservoir Sediment Removal
and Management Project

LIST OF FIGURES

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1.0 INTRODUCTION

At the request of the Los Angeles County Flood Control District (LACFCD), ECORP Consulting, Inc. (ECORP) conducted a California Rapid Assessment Method (CRAM) study for the Devil's Gate Reservoir Sediment Removal and Management Project (Project). The Project is located within Hahamongna Watershed Park in the City of Pasadena, Los Angeles County, and is bordered by the City of La Cañada Flintridge and the unincorporated community of Altadena (Figure 1). The Project is located within the northwest corner of the San Pascual (Garfias) Land-grant and the southeast corner of the La Canada Land-grant as depicted on the U.S. Geologic Survey 7.5-minute Pasadena topographic quadrangle (Figure 2). The Hahamongna Watershed Park consists of over 300 acres that provide a transition between Pasadena and the foothills of the Angeles National Forest (ANF). For more details regarding Hahamongna Watershed Park and the ANF, see the Mitigation Plan for Devil's Gate.

The Project entails temporary and permanent impact areas within the reservoir, designed to reduce and manage sedimentation within the basin. The goal of the Project is to restore and maintain the flood capacity of the reservoir to meet its intended level of flood protection for the communities located downstream of the facility. The Devil's Gate Dam was built in 1920 for flood control and water conservation. Rain and water flow have resulted in regular accumulations of sediment at the base of the Dam, causing reduction of function of the facility and increased danger of flooding. The Project would involve a comprehensive plan to remove sediment, which will restore the desired flood capacity, and allow continued management and maintenance of the flood control capacity of the reservoir. The CRAM study was conducted to assess the function and value of both the impact area within the reservoir and the proposed mitigation areas within the Hahamongna Watershed Park.

This study took place within five CRAM Assessment Areas (AAs) (Figures 3, 4, and 5) on the site, with three located where Project work will take place and two located within proposed mitigation areas within Hahamongna Watershed Park. The five Devil's Gate AAs include Devil's Gate (DG) Wetland (DG-Wetland), DG-4, DG-5, DG Permanent Impacts (DG-PERM), and DG Temporary Impacts (DG-TEMP). ECORP performed the CRAM analysis in accordance with the Riverine Wetlands Field Book, Version 6.1 (California Wetlands Monitoring Workgroup, January 2013b) (CWMW).

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Vicinity_v2.mxd (DW)-mapping_guest 11/6/2015

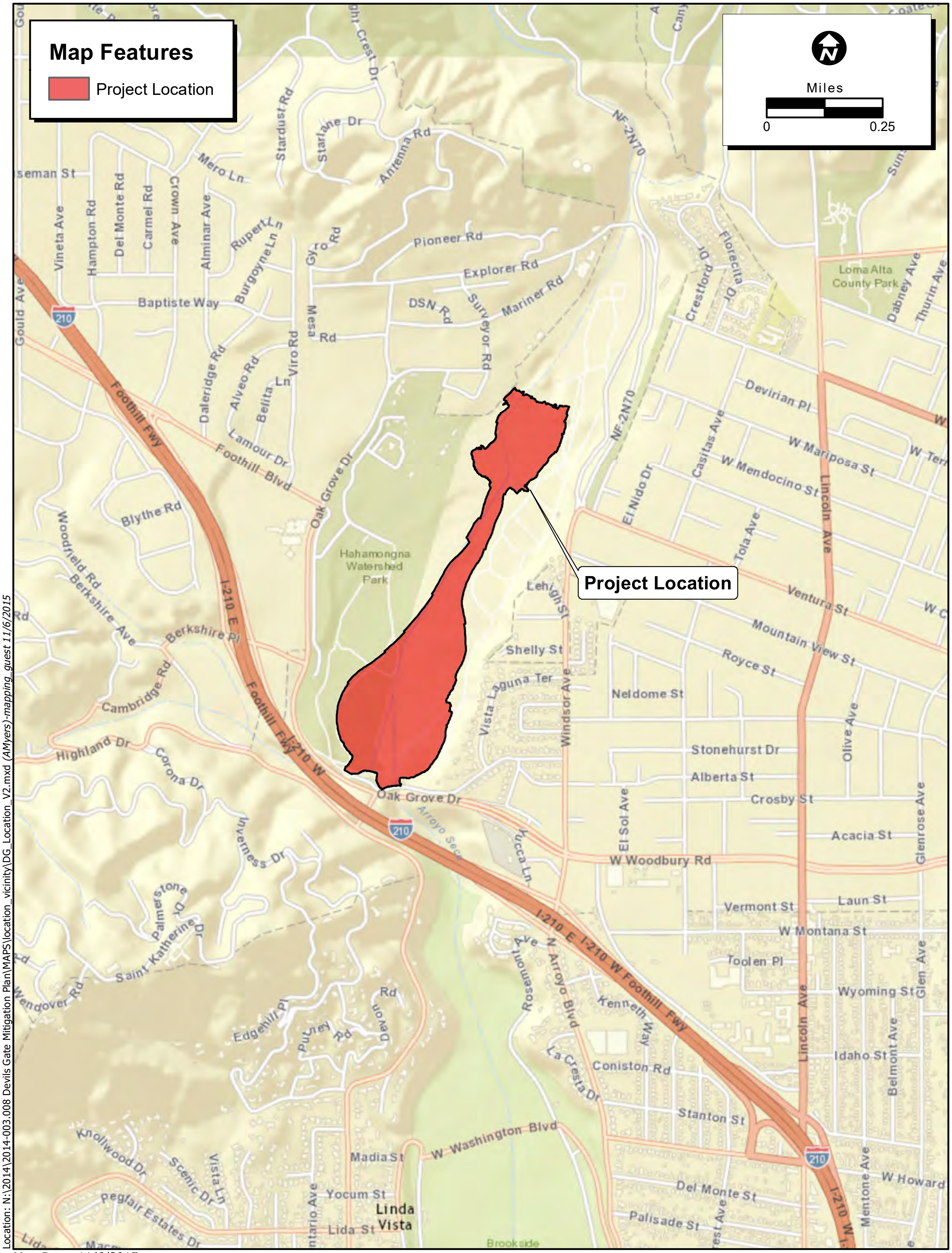
Map Date: 11/6/2015

Service Layer Credits: Sources: Esri, USGS, NOAA

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Vicinity

2014-003.008 Devil's Gate Mitigation Plan



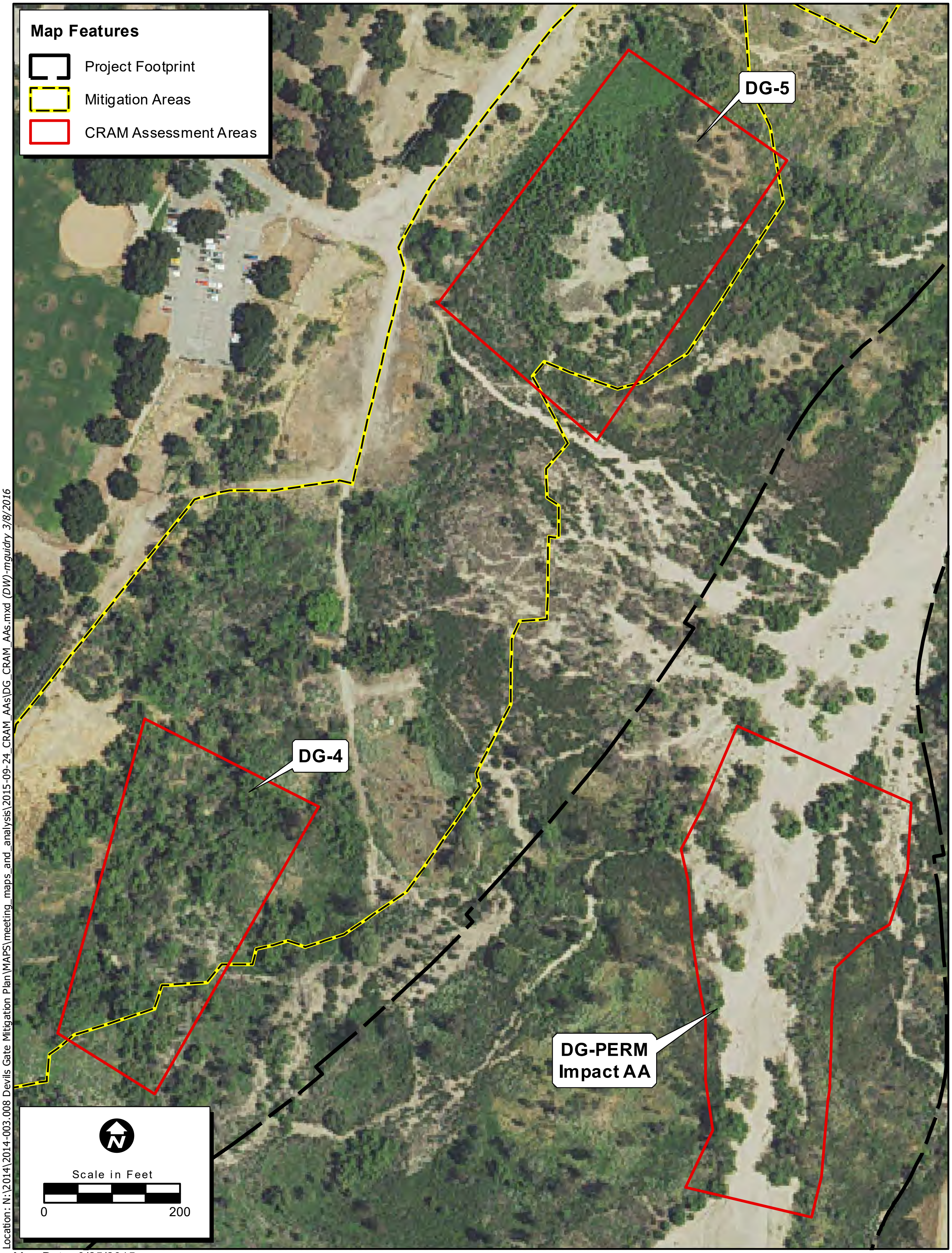
Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Location_V2.mxd (AMyers)-mapping_guest 11/6/2015

Map Date: 11/6/2015
Source: ESRI

Figure 2. Project Location

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2014-003.008 Devils's Gate Mitigation Plan



Map Date: 9/25/2015
Photo Source: NAIP 2014

Figure 3. CRAM Assessment Areas

ECORP Consulting, Inc.
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2014-003.008 Devil's Gate Mitigation Plan

Map Date: 9/25/2015
Photo Source: NAIP 2014

Figure 4. CRAM Assessment Areas

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2014-003.008 Devil's Gate Mitigation Plan

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\meeting_maps_and_analysis\2015-09-24_CRAM_AAs\DG_CRAM_AAs.mxd (DW)-mguidry 3/8/2016

Map Date: 9/25/2015
Photo Source: NAIP 2014

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 5. CRAM Assessment Areas

2014-003.008 Devil's Gate Mitigation Plan

1.1 Study Area Description

Devil's Gate AAs

The following AAs are located within Hahamongna Watershed Park: DG-TEMP, DG-PERM, DG-4, DG-5, and DG-Wetland. DG-TEMP, DG-PERM, and DG-Wetland represent areas where impacts are proposed to take place. DG-4 and DG-5 are within the proposed mitigation areas. The AAs are described briefly below.

DG-TEMP (Impacted)
This AA is located within the area being proposed to be temporarily impacted by the sediment removal project. It encompasses a wide section of largely unvegetated streambed. Aside from some scattered floodplain debris within the streambed (logs, rocks, etc.) the AA stream bottom is composed of course sand. The AA is about 200 meters long and wide. The stream boundaries are vegetated with a mixture of riparian vegetation and drier chaparral vegetation.

DG-PERM (Impacted)
Located downstream of DG-TEMP, this AA encompasses a portion of the area closer to the Devil's Gate Dam being proposed for permanent impact by the sediment removal project. The AA is about 200 meters in length and averages about 60 meters in width. The stream segment is narrower than that found in DG-TEMP, but supports more riparian vegetation and has less-defined stream banks. The gradient of the stream is slightly higher in this section and the riparian vegetation is denser than it is within DG-TEMP.

DG-Wetland (Impacted)
The wetland areas just north of Devil's Gate Dam correspond to the lowest point within the Hahamongna Watershed Park directly adjacent to the dam. This AA was chosen because it is located within the permanent impact area for the sediment removal project and is within mapped jurisdictional wetlands, which differ from either the DG-TEMP or DG-PERM habitats. The AA is about 100 meters long and 30 meters wide, located within a deep channel that conveys flows from Berkshire Creek and other surrounding urban creeks to the dam. Vegetation within the channel has been scoured, but the sides support a mixture of riparian herbaceous vegetation and bare ground.

DG-4 (Mitigation)
This AA is located west of the DG-PERM AA within more upland portions of the park that support dense riparian vegetation with some patches of non-native vegetation. The AA is about 150 meters long and 70 meters wide. There is a small unvegetated streambed that traverses this section, but it does not contain a consistent defined channel and is not thought to provide a significant contribution to the hydrogeomorphology. During storm events, the AA is dominated by overland sheet flows and underground flows towards the main channel. The riparian vegetation is mature and dense throughout most of the AA, but there are large patches of eucalyptus trees (*Eucalyptus* sp.) along with perennial pepper weed (*Lepidium latifolium*). Southernmost portions of the AA can become inundated if there is sufficient rainfall.

DG-5 (Mitigation)
This AA is located slightly north of the DG-4 AA and supports similar hydrogeomorphic conditions. A former mine pit is located on the northern edge of the AA, along with a small unvegetated stream that flows from the mainstem before terminating in sheet flows. During rain events, the former mine pit receives water flows from runoff through a culvert originating to the west. The pit is lower elevation than most of the surrounding AA, subjecting it to periodic seasonal inundation. The AA is about 150 meters long and 80 meters wide. Riparian habitat within this AA is dense with a well-developed understory of riparian herbaceous plants. However, the central portion of the AA is characterized by barren areas where sediment has been deposited during rain events and little vegetation is present.

1.2 Study Purpose

The purpose of the CRAM analysis for this Project was primarily to provide an ambient assessment of the reservoir area for the purpose of determining the best practices for project mitigation. A secondary purpose is to provide a basis for LACFCD to measure effects of proposed restoration or mitigation progress relative to baseline/ambient conditions and expected ecological trajectories. To this end, this CRAM assessment included an assessment of both the conditions within the impact areas for the project and an assessment of riparian areas adjacent to the Project.

The CRAM values were also used for determination of mitigation ratios in the U.S. Army Corps of Engineers (USACE) "Standard Operating Procedure for Determination of Mitigation Ratios" (12501-SPD; USACE 2013). The CRAM values are also being used to apply for impacts to jurisdiction for the California Department of Fish and Wildlife (CDFW).

2.0 METHODS

2.1 CRAM Methodology

CRAM assesses a variety of metrics within wetland, vernal pool, riparian, or estuarine systems over time. It is an effective tool for public agencies or other entities managing these resources to aid them in measuring progress and effectiveness of management efforts over time. The method can also be used in general assessments of wetland conditions or to help make determinations whether additional studies might be necessary.

For this study, the Riverine Fieldbook of CRAM was used (v. 6.1, January 2013). This module was developed specifically for assessment of riverine wetlands and closely associated riparian areas. The CRAM methodology assesses four attributes including buffer and landscape context, hydrology, physical structure, and biotic structure. These four attributes have been determined to be important for wetland function (e.g., water storage, groundwater discharge and flow, dissipation of energy, and nutrient cycling), and all wetlands share these four attributes (CWMW, 2012). Each of the four attributes, including sub-metrics, is described below (Table 1).

Table 1. CRAM Attributes and Metrics[1]

Attributes	Metrics
Buffer and Landscape Context	Landscape Connectivity or Riparian Continuity for Riverine Wetlands
	Buffer
	Percentage of Assessment Area with Buffer
	Average Buffer Width
	Buffer Condition
Hydrology	Water Source
	Hydroperiod or Channel Stability for Riverine Wetlands
	Hydrological Connectivity
Physical Structure	Structural Patch Richness
	Topographic Complexity
Biotic Structure	Plant Community
	Number of Plant Layers Present
	Number of Co-dominant species
	Percent Invasion
	Horizontal Interspersion
	Vertical Biotic Structure

1- Table modified from *CWMW 2013a*.

The metrics are defined by narrative descriptive conditions that are assessed in the field and each narrative condition correlates to a numeric value. In general, the numeric values are lower for wetlands that have "undesirable" attributes; conversely, wetlands with "desirable" attributes are scored higher in a given metric. The numeric values contribute to an overall CRAM score (from 25 to 100), which indicates the overall condition of the riverine wetland system.

Stressors are defined, for the purposes of CRAM, as anthropogenic perturbations within a wetland or its riverine environment that are likely to negatively affect the condition and function of the CRAM AA. By contrast, a disturbance is considered to be a natural phenomenon such as fire, flood, or landslide. Stressors are separated into four general categories: Hydrology Attribute, Physical Structure Attribute, Biotic Structure Attribute, and Buffer and Landscape Context Attribute. The separate categories of stressors are structured to aid in identifying the attribute areas that are the chief source of stressors on a riverine system.

2.2 Assessment Areas

For purposes of this CRAM analysis, five AAs were identified (Figures 3, 4 and 5). Each AA represents a portion of the riverine wetland system to be assessed and should remain constant over time to allow for a repeatable CRAM survey in future years. AAs were established using the guidelines outlined in the *CRAM User's Manual, Version 6.1* (CWMW 2013a). Each AA covered at least 100 meters but no more than 200 meters of the creek. The following paragraphs describe the AAs in more detail.

<u>Devil's Gate AAs</u>

Five AAs are located within Devil's Gate Reservoir and within the Hahamongna Watershed Park. The area consists of an ephemeral wash that drains from the north into the reservoir. The Hahamongna Watershed Park is a 300 acre park consisting of an interconnected system of hiking trails, picnic areas, oak woodland, and equestrian facilities. The five AAs are as follows:

- DG-PERM (Devil's Gate Permanent Impact): Located approximately 1,000 feet north of the Devil's Gate Dam, within the main stream channel and 600 feet east of DG-4.
- DG-TEMP (Devil's Gate Temporary Impact): Located approximately 1,000 feet north of DG-PERM within the main channel.
- DG-WETLAND (Devils Gate Wetland Impact): Located at the base of the Devil's Gate Dam.
- DG-5 (Devil's Gate 5; Mitigation): Located west of the main stream channel and just southwest of DG-TEMP.
- DG-4 (Devil's Gate 4; Mitigation): Located directly to the south of DG-5.sout

2.3 Field Data Collection

Field surveys were conducted by certified Riverine CRAM Practitioners. In accordance with the methods discussed in the CRAM Field Books, each AA was assessed for buffer and landscape context, hydrology, physical structure, and biotic structure. The overall AA score was calculated following the field book guidelines and copies of the CRAM scoring sheets and maps for each AA have been included in Appendix A. Photographs of the five AAs are included in Appendix B.

3.0 RESULTS

3.1 Survey Information

Dates, surveyors, and weather conditions recorded during field surveys are listed in Table 2 below.

Table 2. Survey Conditions

Date	Surveyors*	Sites assessed
7/2/15	ST, AT	DG-Perm, DG-Temp
7/7/15	ST, BL, CL	DG-4, DG-5, DG-Wetland

*AT= Amy Trost, BL=Ben Lardiere, CL= Carley Lancaster, ST= Scott Taylor

3.2 CRAM Assessment and Scoring

The CRAM scoring in this report represents a baseline condition for 2015 for each of the AAs that were assessed. The AAs within Devil's Gate (DG-TEMP, DG-PERM, DG-4, DG-5, and DG-Wetland) were all categorized as the "riverine:confined" wetland sub-type. The apparent hydrologic flow regime for these areas was considered to be "intermittent."

CRAM scores are present in accordance with summarized results for each major category on the data sheets. These scores summarize sub-metric values for buffer and landscape context, hydrology, physical structure, and biotic structure. More detailed scoring can be found on the data sheets attached to this report in Appendix A. Summarized Attribute Scores (percent) and Overall AA Scores (percent) for each of the AAs are listed in Table 3 below.

Table 3. Final Attribute Scores and Overall AA Scores

Final Attribute Score					
Assessment Area	**Buffer and Landscape**	**Hydrology**	**Physical Structure**	**Biotic Structure**	**Overall AA Score**
DG-PERM	80.9	91.7	25	69.5	67
DG-TEMP	49	83.4	50	41.7	57
DG-WETLAND	48.9	75	50	63.9	59
DG-4	49	91.7	62.5	61.2	67
DG-5	55.8	83.3	62.5	61.2	65.7

4.0 SUMMARY

ECORP conducted a CRAM analysis for the Devil's Gate Reservoir Sediment Removal and Management Project. The CRAM analysis was conducted to document current (pre-project) conditions to better understand the level of integrity of the landscape, hydrology, physical, and biotic factors contributing to the overall health of the watershed. The results of the CRAM will also help compare relative values of unvegetated waters of the U.S. and wetlands across the Project area and proposed mitigation sites under USACE and CDFW guidelines. ECORP biologists collected field data related to four attributes identified by the CRAM methodology as important indicators of wetland (and riparian by proxy) conditions.

The CRAM scores showed an average of 61 within AAs of the proposed project impact areas and an average score of 66.35 within AAs of the proposed project mitigation areas. The differences in scoring between impact and mitigation areas appear to be primarily related to the categories of biotic structure and physical structure. Within areas to be impacted, riparian habitat is less well-developed and structural elements (logs, rocks, and so on) are less prevalent than within the mitigation areas. Impact areas tend to be scoured more frequently during rain events, resulting in less habitat being present, The mitigation areas, by contrast, do not receive scouring flows generally, which has allowed more riparian habitat and structural features to develop.

5.0 REFERENCES

California Wetlands Monitoring Workgroup (CWMW). 2012. California Rapid Assessment Method (CRAM) for Wetlands and Riparian Areas. Version 6.0. User's Manual.

California Wetlands Monitoring Workgroup (CWMW). 2013a. California Rapid Assessment Method (CRAM) for Wetlands and Riparian Areas. Version 6.1. User's Manual.

California Wetlands Monitoring Workgroup (CWMW). 2013b. California Rapid Assessment Method (CRAM) for Wetlands. Version 6.1. Riverine Wetlands Field Book.

RAWS, 2015 Mt. Washington location, accessed on September 23, 2015 from http://www.raws.dri.edu/cgi-bin/rawMAIN.pl?caCMTW

USACE. 2013. 12501-SPD Regulatory Program Standard Operating Procedure for the Determination of Mitigation Ratios. U.S. Army Corps of Engineers, South Pacific Division.

APPENDIX A

CRAM Scoring Sheets

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-DG-TEMP	
Project Name: Devil's Gate	
Assessment Area ID #: DG-TEMP	
Project ID #: 2014-003.008	**Date:** 7/2/2015
Assessment Team Members for This AA:	
Scott Taylor	
Amy Trost	
Average Bankfull Width: 216.7 m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 200m	
Upstream Point Latitude: 34.196868	**Longitude:** -118.169820
Downstream Point Latitude: 34.195597	**Longitude:** -118.170470

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☑ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☑ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☑ intermittent ☐ ephemeral

Scoring Sheet: Riverine Wetlands

AA Name: DG-TEMP			Date: 7/2/2015
Attribute 1: Buffer and Landscape Context (pp. 11-19)			**Comments**
	Alpha.	Numeric	
Stream Corridor Continuity (D)	D	3	
Buffer:			
Buffer submetric A: Percent of AA with Buffer	A	12	
Buffer submetric B: Average Buffer Width	C	6	
Buffer submetric C: Buffer Condition	B	9	
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$		11.7	**Final Attribute Score = (Raw Score/24) x 100** 49
Attribute 2: Hydrology (pp. 20-26)			
	Alpha.	Numeric	
Water Source	B	9	
Channel Stability	B	9	
Hydrologic Connectivity	A	12	
Raw Attribute Score = sum of numeric scores		30	**Final Attribute Score = (Raw Score/36) x 100** 83.4
Attribute 3: Physical Structure (pp. 27-33)			
	Alpha.	Numeric	
Structural Patch Richness	B	9	
Topographic Complexity	D	3	
Raw Attribute Score = sum of numeric scores		12	**Final Attribute Score = (Raw Score/24) x 100** 50
Attribute 4: Biotic Structure (pp. 34-41)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C	6	
Plant Community submetric B: Number of Co-dominant species	D	3	
Plant Community submetric C: Percent Invasion	B	9	
Plant Community Composition Metric *(numeric average of submetrics A-C)*		6	
Horizontal Interspersion	C	6	
Vertical Biotic Structure	D	3	
Raw Attribute Score = sum of numeric scores		15	**Final Attribute Score = (Raw Score/36) x 100** 41.7
Overall AA Score (average of four final Attribute Scores)			57

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-DG-PERM	
Project Name: Devil's Gate	
Assessment Area ID #: DG-PERM	
Project ID #: 2014-003.008	**Date:** 7/2/2015
Assessment Team Members for This AA:	
Scott Taylor	
Amy Trost	
Average Bankfull Width: 21 m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 200 m	
Upstream Point Latitude: 34.190269	**Longitude:** -118.173233
Downstream Point Latitude: 34.188792	**Longitude:** -118.173453

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☑ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☑ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☑ intermittent ☐ ephemeral

DG-PERM
7/2/2015

Scoring Sheet: Riverine Wetlands

AA Name: DG-PERM					Date: 7/2/2015	
Attribute 1: Buffer and Landscape Context (pp. 11-19)					**Comments**	
			Alpha.	Numeric		
Stream Corridor Continuity (D)			B	9		
Buffer:						
	Alpha.	Numeric				
Buffer submetric A: Percent of AA with Buffer	A	12				
Buffer submetric B: Average Buffer Width	A	12				
Buffer submetric C: Buffer Condition	B	9				
Raw Attribute Score = D+[C x (A x B)^{½}]^{½}				19.4	**Final Attribute Score = (Raw Score/24) x 100**	80.9
Attribute 2: Hydrology (pp. 20-26)						
			Alpha.	Numeric		
Water Source			B	9		
Channel Stability			A	12		
Hydrologic Connectivity			A	12		
Raw Attribute Score = sum of numeric scores				33	**Final Attribute Score = (Raw Score/36) x 100**	91.7
Attribute 3: Physical Structure (pp. 27-33)						
			Alpha.	Numeric		
Structural Patch Richness			D	3		
Topographic Complexity			D	3		
Raw Attribute Score = sum of numeric scores				6	**Final Attribute Score = (Raw Score/24) x 100**	25
Attribute 4: Biotic Structure (pp. 34-41)						
Plant Community Composition (based on sub-metrics A-C)						
	Alpha.	Numeric				
Plant Community submetric A: Number of plant layers	A	12				
Plant Community submetric B: Number of Co-dominant species	D	3				
Plant Community submetric C: Percent Invasion	C	6				
Plant Community Composition Metric *(numeric average of submetrics A-C)*				7		
Horizontal Interspersion				9		
Vertical Biotic Structure				9		
Raw Attribute Score = sum of numeric scores				25	**Final Attribute Score = (Raw Score/36) x 100**	69.5
Overall AA Score (average of four final Attribute Scores)					67	

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-DG-Wetland	
Project Name: Devil's Gate	
Assessment Area ID #: DG-Wetland	
Project ID #: 2014-003.008	**Date:** 7/7/2015
Assessment Team Members for This AA:	
Scott Taylor	
Ben Lardiere	
Average Bankfull Width: 7 m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 100m	
Upstream Point Latitude: 34.186341	**Longitude:** -118.175833
Downstream Point Latitude: 34.185801	**Longitude:** -118.175344

Wetland Sub-type:

☑ Confined ☐ Non-confined

AA Category:

☐ Restoration ☐ Mitigation ☑ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☑ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☑ intermittent ☐ ephemeral

Scoring Sheet: Riverine Wetlands

AA Name: D6-Wetland				**Date:** 7/2/2015	
Attribute 1: Buffer and Landscape Context (pp. 11-19)				**Comments**	
Stream Corridor Continuity (D)		Alpha. D	Numeric 3		
Buffer:					
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12			
Buffer submetric B: Average Buffer Width	C	6			
Buffer submetric C: Buffer Condition	B	9			
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$				**Final Attribute Score = (Raw Score/24) x 100**	48.9
Attribute 2: Hydrology (pp. 20-26)					
		Alpha.	Numeric		
Water Source		C	6		
Channel Stability		B	9		
Hydrologic Connectivity		A	12		
Raw Attribute Score = sum of numeric scores			27	**Final Attribute Score = (Raw Score/36) x 100**	75
Attribute 3: Physical Structure (pp. 27-33)					
		Alpha.	Numeric		
Structural Patch Richness		D	3		
Topographic Complexity		B	9		
Raw Attribute Score = sum of numeric scores			12	**Final Attribute Score = (Raw Score/24) x 100**	50
Attribute 4: Biotic Structure (pp. 34-41)					
Plant Community Composition (based on sub-metrics A-C)					
Plant Community submetric A: Number of plant layers	Alpha. B	Numeric 9			
Plant Community submetric B: Number of Co-dominant species	D	3			
Plant Community submetric C: Percent Invasion	A	12			
Plant Community Composition Metric *(numeric average of submetrics A-C)*					
Horizontal Interspersion		C	6		
Vertical Biotic Structure		B	9		
Raw Attribute Score = sum of numeric scores			15	**Final Attribute Score = (Raw Score/36) x 100**	63.9
Overall AA Score (average of four final Attribute Scores)				59	

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-DG-4	
Project Name: Devil's Gate	
Assessment Area ID #: DG-4	
Project ID #: 2014-003.008	**Date:** 7/7/2015
Assessment Team Members for This AA:	
Scott Taylor	
Carley Lancaster	
Average Bankfull Width: 21 m	
Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 200	
Upstream Point Latitude: 34.188858	**Longitude:** -118.173590
Downstream Point Latitude: 34.187419	**Longitude:** -118.174610

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☑ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☑ intermittent ☐ ephemeral

Scoring Sheet: Riverine Wetlands

AA Name: DG-4					Date: 7/7/2015	
Attribute 1: Buffer and Landscape Context (pp. 11-19)					**Comments**	
Stream Corridor Continuity (D)			Alpha.	Numeric		
			D	3		
Buffer:						
Buffer submetric A: Percent of AA with Buffer	Alpha.	Numeric				
	A	12				
Buffer submetric B: Average Buffer Width	C	6				
Buffer submetric C: Buffer Condition	B	9				
Raw Attribute Score = D+[C x (A x B)$^{1/2}$]$^{1/2}$				11.7	**Final Attribute Score = (Raw Score/24) x 100**	49
Attribute 2: Hydrology (pp. 20-26)						
			Alpha.	Numeric		
Water Source			B	9		
Channel Stability			A	12		
Hydrologic Connectivity			A	12		
Raw Attribute Score = sum of numeric scores				33	**Final Attribute Score = (Raw Score/36) x 100**	91.7
Attribute 3: Physical Structure (pp. 27-33)						
			Alpha.	Numeric		
Structural Patch Richness			C	6		
Topographic Complexity			B	9		
Raw Attribute Score = sum of numeric scores				15	**Final Attribute Score = (Raw Score/24) x 100**	62.5
Attribute 4: Biotic Structure (pp. 34-41)						
Plant Community Composition (based on sub-metrics A-C)						
	Alpha.	Numeric				
Plant Community submetric A: Number of plant layers	A	12				
Plant Community submetric B: Number of Co-dominant species	D	3				
Plant Community submetric C: Percent Invasion	C	6				
Plant Community Composition Metric *(numeric average of submetrics A-C)*				7		
Horizontal Interspersion			C	6		
Vertical Biotic Structure			B	9		
Raw Attribute Score = sum of numeric scores				22	**Final Attribute Score = (Raw Score/36) x 100**	61.2
Overall AA Score (average of four final Attribute Scores)					67	

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: AA-DG-5	
Project Name: Devil's Gate	
Assessment Area ID #: DG-5	
Project ID #: 2014-003.008	**Date:** 7/7/2015

Assessment Team Members for This AA:

Scott Taylor

Carley Lancaster

Average Bankfull Width: 21m

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m): 200m

Upstream Point Latitude: 34.191595 **Longitude:** -118.171995

Downstream Point Latitude: 34.191280 **Longitude:** -118.172829

Wetland Sub-type:

☐ Confined ☑ Non-confined

AA Category:

☐ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

Did the river/stream have flowing water at the time of the assessment? ☐ yes ☑ no

What is the apparent hydrologic flow regime of the reach you are assessing?

The hydrologic flow regime of a stream describes the frequency with which the channel conducts water. *Perennial* streams conduct water all year long, whereas *ephemeral* streams conduct water only during and immediately following precipitation events. *Intermittent* streams are dry for part of the year, but conduct water for periods longer than ephemeral streams, as a function of watershed size and water source.

☐ perennial ☑ intermittent ☐ ephemeral

Scoring Sheet: Riverine Wetlands

AA Name: DG-5					Date: 7/7/2015	
Attribute 1: Buffer and Landscape Context (pp. 11-19)					**Comments**	
			Alpha.	Numeric		
Stream Corridor Continuity (D)			D	3		
Buffer:						
	Alpha.	Numeric				
Buffer submetric A: Percent of AA with Buffer	A	12				
Buffer submetric B: Average Buffer Width	A	12				
Buffer submetric C: Buffer Condition	B	9				
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$				13.4	**Final Attribute Score = (Raw Score/24) x 100**	55.8
Attribute 2: Hydrology (pp. 20-26)						
			Alpha.	Numeric		
Water Source			B	9		
Channel Stability			B	9		
Hydrologic Connectivity			A	12		
Raw Attribute Score = sum of numeric scores				30	**Final Attribute Score = (Raw Score/36) x 100**	83.3
Attribute 3: Physical Structure (pp. 27-33)						
			Alpha.	Numeric		
Structural Patch Richness			C	6		
Topographic Complexity			B	9		
Raw Attribute Score = sum of numeric scores				15	**Final Attribute Score = (Raw Score/24) x 100**	62.5
Attribute 4: Biotic Structure (pp. 34-41)						
Plant Community Composition (based on sub-metrics A-C)						
	Alpha.	Numeric				
Plant Community submetric A: Number of plant layers	A	12				
Plant Community submetric B: Number of Co-dominant species	D	3				
Plant Community submetric C: Percent Invasion	C	6				
Plant Community Composition Metric *(numeric average of submetrics A-C)*				7		
Horizontal Interspersion			C	6		
Vertical Biotic Structure			B	9		
Raw Attribute Score = sum of numeric scores				22	**Final Attribute Score = (Raw Score/36) x 100**	61.2
Overall AA Score (average of four final Attribute Scores)					65.7	

APPENDIX B

Photo Pages

DG-PERM: Upstream

DG-PERM: Downstream

DG-TEMP. Upstream

DG-TEMP. Downstream

DG-WETLAND. Aerial View

DG-4. Upstream

DG-5 Upstream

APPENDIX I

Mitigation Areas Photographic Compendium

Appendix I - Devil's Gate Reservoir Mitigation Areas Photo Compendium

Photograph 1: DG-1.

Photograph 2: DG-1


Photograph 3: DG-2.


Photograph 4: DG-2.

Photograph 5: DG-2A.

Photograph 6: DG-2A.

Photograph 7: DG-2B.

Photograph 8: DG-3A.

Photograph 9: DG-4.

Photograph 10: DG-4.

Photograph 11: DG-4A.

Photograph 12: DG-4A.

Photograph 13: DG 4-B.

Photograph 14: DG 4-C.

Photograph 15: DG-5.

Photograph 16: DG-7.

Photograph 17: DG-8.

Photograph 18: DG-9.

Photograph 19: DG-SF-1.

Photograph 20: DG-SF-2.


Photograph 21: DG-W-1.


Photograph 22: DG-W-2.

Photograph 23: DG-W-2.

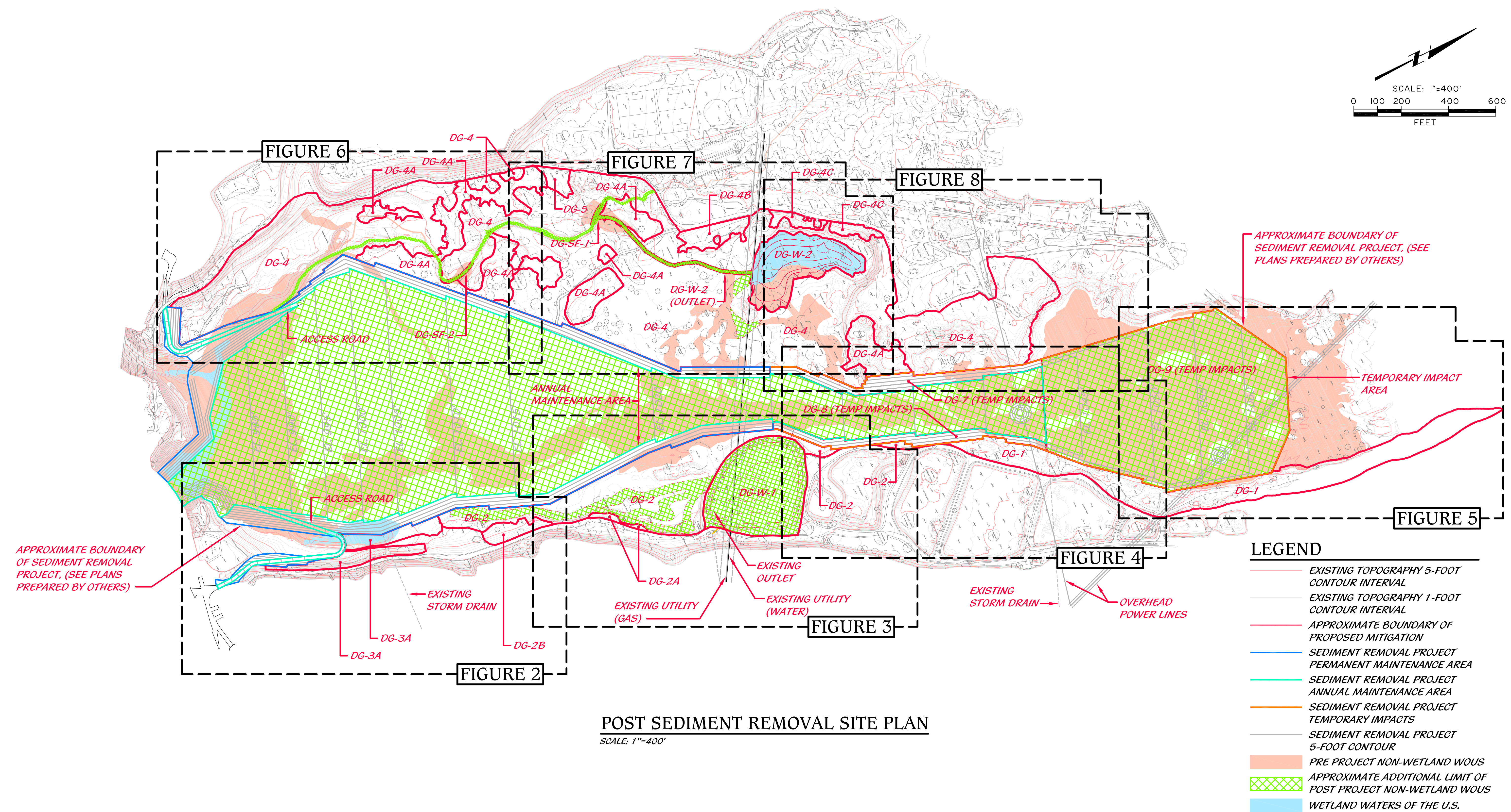
Photograph 24: DG-W-2.

Photograph 25: DG W-2.

Photograph 26: DG W-2 (Outlet).

APPENDIX J

Mitigation Areas Design Plans



POST SEDIMENT REMOVAL SITE PLAN

SCALE: 1"=400'

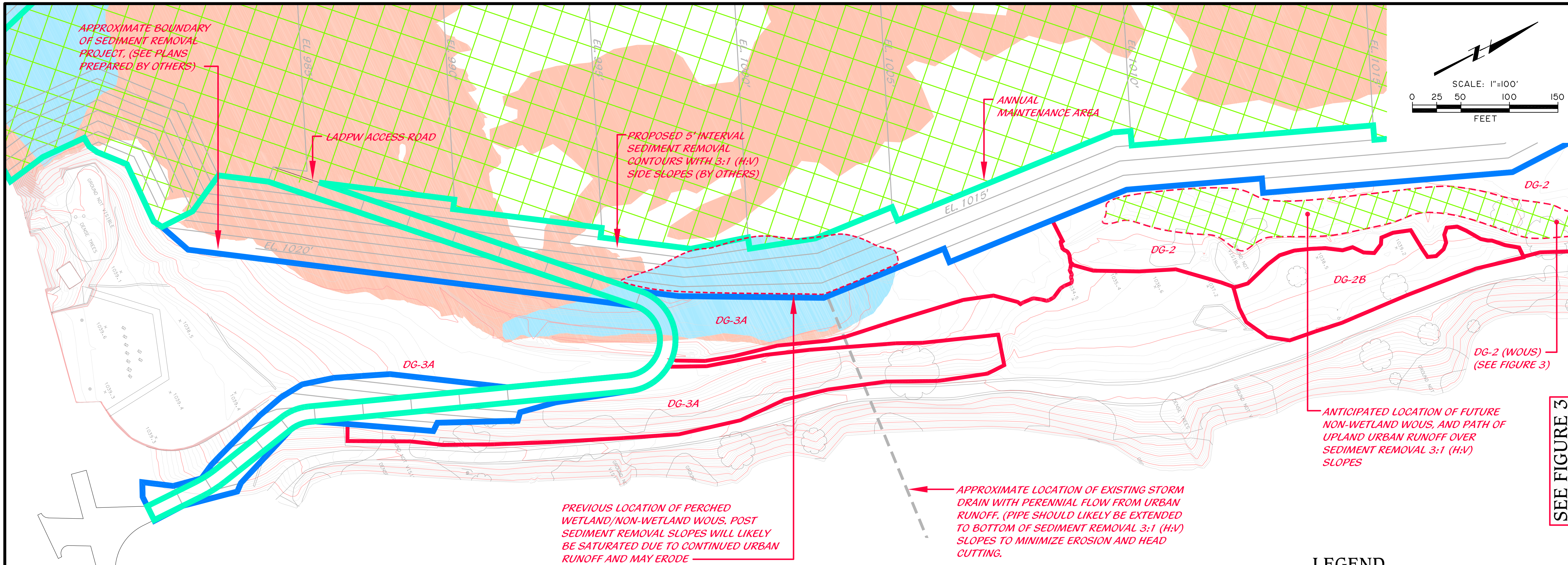
ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP
ENGINEERS AND GEOLOGISTS
3890 MURPHY CANYON ROAD, SUITE 200
SAN DIEGO, CA 92123 (858) 573-6900

FIGURE NUMBER	PROJECT NAME	PROPOSAL NUMBER
1	DEVIL'S GATE RESERVOIR	3019

OVERALL POST SEDIMENT REMOVAL SITE PLAN - INDEX



DETAILED SITE PLAN

SCALE: 1"=100'

DG-3A

DG-3A is a 1.15-acre area in the southeastern portion of the Reservoir. Currently, the area consists of disturbed riparian/oak woodland dominated by large eucalyptus trees with an understory of exotics including mustards and nonnative grasses.

Planned Activities:

1. *Planting and seeding with native riparian (and oak) species.*
2. *Remove non-native/invasive plant species from approximately 1.0 acre within the mitigation area.*

DG-2

DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.*

DG-2B

DG-2B is a 0.38-acre area on the easternmost side of the Reservoir also adjacent to the pedestrian pathway. The area is a disturbed area that gently slopes away from the pathway and it supports a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by poison hemlock, perennial pepperweed, nonnative grasses, mustards, wild radish, and Italian thistle. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side and north sides and oak woodland on the east side of the pathway.

Planned Activities:

1. *Planting and seeding with native species.*
2. *Remove non-native/invasive plant species from approximately 0.38 acres within the mitigation area.*

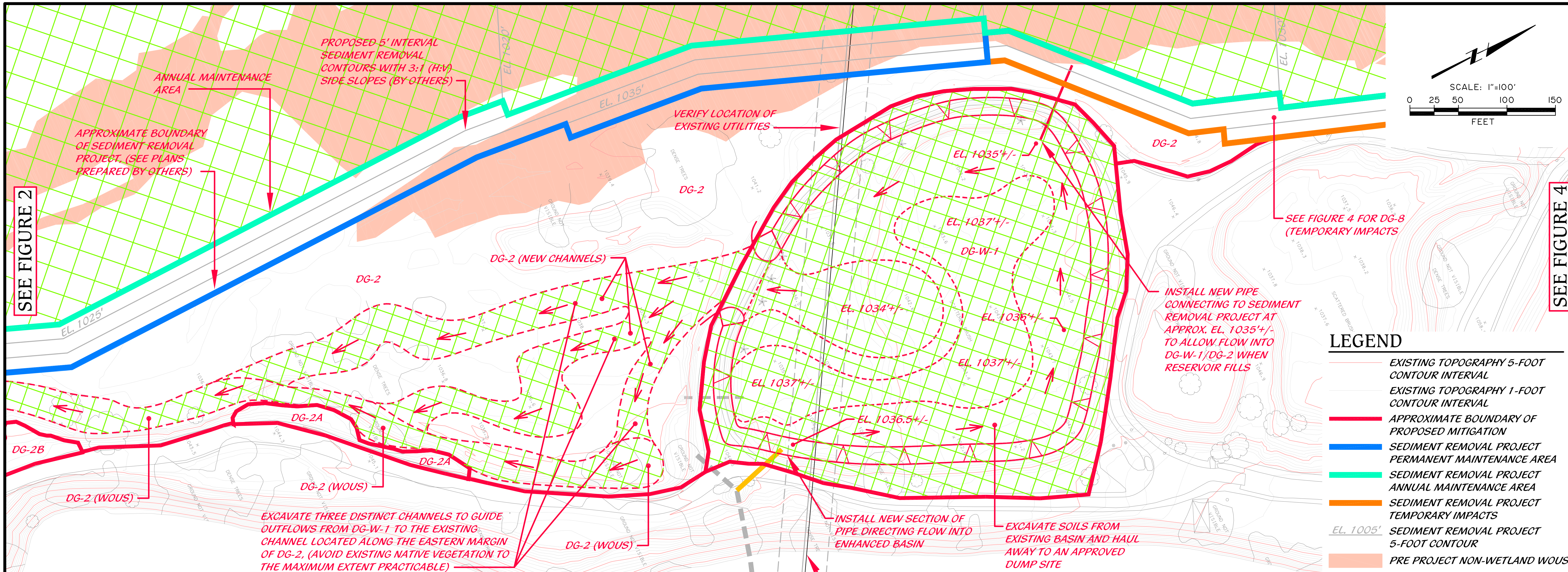
LEGEND

- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
- EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
- APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
- SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
- EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
- PRE PROJECT NON-WETLAND WOUS
- APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
- WETLAND WATERS OF THE U.S.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900	FIGURE NUMBER 2
PROJECT NAME DEVIL'S GATE RESERVOIR	PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN	



DETAILED SITE PLAN

SCALE: 1"=100'

DG-W-1

DG-W-1 (Johnson Field) is a 3.44-acre non-operational percolation basin on the east side of the Reservoir. This area is not currently jurisdictional as it is not considered wetlands or non-wetland WOUS. Bounded by an elevated dirt maintenance road on all sides, most of the basin consists of disturbed fill of varying grades of sediment and gravel from previous maintenance activities associated with the Interim Management Project to manage sediment behind Devil's Gate Dam. The disturbed portion of the area primarily consists of a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by nonnative annuals including mustards, nonnative grasses, tocalote, wild radish, Italian thistle, and some perennial pepperweed. Several escaped cultivars border the basin on the east and west sides including palms and large eucalyptus trees.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
5. Improve hydrology so that DG-W-1 can convey flows to DG-2 and DG-2 non-wetland WOUS.
6. Remove non-native/invasive plant species from approximately 1.0 acre within the mitigation area.
7. Export of soil will occur with a total estimated volume of 34,287 cu yd.

Additional Notes:
Select areas will be graded to be lower in elevation than the locations slated for re-establishment of riparian woodland/mulefat thickets in order to allow water to collect to support hydrophytic vegetation development. Although wetland mitigation is not a goal for DG-W-1, if wetland habitat can be supported then the habitat restoration program will maintain these areas appropriately. The existing maintenance road on the west and south sides of DG-W-1 will be partially excavated to have a sloped berm without a flattened top, and a minimum 15-foot-wide channel will be cut through the southwestern corner so water can flow into DG-2, and ultimately into the main basin. The existing street drain that outflows just south of DG-W-1 directly into DG-2 will be modified to flow directly into DG-W-1. Also, approximately 2-foot diameter corrugated HDPE pipe will be installed at the northwestern corner of DG-W-1at approximately elevation 1035' to allow backup flows into the basin. It is anticipated that this may occur for a 4 to 8 hour period during 2-year storm events. Final resulting acreage will be determined following the habitat mitigation implementation.

DG-2 (NEW CHANNELS)

DG-2 (NEW CHANNELS) is a 0.83-acre area within DG-2. The plan is to excavate three distinct channels to guide outflows from the modified DG-W-1 basin, and reconnect flows to the existing DG-2 (WOUS) drainage.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil to improve conveyance of flows during inclement weather.
3. Recontour existing soil to improve distribution of water throughout mitigation area.
4. Recontour and homogenize soil to improve soil conditions to support riparian trees.
5. Improve hydrology so that DG-W-1 can convey flows to DG-2.
6. Remove non-native/invasive plant species from approximately 0.5 acre within the mitigation area.
7. Estimated volume of soil to be manipulated throughout mitigation area is 540.0 cu yd. Neither import or export of soil is anticipated.

DG-2 (WOUS)

DG-2 (WOUS) is a 0.75-acre drainage area in the eastern portion of the Reservoir located westerly of DG-2A and the pedestrian pathway. The plan is to rehabilitate the area.

Planned Activities:

1. Planting and seeding with native riparian species.
2. Recontour existing soil in select locations to improve conveyance of flows during inclement weather.
3. Improve hydrology so that DG-W-1 can convey flows to the Reservoir.
4. Remove non-native/invasive plant species from approximately 0.3 acre within the mitigation area.
5. Neither import or export of soil is anticipated.

DG-2A

DG-2A is a 0.10-acre area on the easternmost side of the Reservoir immediately adjacent to the pedestrian pathway. The area is on an elevated terrace nearly level with the adjacent pathway and primarily consists of a Mustard and Annual Brome Semi-Natural Herbaceous Stand community dominated by nonnative grasses, mustards, and horehound. Adjacent vegetation communities include pockets of riparian woodland interspersed in mulefat thickets on the west side, disturbed oak woodland bisecting the area, and coast live oak woodland on the east side of the pathway.

Planned Activities:

1. Planting and seeding with native species.
2. Remove non-native/invasive plant species from approximately 0.1 acre within the mitigation area.

DG-2

DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

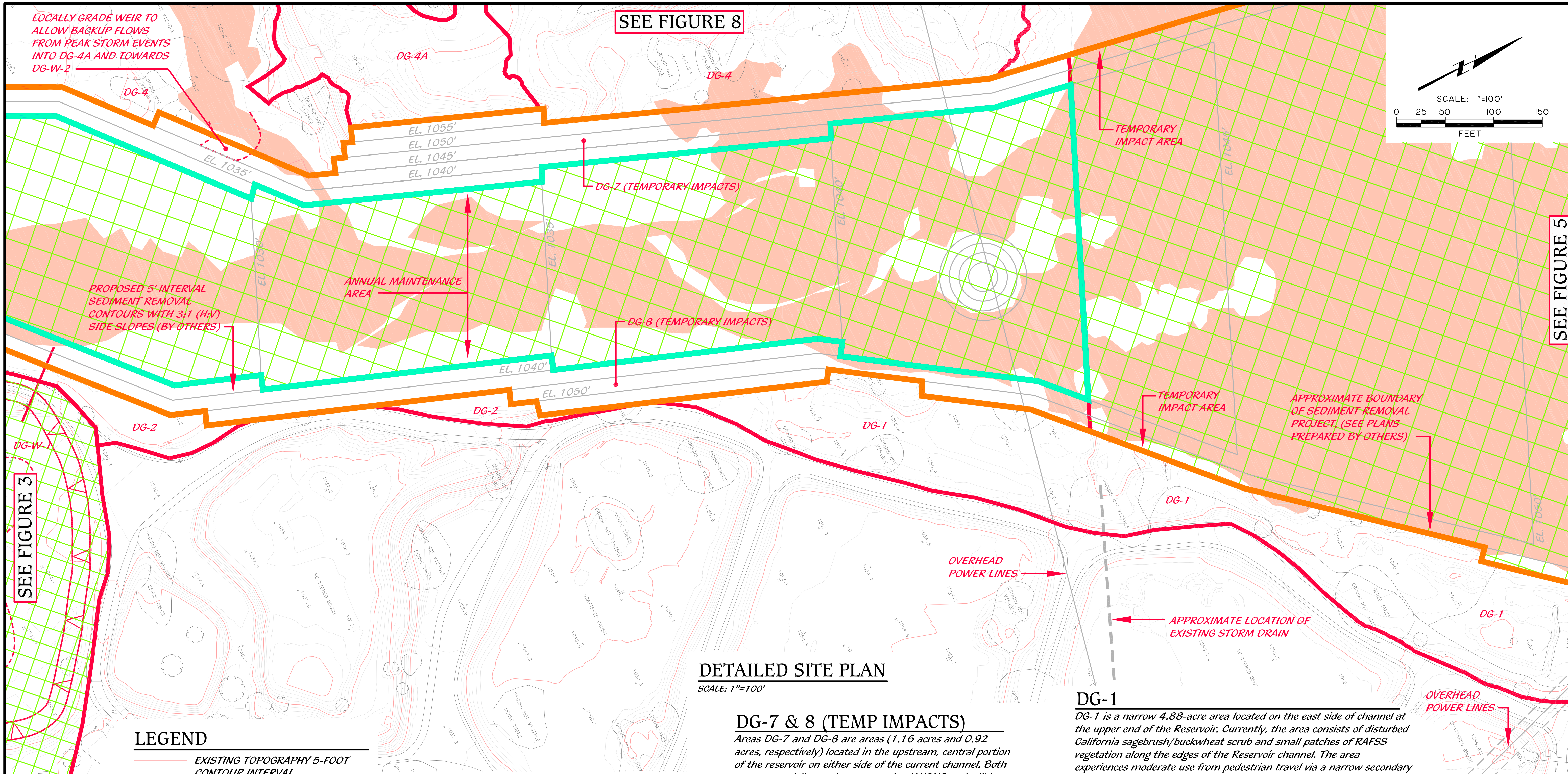
Planned Activities:

1. Planting and seeding with native riparian species.
2. Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900	FIGURE NUMBER 3
PROJECT NAME DEVIL'S GATE RESERVOIR	PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN	



DETAILED SITE PLAN

SCALE: 1"=100'

LEGEND

- EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
- EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
- APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
- SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
- SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
- EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
- PRE PROJECT NON-WETLAND WOUS
- APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS

DG-2

DG-2 is a 3.83-acre area in the eastern portion of the Reservoir located between the Reservoir channel and the pedestrian pathway. Currently, the area consists of a mix of riparian woodland, mulefat thickets, and riparian herbaceous vegetation communities with several areas dominated by exotics including perennial pepperweed, poison hemlock, mustards, wild radish, and Italian thistle.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 1.1 acres within the mitigation area.*

DG-7 & 8 (TEMP IMPACTS)

Areas DG-7 and DG-8 are areas (1.16 acres and 0.92 acres, respectively) located in the upstream, central portion of the reservoir on either side of the current channel. Both areas were delineated as non-wetland WOUS and will be temporarily impacted during the initial sediment removal phase of the Project. Currently, both areas consist of a mix of scoured streambed, riparian woodland, and mulefat thicket habitat types. Adjacent habitat types include scoured streambed, black willow thickets and mulefat thickets.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 0.7 acres within DG-7, and 0.3 acres within DG-8.*

DG-1

DG-1 is a narrow 4.88-acre area located on the east side of channel at the upper end of the Reservoir. Currently, the area consists of disturbed California sagebrush/buckwheat scrub and small patches of RAFSS vegetation along the edges of the Reservoir channel. The area experiences moderate use from pedestrian travel via a narrow secondary trail that runs through the northern portion of the area.

Planned Activities:

1. *Planting and seeding with native species.*
2. *Remove non-native/invasive plant species from approximately 3.5 acres within the mitigation area.*

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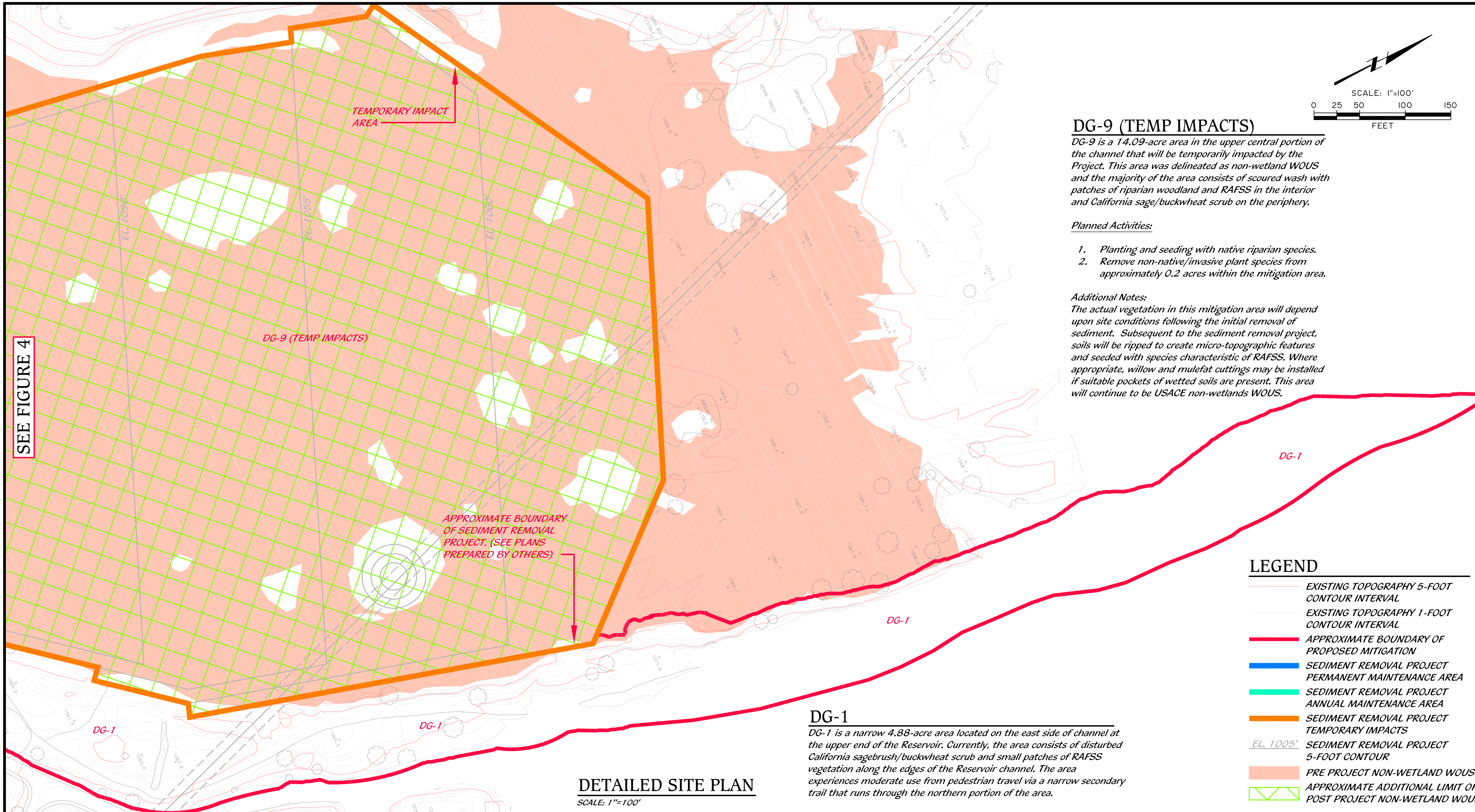
TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 4
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN		



DG-9 (TEMP IMPACTS)

DG-9 is a 14.09-acre area in the upper central portion of the channel that will be temporarily impacted by the Project. This area was delineated as non-wetland WOUS and the majority of the area consists of scoured wash with patches of riparian woodland and RAFSS in the interior and California sage/buckwheat scrub on the periphery.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 0.2 acres within the mitigation area.*

Additional Notes:
The actual vegetation in this mitigation area will depend upon site conditions following the initial removal of sediment. Subsequent to the sediment removal project, soils will be ripped to create micro-topographic features and seeded with species characteristic of RAFSS. Where appropriate, willow and mulefat cuttings may be installed if suitable pockets of wetted soils are present. This area will continue to be USACE non-wetlands WOUS.

LEGEND

- *EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL*
- *EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL*
- *APPROXIMATE BOUNDARY OF PROPOSED MITIGATION*
- *SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA*
- *SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA*
- *SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS*
- *EL. 1005'* — *SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR*
- *PRE PROJECT NON-WETLAND WOUS*
- *APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS*

DG-1

DG-1 is a narrow 4.88-acre area located on the east side of channel at the upper end of the Reservoir. Currently, the area consists of disturbed California sagebrush/buckwheat scrub and small patches of RAFSS vegetation along the edges of the Reservoir channel. The area experiences moderate use from pedestrian travel via a narrow secondary trail that runs through the northern portion of the area.

Planned Activities:

1. *Planting and seeding with native species.*
2. *Remove non-native/invasive plant species from approximately 3.5 acres within the mitigation area.*

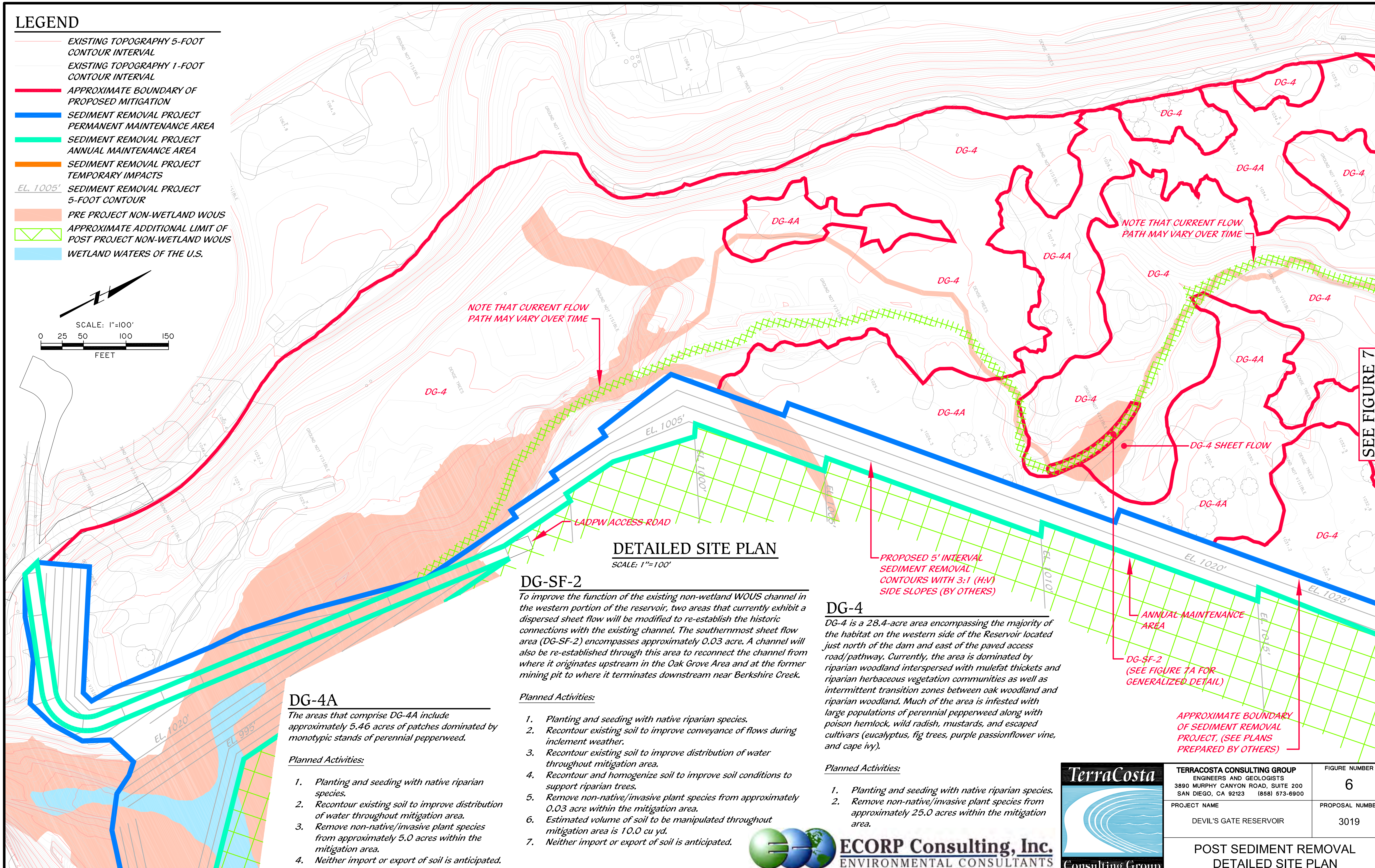
DETAILED SITE PLAN

SCALE: 1"=100'

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 5
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN		



DETAILED SITE PLAN

SCALE: 1"=100'

DG-SF-2

To improve the function of the existing non-wetland WOUS channel in the western portion of the reservoir, two areas that currently exhibit a dispersed sheet flow will be modified to re-establish the historic connections with the existing channel. The southernmost sheet flow area (DG-SF-2) encompasses approximately 0.03 acre. A channel will also be re-established through this area to reconnect the channel from where it originates upstream in the Oak Grove Area and at the former mining pit to where it terminates downstream near Berkshire Creek.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve conveyance of flows during inclement weather.*
3. *Recontour existing soil to improve distribution of water throughout mitigation area.*
4. *Recontour and homogenize soil to improve soil conditions to support riparian trees.*
5. *Remove non-native/invasive plant species from approximately 0.03 acre within the mitigation area.*
6. *Estimated volume of soil to be manipulated throughout mitigation area is 10.0 cu yd.*
7. *Neither import or export of soil is anticipated.*

DG-4A

The areas that comprise DG-4A include approximately 5.46 acres of patches dominated by monotypic stands of perennial pepperweed.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve distribution of water throughout mitigation area.*
3. *Remove non-native/invasive plant species from approximately 5.0 acres within the mitigation area.*
4. *Neither import or export of soil is anticipated.*

DG-4

DG-4 is a 28.4-acre area encompassing the majority of the habitat on the western side of the Reservoir located just north of the dam and east of the paved access road/pathway. Currently, the area is dominated by riparian woodland interspersed with mulefat thickets and riparian herbaceous vegetation communities as well as intermittent transition zones between oak woodland and riparian woodland. Much of the area is infested with large populations of perennial pepperweed along with poison hemlock, wild radish, mustards, and escaped cultivars (eucalyptus, fig trees, purple passionflower vine, and cape ivy).

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 25.0 acres within the mitigation area.*

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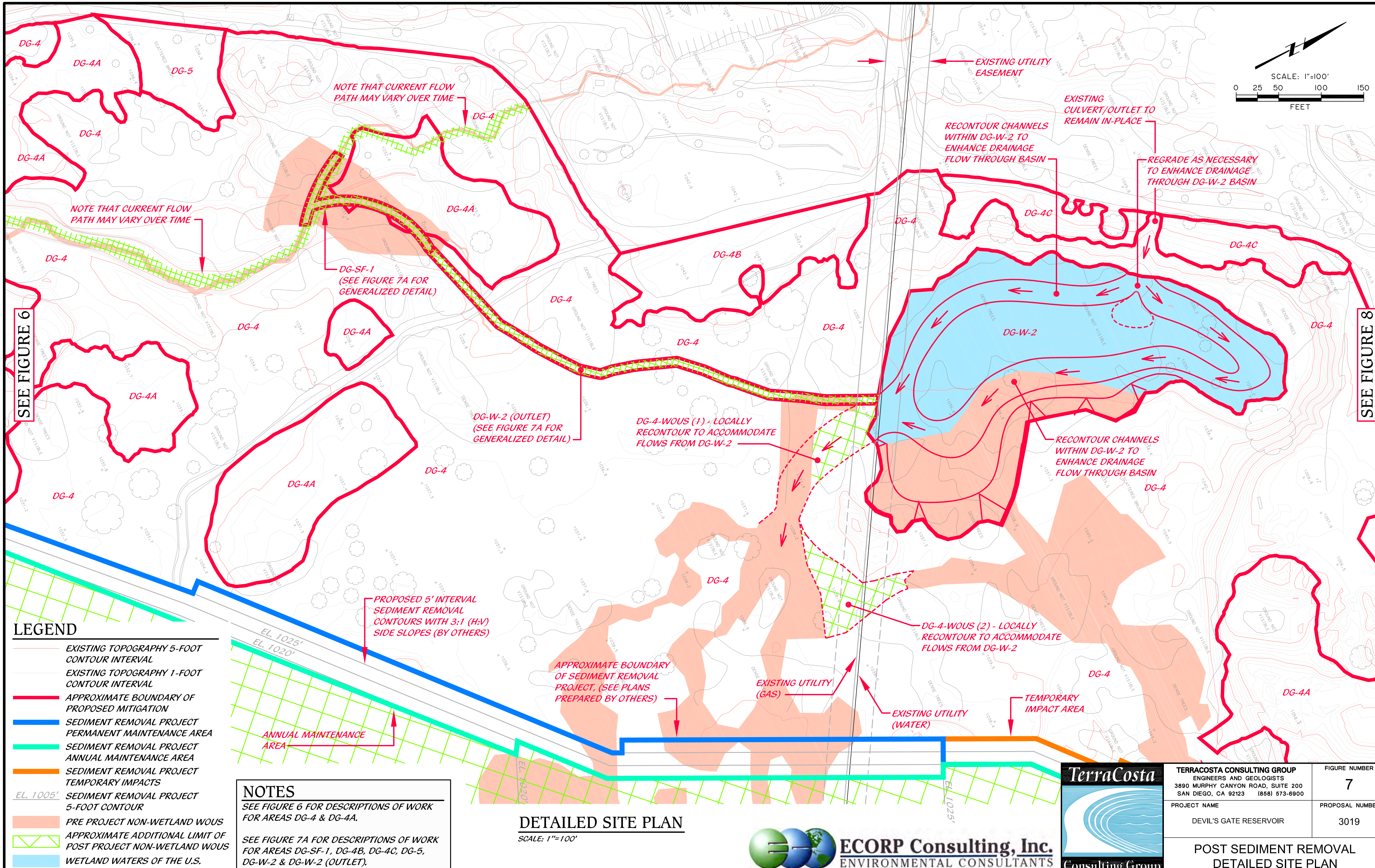
TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900		FIGURE NUMBER 6
PROJECT NAME DEVIL'S GATE RESERVOIR		PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN		


SCALE: 1"=100'
0 25 50 100 150
FEET
SEE FIGURE 6
SEE FIGURE 8
DG-4
DG-4A
DG-4B
DG-4C
DG-5
DG-W-2
NOTE THAT CURRENT FLOW PATH MAY VARY OVER TIME
EXISTING UTILITY EASEMENT
EXISTING CULVERT/OUTLET TO REMAIN IN-PLACE
RECONTOUR CHANNELS WITHIN DG-W-2 TO ENHANCE DRAINAGE FLOW THROUGH BASIN
REGRADE AS NECESSARY TO ENHANCE DRAINAGE THROUGH DG-W-2 BASIN
DG-SF-1 (SEE FIGURE 7A FOR GENERALIZED DETAIL)
DG-W-2 (OUTLET) (SEE FIGURE 7A FOR GENERALIZED DETAIL)
DG-4-WOUS (1) - LOCALLY RECONTOUR TO ACCOMMODATE FLOWS FROM DG-W-2
DG-4-WOUS (2) - LOCALLY RECONTOUR TO ACCOMMODATE FLOWS FROM DG-W-2
PROPOSED 5' INTERVAL SEDIMENT REMOVAL CONTOURS WITH 3:1 (H:V) SIDE SLOPES (BY OTHERS)
APPROXIMATE BOUNDARY OF SEDIMENT REMOVAL PROJECT, (SEE PLANS PREPARED BY OTHERS)
EXISTING UTILITY (GAS)
EXISTING UTILITY (WATER)
TEMPORARY IMPACT AREA
ANNUAL MAINTENANCE AREA
EL. 1025'
EL. 1020'
LEGEND
EXISTING TOPOGRAPHY 5-FOOT CONTOUR INTERVAL
EXISTING TOPOGRAPHY 1-FOOT CONTOUR INTERVAL
APPROXIMATE BOUNDARY OF PROPOSED MITIGATION
SEDIMENT REMOVAL PROJECT PERMANENT MAINTENANCE AREA
SEDIMENT REMOVAL PROJECT ANNUAL MAINTENANCE AREA
SEDIMENT REMOVAL PROJECT TEMPORARY IMPACTS
EL. 1005' SEDIMENT REMOVAL PROJECT 5-FOOT CONTOUR
PRE PROJECT NON-WETLAND WOUS
APPROXIMATE ADDITIONAL LIMIT OF POST PROJECT NON-WETLAND WOUS
WETLAND WATERS OF THE U.S.
NOTES
SEE FIGURE 6 FOR DESCRIPTIONS OF WORK FOR AREAS DG-4 & DG-4A.
SEE FIGURE 7A FOR DESCRIPTIONS OF WORK FOR AREAS DG-SF-1, DG-4B, DG-4C, DG-5, DG-W-2 & DG-W-2 (OUTLET).
DETAILED SITE PLAN
SCALE: 1"=100'
ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
TerraCosta Consulting Group
TERRACOSTA CONSULTING GROUP
ENGINEERS AND GEOLOGISTS
3890 MURPHY CANYON ROAD, SUITE 200
SAN DIEGO, CA 92123 (858) 573-6900
FIGURE NUMBER
7
PROJECT NAME
DEVIL'S GATE RESERVOIR
PROPOSAL NUMBER
3019
POST SEDIMENT REMOVAL DETAILED SITE PLAN

DG-SF-1 & DG-SF-2

To improve the function of the existing non-wetland WOUS channel in the western portion of the reservoir, two areas that currently exhibit a dispersed sheet flow will be modified to re-establish the historic connections with the existing channel. The northernmost sheet flow area (DG-SF-1) encompasses approximately 0.08 acre. At the point where the re-established outflow channel from the former mining pit enters this sheet flow area, the channel will be re-established and connected with the channels that enter from the Oak Grove area and the former mining pit. The southernmost sheet flow area (DG-SF-2) encompasses approximately 0.03 acres. This will re-establish the connections of the two channels with the existing non-wetland WOUS channel that proceeds through the western portion of the reservoir to Berkshire Creek, (i.e., DG-4-Drainage).

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve conveyance of flows during inclement weather.*
3. *Recontour existing soil to improve distribution of water throughout mitigation area.*
4. *Recontour and homogenize soil to improve soil conditions to support riparian trees.*
5. *Remove non-native/invasive plant species from approximately 0.05 acre within DG-SF-1 & 0.03 acres within DG-SF-2.*
6. *Estimated volume of soil to be manipulated throughout mitigation area is 31.0 cu yd within DG-SF-1 & 10 cu yd within DG-SF-2.*
7. *Neither import or export of soil is anticipated.*

DG-4B

DG-4B is a 0.54-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and east of the Lower Oak Grove Parking Lot. Currently, the area consists of disturbed bare ground with patches of exotic annuals including horehound, mustards, poison hemlock, and perennial pepperweed. Adjacent vegetation communities include mulefat thickets and patches of willow thickets to the north, east, and south and disturbed areas to the west.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 0.54 acre within the mitigation area.*

DG-4C

DG-4C is a 0.45-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and northeast of the Oak Grove Park lower parking lot. Currently, the area consists of disturbed riparian scrub habitat with patches of exotic annuals, including nonnative grasses and mustards. Adjacent vegetation communities include willow thickets to the east and south and disturbed areas to the west.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Remove non-native/invasive plant species from approximately 0.45 acre within the mitigation area.*

DG-5

DG-5 is a 0.26-acre area on the far west side of the Reservoir immediately adjacent to the pedestrian pathway and the larger enhancement area DG-4. Currently, the area consists of compacted disturbed bare ground with patches of riparian scrub. Adjacent vegetation communities include riparian woodland on the north, east, and west sides and oak woodland on the opposite side of the pathway to the west. One of the baskets from the disc golf course is located within DG-5 and the area receives fairly regular pedestrian traffic.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve distribution of water throughout mitigation area.*
3. *Recontour and homogenize soil to improve soil conditions to support riparian trees.*
4. *Remove non-native/invasive plant species from approximately 0.26 acre within the mitigation area.*
5. *Neither import or export of soil is anticipated.*

DG-W-2 (Mining Pit)

DG-W-2 is a 2.13-acre area on the west side of the Reservoir that is surrounded by the DG-4 enhancement area. The area is located within a topographic depression that was created when the area was historically mined. The majority of DG-W-2 has been delineated as USACE jurisdictional wetlands. This area has a history of inundation following storm events, which is evident in historic aerial photographs. In addition to inundation, the former mining pit receives sheet flows from the Oak Grove Area of Hahamongna Watershed Park through a culvert under the road located to the west of the mining pit. Flow also historically entered the pit from the east during high flows as evidenced by the presence of jurisdictional non-wetland WOUS sheet flow area located east of the pit. DG-W-2 currently supports vegetation that is typical of both wetland and riparian habitat. Vegetation within this area was a mix of non-native plants in areas with high clay content, surrounded by thickets of mulefat (Baccharis salicifolia) and black willow (Salix gooddingii) in areas where soil appeared to be higher sand content. Black willow thickets had willows ranging from approximately 10 to 20 feet in height with trunks having diameter at breast height of four to six inches. The area closest to the existing culvert outlet (on western bank) has a prevalence of accumulated soils that seem to range in texture from sand, silty sand, silty clay, clay loam, to sandy loam (determined by visual examination, texture analysis was not performed). Much of this accumulated soil has likely been deposited into this area during storm events. Excavations into the soil profile (by-hand) revealed that accumulated sediments with clays and silts may only be present within the first 12 to 18 inches of soil. Adjacent vegetation communities include disturbed California sagebrush/buckwheat scrub to the north, riparian woodland/mulefat thickets to the south and east, and developed areas to the west. Overflow exits DG-W-2 to the south and when it encounters a heavily used trail, it is diverted to the south as evidenced by multiple sheet flow channels running east towards the main channel. Evidence of inundation from the south is also present, which is likely a result of filling of the reservoir during heavy storms.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil in select areas to improve conveyance of flows during inclement weather.*
3. *Recontour existing soil in select areas to improve distribution of water throughout mitigation area.*
4. *Recontour and homogenize existing soil in select areas to improve soil conditions to support riparian trees.*
5. *Improve hydrology so that connection with DG-W-2 (Outlet) and existing non-wetland WOUS in DG-4 occurs.*
6. *Remove non-native/invasive plant species from approximately 0.6 acre within the mitigation area.*
7. *Estimated volume of soil to be manipulated throughout mitigation area is 4,000 cubic yards (cu yd).*
8. *Estimated area where soil manipulation will occur is 1.3 acres. Neither import or export of soil is anticipated.*

Additional Notes:
Although additional wetland mitigation is not a goal for DG-W-2, if wetland habitat can be supported then the habitat restoration program will maintain these areas appropriately so that wetland vegetation will become well established and self-sustaining. Wetland vegetation will be planted as appropriate and the perimeter will be planted with willows and mulefat to form a multi-structured riparian habitat surrounding the basin. The post-project condition of this mitigation area will be riparian woodland and mulefat thickets, with a potential for additional USACE jurisdictional wetland.

DG-W-2 (OUTLET)

DG-W-2 (Outlet) is a 0.13-acre channel area that will be re-established on the southwest side of the former mining pit (DG-W-2). At present, the outflow channel from the former mining pit intersects a heavily used trail and the flow is diverted along the trail towards the main drainage channel. Currently, the area where the channel will be re-established is vegetated with a patchy distribution of mulefat scrub and riparian woodland/scrub. The understory of the existing habitat contains an abundance of perennial pepperweed and other nonnative plants. To improve the function of the rehabilitated wetland in the former mining pit and to allow flow to return to the historic flow path to the western portion of the reservoir, a non-wetland WOUS channel will be reestablished. The location of where the channel exits the former mining pit will remain approximately the same but the channel will be re-established by removing the sediment that has created the diversion to the south and re-contouring the channel. The re-established channel will be approximately 475 feet long and the width will approximately match the existing outflow channel and the existing channel where the connection will be re-established (approximately 4 to 10 feet wide). The trail that has caused the diversion of this drainage in the past will be closed. Approximately 0.13 acre of non-wetland WOUS will be reestablished, which will result in a return of natural flow from the mining pit to the western portion of the reservoir. Existing native plants will be avoided to the extent possible during the construction of the channel. Invasive and nonnative plants and weeds will be removed and willows and mulefat will be planted along the banks of the re-established channel, where appropriate, to create or restore the riparian woodland/scrub.

Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve conveyance of flows during inclement weather.*
3. *Recontour existing soil to improve distribution of water throughout mitigation area.*
4. *Recontour and homogenize soil to improve soil conditions to support riparian trees.*
5. *Improve hydrology so that DW-W-2 can convey flows to DG-4 (Drainage).*
6. *Remove non-native/invasive plant species from approximately 0.1 acre within the mitigation area.*
7. *Estimated volume of soil to be manipulated throughout mitigation area is 260.0 cu yd.*
8. *Neither import or export of soil is anticipated.*

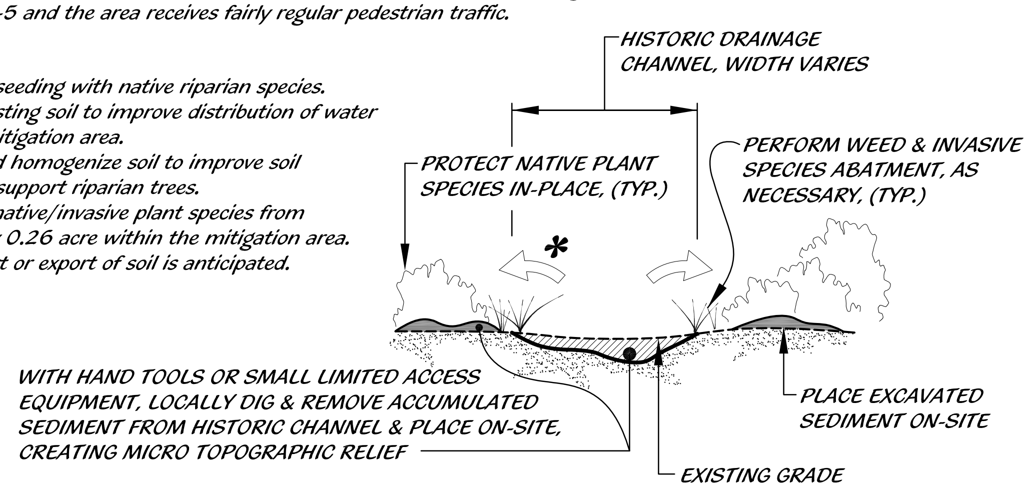
DG-4-WOUS CONNECTIONS (RE-ESTABLISHMENT)

DG-4-WOUS Connections comprises two areas with a combined acreage of approximately 0.22-acre. These two mitigation areas serve to re-establish non-wetland WOUS in two locations: (1) from the mining pit to existing non-wetland WOUS located in DG-4, and (2) as a connection between two existing non-wetland WOUS areas within DG-4. Both mitigation areas are on the west side of the Reservoir, within DG-4 and east of DG-W-2 (Mining Pit) and DG-W-2 (Outlet). These two mitigation areas will allow for flows from DG-W-2 to reach existing non-wetland WOUS, and then flow to the side slopes of the western edge of the reservoir. In addition, the second mitigation area will allow flows to move in a southerly direction from existing non-wetland WOUS (when the Reservoir is filled with water) to the other section of non-wetland WOUS immediately to the south. The area where these channels will be formed is currently a mix of sparse riparian tree species, mulefat thickets, and non-native infestations of perennial pepperweed, poison hemlock, and other nonnative species. During formation of these non-wetland WOUS avoidance of native plants will be achieved to the maximum extent practicable. Ultimately, the DG-4-WOUS Connections will re-establish non-wetland WOUS through DG-4 and provide for connections to other existing non-wetland WOUS areas.

Specifically, DG-4-WOUS Connections will be recontoured to improve conveyance of flows during inclement weather. In addition, soil manipulation during formation of channels will improve distribution of water in DG-4 and improve soil conditions to support growth of riparian trees. Following removal of non-native and invasive plant species from approximately 0.01 acre of DG-4, planting and seeding with native riparian trees and shrubs will occur so that black willow woodland can grow and persist and improve the hydrological function of this area.

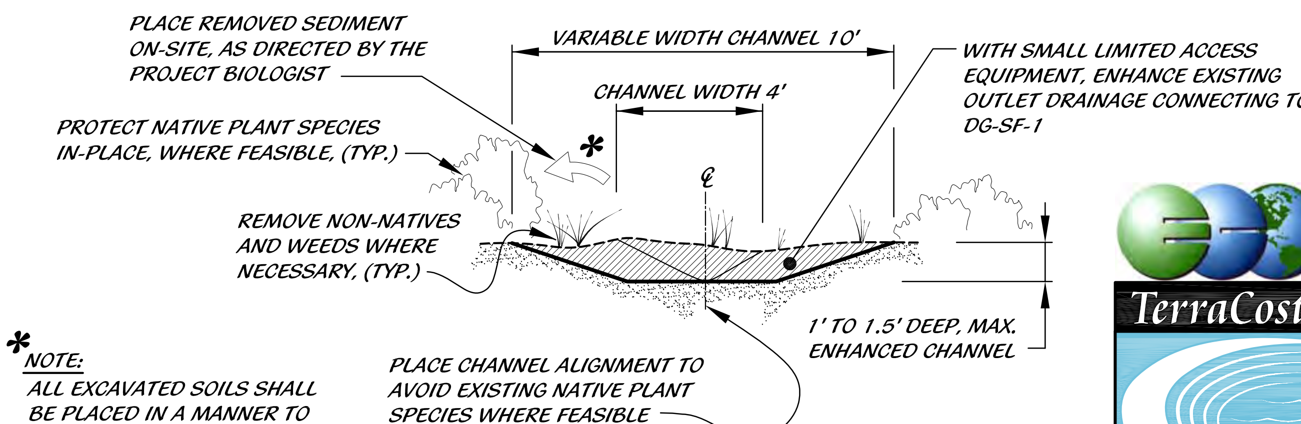
Planned Activities:

1. *Planting and seeding with native riparian species.*
2. *Recontour existing soil to improve conveyance of flows during inclement weather.*
3. *Recontour existing soil to improve distribution of water throughout mitigation area.*
4. *Improve hydrology so that DG-W-2 can convey flows to non-wetland WOUS in DG-4.*
5. *Improve hydrology so that a connection is established between two areas of non-wetland WOUS in DG-4.*
6. *Remove non-native/invasive plant species from approximately 0.01 acre within the mitigation area.*
7. *Estimated volume of soil to be manipulated throughout mitigation area is 20.0 cu yd.*
8. *Neither import or export of soil is anticipated.*



DG-SF-1 & DG-SF-2 GENERALIZED DETAIL
NOT TO SCALE

* *NOTE:*
ALL EXCAVATED SOILS SHALL BE PLACED IN A MANNER TO AVOID IMPACTS TO EXISTING NATIVE VEGETATION

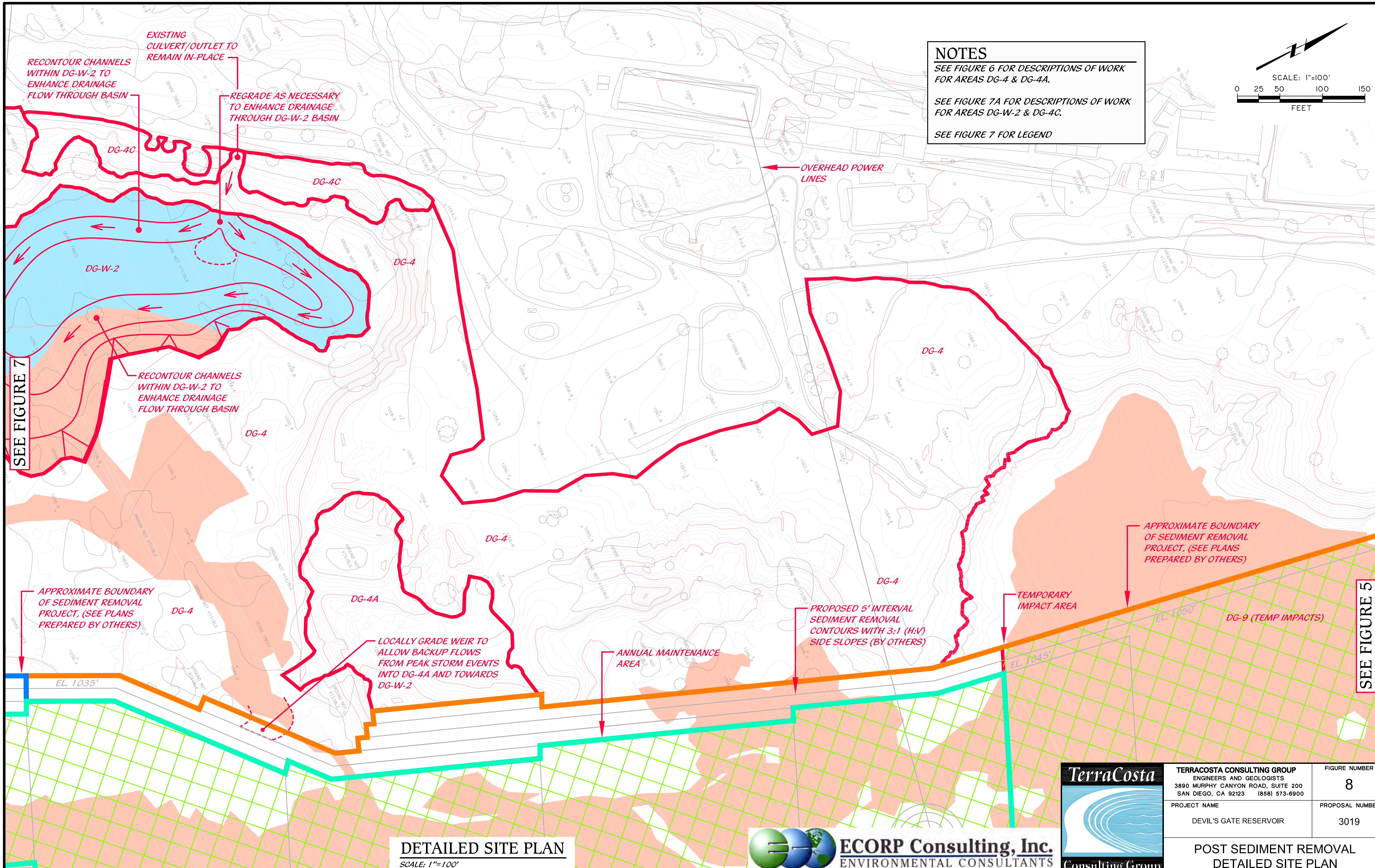


DG-W-2-(OUTLET) GENERALIZED DETAIL
NOT TO SCALE

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

TerraCosta Consulting Group

TERRACOSTA CONSULTING GROUP ENGINEERS AND GEOLOGISTS 3890 MURPHY CANYON ROAD, SUITE 200 SAN DIEGO, CA 92123 (858) 573-6900	FIGURE NUMBER 7A
PROJECT NAME DEVIL'S GATE RESERVOIR	PROPOSAL NUMBER 3019
POST SEDIMENT REMOVAL FIGURE 7 DESCRIPTIONS OF WORK	



TERRACOSTA CONSULTING GROUP
ENGINEERS AND GEOLOGISTS
3890 MURPHY CANYON ROAD, SUITE 200
SAN DIEGO, CA 92123 (858) 573-6900

FIGURE NUMBER: 8

PROJECT NAME: DEVIL'S GATE RESERVOIR

PROPOSAL NUMBER: 3019

POST SEDIMENT REMOVAL DETAILED SITE PLAN

APPENDIX K

USACE Compensatory Mitigation Checklists

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date:	Corps File No.:	SPL-2013-NNN	Project Manager:	Bonnie Rogers			
	Impact Site Name:	Wet-1	ORM Resource Type:	Wetland WOUS		Hydrology:	Seasonally flooded	
	Impact Cowardin or HGM type:	Palustrine	Impact area :	0.651	acres	Impact distance:		linear feet

		Column A		Column B		Column C	
1		Mitigation Site Name:	DG-W-2	Mitigation Site Name:		Mitigation Site Name:	
		Mitigation Type:	Rehabilitation	Mitigation Type:		Mitigation Type:	
		ORM Resource Type:	Wetland WOUS	ORM Resource Type:		ORM Resource Type:	
		Cowardin/HGM type:	Palustrine	Cowardin/HGM type:		Cowardin/HGM type:	
		Hydrology:	Seasonally flooded	Hydrology:		Hydrology:	
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**
		Ratio adjustment:		Ratio adjustment:		Ratio adjustment:	
		Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**
		PM justification:	see Table 1	PM justification:	see Table 1	PM justification:	see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**1.0 : 1.3**	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	:
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**1.0**	Ratio adjustment:		Ratio adjustment:	
		Existing functions at the impact site are high and no long-term instrument for preservation is in place					
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Mitigation within same immediate area as impact site		PM justification:		PM justification:	
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**1**	Ratio adjustment:		Ratio adjustment:	
		Permanent impact to wetland (Non-Native Herbaceous) would be mitigated with rehabilitation of wetland (Salix Goodingii Woodland Alliance), resulting in only a net loss of wetland with non-native riparian herbaceous habitat. (1)		PM justification:		PM justification:	
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Mitigation of mpacts to Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium with rehabilitation of Salix goodingii Woodland Alliance. The mitigation site is expected to become more diverse with native habitat types and many fewer invasive weeds.		PM justification:		PM justification:	
7	**Risk and uncertainty**:	Ratio adjustment:	**0.4**	Ratio adjustment:		Ratio adjustment:	
		Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)		PM justification:		PM justification:	
8	**Temporal loss**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		The restoration activity would take place during a single season, with no planned delay.		PM justification:		PM justification:	
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.30	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00
		Total adjustments (3-8):	2.40	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00
		Final ratio:	**2.62 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**
		Proposed impact (total):	0.651 acres	Remaining impact:	0.00 acres	Remaining impact (acres):	acres
			0 linear feet		0 linear feet	Remaining impact (linear feet):	#VALUE! linear feet
		to Resource type:	0	to Resource type:	0	to Resource type:	0
		Cowardin or HGM:	Palustrine	Cowardin or HGM:	Palustrine	Cowardin or HGM:	Palustrine
		Hydrology:	Seasonally flooded	Hydrology:	Seasonally flooded	Hydrology:	Seasonally flooded
		Required Mitigation*:	1.703 acres	Required Mitigation*:	0.00 acres	Required Mitigation:	#VALUE! acres
			0.0 linear feet		0.0 linear feet		#VALUE! linear feet
		of Resource type:	Wetland WOUS	of Resource type:	0	of Resource type:	0
		Cowardin or HGM:	Palustrine	Cowardin or HGM:	0	Cowardin or HGM:	0
		Hydrology:	Seasonaly flooded	Hydrology:	0	Hydrology:	0
		Proposed Mitigation**:	1.703 acres	Proposed Mitigation**:	acres	Proposed Mitigation**:	acres
			linear feet		linear feet		linear feet
		Impact Unmitigated:	0 %	Impact Unmitigated:	%	Impact Unmitigated:	%
			0.00 acres		acres		acres
		This takes up a portion of the DG-W-2 Wetland Mitigation area (total acreage of 2.13). See Additional Checklists for more details		Additional PM comments:		Additional PM comments:	
10	**Final compensatory mitigation requirements:**						

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:
A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.
B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
  Low end of range (>75% of reference standard FCAM score) (+5)
  Medium part of range (>85%) (+3)
  High end of range (>95%) (+1)
*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.
C. Level of threat:
  Low (+5) (increasing/continuing trend of development in watershed)
  Medium (+3) (site shown as developed in specific/general plan)
  High (+1) (development entitlements/permits in place)
D. “Degrees” of long-term protection:
  Low (management plan) (+5)
  Medium (restrictive covenant/deed restriction) (+3)
  High (conservation easement) (+1)
E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$
4.1 Buffer and Landscape Context						
4.1.1 Landscape Connectivity	9	9		3	3	0
4.1.2 Percent of AA with Buffer	12	12		12	12	0
4.1.3 Average Buffer Width	9	9		12	12	0
4.1.4 Buffer Condition	9	9		9	9	0
RAW SCORE	**18.7**	**18.7**	**0**	**13.4**	**13.4**	**0**
FINAL SCORE	**77.8**	**77.8**	**0**	**55.9**	**55.9**	**0**
4.2 Attribute 2: Hydrology						
4.2.1 Water Source	12	12		9	9	0
4.2.2 Hydroperiod or Channel Stability	9	9		9	9	0
4.2.3 Hydrologic Connectivity	12	12		12	12	0
RAW SCORE	**33.0**	**33.0**	**0**	**30.0**	**30.0**	**0**
FINAL SCORE	**91.7**	**91.7**	**0**	**83.4**	**83.4**	**0**
4.3 Attribute 3: Physical Structure						
4.3.1 Structural Patch Richness	3	3		6	9	3
4.3.2 Topographic Complexity	3	3		9	9	0
RAW SCORE	**6.0**	**6.0**	**0**	**15.0**	**18.0**	**3**
FINAL SCORE	**25.0**	**25.0**	**0**	**62.5**	**75.0**	**13**
4.4 Attribute 4: Biotic Structure						
4.4.1 Number of Plant Layers	9	6		12	12	0
4.4.2 Co-Dominant Species	3	3		3	3	0
4.4.3 Percent Invasion	12	6		6	9	3
4.4.4 Interspersion/Zonation	3	3		6	6	0
4.4.5 Vertical Structure	3	3		9	9	0
RAW SCORE	**14**	**11**	**-3**	**22**	**23**	**1**
FINAL SCORE	**38.9**	**30.6**	**-8**	**61.2**	**63.9**	**3**
OVERALL SCORE	**59.0**	**57.0**	**-3**	**66.0**	**70.0**	**4**

$Quotient=ABS(M/I)_{deltas}$
1 1/3

Baseline ratio:
1 : 1.3

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	**Cowardin System**	**HGM categories**		**Hydrology categories**
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Area

This consists of two separate impact areas that were combined due to similarities in vegetation type and which both are located within an area below the 1,020 foot elevational limits near the dam that is considered to be a wetland Water of the U.S. and is considered to be a Palustrine environment (after Cowardin). Because the reservoir is built within the Arroyo Seco, the hydrogeomorphic (HGM) designation is considered to be Riverine. The hydrology is considered to be "Seasonally Flooded" because it is near the dam and within the portions of the reservoir that can hold water during rainy periods. Vegetation consists of Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium and Xanthium strumarium Herbaceous Alliance (unofficial alliance). This area is designated to have sediment removal under the proposed project.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date:	Corps File No.: SPL-2013-NNN	Project Manager: Bonnie Rogers
	Impact Site Name: Wet-2	ORM Resource Type: Wetland and Non-Wetland	Hydrology: See below
	Impact Cowardin or HGM type: Palustrine	Impact area : 0.497 acres	Impact distance: linear feet

		Column A	Column B	Column C
		Mitigation Site Name: DG-W-2 Mitigation Type: Rehabilitation ORM Resource Type: Wetland WOUS Cowardin/HGM type: Palustrine Hydrology: Seasonally flooded	Mitigation Site Name: DG-W-1 Mitigation Type: Re-Establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see BAMI	Starting ratio: 1.0 : 1.0 Ratio adjustment: 1.0 Baseline ratio: 2.00 : 1.00 PM justification: see Table 1	Starting ratio: 1.0 : 1.0 Ratio adjustment: Baseline ratio: 1.00 : 1.00 PM justification: see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): 1.0 : 1.3	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: : 1.00	Baseline ratio: : 1.00	Baseline ratio: : 1.00
3	**Preservation (Table 2, step E)**	Ratio adjustment: 1.0 Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment: 1.0 Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment:
4	**Mitigation site location**:	Ratio adjustment: 0 Mitigation within same immediate area as impact site	Ratio adjustment: 0 Mitigation within same immediate area as impact site	Ratio adjustment: PM justification:
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: 1 Permanent impact to Scoured Channel would be mitigated with rehabilitation of Salix goodingii Woodland Alliance, resulting in a net loss of wetland with non-native riparian herbaceous habitat. (1)	Ratio adjustment: 0 Permanent impact to Scoured Channel would be mitigated with re-establishment of WOUS and riparian habitat, resulting in a net loss of wetland but a net g ain in function at the mitigation site	Ratio adjustment: PM justification:
6	**Type conversion:**	Ratio adjustment: 0 Mitigation of mpacts to Scoured Channel with rehabilitation of Salix goodingii Woodland Alliance. The mitigation site is expected to become more diverse with native habitat types and many fewer invasive weeds.	Ratio adjustment: 0 Mitigation of mpacts to Scoured Channel with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment: PM justification:
7	**Risk and uncertainty**:	Ratio adjustment: 0.4 Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (-0.2)	Ratio adjustment: 0.4 Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (-0.2)	Ratio adjustment: PM justification:
8	**Temporal loss**:	Ratio adjustment: 0 The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 1.30 Total adjustments (3-8): 2.40 **Final ratio: 2.62 : 1.00** Proposed impact (total): 0.497 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: See below Required Mitigation*: 1.300 acres 0.0 linear feet of Resource type: Wetland WOUS Cowardin or HGM: Palustrine Hydrology: Seasonally flooded Proposed Mitigation**: 0.427 acres linear feet Impact Unmitigated: 67 % 0.33 acres This takes up a portion of the DG-W-2 Wetland Mitigation area (total acreage of 2.13). See Additional Checklists for more details	Baseline ratio from 2.a, b or c: 2.00 : 1.00 Total adjustments (3-8): 1.40 Final ratio: **3.40 : 1.00** Remaining impact: 0.33 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: See below Required Mitigation*: 1.13 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 1.13 acres linear feet Impact Unmitigated: 0 % 0.00 acres This takes up a portion of the DG-W-1 Johnson Field Mitigation area (total acreage of 3.44). See Additional Checklists for more details	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact (acres): 0.00 acres Remaining impact (linear feet): 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: See below Required Mitigation: 0.00 acres 0.0 linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Additional PM comments:
10	**Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Impact area will move from a vegetative to a mostly non-vegetative state

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	Small loss	Small gain
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	Small loss	No change
Dissipation of energy	No change	No change
Cycling of nutrients	Small loss	Moderate gain
Removal of elements and compounds	Small loss	Moderate gain
Retention of particulates	No change	Small gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	Small loss	Moderate gain

Adjustment: 1

Impact area will not change in terms of vegetation coverage. Mitigation site will move from an upland area to a riverine area

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity	9	9		3	3	0	
4.1.2 Percent of AA with Buffer	12	12		12	12	0	
4.1.3 Average Buffer Width	9	9		12	12	0	
4.1.4 Buffer Condition	9	9		9	9	0	
RAW SCORE	**18.7**	**18.7**	**0**	**13.4**	**13.4**	**0**	
FINAL SCORE	**77.8**	**77.8**	**0**	**55.9**	**55.9**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source	12	12		9	9	0	
4.2.2 Hydroperiod or Channel Stability	9	9		9	9	0	
4.2.3 Hydrologic Connectivity	12	12		12	12	0	
RAW SCORE	**33.0**	**33.0**	**0**	**30.0**	**30.0**	**0**	
FINAL SCORE	**91.7**	**91.7**	**0**	**83.4**	**83.4**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness	3	3		6	9	3	
4.3.2 Topographic Complexity	3	3		9	9	0	
RAW SCORE	**6.0**	**6.0**	**0**	**15.0**	**18.0**	**3**	
FINAL SCORE	**25.0**	**25.0**	**0**	**62.5**	**75.0**	**13**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers	9	6		12	12	0	
4.4.2 Co-Dominant Species	3	3		3	3	0	
4.4.3 Percent Invasion	12	6		6	9	3	
4.4.4 Interspersion/Zonation	3	3		6	6	0	
4.4.5 Vertical Structure	3	3		9	9	0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**14**	**11**	**-3**	**22**	**23**	**1**	**1 1/3**
FINAL SCORE	**38.9**	**30.6**	**-8**	**61.2**	**63.9**	**3**	Baseline ratio:
OVERALL SCORE	**59.0**	**57.0**	**-3**	**66.0**	**70.0**	**4**	**1 : 1.3**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories		Hydrology categories
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Area

This impact area is located within an area below the 1,020 foot elevational limits near the dam that is considered to be a wetland Water of the U.S. and is considered to be a Palustrine environment (after Cowardin). Because the reservoir is built within the Arroyo Seco, the hydrogeomorphic (HGM) designation is considered to be Riverine. The hydrology is considered to be "Seasonally Flooded" because it is near the dam and within the portions of the reservoir that can hold water during rainy periods. Vegetation is lacking in this area, due to stream scouring during flood events . This area is designated to have sediment removal under the proposed project.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: Impact Site Name: Impact Cowardin or HGM type:	Corps File No.: SPL-2013-NNN Wet-3 Palustrine	Project Manager: Bonnie Rogers ORM Resource Type: Wetland WOUS Impact area : 0.369 acres	Hydrology: Seasonally flooded Impact distance: linear feet
		Column A Mitigation Site Name: DG-W-1 Mitigation Type: Re-establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:	**Column C** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **1.0** Baseline ratio: **2.00 : 1.00** PM justification: see Table 1	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table 1	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): **1.0 : 2.5**	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment:	Ratio adjustment:
4	**Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: **0** Permanent impact to wetland Gooding willow scrub would be mitigated with re-establishment of WOUS and riparian habitat, resulting in a net loss of wetland but a net g ain in function at the mitigation site	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
6	**Type conversion:**	Ratio adjustment: **0** Mitigation of mpacts to Gooding's willow woodland with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
7	**Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
8	**Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: PM justification:	Ratio adjustment: PM justification:
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 2.00 : 1.00 Total adjustments (3-8): 1.40 **Final ratio: 3.40 : 1.00** Proposed impact (total): 0.369 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Seasonally flooded Required Mitigation*: 1.255 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 1.255 acres linear feet Impact Unmitigated: 0 % 0.00 acres This takes up a portion of the DG-W-1 Wetland Mitigation area (total acreage of 3.44). See Additional Checklists for more details	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact: 0.00 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Seasonally flooded Required Mitigation*: 0.00 acres 0.0 linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Additional PM comments:	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact (acres): acres Remaining impact (linear feet): #VALUE! linear feet to Resource type: 0 Cowardin or HGM: Palustrine Hydrology: Seasonally flooded Required Mitigation: #VALUE! acres #VALUE! linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Additional PM comments:
10	**Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	Small loss	Small gain
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	Small loss	No change
Dissipation of energy	No change	No change
Cycling of nutrients	Moderate loss	Moderate gain
Removal of elements and compounds	Moderate loss	Moderate gain
Retention of particulates	No change	Small gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	Large loss	Moderate gain

Adjustment: 1

Impact area will move from a vegetative to a non-vegetative state. Mitigation site will move from an upland area to a riverine area

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories		Hydrology categories
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Area

This impact area is comprised of two different sites that were combined because they are both dominated by willow woodland and are both designated as wetlands. Both are located within an area below the 1,020 foot elevational limits near the dam that is considered to be a wetland Water of the U.S. and is considered to be a Palustrine environment (after Cowardin). Because the reservoir is built within the Arroyo Seco, the hydrogeomorphic (HGM) designation is considered to be Riverine. The hydrology is considered to be "Seasonally Flooded" because it is near the dam and within the portions of the reservoir that can hold water during rainy periods. Vegetation consists of Salix gooddingii Woodland Alliance and Salix gooddingii Woodland Alliance Understory: 20% Lepidium latifolium/Xanthium strumarium. This area is designated to have sediment removal under the proposed project.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date:	Corps File No.:	SPL-2013-NNN	Project Manager:	Bonnie Rogers		
	Impact Site Name:	NWet-1	ORM Resource Type:	Non-wetland WOUS		Hydrology:	Intermittent
	Impact Cowardin or HGM type:	Riverine	Impact area :	0.006	acres	Impact distance:	linear feet
		Column A		**Column B**		**Column C**	
		Mitigation Site Name:	DG-9	Mitigation Site Name:		Mitigation Site Name:	
		Mitigation Type:	Re-Establishment	Mitigation Type:		Mitigation Type:	
		ORM Resource Type:	Non-wetland WOUS	ORM Resource Type:		ORM Resource Type:	
		Cowardin/HGM type:	Riverine	Cowardin/HGM type:		Cowardin/HGM type:	
		Hydrology:	Intermittent	Hydrology:		Hydrology:	
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**
		Ratio adjustment:	**0.0**	Ratio adjustment:		Ratio adjustment:	
		Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**
		PM justification:	see Table 1	PM justification:	see Table 1	PM justification:	see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	:
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**0.0**	Ratio adjustment:		Ratio adjustment:	
		This proposed mitigation occurs at the point of impact, and is to be restored according to the footprint of the impacts					
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Mitigation within same immediate area as impact site		PM justification:		PM justification:	
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Temporary impact to non-wetland WOUS sage scrub shrubland alliance would be mitigated with re-establishment of the same habitat, resulting in no net loss of Waters of the U.S. or function at the mitigation site		PM justification:		PM justification:	
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Mitigation of impacts to non-wetland WOUS sage scrub alliance with re-establishment of the same habitats in place. The mitigation site is expected to become the same in vegetation and in function as is present currently.		PM justification:		PM justification:	
7	**Risk and uncertainty**:	Ratio adjustment:	**0.4**	Ratio adjustment:		Ratio adjustment:	
		Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)		PM justification:		PM justification:	
8	**Temporal loss**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		The restoration activity would take place during a single season, with no planned delay.		PM justification:		PM justification:	
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00
		Total adjustments (3-8):	0.40	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00
		Final ratio:	**1.40 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**
		Proposed impact (total):	0.006 acres	Remaining impact:	0.00 acres	Remaining impact (acres):	acres
			0 linear feet		0 linear feet	Remaining impact (linear feet):	#VALUE! linear feet
		to Resource type:	0	to Resource type:	0	to Resource type:	0
		Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine
		Hydrology:	Intermittent	Hydrology:	Intermittent	Hydrology:	Intermittent
		Required Mitigation*:	0.008 acres	Required Mitigation*:	0.00 acres	Required Mitigation:	#VALUE! acres
			0.0 linear feet		0.0 linear feet		#VALUE! linear feet
		of Resource type:	Non-wetland WOUS	of Resource type:	0	of Resource type:	0
		Cowardin or HGM:	Riverine	Cowardin or HGM:	0	Cowardin or HGM:	0
		Hydrology:	Intermittent	Hydrology:	0	Hydrology:	0
		Proposed Mitigation**:	0.008 acres	Proposed Mitigation**:	acres	Proposed Mitigation**:	acres
			linear feet		linear feet		linear feet
		Impact Unmitigated:	5 %	Impact Unmitigated:	%	Impact Unmitigated:	%
			0.00 acres		acres		acres
		Differential in impact unmitigated is a result of rounding error.		Additional PM comments:		Additional PM comments:	
10	**Final compensatory mitigation requirements:**						

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	No change
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	No change	No change
Removal of elements and compounds	No change	No change
Retention of particulates	No change	No change
Export of organic carbon	No change	No change
Maintenance of plant and animal communities	No change	No change

Adjustment: 0

Impact area will change over a short term because impacts are temporary, but mitigation will occur immediately after impacts

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:
A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.
B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
  Low end of range (>75% of reference standard FCAM score) (+5)
  Medium part of range (>85%) (+3)
  High end of range (>95%) (+1)
*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.
C. Level of threat:
  Low (+5) (increasing/continuing trend of development in watershed)
  Medium (+3) (site shown as developed in specific/general plan)
  High (+1) (development entitlements/permits in place)
D. "Degrees" of long-term protection:
  Low (management plan) (+5)
  Medium (restrictive covenant/deed restriction) (+3)
  High (conservation easement) (+1)
E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS$(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS$(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$\text{Impact}_{\text{Before}}$	$\text{Impact}_{\text{After}}$	$\text{Impact}_{\text{delta}}$	$\text{Mitigation}_{\text{Before}}$	$\text{Mitigation}_{\text{After}}$	$\text{Mitigation}_{\text{delta}}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$\text{Quotient=ABS(M/I)}_{\text{deltas}}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories		Hydrology categories
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site is a small area dominated by Artemisia californica - Eriogonum fasciculatum Shrubland Alliance Understory: 20% Lepidium latifolium within the temporary impact zone for the project, upstream of the permanent sediment removal area. The area is being contoured and graded to assist with sediment flows throught he riverine environment. The hydrology and hydrogeomorphic designations are Intermittent and the resource type (Cowardin) is considered Riverine. Impacts are considered temporary because they would not be part of the permanent maintenance area and would be revegetated shortly after impacts occur.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date:	Corps File No.: SPL-2013-NNN	Project Manager: Bonnie Rogers	
	Impact Site Name:	NWet-2p ORM Resource Type:	Non-wetland WOUS	Hydrology: Intermittent
	Impact Cowardin or HGM type:	Riverine Impact area :	1.435 acres	Impact distance: linear feet
		Column A Mitigation Site Name: DG-W-1 Mitigation Type: Re-Establishment ORM Resource Type: Non-wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:	**Column C** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-1.0** Baseline ratio: **1.00 : 2.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: **0.0** Baseline ratio: **1.00 : 1.00** PM justification: see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment:	Ratio adjustment:
4	**Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment: **0**	Ratio adjustment: **0**
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: **0** Permanent impact to non-wetland WOUS mule fat scrub shrubland alliance would be mitigated with re-establishment of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site	Ratio adjustment:	Ratio adjustment:
6	**Type conversion:**	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS mule fat scrub alliance with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment:	Ratio adjustment:
7	**Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)	Ratio adjustment:	Ratio adjustment:
8	**Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment:	Ratio adjustment: **0**
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 2.00 Total adjustments (3-8): 1.40 **Final ratio: 1.20 : 1.00** Proposed impact (total): 1.435 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermitten t Required Mitigation*: 1.722 acres 0.0 linear feet of Resource type: Non-wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 1.722 acres linear feet Impact Unmitigated: 0 % 0.00 acres This uses a portion of Johnson Field (total 3.44 acres)	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact: 0.00 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 0.00 acres 0.0 linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: 0.13 acres linear feet Impact Unmitigated: #DIV/0! % #DIV/0! acres Additional PM comments:	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **1.00 : 1.00** Remaining impact (acres): #DIV/0! acres Remaining impact (linear feet): #DIV/0! linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation: #DIV/0! acres #DIV/0! linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: 0.48 acres linear feet Impact Unmitigated: #DIV/0! % #DIV/0! acres
10	**Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation [illegible] lower than required ratio [illegible]

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	Small loss	Small gain
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	Small loss	Moderate gain
Removal of elements and compounds	Small loss	Moderate gain
Retention of particulates	Small loss	Small gain
Export of organic carbon	Small loss	Small gain
Maintenance of plant and animal communities	Small loss	Moderate gain

Adjustment: -1

Impact area will change because impacts are permanent. However, the functions will be expected to remain similar in most respects. Mitigation site will be improved as a new riparian area and WOUS that is re-established from an uplanc area.

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:
A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.
B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
  Low end of range (>75% of reference standard FCAM score) (+5)
  Medium part of range (>85%) (+3)
  High end of range (>95%) (+1)
*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.
C. Level of threat:
  Low (+5) (increasing/continuing trend of development in watershed)
  Medium (+3) (site shown as developed in specific/general plan)
  High (+1) (development entitlements/permits in place)
D. “Degrees” of long-term protection:
  Low (management plan) (+5)
  Medium (restrictive covenant/deed restriction) (+3)
  High (conservation easement) (+1)
E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

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2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

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6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$\text{Impact}_{\text{Before}}$	$\text{Impact}_{\text{After}}$	$\text{Impact}_{\text{delta}}$	$\text{Mitigation}_{\text{Before}}$	$\text{Mitigation}_{\text{After}}$	$\text{Mitigation}_{\text{delta}}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$\text{Quotient=ABS(M/I)}_{\text{deltas}}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

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2. List functions/condition categories in leftmost column.

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6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

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2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories	Hydrology categories	
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Area

This impact area is located within four non-wetland Water of the U.S. areas along the existing Arroyo Seco that were all combined because of their similarities in both vegetation and hydrology. Vegetation classifications include Baccharis salicifolia Shrubland Alliance No understory, Baccharis salicifolia Shrubland Alliance Understory: 20% Conium maculatum/Lepidium latifolium, Baccharis salicifolia Shrubland Alliance Understory: 30% Conium maculatum/Lepidium latifolium, and Baccharis salicifolia Shrubland Alliance Understory: 40% Conium maculatum/Lepidium latifolium. The Cowardin class is considered Riverine for all four sites and the hydrology/hydrogeomorphology is considered to be intermittent. These impact sites are located in the permanent impact area and side slopes that are being proposed for sediment removal and maintenance over the life of the project.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1 Date:	Corps File No.: SPL-2013-NNN	Project Manager: Bonnie Rogers	
Impact Site Name:	NWet-2p	ORM Resource Type: Non-wetland WOUS	Hydrology: Intermittent
Impact Cowardin or HGM type:	Riverine	Impact area : 1.435 acres	Impact distance: linear feet
	Column A Mitigation Site Name: DG-9 Mitigation Type: Re-Establishment ORM Resource Type: Non-wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:	**Column C** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2.a **Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **0.0** Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table 1
2.b **Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c **Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3 **Preservation (Table 2, step E)**	Ratio adjustment: **0.0** This proposed mitigation occurs at the point of impact, and is to be restored according to the footprint of the impacts	Ratio adjustment:	Ratio adjustment:
4 **Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment:	Ratio adjustment: **0**
5 **Net loss of aquatic resource surface area**:	Ratio adjustment: **0** Temporary impact to non-wetland WOUS sage scrub shrubland alliance would be mitigated with re-establishment of the same habitat, resulting in no net loss of Waters of the U.S. or function at the mitigation site	Ratio adjustment:	Ratio adjustment:
6 **Type conversion:**	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS mule fat scrub alliance with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment:	Ratio adjustment:
7 **Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)	Ratio adjustment:	Ratio adjustment:
8 **Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment:	Ratio adjustment:
9 **Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 0.40 **Final ratio: 1.40 : 1.00** Proposed impact (total): 1.435 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermitten t Required Mitigation*: 2.009 acres 0.0 linear feet of Resource type: Non-wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 2.009 acres linear feet Impact Unmitigated: 0 % 0.00 acres Impacts are mitigated in place	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact: 0.00 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 0.00 acres 0.0 linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Additional PM comments:	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact (acres): acres Remaining impact (linear feet): #VALUE! linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation: #VALUE! acres #VALUE! linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: 0.11 acres linear feet Impact Unmitigated: #VALUE! % #VALUE! acres Differential in impact unmitigated due to rounding error
10 **Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	No change
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	No change	No change
Removal of elements and compounds	No change	No change
Retention of particulates	No change	No change
Export of organic carbon	No change	No change
Maintenance of plant and animal communities	No change	No change

Adjustment: 0

Impact area will change over a short term because impacts are temporary, but mitigation will occur immediately after impacts

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories		Hydrology categories
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site consists of two areas dominated by mule fat (Baccharis salicifolia) that were combined because both are considered non-wetland Waters of the U.S. and both support very similar plant communities,. The vegtative classifications are Baccharis salicifolia Shrubland Alliance No understory and Baccharis salicifolia Shrubland Alliance Understory: 20% Conium maculatum/Lepidium latifolium. This site is within the temporary impact zone for the project, upstream of the permanent sediment removal area. The area is being contoured and graded to assist with sediment flows throught he riverine environment. The hydrology and hydrogeomorphic designations are Intermittent and the resource type (Cowardin) is considered Riverine. Impacts are considered temporary because they would not be part of the permanent maintenance area and would be revegetated shortly after impacts occur.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date:	Corps File No.: SPL-2013-NNN	Project Manager: Bonnie Rogers	
	Impact Site Name:	NWet-3p ORM Resource Type:	Non-wetland WOUS	Hydrology: Intermittent
	Impact Cowardin or HGM type:	Riverine Impact area :	2.386 acres	Impact distance: linear feet
		Column A Mitigation Site Name: See below list Mitigation Type: Re-Establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: DG-4-WOUS Connections Mitigation Type: Re-Establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column C** Mitigation Site Name: See list below Mitigation Type: Rehabilitation ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-1.0** Baseline ratio: **1.00 : 2.00** PM justification: see Table 1	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-1.0** Baseline ratio: **1.00 : 2.00** PM justification: see Table 1	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-0.2** Baseline ratio: **1.00 : 1.20** PM justification: see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place
4	**Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment: Mitigation within same immediate area as impact site
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: **0** Permanent impact to non-wetland WOUS non-native herbaceous weeds would be mitigated with re-establishment of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site	Ratio adjustment: **0** Permanent impact to non-wetland WOUS non-native herbaceous weeds would be mitigated with re-establishment of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site	Ratio adjustment: **0** Permanent impact to non-wetland WOUS non-native herbaceous weeds would be mitigated with rehabilitation of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site
6	**Type conversion:**	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS non-native herbaceous weeds with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS non-native herbaceous weedswith re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS non-native herbaceous weedswith rehabilitation of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.
7	**Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)
8	**Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 2.00 Total adjustments (3-8): 1.40 **Final ratio: 1.20 : 1.00** Proposed impact (total): 1.796 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermitten t Required Mitigation*: 2.155 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 1.580 acres linear feet Impact Unmitigated: 27 % 0.48 acres This is adjacent to the Johnson Field area, within proposed new Waters of the U.S. channels. DG-2-New Channels and DG-2-WOUS	Baseline ratio from 2.a, b or c: 1.00 : 2.00 Total adjustments (3-8): 1.40 Final ratio: **1.20 : 1.00** Remaining impact: 0.48 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 0.58 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 0.22 acres linear feet Impact Unmitigated: 62 % 0.30 acres Additional PM comments:	Baseline ratio from 2.a, b or c: 1.00 : 1.20 Total adjustments (3-8): 1.40 Final ratio: **2.00 : 1.00** Remaining impact (acres): 0.30 acres Remaining impact (linear feet): 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation: 0.59 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 0.60 acres linear feet Impact Unmitigated: -1 % 0.00 acres DG-SF-1, DG-SF-2, and DG-4-Drainage
10	**Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower than required ratio proposal

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	Small gain
Subsurface water storage	No change	Small gain
Moderation of groundwater flow or discharge	No change	Small gain
Dissipation of energy	No change	Small gain
Cycling of nutrients	No change	Moderate gain
Removal of elements and compounds	No change	Moderate gain
Retention of particulates	No change	Moderate gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	Small loss	Moderate gain

Adjustment:	-1

Impact area will change because impacts are permanent, but some weed cover may continue under the long-range plan which would retain current function. Mitigation site will be developed into a new waters of the U.S. from an upland area

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	Small gain
Subsurface water storage	No change	Small gain
Moderation of groundwater flow or discharge	No change	Small gain
Dissipation of energy	No change	Small gain
Cycling of nutrients	No change	Moderate gain
Removal of elements and compounds	No change	Moderate gain
Retention of particulates	No change	Moderate gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	Small loss	Moderate gain

Adjustment:	-1

Impact area will change because impacts are permanent, but some weed cover may continue under the long-range plan which would retain current function. Mitigation site will be developed into a new waters of the U.S. from an upland area

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	Small gain
Subsurface water storage	No change	Small gain
Moderation of groundwater flow or discharge	No change	Small gain
Dissipation of energy	No change	Small gain
Cycling of nutrients	No change	Small gain
Removal of elements and compounds	No change	Small gain
Retention of particulates	No change	Small gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	Small loss	Small gain

Adjustment:	-0.3

Impact area will change because impacts are permanent, but some weed cover may continue under the long-range plan which would retain current function. Mitigation site will be developed into a more functional riverine area

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. "Degrees" of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=$ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$\text{Impact}_{\text{Before}}$	$\text{Impact}_{\text{After}}$	$\text{Impact}_{\text{delta}}$	$\text{Mitigation}_{\text{Before}}$	$\text{Mitigation}_{\text{After}}$	$\text{Mitigation}_{\text{delta}}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$\text{Quotient=ABS(M/I)}_{\text{deltas}}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories	Hydrology categories	
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Area

This impact area is located within two non-wetland Water of the U.S. areas along the existing Arroyo Seco that were combined because of their similarities in both vegetation and hydrology. Vegetation classifications include Conium maculatum Herbaceous Semi-Natural Alliance 30% Lepidium latifolium and Lepidium latifolium-Conium maculatum Herbaceous Semi-Natural Alliance. The Cowardin class is considered Riverine for all four sites and the hydrology/hydrogeomorphology is considered to be intermittent. These impact sites are located in the permanent impact area and side slopes that are being proposed for sediment removal and maintenance over the life of the project.

1 Date:	Corps File No.:	SPL-2013-NNN	Project Manager:	Bonnie Rogers		
Impact Site Name:	NWet-4p	ORM Resource Type:	Non-wetland WOUS		Hydrology:	Intermittent
Impact Cowardin or HGM type:	Riverine	Impact area :	1.769	acres Impact distance:		linear feet
	Column A		**Column B**		**Column C**	
	Mitigation Site Name:	DG-W-2 (Outlet)	Mitigation Site Name:	See list below	Mitigation Site Name:	*Buffers
	Mitigation Type:	Re-establishment	Mitigation Type:	Enhancement	Mitigation Type:	Enhancement
	ORM Resource Type:	Non-Wetland WOUS	ORM Resource Type:	Non-Wetland WOUS	ORM Resource Type:	Non-Wetland WOUS
	Cowardin/HGM type:	Riverine	Cowardin/HGM type:	Riverine	Cowardin/HGM type:	Riverine
	Hydrology:	Intermittent	Hydrology:	Intermittent	Hydrology:	Intermittent
2.a **Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**
	Ratio adjustment:	**0.0**	Ratio adjustment:		Ratio adjustment:	
	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**
	PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1
2.b **Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	**1.0 : 1.3**	Ratio adjustment from BAMI procedure (attached):	**1.0 : 1.3**
2.c **Preservation (Table 2, step A)**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**
3 **Preservation (Table 2, step E)**	Ratio adjustment:	**1.0**	Ratio adjustment:	**1.0**	Ratio adjustment:	**1.0**
	Existing functions at the impact site are high and no long-term instrument for preservation is in place		Existing functions at the impact site are high and no long-term instrument for preservation is in place		Existing functions at the impact site are high and no long-term instrument for preservation is in place	
4 **Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:	**0**	Ratio adjustment:	**0**
	Mitigation within same immediate area as impact site		Mitigation within same immediate area as impact site		Mitigation within same immediate area as impact site	
5 **Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:	**0**	Ratio adjustment:	**0**
	Permanent impact to non-wetland WOUS alluvial scrub would be mitigated with reestablishment of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site		Permanent impact to non-wetland WOUS alluvial scrub would be mitigated with enhancement of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site		Permanent impact to non-wetland WOUS alluvial scrub would be mitigated with enhancement of WOUS and riparian habitat, resulting in no net loss of wetland but a net gain in function at the mitigation site	
6 **Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:	**1**	Ratio adjustment:	**1**
	Mitigation of impacts to non-wetland WOUS alluvial scrub with re-establishment of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.		Mitigation of impacts to non-wetland WOUS alluvial scrub with enhancement of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.		Mitigation of impacts to non-wetland WOUS alluvial scrub with enhancement of WOUS and riparian habitats. The mitigation site is expected to become more diverse with native habitat and gain functions that were not present before with many fewer invasive weeds.	
7 **Risk and uncertainty**:	Ratio adjustment:	**0.4**	Ratio adjustment:	**0.4**	Ratio adjustment:	**0.4**
	Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)		Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)		Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)	
8 **Temporal loss**:	Ratio adjustment:	**0**	Ratio adjustment:	**0**	Ratio adjustment:	
	The restoration activity would take place during a single season, with no planned delay.		The restoration activity would take place during a single season, with no planned delay.		The restoration activity would take place during a single season, with no planned delay.	
9 **Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.00	Baseline ratio from 2.a, b or c:	1.00 : 1.30	Baseline ratio from 2.a, b or c:	1.00 : 1.30
	Total adjustments (3-8):	1.40	Total adjustments (3-8):	2.40	Total adjustments (3-8):	2.40
	Final ratio:	**2.40 : 1.00**	Final ratio:	**2.62 : 1.00**	Final ratio:	**2.62 : 1.00**
	Proposed impact (total):	1.796 acres 0 linear feet	Remaining impact:	1.74 acres 0 linear feet	Remaining impact (acres): Remaining impact (linear feet):	0.83 acres 0 linear feet
	to Resource type:	0	to Resource type:	0	to Resource type:	0
	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine
	Hydrology:	Intermittent	Hydrology:	Intermittent	Hydrology:	Intermittent
	Required Mitigation*:	4.310 acres 0.0 linear feet	Required Mitigation*:	4.56 acres 0.0 linear feet	Required Mitigation:	2.17 acres 0.0 linear feet
	of Resource type:	Non-Wetland WOUS	of Resource type:	Non-Wetland WOUS	of Resource type:	Non-Wetland WOUS
	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine
	Hydrology:	Intermittent	Hydrology:	Intermittent	Hydrology:	Intermittent
	Proposed Mitigation**:	0.130 acres linear feet	Proposed Mitigation**:	2.39 acres linear feet	Proposed Mitigation**:	2.17 acres linear feet
	Impact Unmitigated:	97 % 1.74 acres	Impact Unmitigated:	48 % 0.83 acres	Impact Unmitigated:	0 % 0.00 acres
			DG-4-Sheet Flow, DG-4- WOUS, and DG-1-WOUS		Non-aquatic riparian buffer zones	
10 **Final compensatory mitigation requirements:**						

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	Small loss	Small gain
Subsurface water storage	Small loss	Small gain
Moderation of groundwater flow or discharge	Small loss	Small gain
Dissipation of energy	Small loss	Small gain
Cycling of nutrients	Small loss	Small gain
Removal of elements and compounds	Small loss	Small gain
Retention of particulates	Small loss	Small gain
Export of organic carbon	Small loss	Small gain
Maintenance of plant and animal communities	Small loss	Small gain

Adjustment: 0

Impact area will change because impacts are permanent, but some weed cover may continue under the long-range plan which would retain current function. Mitigation site will be developed into a more functional riverine area

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$\text{Impact}_{\text{Before}}$	$\text{Impact}_{\text{After}}$	$\text{Impact}_{\text{delta}}$	$\text{Mitigation}_{\text{Before}}$	$\text{Mitigation}_{\text{After}}$	$\text{Mitigation}_{\text{delta}}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$\text{Quotient=ABS(M/I)}_{\text{deltas}}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity	9	9		3	3	0	
4.1.2 Percent of AA with Buffer	12	12		12	12	0	
4.1.3 Average Buffer Width	9	9		12	12	0	
4.1.4 Buffer Condition	9	9		9	9	0	
RAW SCORE	**18.7**	**18.7**	**0**	**13.4**	**13.4**	**0**	
FINAL SCORE	**77.8**	**77.8**	**0**	**55.9**	**55.9**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source	12	12		9	9	0	
4.2.2 Hydroperiod or Channel Stability	9	9		9	9	0	
4.2.3 Hydrologic Connectivity	12	12		12	12	0	
RAW SCORE	**33.0**	**33.0**	**0**	**30.0**	**30.0**	**0**	
FINAL SCORE	**91.7**	**91.7**	**0**	**83.4**	**83.4**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness	3	3		6	9	3	
4.3.2 Topographic Complexity	3	3		9	9	0	
RAW SCORE	**6.0**	**6.0**	**0**	**15.0**	**18.0**	**3**	
FINAL SCORE	**25.0**	**25.0**	**0**	**62.5**	**75.0**	**13**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers	9	6		12	12	0	
4.4.2 Co-Dominant Species	3	3		3	3	0	
4.4.3 Percent Invasion	12	6		6	9	3	
4.4.4 Interspersion/Zonation	3	3		6	6	0	
4.4.5 Vertical Structure	3	3		9	9	0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**14**	**11**	**-3**	**22**	**23**	**1**	**1 1/3**
FINAL SCORE	**38.9**	**30.6**	**-8**	**61.2**	**63.9**	**3**	Baseline ratio:
OVERALL SCORE	**59.0**	**57.0**	**-3**	**66.0**	**70.0**	**4**	**1 : 1.3**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity	9	9		3	3	0	
4.1.2 Percent of AA with Buffer	12	12		12	12	0	
4.1.3 Average Buffer Width	9	9		12	12	0	
4.1.4 Buffer Condition	9	9		9	9	0	
RAW SCORE	**18.7**	**18.7**	**0**	**13.4**	**13.4**	**0**	
FINAL SCORE	**77.8**	**77.8**	**0**	**55.9**	**55.9**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source	12	12		9	9	0	
4.2.2 Hydroperiod or Channel Stability	9	9		9	9	0	
4.2.3 Hydrologic Connectivity	12	12		12	12	0	
RAW SCORE	**33.0**	**33.0**	**0**	**30.0**	**30.0**	**0**	
FINAL SCORE	**91.7**	**91.7**	**0**	**83.4**	**83.4**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness	3	3		6	9	3	
4.3.2 Topographic Complexity	3	3		9	9	0	
RAW SCORE	**6.0**	**6.0**	**0**	**15.0**	**18.0**	**3**	
FINAL SCORE	**25.0**	**25.0**	**0**	**62.5**	**75.0**	**13**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers	9	6		12	12	0	
4.4.2 Co-Dominant Species	3	3		3	3	0	
4.4.3 Percent Invasion	12	6		6	9	3	
4.4.4 Interspersion/Zonation	3	3		6	6	0	
4.4.5 Vertical Structure	3	3		9	9	0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**14**	**11**	**-3**	**22**	**23**	**1**	**1 1/3**
FINAL SCORE	**38.9**	**30.6**	**-8**	**61.2**	**63.9**	**3**	Baseline ratio:
OVERALL SCORE	**59.0**	**57.0**	**-3**	**66.0**	**70.0**	**4**	**1 : 1.3**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories	Hydrology categories	
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site consists of an area dominated by scalebroom (Lepidospartum squamatum) that is considered a non-wetland Waters of the U.S. The vegtative classification is Lepidospartum squamatum Scrubland Alliance - Sparse. This site is within the existing Arroyo Seco and is a part of the proposed permanent sediment removal area to be maintaned throughout the life of the project. The hydrology and hydrogeomorphic designation is Intermittent and the resource type (Cowardin) is considered Riverine.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1 Date:	Corps File No.: SPL-2013-NNN	Project Manager: Bonnie Rogers	
Impact Site Name:	NWet-4t	ORM Resource Type: Non-wetland WOUS	Hydrology: Intermittent
Impact Cowardin or HGM type:	Riverine	Impact area : 11.919 acres	Impact distance: linear feet
	Column A Mitigation Site Name: DG-9 Mitigation Type: Rehabilitation ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: DG-7 and DG-8 Mitigation Type: Re-establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column C** Mitigation Site Name: Side Slopes Mitigation Type: Enhancement ORM Resource Type: Non-wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent
2.a **Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **0.0** Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: **0.0** Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: **1.0** Baseline ratio: **2.00 : 1.00** PM justification: see Table 1
2.b **Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c **Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3 **Preservation (Table 2, step E)**	Ratio adjustment: **0.0** This proposed mitigation occurs at the point of impact, and is to be restored according to the footprint of the impacts	Ratio adjustment: **0.0** This proposed mitigation occurs at the point of impact, and is to be restored according to the footprint of the impacts	Ratio adjustment: **0.0** This proposed mitigation occurs downstream of the point of impact, and is to be restored according to the footprint of the impacts
4 **Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment: **0** Mitigation is in same area as impact site. Revegetating temporarily lost habitat.	Ratio adjustment: **0** Mitigation is in same area as impact site. Revegetating temporarily lost habitat.
5 **Net loss of aquatic resource surface area**:	Ratio adjustment: **0** Temporary impact to non-wetland WOUS alluvial scrub would be mitigated with re-establishment of the same habitat, resulting in no net loss of Waters of the U.S. or function at the mitigation site	Ratio adjustment: **0** Temporary impact to non-wetland WOUS alluvial scrub would be mitigated with re-establishment of the same habitat, resulting in no net loss of Waters of the U.S. or function at the mitigation site	Ratio adjustment: **1** Temporary impact to non-wetland WOUS alluvial scrub would be mitigated with enhancement of a portion of the permanent impact area, resulting in a net loss of Waters of the U.S. or function at the impact site
6 **Type conversion:**	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS alluvial scrub alliance with re-establishment of the same habitats in place. The mitigation site is expected to become the same in vegetation and in function as is present currently.	Ratio adjustment: **0** Mitigation of impacts to non-wetland WOUS alluvial scrub alliance with re-establishment of the same habitats in place. The mitigation site is expected to become the same in vegetation and in function as is present currently.	Ratio adjustment: **1** Mitigation of impacts to non-wetland WOUS alluvial scrub alliance with enhancement in the permanent impact area. The mitigation site is expected to be less vegetated than the impact site is currently but is expected to maintain some similar functionality as wildlife habitat.
7 **Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)
8 **Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.
9 **Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 0.40 **Final ratio: 1.40 : 1.00** Proposed impact (total): 11.919 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermitten t Required Mitigation*: 16.687 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 12.073 acres linear feet Impact Unmitigated: 28 % 3.30 acres Temporary impact replaced in situ	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 0.40 Final ratio: **1.40 : 1.00** Remaining impact: 3.30 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 4.61 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 2.08 acres linear feet Impact Unmitigated: 55 % 1.81 acres Temporary impact replaced in situ	Baseline ratio from 2.a, b or c: 2.00 : 1.00 Total adjustments (3-8): 2.40 Final ratio: **4.40 : 1.00** Remaining impact (acres): 1.81 acres Remaining impact (linear feet): 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation: 7.96 acres 0.0 linear feet of Resource type: Non-wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 7.34 acres linear feet Impact Unmitigated: 8 % 0.14 acres Remainder to be mitigated is on an additional sheet
10 **Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	No change
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	No change	No change
Removal of elements and compounds	No change	No change
Retention of particulates	No change	No change
Export of organic carbon	No change	No change
Maintenance of plant and animal communities	No change	No change

Adjustment: 0

Impact area will change over a short term because impacts are temporary, but mitigation will occur immediately after impacts

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	No change
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	No change	No change
Removal of elements and compounds	No change	No change
Retention of particulates	No change	No change
Export of organic carbon	No change	No change
Maintenance of plant and animal communities	No change	No change

Adjustment: 0

Impact area will change over a short term because impacts are temporary, but mitigation will occur immediately after impacts

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	Small loss
Subsurface water storage	No change	Small loss
Moderation of groundwater flow or discharge	No change	Small loss
Dissipation of energy	No change	Small loss
Cycling of nutrients	No change	Small loss
Removal of elements and compounds	No change	Small loss
Retention of particulates	No change	Small loss
Export of organic carbon	No change	Small loss
Maintenance of plant and animal communities	No change	Moderate loss

Adjustment: 1

Impact area will change over a short term because impacts are temporary, and will be re-established. Functional loss at mitigation site would occur because it is within the permanent impact area. It is within an area that will be maintained at a lesser degree and planted and seeded with native species.

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$\text{Impact}_{\text{Before}}$	$\text{Impact}_{\text{After}}$	$\text{Impact}_{\text{delta}}$	$\text{Mitigation}_{\text{Before}}$	$\text{Mitigation}_{\text{After}}$	$\text{Mitigation}_{\text{delta}}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$\text{Quotient=ABS(M/I)}_{\text{deltas}}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories	Hydrology categories	
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site consists of two areas dominated by scalebroom (Lepidospartum squamatum) that were combined because both are considered non-wetland Waters of the U.S. and both support very similar plant communities,. The vegtative classifications are Lepidospartum squamatum Scrubland Alliance - Sparse and Lepidospartum squamatum Shrubland Alliance. This site is within the temporary impact zone for the project, upstream of the permanent sediment removal area. The area is being contoured and graded to assist with sediment flows throught he riverine environment. The hydrology and hydrogeomorphic designations are Intermittent and the resource type (Cowardin) is considered Riverine. Impacts are considered temporary because they would not be part of the permanent maintenance area and would be revegetated shortly after impacts occur.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: Impact Site Name: Impact Cowardin or HGM type:	Corps File No.: SPL-2013-NNN NWet-4t Riverine	ORM Resource Type: Non-wetland WOUS Impact area : 0.14 acres	Project Manager: Bonnie Rogers Hydrology: Intermittent Impact distance: linear feet
		Column A Mitigation Site Name: DG-W-1 Mitigation Type: Re-establishment ORM Resource Type: Non-Wetland WOUS Cowardin/HGM type: Riverine Hydrology: Intermittent	**Column B** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:	**Column C** Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio: **1.0 : 1.0** Ratio adjustment: **0.0** Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :	Ratio adjustment from BAMI procedure (attached): :
2.c	**Preservation (Table 2, step A)**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**	Baseline ratio: **: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment: **1.0** Existing functions at the impact site are high and no long-term instrument for preservation is in place	Ratio adjustment:	Ratio adjustment:
4	**Mitigation site location**:	Ratio adjustment: **0** Mitigation within same immediate area as impact site	Ratio adjustment:	Ratio adjustment:
5	**Net loss of aquatic resource surface area**:	Ratio adjustment: **-1** Temporary impact to non-wetland alluvial scrub would be mitigated with re-establishment of WOUS and riparian habitat. There would be no net loss but a net gain in Waters of the U.S.	Ratio adjustment:	Ratio adjustment:
6	**Type conversion:**	Ratio adjustment: **0** Mitigation of temporary impacts to alluvial scrub with re-establishment of WOUS and riparian habitats.	Ratio adjustment:	Ratio adjustment:
7	**Risk and uncertainty**:	Ratio adjustment: **0.4** Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism is in place (+0.2)	Ratio adjustment:	Ratio adjustment:
8	**Temporal loss**:	Ratio adjustment: **0** The restoration activity would take place during a single season, with no planned delay.	Ratio adjustment:	Ratio adjustment:
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c: 1.00 : 1.00 Total adjustments (3-8): 0.40 **Final ratio: 1.40 : 1.00** Proposed impact (total): 0.14 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 0.196 acres 0.0 linear feet of Resource type: Non-Wetland WOUS Cowardin or HGM: Riverine Hydrology: Intermittent Proposed Mitigation**: 0.196 acres linear feet Impact Unmitigated: 0 % 0.00 acres Temporary impact replaced in situ	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact: 0.00 acres 0 linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation*: 0.00 acres 0.0 linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Temporary impact replaced in situ	Baseline ratio from 2.a, b or c: 0.00 : 1.00 Total adjustments (3-8): 0.00 Final ratio: **0.00 : 1.00** Remaining impact (acres): acres Remaining impact (linear feet): #VALUE! linear feet to Resource type: 0 Cowardin or HGM: Riverine Hydrology: Intermittent Required Mitigation: #VALUE! acres #VALUE! linear feet of Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres linear feet Impact Unmitigated: % acres Remainder to be mitigated is on an additional sheet
10	**Final compensatory mitigation requirements:**			

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	No change	Small gain
Subsurface water storage	No change	No change
Moderation of groundwater flow or discharge	No change	No change
Dissipation of energy	No change	No change
Cycling of nutrients	No change	Moderate gain
Removal of elements and compounds	No change	Moderate gain
Retention of particulates	No change	Small gain
Export of organic carbon	No change	Small gain
Maintenance of plant and animal communities	No change	Moderate gain

Adjustment: 0

Impact area will change over a short term because impacts are temporary, but mitigation site will move from an upland area to a riverine area

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

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2. List functions/condition categories in leftmost column.

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4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

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2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=$ABS(M/I)_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories		Hydrology categories
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site consists of two areas dominated by scalebroom (Lepidospartum squamatum) that were combined because both are considered non-wetland Waters of the U.S. and both support very similar plant communities,. The vegtative classifications are Lepidospartum squamatum Scrubland Alliance - Sparse and Lepidospartum squamatum Shrubland Alliance. This site is within the temporary impact zone for the project, upstream of the permanent sediment removal area. The area is being contoured and graded to assist with sediment flows throught he riverine environment. The hydrology and hydrogeomorphic designations are Intermittent and the resource type (Cowardin) is considered Riverine. Impacts are considered temporary because they would not be part of the permanent maintenance area and would be revegetated shortly after impacts occur.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

#	Item						
1	Date:	Corps File No.:	SPL-2013-NNN	Project Manager:	Bonnie Rogers		
	Impact Site Name:	NWet-5p, 6t, 6p and 7p	ORM Resource Type:	Non-wetland WOUS		Hydrology:	Intermittent
	Impact Cowardin or HGM type:	Riverine	Impact area :	14.7731	acres	Impact distance:	linear feet
		Column A		**Column B**		**Column C**	
		Mitigation Site Name:	*Buffers	Mitigation Site Name:		Mitigation Site Name:	
		Mitigation Type:	Enhancement	Mitigation Type:		Mitigation Type:	
		ORM Resource Type:	Non-Wetland WOUS	ORM Resource Type:		ORM Resource Type:	
		Cowardin/HGM type:	Riverine	Cowardin/HGM type:		Cowardin/HGM type:	
		Hydrology:	Intermittent	Hydrology:		Hydrology:	
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**
		Ratio adjustment:		Ratio adjustment:		Ratio adjustment:	
		Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**1.0 : 1.3**	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	:
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**1.0**	Ratio adjustment:		Ratio adjustment:	
		Existing functions at the impact site are high and no long-term instrument for preservation is in place					
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		Mitigation within same immediate area as impact site					
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**2**	Ratio adjustment:		Ratio adjustment:	
		Permanent impact to non-wetland WOUS with willows and like habitats would be mitigated with enhancment of WOUS and riparian habitat. There would be a net loss in waters but a net gain in riparian habitat.					
6	**Type conversion:**	Ratio adjustment:	**1**	Ratio adjustment:		Ratio adjustment:	
		Mitigation of impacts to Gooding's willow woodland/non-wetland WOUS with enhancement of non-WOUS and riparian buffer areas.					
7	**Risk and uncertainty**:	Ratio adjustment:	**0.4**	Ratio adjustment:		Ratio adjustment:	
		Risk factors and their associated ratio modifications are provided below: permittee-responsible mitigation (+0.2) and there is no long-term preservation mechanism in place (+0.2)					
8	**Temporal loss**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:	
		The restoration activity would take place during a single season, with no planned delay.					
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.30	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00
		Total adjustments (3-8):	4.40	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00
		Final ratio:	**4.15 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**
		Proposed impact (total):	12.693 acres	Remaining impact:	2.27 acres	Remaining impact (acres):	acres
			0 linear feet		0 linear feet	Remaining impact (linear feet):	#VALUE! linear feet
		to Resource type:	0	to Resource type:	0	to Resource type:	0
		Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine	Cowardin or HGM:	Riverine
		Hydrology:	Intermittent	Hydrology:	Intermittent	Hydrology:	Intermittent
		Required Mitigation*:	52.725 acres	Required Mitigation*:	0.00 acres	Required Mitigation:	#VALUE! acres
			0.0 linear feet		0.0 linear feet		#VALUE! linear feet
		of Resource type:	Non-Wetland WOUS	of Resource type:	0	of Resource type:	0
		Cowardin or HGM:	Riverine	Cowardin or HGM:	0	Cowardin or HGM:	0
		Hydrology:	Intermittent	Hydrology:	0	Hydrology:	0
		Proposed Mitigation**:	43.280 acres	Proposed Mitigation**:	acres	Proposed Mitigation**:	45.45 acres
			linear feet		linear feet		linear feet
		Impact Unmitigated:	18 %	Impact Unmitigated:	%	Impact Unmitigated:	#VALUE! %
			2.27 acres		acres		#VALUE! acres
		This impact area contains the remaining habitat types: Gooding's willow woodland (temp and perm impacts), Oak woodland (perm impacts, and scoured channel impacts				*Riparian buffers and non-aquatic buffers	
10	**Final compensatory mitigation requirements:**	Additional off site mitigation of 6 acres is being proposed					

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Table 2: Starting and base ratio determination for preservation (instructions at bottom).

Steps (Column A)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column B)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Steps (Column C)	Criteria	Results	PM Justification
A. (for step 2.c)	Baseline ratio (5:1, 3:1, or 1:1):		
B.	Functions adjustment (5, 3, or 1):		
C.	Threat adjustment (5, 3, or 1):		
D.	Degree of protection adjustment (5, 3, or 1):		
E. (for step 3)	Total adjustment (add steps B-D):	0	
Supporting information:			
	Impacted aquatic resource(s):		
	Preserved aquatic resource(s)/site(s):		
	Threat:		
	Protection type:		

Table 2 (Steps 2.c and 3) instructions:

A. Baseline ratio based on expected functional loss at impact site (1:1 low; 3:1 Moderate; 5:1 high). Copy to step 2.c in checklist.

B. Describe existing functions by requiring FCAM where available (otherwise make qualitative determination using table)(note: these are all within a range of high functional scores):
- Low end of range (>75% of reference standard FCAM score) (+5)
- Medium part of range (>85%) (+3)
- High end of range (>95%) (+1)

*Assumption: waters of the U.S. and riparian buffer can fall into any category, but upland buffer should always assumed to be in low part of the range.

C. Level of threat:
- Low (+5) (increasing/continuing trend of development in watershed)
- Medium (+3) (site shown as developed in specific/general plan)
- High (+1) (development entitlements/permits in place)

D. “Degrees” of long-term protection:
- Low (management plan) (+5)
- Medium (restrictive covenant/deed restriction) (+3)
- High (conservation easement) (+1)

E. Total adjustment (add steps B-D). Copy adjustment to step 3 in checklist.

Supporting information:

Impacted aquatic resource(s): Describe functional loss at impact site, preferably based on functional or condition assessment data.

Preserved aquatic resource(s)/site(s): Describe aquatic resource functions at preserved site, preferably based on functional or condition assessment data.

Threat: Describe threat to preserved site based on local planning document(s), pending/issued development permits, watershed study/plan, etc.

Protection type: Describe type of long-term protection.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **DG-5**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity	9	9		3	3	0	
4.1.2 Percent of AA with Buffer	12	12		12	12	0	
4.1.3 Average Buffer Width	9	9		12	12	0	
4.1.4 Buffer Condition	9	9		9	9	0	
RAW SCORE	**18.7**	**18.7**	**0**	**13.4**	**13.4**	**0**	
FINAL SCORE	**77.8**	**77.8**	**0**	**55.9**	**55.9**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source	12	12		9	9	0	
4.2.2 Hydroperiod or Channel Stability	9	9		9	9	0	
4.2.3 Hydrologic Connectivity	12	12		12	12	0	
RAW SCORE	**33.0**	**33.0**	**0**	**30.0**	**30.0**	**0**	
FINAL SCORE	**91.7**	**91.7**	**0**	**83.4**	**83.4**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness	3	3		6	9	3	
4.3.2 Topographic Complexity	3	3		9	9	0	
RAW SCORE	**6.0**	**6.0**	**0**	**15.0**	**18.0**	**3**	
FINAL SCORE	**25.0**	**25.0**	**0**	**62.5**	**75.0**	**13**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers	9	6		12	12	0	
4.4.2 Co-Dominant Species	3	3		3	3	0	
4.4.3 Percent Invasion	12	6		6	9	3	
4.4.4 Interspersion/Zonation	3	3		6	6	0	
4.4.5 Vertical Structure	3	3		9	9	0	$Quotient=ABS(M/I)_{deltas}$
RAW SCORE	**14**	**11**	**-3**	**22**	**23**	**1**	**1 1/3**
FINAL SCORE	**38.9**	**30.6**	**-8**	**61.2**	**63.9**	**3**	Baseline ratio:
OVERALL SCORE	**59.0**	**57.0**	**-3**	**66.0**	**70.0**	**4**	**1 : 1.3**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	Impact$_{Before}$	Impact$_{After}$	Impact$_{delta}$	Mitigation$_{Before}$	Mitigation$_{After}$	Mitigation$_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

Step 3: Before-After-Mitigation-Impact (BAMI) procedure **(CRAM example)**

Functions/conditions	$Impact_{Before}$	$Impact_{After}$	$Impact_{delta}$	$Mitigation_{Before}$	$Mitigation_{After}$	$Mitigation_{delta}$	
4.1 Buffer and Landscape Context							
4.1.1 Landscape Connectivity						0	
4.1.2 Percent of AA with Buffer						0	
4.1.3 Average Buffer Width						0	
4.1.4 Buffer Condition						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.2 Attribute 2: Hydrology							
4.2.1 Water Source						0	
4.2.2 Hydroperiod or Channel Stability						0	
4.2.3 Hydrologic Connectivity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.3 Attribute 3: Physical Structure							
4.3.1 Structural Patch Richness						0	
4.3.2 Topographic Complexity						0	
RAW SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
FINAL SCORE	**0.0**	**0.0**	**0**	**0.0**	**0.0**	**0**	
4.4 Attribute 4: Biotic Structure							
4.4.1 Number of Plant Layers						0	
4.4.2 Co-Dominant Species						0	
4.4.3 Percent Invasion						0	
4.4.4 Interspersion/Zonation						0	
4.4.5 Vertical Structure						0	Quotient=ABS(M/I)$_{deltas}$
RAW SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
FINAL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	Baseline ratio:
OVERALL SCORE	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0! : #DIV/0!**

Instructions:

1. Choose functional method. Acceptable functional assessment methods must be aquatic resource-based, standardized, comparable from site to site, peer-reviewed, and must be approved by the applicable Corps District.

2. List functions/condition categories in leftmost column.

3. Utilize Before-After-Mitigation-Impact (BAMI) procedure above to calculate function deltas.

4. Obtain absolute value (ABS*) of quotient of mitigation-delta over impact-delta for overall score (if method has no overall score, use median of quotients for function categories or individual functions). *Absolute value is the nonnegative number for any real number, so if your quotient is negative, simply drop the negative sign to get the ABS. For example: the ABS of -9/3 = 3.

5. To get baseline ratio: If quotient (Q) is less than 1, baseline ratio = 1/Q : 1; if quotient is greater than 1, baseline ratio = 1 : Q.

6. Input Step 3 baseline ratio into the checklist document.

ORM Resource Type	Cowardin System	HGM categories	Hydrology categories	
Harbor/Ocean	Estuarine	Depressional		perennial
Lake	Lacustrine	Estuarine fringed	Stream:	intermittent
Non-tidal wetland	Marine	Lacustrine fringe		ephemeral
Tidal wetland	Palustrine	Mineral soil flats		saturated (groundwater driven)
River/stream	Riparian	Organic soil flats	Wetland:	seasonally flooded
Pond	Riverine	Riverine		permanently flooded
Other	Uplands	Slope		

Description of Impact Site

This impact site consists of four areas dominated by Gooding's black willows (Salix goodingii) that are considered a non-wetland Waters of the U.S. and were combined because of their similarities. The vegtative classifications are Salix gooddingii Woodland Alliance, Salix gooddingii Woodland Alliance - Sparse, Salix gooddingii Woodland Alliance Understory: 20% Lepidium latifolium/Xanthium strumarium, and Salix gooddingii Woodland Alliance Understory: 30% Lepidium latifolium/Conium maculatum. The site also includes some scoured channel areas associated with the willow woodland as well as a very small amount (approximately 4 square feet) of oak woodland nearby. This site is within the existing Arroyo Seco and is a part of the proposed permanent sediment removal area to be maintaned throughout the life of the project. The hydrology and hydrogeomorphic designation is Intermittent and the resource type (Cowardin) is considered Riverine.

APPENDIX L

City of Pasadena Commitment Letter

OFFICE OF THE DIRECTOR
DEPARTMENT OF PUBLIC WORKS

June 19, 2018

Mr. Mark Pestrella, Director
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803

Attention: Christopher Stone

SUBJECT: DEVIL'S GATE RESERVOIR SEDIMENT REMOVAL AND MANAGEMENT PROJECT: MITIGATION SITES WITHIN HAHAMONGNA WATERSHED PARK

Dear Mr. Pestrella:

The City of Pasadena (City) recognizes the Mitigation Sites proposed by the Los Angeles County Flood Control District (District), within Devil's Gate Reservoir, as compensatory mitigation for Devil's Gate Reservoir Sediment Removal and Management Project, and as a requirement of the United States Army Corps of Engineers (Corps) Section 404 Permit (SPL-2014-00591), California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement (1600-2015-0263-R85) and Incidental Take Permit (2081-2016-031-05), and Regional Water Quality Control Board (RWQCB) Section 401 Certification (15-053).

The Mitigation Sites, as shown in Attachment A, are within Devil's Gate Reservoir. The reservoir is part of the City's Hahamongna Watershed Park (HWP). The City is the sole owner of the underlying property of the Mitigation Sites; and the District holds property rights over the reservoir and all Mitigation Sites as recorded through easements granted in May of 1919 and March of 1965 and shown in Attachment B. The City, in collaboration with the District, recognizes the value of the Mitigation Sites to the HWP.

For decades, the City has implemented policies to protect and enhance the natural character of this alluvial canyon and its rich riparian and stream zone habitat through major community-based planning efforts. The City has adopted numerous policy documents relevant to HWP, such as the Hahamongna Watershed Park Master Plan (2003), Hahamongna Watershed Park Master Plan Addendum for the Hahamongna Annex (2010), and Open Space & Conservation Element of the General Plan (2012).

These documents commit the City to protect native habitats and conserve and protect the natural resources of the Arroyo Seco. The HWPMP is the central guiding document for the City's planning for this area. The proposed compensatory Mitigation Sites have a General Land Use designation of Open Space and are zoned Open Space under the City of Pasadena Open Space & Conservation Element of the General Plan. One of the main goals for the Arroyo Seco under this plan is to "Preserve, restore and maintain the natural character of the Arroyo Seco as self-sustaining healthy ecosystems of plants and animals."

The District has collaborated with the City to determine the most suitable restoration areas and ensure that the proposed Mitigation Sites are coherent with goals of the HWPMP. The District plans to establish, re-establish, rehabilitate, and enhance wetland and/or non-wetland waters of the United States in the Mitigation Sites. In addition, the District plans to revegetate and enhance riparian and upland buffer habitat within HWP. The Mitigation Sites will provide a significant increase in the quality of habitat for numerous wildlife species that may occur in the area, including the state and federally protected Least Bell's vireo (*Vireo bellii pusillus*). The habitat types and plant and animal species that will comprise the conservation values of the Mitigation Sites are listed in Attachment C.

The HWP is a valued recreational facility and the Mitigation Sites are designed to be consistent with the City's planned recreational uses. The mitigation strategy proposed by the District includes a number of measures designed to reduce the impacts of human presence on the Mitigation Sites and to protect the wildlife that reside in the habitats. The measures include closures of unnecessary trails, planting of uninviting plants along trails to buffer sensitive habitat areas, placing woody debris at strategic locations in mitigation areas to increase functional value, removing trash, and conducting educational outreach. These measures in combination with the restoration and enhancement of habitats will greatly increase the function and the amount of suitable habitat for wildlife.

The Mitigation Sites will be protected by the District in the long-term and will be maintained and monitored by the District to ensure established performance standards are met. In order to protect and maintain the natural condition of the Mitigation Sites, it is the understanding of the City that the District will:

- Undertake all reasonable measures to discourage actions by persons that would be inconsistent with the natural condition and objectives of the Mitigation Sites;
- Cooperate with City, Corps, CDFW, and RWQCB in the protection of the natural conditions of the Mitigation Sites;
- Undertake construction, maintenance, and monitoring of the approved Mitigation Plan on the Mitigation Sites; and
- Erect signs and other notification features designed to limit access to the Mitigation Sites or uses of the mitigation site that are not consistent with the permitted uses of the mitigation.

The City is committed to supporting the District in its efforts to ensure that the conservation values of the Mitigation Sites are protected. The City looks forward to continued cooperation with the District on the implementation of the Mitigation Sites and appreciates your agency's cooperation on this important effort.

Sincerely,

Ara Maloyan, P.E.
Director of Public Works
City of Pasadena

Enclosures:
Attachment A - Mitigation Sites
Attachment B - Easements
Attachment C - Habitat Types

cc: Julie Gutierrez, City of Pasadena, Assistant City Manager
Kris Markarian, City of Pasadena, City Engineer
Yannie Wu, City of Pasadena, Principal Engineer
Charles Peretz, City of Pasadena, Parks & Natural Resources Administrator


ATTACHMENT A
PROPOSED ON-SITE MITIGATION
LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
DEVIL'S GATE RESERVOIR
SEDIMENT REMOVAL AND
MANAGEMENT PROJECT
Legend
Initial Project Footprint
Annual Maintenance Area
Revegetated Side Slopes
Access Roads
Proposed Mitigation Areas
LACFCD Easement
SCALE
AS SHOWN
5/22/2018
V MARDIS
400 200 0 400 800 Feet
N
OAK GROVE DRIVE
W KENT ST
W SHELLEY ST
N WINDSOR AVE
VISTA LAGUNA TERRACE
CHEVRON CT
LA CANADA VERDUGO RD
210

ATTACHMENT B

78A186—11/63

ORIGINAL

DEVIL'S GATE DAM AND RESERVOIR 4
CI 38
65-RW 1.1 and 65-RW 1.2
Fifth District

4533

RECORDED IN OFFICIAL RECORDS OF LOS ANGELES COUNTY, CALIF
59 Min. Past 1 P.M. MAR 1 1965
RAY E. LEE County Recorder

EASEMENT DEED

FREE 7 P

WHEREAS, THE CITY OF PASADENA, a municipal corporation (hereinafter referred to as "Grantor"), has heretofore acquired and is now the owner in fee of the hereinafter described real property, and

WHEREAS, LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, a body corporate and politic, (hereinafter referred to as "Grantee"), has heretofore acquired certain rights over Grantor's lands under and by virtue of Grant of Easement executed by the City of Pasadena, recorded in Book 6864, page 24 of Deeds in the office of the Recorder of the County of Los Angeles; and

WHEREAS, in the light of the reservoir, water conservation and flood control needs of both, Grantor and Grantee, it is desirable and the intent of this grant to provide the Grantee over the hereinafter described real property with the same rights as the Grantee now possesses over other land of Grantor under said by virtue of said Grant of Easement recorded in Book 6864, page 24 of Deeds and to define the boundaries over which Grantee may exercise said rights.

Grantor acknowledges that the conditions contained in above mentioned Grant of Easement recorded in Book 6864, page 24 of Deeds, have been and are (as the case may be) being fulfilled and met by Grantee; to be effective for the purpose of continuity and with respect to additional property made subject to said conditions by this grant, Grantor further acknowledges that said conditions heretofore satisfied have been and are being (as the case may be) satisfactorily discharged by Grantee as to any and all land owned by Grantor and subject to this grant of easement.

NOW THEREFORE, in consideration of the benefits to be received by Grantor from Grantee's reservoir, water conservation and flood control operations, and for a valuable consideration, receipt of which is hereby acknowledged, Grantor does hereby grant to Grantee a perpetual easement for reservoir, water conservation and flood control purposes, including the right to construct,

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reconstruct, inspect, maintain, repair and operate a dam, spillway, reservoirs, tunnels, by-passes, channels, embankments, protection works, and appurtenant structures for the purpose of controlling, confining, storing and conserving water on, over and across real property hereinafter described.

Said easement shall be subject to the terms contained in the hereinbefore mentioned Grant of Easement recorded in Book 6864, page 24, of Deeds which terms are incorporated herein as if they had been fully set out.

Said real property is situate in the City of Pasadena, County of Los Angeles, State of California, and is described as follows:

That portion of Lot 5, Block 13, that portion of Lot 1, Block 14 and that portion of Lot 1, Block 15, all said lots and blocks of "FLINTRIDGE", as shown on map recorded in Book 26, pages 23 to 33 inclusive, of Maps, in the office of the Recorder of the County of Los Angeles, together with the following portions of land, that portion of Lots 1 and 2, of "Subdivisions of Rancho La Canada", as shown on map recorded in Book 4, page 351, of Miscellaneous Records, in the office of said recorder, that portion of Lot 35, "Altadena Map No. 3", as shown on map recorded in Book 52, page 50, of Miscellaneous Records, in the office of said recorder, that portion of that part of the Rancho San Pascual, as shown on map recorded in Book 42, pages 71 and 72, of Miscellaneous Records, in the office of said recorder, that portion of the land designated "ARROYO", on "map of a tract of land owned by L. W. Giddings", recorded in Book 5, pages 106 and 107, of Miscellaneous Records, in the office of said recorder, that portion of that part of Michigan Avenue "4 rods wide", as shown on map of Subdivision of Rancho La Canada, together with all that land of those streets or roads or of those vacated streets or roads, lying within the following described boundaries:

"Beginning at the southeast corner of Lot 1, Block 15, Flintridge, Sheet No. 6, as recorded in Book of Maps 26, page 28, Records of Los Angeles County", as described in the "territory" known as "Arroyo Addition", filed with the Secretary of State, April 19, 1919, which was annexed to the City of Pasadena, "said point being on the northerly boundary of the City of Pasadena, in the State of California; thence south 87 degrees 53 minutes 55 seconds west, 191.98 feet along the southerly line of said Lot 1, Block 15, to the west line of Park Avenue, as shown on said map; thence northerly along the westerly line of Park Avenue, to the southerly line of the La Canada Verdugo Road, said point being the end of a certain curve whose radius is 50 feet and delta 95 degrees 30 minutes 05 seconds, as shown on said map of Flintridge, Sheet No. 6; thence westerly along the southerly line of the La Canada Verdugo Road, along a curve to the left whose radius is 275 feet and delta 7 degrees 13 minutes 50 seconds, 34.70 feet to a point; thense south 76 degrees 53 minutes 15 seconds west, 54.45 feet to a point; thence on a curve to the right whose radius is 175 feet and delta 39 degrees 46 minutes 30 seconds, 121.49 feet to a point; thence north 63 degrees 10 minutes 15 seconds west, 27.38 feet to a point on the easterly boundary of Lot 5, Block 13, Flintridge; thence southerly and westerly

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along the easterly and southerly boundaries of said Lot 5, to the most westerly corner of said lot; thence north 50 degrees 30 minutes east along the westerly side of said Lot 5 and the production thereof, to the intersection with the northerly line of the La Canada Verdugo Road, as shown on said map of Flintridge, Sheet No. 6; thence along the northerly side of the La Canada Verdugo Road north 22 degrees 22 minutes west, 136.89 feet to a point; thence along a curve to the right whose radius is 973 feet and delta 3 degrees 24 minutes 30 seconds to the intersection with the northerly line of Lot 1, Block 14, of said Flintridge, Sheet No. 6; thence, along said northerly line to the southwest corner of Lot 2 of Map of Subdivision of Rancho La Canada, as partitioned between J. L. Lanterman and the representatives of A. W. Williams, deceased, as recorded in Book 4, page 351, of Miscellaneous Records of Los Angeles County; thence northerly along the westerly line of said Lot 2" to a point designated herein as "A", for the purpose of this description, said point A being located from the traverse of a line described as beginning at a point in the center line of Michigan Avenue, 66 feet wide, distant along said center line (on a different basis of bearings) S. 61° 03' 30" E. 229.73 feet from the centerline of Viro Road, 70 feet wide, as said Avenue and said Road are shown in Los Angeles County Road Department Field Book, R.D.F.B. 456, page 26, on file in the office of the Road Commissioner of the County of Los Angeles; thence S. 0° 19' 30" W. 1719.50 feet; thence S. 44° 15' 38" E. 49.86 feet, more or less, to a point in the westerly line of said Lot 2, said point being that point herein designated as "A", said westerly line of said Lot 2 being designated "WEST CITY BOUNDARY" lying between that point designated "Found 4" Iron Pipe Filled with concrete N.W. Cor. Lot 2 L-C-Rº" and that point designated "Found 4" Iron Pipe Filled with Concrete S.W. Cor. Lot 2", as shown on Los Angeles County's Filed Map No. 18268, on file in the office of the Engineer of said County; thence, from said point A, N. 62° 23' 32" E. on a line deflecting northerly 73° 20' 50" from the prolongation of that line having a bearing of S. 44° 15' 38" E., a distance of 196.13 feet; thence N. 25° 01' 00" E. 247.71 feet; thence N. 17° 11' 10" W. 306.38 feet; thence N. 0° 12' 52" E. 414.01 feet; thence N. 15° 53' 30" E. 226.06 feet; thence N. 32° 15' 33" E. 208.60 feet; thence N. 11° 42' 51" W. 361.38 feet; thence N. 39° 48' 19" E. 309.27 feet; thence N. 19° 44' 58" E. 155.75 feet; thence N. 50° 26' 23" E. 273.52 feet; thence S. 18° 37' 50" E. 104.78 feet; thence N. 76° 48' 45" E. 191.72 feet; thence N. 39° 53' 00" E. 189.45 feet; thence N. 53° 46' 44" E. 194.17 feet; thence S. 10° 40' 42" E. 120.27 feet; thence S. 43° 48' 03" E. 243.40 feet; thence N. 26° 45' 02" E. 511.26 feet; thence N. 89° 46' 45" E. 253.05 feet; thence N. 29° 42' 50" E. 401.60 feet; thence N. 86° 09' 28" E. 734.47 feet; thence N. 16° 43' 10" E. 251.00 feet; thence S. 73° 19' 17" E. 512.00 feet; thence S. 7° 01' 55" W. 140.18 feet; thence S. 11° 49' 47" W. 720.43 feet; thence S. 25° 08' 30" W. 790.67 feet; thence N. 70° 57' 50" W. 60.00 feet; thence S. 19° 02' 10" W. 101.38 feet; thence S. 25° 57' 50" E. 21.21 feet; thence S. 70° 57' 50" E. 45.00 feet; thence S. 27° 33' 32" W. 1088.29 feet to the most northwest corner of Lot 44, Tract No. 85, as shown on map recorded in Book 14, page 44, of Maps, in the office of said recorder, said corner also being shown on said Los Angeles County's Filed Map No. 18268, and designated on said maps as "Set 4" Pipe", said pipe also being shown at the northerly extremity of that line shown having abearing of "N. 4° 54' 00" E." and a length of "369.28" feet on map of Tract No. 12919, recorded in Book 250, pages 13 and 14, of Maps, in the office of said recorder; said point also being an angle point in the

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boundary of said "Arroyo Addition"; thence southerly along said last mentioned line to the southerly extremity thereof, said extremity also being an angle point in the boundary of said "Arroyo Addition", and being designated as "Fd. 2" I.P. at Cor. in 7187-122 Official Records" on said last mentioned map; thence southwesterly along the northwesterly boundary of said tract and southwesterly along the southwesterly prolongation of that portion of said northwesterly boundary having a bearing of "N. 31° 09' E." and a length of "28.72" feet to an intersection with the northerly prolongation of the westerly boundary of Tract No. 4305, as shown on map recorded in Book 47, page 97, of Maps, in the office of said recorder, said last mentioned intersection being at the northerly extremity of that line having a length of "67.14" feet and designated "Relocated 2" Pipe Set by City Engineer Pasadena, Jan. 1919", as shown on said last mentioned map; thence southerly along said prolongation to the southerly extremity thereof, said extremity being the most northerly corner of the westerly boundary of said Tract No. 4305; thence southerly along the westerly boundary of said last mentioned tract to the intersection with the northerly line of La Canada Verdugo Road, 50 feet wide, as shown on said last mentioned map, said intersection being designated "Found 4" Iron Pipe Filled with cement" as shown on map of said Tract No. 4305; thence southerly on a line deflecting easterly 15° 15' 00" from the southerly prolongation of that course having a bearing of N. 3° 35' 30" E. and a length of 451.92 feet in said last mentioned westerly boundary, a distance of 968.03 feet; thence westerly, in a direct line, to the place of beginning.

ALSO that portion of said Lot 35, of said Altadena Map No. 3, bounded as follows:

On the northwest by the northwest boundary of said Lot 35, on the north by the westerly prolongation of that line described herein as having a bearing of N. 86° 09' 28" E. and a length of "734.47 feet", on the southeast by that line described herein as having a bearing of "N. 29° 42' 50" E." and a length of "401.60 feet", and bounded on the south by that line described herein as having a bearing of "N. 89° 46' 45" E." and a length of "253.05 feet".

EXCEPTING from the hereinbefore described land all those certain lands of the Grantor, City of Pasadena, on which and over which the Los Angeles County Flood Control District is the holder of that certain easement recorded in Book 6864, page 24, of Deeds.

ALSO EXCEPTING from the land described herein that portion described in PARCEL 1 in deed to the "Board of Missions and Church Extension of Southern California-Arizona Annual Conference of the Methodist Church, recorded in Book D2323, page 232, of Official Records, in the office of said recorder.

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It is understood that the ... g...

across that portion of the above described land which is owned by said Grantor or in which said Grantor has an interest.

Dated January 5, 1965

CITY OF PASADENA

By Floyd O. Irvine

ATTEST:

By Harriett C. Jenkins
City Clerk

John L. Behner

12/10/1964

12/10/64

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16 Dec 64

City Attorney

City Manager

4533

APPROVED DATE 12/18/64

DIRECTOR OF PARKS

Description Checked and Approved

12/ /64

City Engineer and ... Streets

STATE OF CALIFORNIA, } ss.
County of Los Angeles

On this .... day of ...., 19........, before me, ...
a Notary Public in and for said County and State, personally appeared ....

....

....known to me to be the person.... whose name ....
subscribed to the within instrument, and acknowledged that .... executed the same.

Witness my hand and official seal the day and year first above written.

....
Notary Public in and for sa. County and State

STATE OF CALIFORNIA, } ss.
County of Los Angeles

On this .... day of ...., 19........, before me,
WILLIAM G. SHARP, County Clerk and ex-officio Clerk of the Superior Court in and for said County, personally appeared ....

....

known to me to be the person.... whose.... name.... .... subscribed to the within instrument, and acknowledged to me that .... executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Court, the day and year in this Certificate first above written.

WILLIAM G. SHARP,
County Clerk and ex-officio Clerk of said Superior Court

By ....
Deputy

STATE OF CALIFORNIA, } ss.
County of Los Angeles

On this 5th day of January, 19 65, before me,
Benjamin H. Mead, Jr. a Notary Public in and for said County, personally appeared
Floyd O. Gwinn, known to me to be the Mayor ~~president~~ and
Harriett C. Jenkins, known to me to be the City Clerk ~~secretary~~ of the
CITY OF PASADENA,
the municipal ~~corporation~~ that executed the within instrument ...., and known to me to be the persons who executed the within instrument on behalf of the municipal ~~corporation~~ therein named and acknowledged to me that such Corporation executed the same ~~within instrument pursuant to its by-laws or a resolution of its board of directors.~~

Witness my hand and official seal the day and year first above written.

Benjamin H. Mead
Notary Public in and for said County and State
BENJAMIN H. MEAD, JR.
My Commission Expires June 19, 1967

STATE OF CALIFORNIA, } ss.
County of Los Angeles

On this .... day of ...., 19........, before me, GORDON T. NESVIG, Clerk of the Board of Supervisors of the County of Los Angeles, State of California, personally appeared ...., known to me to be the chairman of the Board of Supervisors of the LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, the District that executed the within instrument, and known to me to be the person who executed the same on behalf of said District and acknowledged to me that said District executed the same.

GORDON T. NESVIG,
Clerk of the Board of Supervisors
of Los Angeles County, California

By ....
Deputy

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ɔject DEVIL'S GATE DAM AND RESERVOI

:cel No. 4

trict Map No. 65-RW 1.1 and 65-RW 1.2

ɪervisorial District Fifth

ITY OF PASADENA

TO

.OS ANGELES COUNTY FLOOD CONTROL DISTRICT

HEN RECORDED MAIL TO
OARD OF SUPERVISORS
OUNTY OF LOS ANGELES

CORDING REQUESTED BY
OS ANGELES COUNTY FLOOD
ONTROL DISTRICT

Approved as to form,

February 8, 1965

HAROLD W. KENNEDY,
County Counsel.

By Edward A. Nugent
Assistant Deputy

Approved as to description,

Oct 30, 1964

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By [illegible]
Civil Engineer
Right of Way Engineering Division

Approved as to title and execution,

January 20, 1965

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
R. A. HOUGH, TITLE OFFICER

By [illegible]
SR TITLE EXAMINER Title Officer

ACCEPTANCE

Under the authority conferred by Resolution duly and regularly adopted by the Board of Supervisors of the Los Angeles County Flood Control District on the 6th day of March, 1962, a certified copy of which was recorded in Book D1543, page 439, of Official Records of Los Angeles County, the undersigned accepts and consents to the recordation on behalf of said District the within instrument on this 26th day of February, 1965.

A. E. [illegible]
Assistant Chief Deputy Engineer

DEVIL'S GATE RESERVOIR (ON-SITE) MITIGATION AREA DESCRIPTION				
Pre-Construction Site Conditions	**Post-Construction Site Conditions**			
Habitat Types	***Habitat Types***	***Mitigation Method***	***Vegetation***	***Hydrology***
Riparian Woodland/Herbaceous/NonNative	Wetlands/Riparian Woodland/Scrub	Rehabilitation	Bulrush/Cattail/Willow/Mulefat	Seasonally Flooded
Disturbed NonNative Grassland		Re-Establishment		
Riparian Woodland/Scrub/NonNative	Riparian Woodland/Scrub	Re-Establishment	Willow/Mulefat Thickets	Intermittent
Unvegetated Channel/Riparian Scrub				
Riparian Woodland/Scrub/NonNative		Enhancement		
Riparian Woodland/Scrub/Herb/NonNative				
Unvegetated Channel/Riparian Woodland				
Disturbed NonNative Grassland	Riparian Scrub	Re-Establishment		
Disturbed Riparian Woodland/Scrub		Enhancement		
Disturbed Riparian Scrub/NonNative				
Disturbed/Riparian Scrub				
Disturbed Riparian Scrub/Bare				
Lepidium				
Disturbed/Unvegetated Channel/Riversidean Alluvial Fan Sage Scrub	Unvegetated Channel/Riversidean Alluvial Fan Sage Scrub/ Riparian Scrub	Re-Establishment	Unvegetated Channel/Riversidean Alluvial Fan Sage Scrub/ Riparian Scrub	Intermittent
Sage Scrub/Riversidean Alluvial Fan Sage Scrub/ Riparian Scrub/NonNative	Sage Scrub/Riversidean Alluvial Fan Sage Scrub	Enhancement	CA Buckwheat Scrub/Riversidean Alluvial Fan Sage Scrub	N/A

APPENDIX M

Site-Specific Performance Standards and Annual Targets

Devil's Gate Sediment Removal and Management Project
Proposed Performance Standards

PS#	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
4	Riverine	Physical	The permittee shall ensure the mitigation site provides diverse physical features or surfaces contributing to riverine habitat function. Specifically: a. By year N, the site must contain 25% or more of the number of structural patch types found at the selected reference site. b. By year N+1 or 2, the site must contain 50% or more of the number of structural patch types found at the selected reference site. c. By year N+3 or 5, the site must contain 75% or more of the number of structural patch types found at the selected reference site. d. By year N+4 or 6, etc, the site must contain 90% or more of the number of structural patch types found at the selected reference site.	Yes - would help to identify what features should be present.	Target = reference site	All years	Such features may not be present in confined or entrenched systems or in headwater or ephemeral streams lacking well-developed floodplains. Project manager determination of stream type and appropriateness of standard application is advised.	Riverine CRAM field book's structural patch richness worksheet or other regionally approved method.	Riverine CRAM field book's structural patch richness worksheet or other regionally approved method.	Yes	It is expected that intermittent and perennial streams with well-developed floodplains would provide a greater diversity and number of physical features contributing to structural patch richness and riverine habitat function. Refer to the structural patch richness worksheet in the Riverine CRAM field book. The physical features can have a strong biological component, such as standing snags, tree-fall holes, animal burrows, adn macroalgae or algal mats. For Riverine CRAM, structural patch richness addresses the number of different patch types, in contrast to topographic complexity which addresses the spatial arrangement and interspersion of the features. Note: structural patch types as listed in CRAM Structural Patch Type Worksheet or other functional assessment list of patch types, as appropriate.
8	Riverine	Hydrologic	The permittee shall ensure that groundwater in the mitigation site(s) occurs within X feet of the ground surface during the wet season and Y feet of the ground surface during the dry season.	Not necessary - site specific	Case-specific: PM set target	All years	This standard may not be applicable in confined or entrenched stream systems such as those with bedrock channels. It would not apply in ephemeral streams. Project manager determination of stream type/appropriateness of standard is recommended.	Observation of water in soil pits at the recommended depth during the recommended season, or installation of piezometers and measure water level at recommended intervals/seasons.	None	Yes	Groundwater will not be a component in ephemeral streams, and it will only be a component in some intermittent or perennial streams.
25	All	Faunal-Diversity Index	The permittee shall ensure a Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	Yes (≥80% of reference)	Diversity within 80% of reference site or peer-reviewed study for similar habitat type by end of monitoring period.	Annually	All mitigation sites where wildlife habitat functions are relevant.	Shannon-Wiener Diversity index		Yes, if mitigation site is for habitat it needs to identify which species it is targeting and how it will meet those species needs.	Need to ensure that suite of species targeted are appropriate for region. Including ubiquitous, invasive, or tolerant species into the assessment may misrepresent habitat quality.
26	All	Flora	Survivorship: the permittee shall ensure target survivorship of tree, shrub, and herb strata container plants are met.	n/a	≥80% of containers	Annually until minimum of 2 years post-irrigation success					
28	All	Flora	Dominance of natives: the permittee shall ensure target [PM pick one or more: percent absolute cover (for combined strata), density, or height] of native species are met for tree, shrub, and herb strata by year 5.	Yes	≥75% of reference If no reference site: relative cover*: ≥75% combined strata	Annually					*if only using this performance standard (and not dominance of hydrophytes), may need to add absolute cover target.

Devil's Gate Sediment Removal and Management Project
Proposed Performance Standards

PS#	Aquatic resource type	PS type	Performance Standard	Reference	Target	Timing	Applicability	Suggested measure	CFCAM metric	Design considerations	Guidance
29	All	Flora	Dominance of exotics: the permittee shall ensure target [PM pick one or more: percent absolute cover (for combined strata), density, and height] are met for exotic species (tree, shrub, and herb strata) by year 5.	Yes	≤100% of reference If no reference site: ≤10% abs cover (zero tolerance for species considered highly invasive per Cal-IPC List or equivalent regional list)	Annually					May not be applicable in seasonal wetlands where FAC species dominate.
31	All	Flora	Species richness: The permittee shall ensure target native species richness values of tree, shrub, and herb strata are met by year 5.	Yes	≥75% of reference	Annually					

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	**Mitigation site(s) name:** DG-1 **Cowardin/HGM type:** PSS1 **Habitat type:** Riparian Scrub Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [X] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [X] establishment; [ ] rehabilitation; [ ] enhancement **If enhancement, indicate function(s) to be increased:** function 1: function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [X] hydrological manipulation; [X] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [X] physical; [ ] hydrologic; [X] fauna; [X] flora; [ ] water quality (ecological)		
7	Using selections from 2-6 above, insert applicable performance standards and targets from .12505.1-SPD Table of Uniform Performance Standards for Compensatory Mitigation Requirements into worksheet rows below. Add or remove rows for any category, as needed.		

#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Hydrologic-1	**Groundwater** in the mitigation site(s) occurs within X feet of the ground surface during the wet season and Y feet of the ground surface during the dry season. (no reference site)	X/Y	X/Y	X/Y	X/Y	X/Y
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	**Mitigation site(s) name:** DG-2A, DG-2B, DG-3B, DG-5A DG-6A, DG-6B, DG-7, DG-8, DG-9 **Cowardin/HGM type:** PSS1 **Habitat type:** Riparian Scrub Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [X] re-establishment; [ ] establishment; [ ] rehabilitation; [ ] enhancement **If enhancement, indicate function(s) to be increased:** function 1: function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [X] physical; [ ] hydrologic; [X] fauna; [X] flora; [ ] water quality (ecological)		
7	Using selections from 2-6 above, insert applicable performance standards and targets from .12505.1-SPD Table of Uniform Performance Standards for Compensatory Mitigation Requirements into worksheet rows below. Add or remove rows for any category, as needed.		

#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	**Mitigation site(s) name:** DG-2, DG-3A, DG-4, DG-5, DG-6 **Cowardin/HGM type:** PSS1 **Habitat type:** Riparian Scrub Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [X] enhancement **If enhancement, indicate function(s) to be increased:** function 1: Habitat biodiversity function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [X] physical; [ ] hydrologic; [X] fauna; [X] flora; [ ] water quality (ecological)		
7	Using selections from 2-6 above, insert applicable performance standards and targets from .12505.1-SPD Table of Uniform Performance Standards for Compensatory Mitigation Requirements into worksheet rows below. Add or remove rows for any category, as needed.		

#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	Mitigation site name: DG-2, DG-4, DG-5, DG-6 Cowardin/HGM type: Habitat type: Riparian Woodland (Black Willow Thickets) Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [X] enhancement **If enhancement, indicate function(s) to be increased:** function 1: habitat biodiversity function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [X] physical; [ ] hydrologic; [X] fauna; [X] flora; [ ] water quality (ecological)		
7	Using selections from 2-6 above, insert applicable performance standards and targets from .12505.1-SPD Table of Uniform Performance Standards for Compensatory Mitigation Requirements into worksheet rows below. Add or remove rows for any category, as needed.		

#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	Mitigation site name: Upper Shields 1, Upper Shields 2 Cowardin/HGM type: Habitat type: Riparian woodland (White alder groves) Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [X] enhancement **If enhancement, indicate function(s) to be increased:** function 1: Habitat biodiversity function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [X] physical; [ ] hydrologic; [X] fauna; [X] flora; [ ] water quality (ecological)		
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#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	Mitigation site name: Millard Canyon, Pruitt-1, Pruitt-2 Cowardin/HGM type: Habitat type: Riparian Woodland (Coast Live Oak Woodland) Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [X] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [X] enhancement **If enhancement, indicate function(s) to be increased:** function 1: Habitat biodiversity function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [X] introduction of plant materials; [X] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [X] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
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#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1	The site must contain target % or more of the number of structural patch types found at the selected reference site.	≥25% R	≥50% R	≥75% R	≥75% R	≥90% of R
Fauna-1	Shannon-Wiener Diversity index of target riparian/aquatic species present within the boundary of mitigation site, including approved buffer, equal to at least 80% of reference site by year 5.	10% R	20% R	40% R	60% R	80% of R
Flora-1	**Survivorship:** Target survivorship of tree, shrub, and herb strata container plants. (Annually until minimum of 2 years post-irrigation success)	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers	≥80% of containers
Flora -2	**Natives:** percent absolute cover (for combined strata) of native species for tree, shrub, and herb strata.	25% R	35% R	50% R	60% R	75% R
Flora -3	**Exotics:** percent absolute cover (for combined strata) of exotic species (tree, shrub, and herb strata).	≤200% R	≤175% R	≤150% R	≤125% R	≤100% R
Flora -4	**Species richness:** Target native species richness values of tree, shrub, and herb strata.	N/A	≥30% of R	≥50% of R	≥60% of R	≥75% of R

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	Mitigation site name: Cowardin/HGM type: Habitat type: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [ ] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [ ] enhancement **If enhancement, indicate function(s) to be increased:** function 1: function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [ ] introduction of plant materials; [ ] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [ ] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
6	**Performance standard categories (select all that apply):** [ ] physical; [ ] hydrologic; [ ] fauna; [ ] flora; [ ] water quality (ecological)		
7	Using selections from 2-6 above, insert applicable performance standards and targets from .12505.1-SPD Table of Uniform Performance Standards for Compensatory Mitigation Requirements into worksheet rows below. Add or remove rows for any category, as needed.		

#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1						
Fauna-1						
Flora-1						
Flora -2						
Flora -3						

Attachment 12505.2 Worksheet for SPD Uniform Performance Standards for Compensatory Mitigation Requirements

1	Date: DA no.: Project manager:	Mitigation site name: Cowardin/HGM type: Habitat type: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:	Reference site name: Site coordinates: Center/1st endpoint: Lat: Lon: 2nd endpoint (if linear) Lat: Lon:
2	**Mitigation objective(s) to improve:** [ ] habitat conservation/biodiversity; [ ] water storage/flow attenuation; [ ] water quality; [ ] target population of special status biota; [ ] specific aquatic resource function(s); [ ] other:		
3	**Mitigation type (select one):** [ ] re-establishment; [ ] establishment; [ ] rehabilitation; [ ] enhancement **If enhancement, indicate function(s) to be increased:** function 1: function 2 (if applicable): function 3 (if applicable):		
4	**Primary type(s) of site treatment:** [ ] introduction of plant materials; [ ] invasive species control; [ ] hydrological manipulation; [ ] topographic/substrate manipulation		
5	**Aquatic resource type (select one):** [ ] riverine; [ ] depressional wetland; [ ] tidal wetland; [ ] slope wetland; [ ] other:		
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#/Categories: **Performance Standards:** **Targets ("R" indicates reference):**

		Year 1:	Year 2:	Year 3:	Year4:	Year 5:
Physical-1						
Fauna-1						
Flora-1						
Flora -2						
Flora -3						

APPENDIX N

On-Site Long-Term Management Plan

Final Long-Term Management Plan

Onsite Mitigation Site of the Devil's Gate Sediment Removal and Management Project

Pasadena, California
Los Angeles County

Prepared for:

Los Angeles County Flood Control District
P.O. Box 1460
Alhambra, California 91802-1460
(626) 458-6100

Prepared by:

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Santa Ana, California 92701
(714) 648-0630

November 2018

Citation: ECORP Consulting, Inc. 2018. Final Long-Term Management Plan for the Onsite Mitigation Site of the Devil's Gate Sediment Removal and Management Project, Pasadena, Los Angeles County. Prepared for Los Angeles County Flood Control District. November.

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1.0 INTRODUCTION

1.1 Purpose of the Mitigation Area Establishment

The Devil's Gate Sediment Removal and Management Project (Project) Mitigation Site (mitigation site) was created to compensate for unavoidable impacts to, and to conserve and to protect waters of the U.S. (WOUS), covered species, and covered habitat under the requirements of the Section 404 Permit (SPL-2014-00591), the CDFW Lake or Streambed Alteration Agreement (1600-2015-0263-R5), the CDFW Incidental Take Permit (2081-2016-031-05), and the RWQCB Section 401 Certification (15-053).

The Los Angeles County Flood Control District (LACFCD) conducted rehabilitation, re-establishment, and enhancement activities in wetland and non-wetland WOUS on-site in Devil's Gate Reservoir to enhance riparian and alluvial scrub and upland buffer habitat in adjacent areas within Hahamongna Watershed Park (HWP). The mitigation site provides a substantial increase in the quality of habitat for numerous wildlife species that may occur in the area, including the state- and federally protected least Bell's vireo (*Vireo bellii pusillus*). The mitigation site includes the rehabilitation of 2.13 acres of wetlands and re-establishment, rehabilitation, and enhancement of 8.36 acres of non-wetlands WOUS that will be protected in perpetuity.

In addition, the compensatory mitigation also included enhancement and rehabilitation of 40.57 acres of riparian and 4.88 acres of upland buffer habitat within and adjacent to Devil's Gate Reservoir.

The mitigation areas will be protected by LACFCD for the long-term and will be maintained and monitored by LACFCD to ensure the established performance standards are met. The United States Army Corps of Engineers (USACE) is the agency responsible for oversight of the long-term management of all mitigation areas.

1.2 Purpose of this Long-term Management Plan

The purpose of this long-term management plan is to ensure the established performance standards continue to be achieved for the long-term, the WOUS continue to function as planned in the Habitat Mitigation and Monitoring Plan (HMMP), the target vegetation communities and vegetative structure continue to exist to support the least Bell's vireo, and the habitats are sustained for the long-term. This management plan establishes specific objectives and and tasks to meet the purpose of the mitigation site. This management plan is a binding and enforceable instrument.

This plan describes the measures that will be implemented by LACFCD to manage and maintain the mitigation areas in perpetuity and in conjunction with the operation of the flood control facility at Devil's Gate Reservoir. The components of this plan include a focus on measures designed to reduce the impacts of human presence on the mitigation areas, to ensure the mitigation areas continue to function as intended, and to protect the wildlife that reside in the habitats in the mitigation areas. The measures generally include:

- Monitoring of the condition of the habitats in both the areas where habitat restoration methods were implemented and in the buffer areas;

- Monitoring of trails, maintenance of undesirable plant species along trails, and closure of unnecessary trails;
- Maintenance to control nonnative and invasive plant species;
- Maintenance of signage designed to alert humans to the sensitivity of the mitigation areas;
- Biological surveys and monitoring;
- Functional assessments (California Rapid Assessment Method [CRAM]);
- Focused surveys for listed and sensitive species of wildlife;
- Removal of trash;
- Maintenance of signs and fencing;
- Adaptive management activities, as necessary; and
- Annual reporting.

1.3 Land Management and Responsibilities

The City of Pasadena (City) is the owner of the underlying lands within Devil's Gate Reservoir where the mitigation site is located. The LACFCD holds a flood control easement from the City to operate the Devil's Gate Dam and the associated reservoir. LACFCD holds property rights over the reservoir and the mitigation site as recorded through easements granted in May of 1919 and March of 1965. Long-term management and oversight of the mitigation site will be the responsibility of LACFCD. Long-term protection of the mitigation site from development, human-related disturbance, and infringement will also be the responsibility of LACFCD. Site management may be transferred to another entity, such as the City, at a later point. As part of this Long-term Management Plan (LTMP), conservation will be ensured through an ongoing agreement between the LACFCD and the City as approved by the USACE.

LACFCD will implement this LTMP following the achievement of the performance standards and will manage and monitor the mitigation site in perpetuity to preserve the habitat and conservation values in accordance with this LTMP. LACFCD has the ability to budget the necessary funding to conduct the required maintenance and to continue to implement the minimization and mitigation measures on an annual basis for mitigation areas. LACFCD shall be responsible for providing an annual report to USACE detailing the time period covered, an itemized account of the management tasks, and total amount expended.

1.4 Site Protection

Site protection not only relates to the protection of downstream communities through the operations of the dam in regards to flood protection, but it also relates to protection of the mitigation site for the long-term. The proximity of the mitigation site to the reservoir and the annual sediment removal area and the fact that it is located within a flood control easement and the HWP will require close coordination between LACFCD (or Land Manager) and the City of Pasadena.

The primary purpose of the Devil's Gate Dam is to provide flood protection to downstream communities. The dam must be able to contain an appropriate volume of water while a storm passes and then slowly release the water at a rate consistent with the capacity of the downstream flood channels. Floodwaters that rise up to an elevation of 1,040.5 feet can typically be accommodated by flowing out through the lower spillway ports. Therefore, habitat restoration efforts were planned with the consideration of potential inundation. The native species composition in the restoration efforts were similar to the existing native plant communities found in Devil's Gate Reservoir. The plant species included in the revegetation and restoration efforts are adapted to survive within the reservoir and will promote habitat of high quality for wildlife.

The excavation configuration was designed to provide proper drainage characteristics and to be capable of handling future anticipated sedimentation load. The configuration conveys stream flows and sediment within the Permanent Maintenance Area, where sediment is excavated annually. Annual sediment management within the Permanent Maintenance Area will reduce buildup of sediment, maintain capacity for future sediment inflows, and eliminate or substantially reduce the future need to remove sediment from areas outside of the Permanent Maintenance Area.

The reservoir is managed through vegetation maintenance, sediment excavation/trucking offsite, and Flow-Assisted Sediment Transport (FAST). During some rain events (during the winter), with the dam gate open, natural flows will pass finer grain size sediment through the reservoir and downstream of the dam. This is referred to as a FAST operation. FAST operations have been routinely used at Devil's Gate Reservoir and result in relatively small amounts of finer grained sediment passing through the reservoir. A FAST operation uses the storm runoffs throughout the storm season to flush the sediment out of the reservoir. This is a passive method that does not use any mechanical agitation or assistance. This method works effectively when sediment deposition behind the dam is minimal. A FAST operation, if performed regularly, can be used to reduce sediment accumulation in the reservoir and thus help maintain capacity. The amount of sediment that will be removed through FAST operations is limited by the amount of storm runoff received into the reservoir. Depending on the efficiency of the FAST operations, some mechanical excavation and trucking offsite may be required for removal of accumulated sediment. Vegetation and any remaining sediment will be removed and excavated from the Permanent Maintenance Area annually.

LACFCD has received written concurrence from the City that states that the City recognizes the mitigation site proposed by LACFCD within Devil's Gate Reservoir will be compensatory mitigation for the Project. Long-term management and oversight of the on-site mitigation site is the responsibility of LACFCD and they will ensure that the performance standards continue to be achieved for the long-term, the WOUS continue to function as planned in the HMMP, the target vegetation communities and vegetative structure continue to exist to support the least Bell's vireo, and the habitats are sustained for the long-term. Long-term protection of the mitigation areas from development, human-related disturbance, and infringement will also be the responsibility of LACFCD.

The on-site mitigation site is located within Devil's Gate Reservoir, which is part of the City's Hahamongna Watershed Park. The City is the sole owner of the underlying property of the mitigation site and LACFCD holds property rights over the reservoir and the mitigation site. The City, in collaboration with LACFCD, recognizes the value of the mitigation site to the Hahamongna Watershed Park.

For decades, the City has implemented policies to protect and enhance the natural character of the Arroyo Seco and the riparian and stream zone habitats through major community-based planning efforts. The City has adopted numerous policy documents relevant to Hahamongna Watershed Park, such as the Hahamongna Watershed Park Master Plan (2003), Hahamongna Watershed Park Master Plan Addendum for the Hahamongna Annex (2010), and Open Space & Conservation Element of the General Plan (2012). These documents commit the City to protect native habitats and conserve and protect the natural resources of the Arroyo Seco. The adoption in 2003 of the Hahamongna Watershed Park Master Plan (HWPMP) was the culmination of a five-year community planning process with extensive participation from the LACFCD. The HWPMP is the central guiding document for the City's planning for this area. The proposed compensatory mitigation site has a General Land Use designation of Open Space and is zoned Open Space under the City Open Space & Conservation Element of the General Plan. One of the main goals for the Arroyo Seco under this plan is to "Preserve, restore and maintain the natural character of the Arroyo Seco as self-sustaining healthy ecosystems of plants and animals."

In January of 1997, the Pasadena City Council established the Hahamongna Watershed Park Advisory Committee (HWPAC) which was given the charge of overseeing the HWPMP process. In 2003, the City of Pasadena adopted the HWPMP, which established a 300-acre park area that encompasses Devil's Gate Reservoir and portions of the surrounding areas. The Master Plan report is a product of an analysis of existing conditions, a review of pertinent documents, and input from a wide variety of stakeholders and the community through an extensive outreach program. LACFCD collaborated with the City, including the HWPAC, to determine the most suitable restoration areas and to ensure that the proposed mitigation site is consistent with the goals of the Master Plan, including:

- Protect and enhance the HWP wildlife corridor linkages to the upper watershed and the downstream reaches of the Arroyo Seco.
- Restore, enhance, and reestablish the historical native plant communities of the Arroyo Seco.
- Develop a grading plan that allows habitat restoration and recreational activities to co-exist with flood management and water conservation.

LACFCD also coordinated with the City regarding planned developments in the HWP and potential conflicts with the proposed mitigation for the Devil's Gate Project. Staff from the City have confirmed that the west side basins and the multi-use play fields were eliminated from the proposed developments in the Master Plan. In 2010, a Pasadena City Council action eliminated the proposed northern multi-use play field. The other proposed multi-use play field was implicitly removed through separate actions including a re-distribution of Integrated Regional Water Management Plan (IRWMP) grant funds and a shift of funds away from the multi-use field in Hahamongna Watershed Park to a replacement location at John Muir High School. In addition, Pasadena Water and Power eliminated plans for developing spreading basins on the west side of the reservoir.. These development projects would have conflicted with the location of the mitigation site. However, since these developments were either removed or relocated, conflicts between the location of the onsite mitigation site and the HWPMP were eliminated.

The proposed HMMP is consistent with the City's General Plan, the HWPMP and the City's future plans for HWP. The City is committed to assisting LACFCD in its efforts to ensure that the conservation values of the mitigation site are protected. LACFCD anticipates the City will initiate the lengthy process to revise the HWPMP following the implementation of the Project to formally include the preservation of the mitigation areas and remove any mention of outdated conflicting recreational facility plans that have already been eliminated by City Council. LACFCD will coordinate closely with the City on any amendments to the HWPMP or any other City planning documents.

For the long-term, the operation of Devil's Gate Dam will follow the Devil's Gate Dam and Reservoir Sediment Management Plan that was prepared by LACFCD in August of 2018 (Appendix A). Dam operations are dependent on the forecasted and existing rainfall/inflows, watershed conditions including expected sediment inflows, and dam and downstream conditions. Generally, the lowest elevation valve is left open prior to the onset of the first rain event of the season, to utilize Flow-Assisted Sediment Transport. During a FAST operation, natural flows will pass finer grain size sediment through the reservoir and downstream of the dam. During a rain event, if water pools and the water surface elevation continues to rise, the lowest elevation valve is closed and water is ponded behind the dam to create a pool that prevents sediment and debris from damaging or blocking the valves and gates of the dam. Two larger slide gates are then operated to manage the reservoir elevation, control outflow, and prevent flows from overwhelming the downstream channel. Depending on storm conditions and forecasts, the pool may remain throughout the storm season. Any water present at the end of storm season (April 15) will be released. If the reservoir experiences significant sediment inflows, the dam operations may need to be altered until the sediment is removed. This altered operation plan typically includes holding a debris pool after each storm to protect the dam outlets from becoming clogged with debris flow.

Based on the historic existing hydrology, it is expected that enough water will be available to support the mitigation site for the long-term. If extreme drought was to occur over a period of more than 10 years then adaptive management would be employed and could include the introduction of supplemental irrigation from reclaimed water sources.

In accordance with protective measures required by the resource agencies, noise levels will be monitored during annual maintenance activities occurring during the breeding season of the least Bell's vireo (March 15 through September 15). Construction noise levels will be restricted to below 60 dBA Leq hourly at 100 feet from areas occupied by least Bell's vireo. The biological monitor will conduct surveys for least Bell's vireo twice weekly in areas of suitable habitat within 500 feet of proposed activities to determine the presence of nest building activities, egg incubation activities, or brood rearing activities. If vireos are present, noise monitoring will be conducted weekly and will demonstrate that noise levels are less than 60 dBA Leq hourly at specified monitoring locations, no less than 100 feet from the active nest(s), as determined by the biological monitor.

The overall protection of the mitigation site will be the responsibility of LACFC (or Land Manager) who will coordinate closely with the City of Pasadena regarding protection issues related to protection of the mitigation site from surrounding uses. If additional protections need to be put in place to protect the mitigation site, such as additional fencing, signage, other barriers, or trail closures, then the Land Manager will notify and coordinate with the City of Pasadena to get concurrence. In addition, if the City of Pasadena's plans for modifications to the areas surrounding the mitigation site have the potential to affect the mitigation site, then the Land Manager will coordinate with the City and provide input or recommendations that will preserve the integrity of the mitigation site. The Land Manager will also notify the City of Pasadena if recreational uses in the areas surrounding the mitigation site are negatively affecting the resources in the mitigation site. In this case, the Land Manager will coordinate with the City of Pasadena to develop measures that can be put in place to eliminate the negative impacts to the mitigation site.

2.0 SITE DESCRIPTION

2.1 Setting and Location

The mitigation site is located in the City of Pasadena in Los Angeles County, California (Figure 2-1). More specifically, the mitigation site is located south of the San Gabriel Mountains within the upper portion of the Arroyo Seco Watershed within the HWP (Figure 2-2). The mitigation site is located along an approximately 4,754-foot linear section of the Arroyo Seco drainage and alluvial fan, which is an area subject to change and disturbance due to erosion, runoff, and sediment movement. All of the areas within the mitigation site are within existing natural areas in the reservoir. The HWP is host to areas containing large, contiguous riparian habitat as well as upland habitat in a location otherwise surrounded by varying types of development. For this reason, the HWP acts as a beacon for wildlife in surrounding areas and provides habitat for a variety of common and special-status wildlife species, including the least Bell's vireo. The area to the north of the mitigation site includes the natural vegetation in the Arroyo Seco channel. To the west of the mitigation site is the Oak Grove Park Area of HWP.

2.1.1 Mitigation Site and Mitigation Areas

The compensatory mitigation site is located on-site within Devil's Gate Reservoir and in areas immediately adjacent to the reservoir (Figure 2-3). The on-site mitigation site includes many different mitigation areas where rehabilitation, re-establishment, and enhancement activities were conducted. Table 2-1 lists each of the mitigation areas that make up the mitigation site and the associated acreages. The total area of the mitigation site, including the sides slopes of the permanent maintenance area is 79.45 acres. The entire 79.45 acres are included within preservation area that will be managed by the Land Manager for the long-term.

Long-term management of the mitigation site commences upon acceptance by the resources agencies that the five-year post-restoration performance standards for the riparian habitats have been met and the ten-year post-restoration performance standards for the habitats in the upland and Riversidean Alluvial Fan Sage Scrub (RAFSS) mitigation areas have also been met.

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Vicinity_v3.mxd (DW/MAG)-mguidry 7/26/2018

Map Date: 7/26/2018

Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 2-1. Mitigation Area Vicinity

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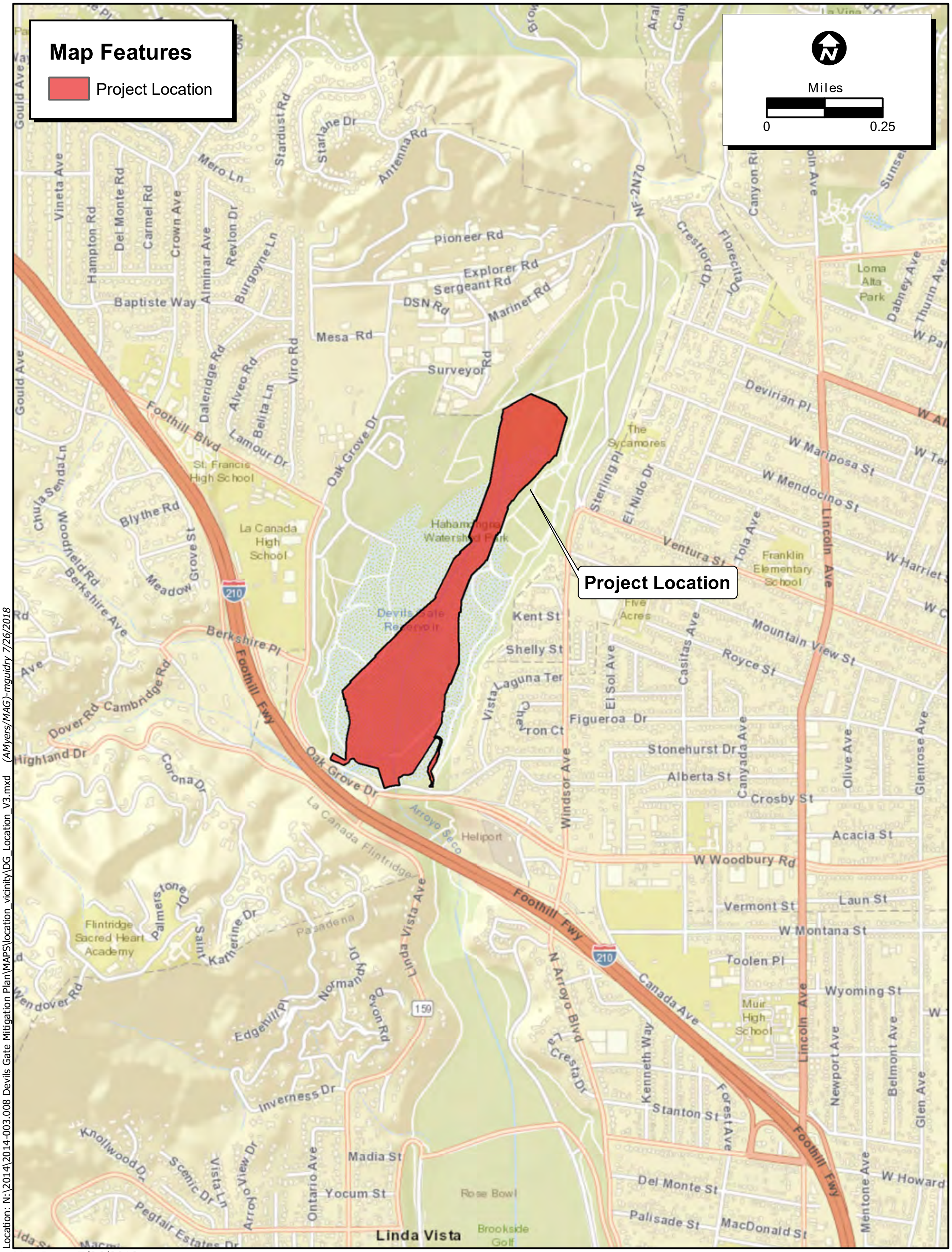
2014-003.008 Devil's Gate Sediment Removal Project



Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\location_vicinity\DG_Location_V3.mxd (AMyers/MAG)-mguidry 7/26/2018

Map Date: 7/26/2018
Source: ESRI

Figure 2-2. Mitigation Area Location

ECORP Consulting, Inc.
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2014-003.013 Devil's Gate Sediment Removal Project

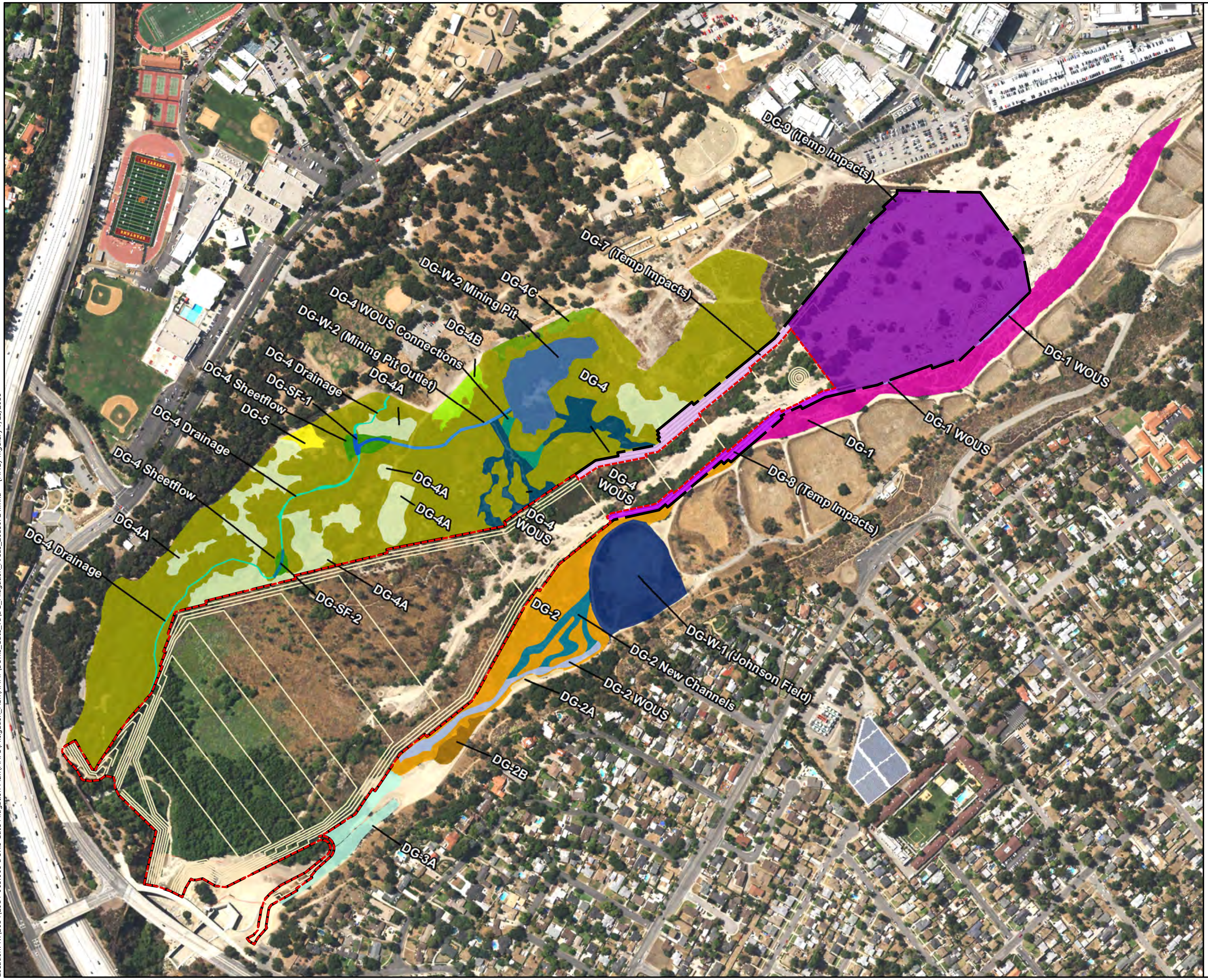

Figure 2-3.
Mitigation Areas

Map Features

- Initial Sediment Removal Footprint [1]
- Permanent Maintenance Footprint [1]
- Sediment Removal Excavation Contours [1]

Mitigation Areas

- DG-1
- DG-1 WOUS
- DG-2
- DG-2 New Channels
- DG-2 WOUS
- DG-2A
- DG-2B
- DG-3A
- DG-4
- DG-4 Drainage
- DG-4 Sheetflow
- DG-4 WOUS
- DG-4 WOUS Connections
- DG-4A
- DG-4B
- DG-4C
- DG-5
- DG-7 (Temp Impacts)
- DG-8 (Temp Impacts)
- DG-9 (Temp Impacts)
- DG-SF-1
- DG-SF-2
- DG-W-1 (Johnson Field)
- DG-W-2 (Mining Pit)
- DG-W-2 (Mining Pit Outlet)

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Mitigation_Plan\HMMP\Devils_Gate_v1\DG_Mitigation_Areas_20180724.mxd (MAG)-mguidry 7/25/2018

2014-003.008 Devils Gate Mitigation Plan

Scale in Feet
0 600

Photo Source: NAIP 2016
[1] LADPW

Map Date: 7/25/2018

Table 2-1 On-Site Mitigation Area Descriptions

Area #	Post-Construction Area Conditions		
	Habitat Types	Vegetation	Acres
Wetland Waters of the US			
DG-W-2 (Mining Pit)	Wetlands/Riparian Woodland/Scrub	Willow Woodland/Mulefat	2.13
		TOTAL WETLANDS	2.13
Non-Wetland Waters of the US			
DG-W-2 (Mining Pit Outlet)	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.13
DG-SF-1 (Part of DG-4 Drainage)	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.08
DG-SF-2 (Part of DG-4 Drainage)	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.03
DG-W-1 (Johnson Field)	Wetlands/Riparian Woodland/Scrub	Willow Woodland/Mulefat	3.44
DG-2 New Channels	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.83
DG-2 WOUS	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.75
DG-4-Drainage	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.49
DG-4 Sheet Flow	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.40
DG-4-WOUS	Riparian Woodland/Scrub	Willow/Mulefat Thickets	1.88
DG-4-WOUS Connections	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.22
DG-1-WOUS	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.11
		TOTAL NON-WETLAND WOUS	8.36
Riparian Buffers			
DG-2	Riparian Woodland/Scrub	Willow/Mulefat Thickets	3.83
DG-2A	Riparian Scrub	Willow/Mulefat Thickets	0.10
DG-2B	Riparian Scrub	Willow/Mulefat Thickets	0.38
DG-3A	Riparian Scrub	Willow/Mulefat Thickets	1.15
DG-4	Riparian Scrub	Willow/Mulefat Thickets	28.40
DG-4A	Riparian Scrub	Willow/Mulefat Thickets	5.46
DG-4B	Riparian Scrub	Willow/Mulefat Thickets	0.54
DG-4C	Riparian Scrub	Willow/Mulefat Thickets	0.45
DG-5	Riparian Scrub	Willow/Mulefat Thickets	0.26
		TOTAL RIPARIAN BUFFERS	40.57
Non-Aquatic Buffers			
DG-1	Sage Scrub/RAFSS	CA Buckwheat Scrub/RAFSS	4.88
		TOTAL NON-AQUATIC BUFFERS	4.88
Side Slope Buffers			
Side Slopes	Riparian Scrub/RAFSS	Mulefat Thickets/RAFSS	7.34
		TOTAL SIDE SLOPE BUFFERS	7.34
Temporary Impact Areas			

Table 2-1 On-Site Mitigation Area Descriptions

Area #	Post-Construction Area Conditions		
	Habitat Types	Vegetation	Acres
DG-7	Riparian Woodland/Scrub	Willow/Mulefat Thickets	1.16
DG-8	Riparian Woodland/Scrub	Willow/Mulefat Thickets	0.92
DG-9	Unveg Channel/RAFSS/ Riparian Scrub	Unveg Channel/RAFSS/ Riparian Scrub	14.09
		TOTAL TEMPORARY IMPACT AREAS	16.17

2.1.2 Episodic Maintenance Areas

The maintenance activities related to sediment removal and repair of the side slopes will only occur after large storm events that damage portions of the side slopes or when erosion compromises a section of the side slopes. The maintenance activities will be limited ot the locations where sediment has accumulated and will only consist of the removal of accumulated sediment and repair of the side slopes. The vegetation buried by sediment may be removed during recontouring. The LACFCD does not anticipate that all 7.34 acres of the side slopes will need to be repaired in the same season or that repair will be necessary on a frequent basis. The primariy purpose of the side slope maintenance is not to remove vegetation, but only to repair the sides slopes so they can revegetate with native plant species.

Regular maintenance on the side slopes will include the removal of nonnative and invasive plant species to limit the spread of these species into the mitigation site. This maintenance will be conducted at the same time that maintenance activities are conducted in the mitigation site. Maintenance will typically occur on a quarterly basis and will include the use of string-trimmers, herbicides, and hand-pulling of weeds near native plants. A Restoration Monitor will be present during the maintenance activities in the mitigation site and on the side slopes. The intended vegetation on the side slopes is a mix of riparian scrub (mulefat and other shrubby species) and RAFSS, which hwill provide foraging opportunities for least Bell's vireo and other wildlife species and will create a buffer between the annual maintenance area and the mitigation site. The Restoration Monitor will ensure that the Landscape Contractor's crew only remove plant species that are appropriate for removal (i.e., nonnative and invasive species).

If recontouring of any portion of the sides slopes is necessary, the Restoration Specialist wil evaluate the need to reseed the side slopes after the recontouring is completed. The vegetation that grows on the side slopes is expected to provide a good seed bank in the soils so after the recontouring is completed, the nonnative and invasive plant species will be controlled to allow the native plants to revegetation naturally. If the vegetation on the side slopes does not successfully germinate and grow, then reseeding of the sides slopes may be conducted. The Restoration Specialist will monitor the repaired portions of the sides slopes to evaluate if reseeding is necessary and when it would be appropriate.

2.1.3 Permanent Maintenance Areas

The Project initially removed vegetation and 1.7 million cubic yards (cy) of sediment from a 65.56-acre area within the reservoir behind Devil's Gate Dam for the purposes of establishing an approximately

42.05-acre permanent maintenance area where sediment is removed on an annual basis. Nonnative plant removal is conducted in the permanent maintenance area

2.1.4 Reference Sites

Reference sites were selected to define effective, objective, and realistic annual performance standard targets for the on-site mitigation areas during the interim phase of mitigation (i.e., prior to meeting all performance standards). The sites were selected in unimpaired habitats that most closely resembled those habitats targeted for rehabilitation, re-establishment, or enhancement within each mitigation area. The initial reference sites selected for the mitigation areas are shown on Figure 2-4.

Reference sites were selected for each vegetation community type targeted for mitigation, including willow/mulefat thickets (riparian scrub), riparian woodland/riparian scrub, coast live oak riparian woodland, California buckwheat scrub (non-aquatic buffer), and RAFSS. The performance standard targets for the long-term management phase will be based on the performance standards that were accepted by the permitting agencies at the time the habitat mitigation was deemed complete. The California Rapid Assessment Method (CRAM) will be performed at each CRAM reference site in conjunction with the CRAM performed at the mitigation areas.

2.2 History and Land Use

The mitigation site is located at Devil's Gate Dam and Reservoir and the HWP. All of the various mitigation areas that make up the mitigation site are located in existing natural areas in the reservoir and along the banks of the Arroyo Seco.

Devil's Gate Dam is a 115-foot high concrete gravity arch structure located in the City of Pasadena approximately 1.5 miles south of the base of the San Gabriel Mountains. The Devil's Gate Dam was built in 1920 by the LACFCD following the floods of 1914 and 1916. The purpose of the dam is to provide flood control to the communities downstream of the dam and water conservation. Devil's Gate Dam retains stormwater runoff, sediment, and debris during storms to prevent high water flow from overwhelming the Arroyo Seco Channel and then releases the stormwater in a safe and controlled manner to the channel.

Following the 1971 Sylmar Earthquake, heightened safety concerns and better understanding of seismic behavior prompted new investigations and analysis of LACFCD dams, including Devil's Gate Dam. In response to findings from these studies, in 1978 the State Department of Water Resources Division of Safety of Dams (DSOD) officially imposed an operational restriction preventing the holding of water at Devil's Gate Dam due to concerns with the dam's ability to withstand a major earthquake. In 1998, the LACFCD completed a construction project that seismically rehabilitated Devil's Gate Dam. The rehabilitation project also enlarged the spillway to safely pass the tributary watershed's updated Probable Maximum Flood, the required level of flood protection, without overtopping the dam. After project completion, the DSOD restriction was removed, restoring use of the dam and reservoir to its full operational capacity, thus providing its potential for water conservation. The project improvements resulted in Devil's Gate Dam meeting current maximum credible earthquake design standards and probable maximum flood design standards.

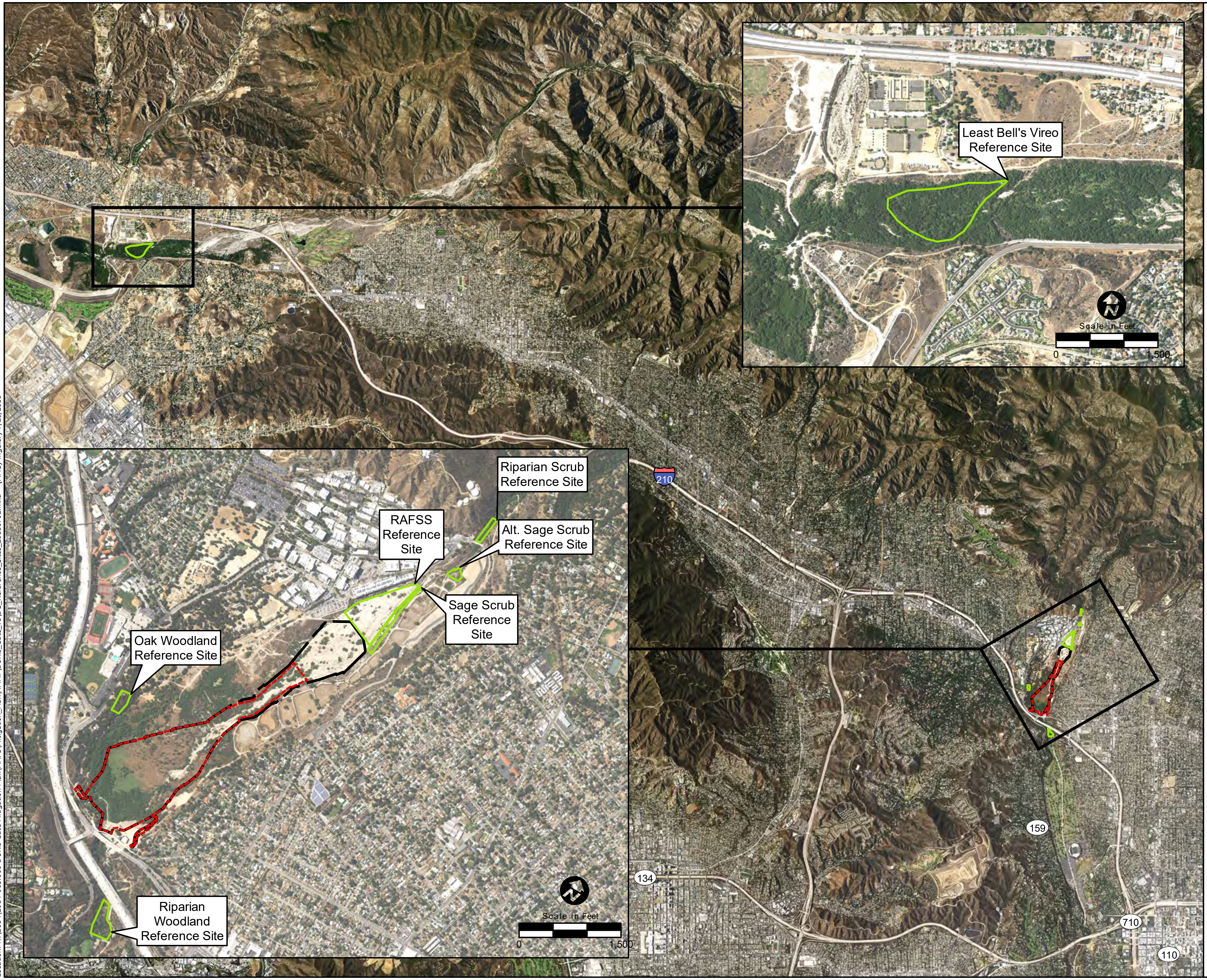

Figure 2-4.
Habitat Mitigation Reference Sites

Map Features

- Initial Sediment Removal Footprint [1]
- Permanent Maintenance Footprint [1]
- Reference Site

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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ENVIRONMENTAL CONSULTANTS

Map Date: 7/26/2018

Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\HMMP\Mitigation_Plan\MAPS\Mitigation_Plan\Devils_Gate_v1\DG_Reference_Sites_20180702.mxd (MAG)-mguidry 7/26/2018

2014-003.008 Devil's Gate Sediment Removal Project

Miles
0 1.25

Photo Source: NAIP 2016
[1] LADPW

LACFCD evaluates the required capacity behind dams for three functions: flood control operations, water conservation, and capturing debris. The required capacity for capturing debris is based upon Design Debris Events (DDE). A reservoir storage design capacity of two DDE below the Devil's Gate Dam's lowest spillway provides LACFCD's standard acceptable level of flood protection for the downstream communities.

The removal of 1.7 mcy of sediment that had accumulated behind the dam as a result of normal runoff from the watershed and from the deposits after the Station Fire in 2009 will reestablish the necessary reservoir capacity storage for Devil's Gate Dam. The removal of the 1.7 mcy of sediment is scheduled to occur between 2019 and approximately 2024 and then annual sediment removal activities will be conducted for the life of the project.

2.3 Cultural Resources

Other than the Devil's Gate Dam itself, there are no existing historical structures located on or adjacent to the mitigation site, nor will the mitigation activities impact any such structures considered to be "historical resources" of the state pursuant to Executive Order W-26-92 and historic resources preservation laws within a one-mile radius of the mitigation site.

No known archeological sites occur in the mitigation site and no archeological resources were encountered during the archeological survey conducted in 2011 (Chambers Group 2014a). Most of the soil in the mitigation site consists of recently accumulated sediment and no archaeological sites are anticipated to exist within these soils. It is not anticipated that the sediment removal, reservoir management, or restoration activities in the mitigation site would exceed the depth of historic flood deposits. Therefore, it is not anticipated that management activities would impact any archeological sites.

2.4 Hydrology and Topography

2.4.1 Hydrology

Hydrology information shows that sub-watersheds on both the western and eastern sides of the reservoir drain directly into the mitigation site. The volume of water entering the western portion of the reservoir from these sub-watersheds ranges from approximately 33 acre-feet during a two-year storm event to approximately 89 acre-feet during a 50-year storm event. The volume of water entering the eastern portion of the reservoir from these sub-watersheds ranges from approximately 159 acre-feet during a two-year storm event to approximately 450 acre-feet during a 50-year storm event. Precipitation falling directly on the mitigation site during storm events will also provide water to the habitats in the various mitigation areas.

Devil's Gate Reservoir is located in the upper portion of the Arroyo Seco watershed. The Arroyo Seco watershed extends approximately 16 miles in length along the centerline of the watershed and 24 miles along the Arroyo Seco from its origin in the Angeles National Forest to the Arroyo Seco's confluence with the Los Angeles River. Approximately 20,400 acres of both residential and undeveloped land drain into Devil's Gate Reservoir. The Arroyo Seco flows freely through a natural creek upstream of the dam, and in an engineered concrete channel from the dam for nine miles downstream to its confluence with the Los Angeles River.

Surface Runoff

On the western side of the mitigation site, water flows from west to east into the reservoir. These flows originate from the Oak Grove Area of Hahamongna Watershed Park and the surrounding communities to the west. The volume of flows from the western tributaries can reach up to 89 acre-feet during a 50-year frequency storm.

On the eastern side of the mitigation site, water flows from east to west into the reservoir. These flows originate from the surrounding Altadena communities to the east. The volume of flows from the eastern tributaries can reach up to 450.67 acre-feet during a 50-year frequency storm. Although some of the runoff from the eastern tributaries is captured within the Arroyo Seco Spreading Grounds, much of the volume and flow is discharged into the reservoir area.

Surface flows from surrounding areas to the west and east of the reservoir remain the primary and most important source of water for the proposed mitigation site. These tributary areas will provide runoff to the mitigation site during even an average rain event (2-year frequency). Various outlets along the western and eastern edges of the reservoir supply water to the reservoir and will continue to supply water directly to the mitigation site.

Stream Flows

The Arroyo Seco is a perennial stream and is highly variable due to seasonal rains, with the majority of rain events occurring between November and April (storm season). During the dry summer months, the stream flows can drop below the surface in the deeper alluvial deposits within the reservoir. The average yearly inflow into Devil's Gate Reservoir is approximately 8,400 acre-feet.

Water Impoundment behind Devil's Gate Dam

Water impounded behind Devil's Gate Dam will begin to inundate the portions of the mitigation site at or above 1,020.00 feet. The majority of the mitigation site is below 1,040.5 feet, which is the lower spillway elevation of the Dam. Water impoundment in the reservoir can have significant benefits to vegetation in the proposed mitigation site. At lower levels, water impounded behind the dam can permeate the side slopes and provide moisture to vegetation situated at higher elevations. The removal of sediment from behind the dam has provided for more water-holding capacity within the permanent maintenance. This increases the amount of water allowed to permeate the side slopes and provide soil moisture to portions of the mitigation site.

Periodic inundation during large storms also provides soil moisture that benefits the surrounding riparian vegetation. Most of the mitigation areas within the mitigation site are located between the 1,020- and 1,040-foot elevation contours. All mitigation areas below the 1,040-foot contour will be below spillway and subject to potential periodic inundation. Between March 15 and August 31 (during the breeding season for least Bell's vireos and other birds), Devil's Gate Dam will be operated to limit the potential for inundation of the 79-acre mitigation area. If weather, hydrological forecasts, and reservoir conditions indicate that water held behind the dam may inundated the mitigation site, then the Dam Operator, in consultation with the Operations Section of the Stormwater Engineering Division of LACDPW, will take the steps necessary (including release of water at the maximum possible rate as safe to do so to protect downstream communities), to prevent or to reduce, to the extent possible, the amount of time the mitigation site is inundated. If inundation of the mitigation site does occur, the Restoration Specialist will determine the adaptive management measures necessary to ensure the recovery or replacement of the damaged habitat.

Groundwater

The mitigation site overlays the Raymond Groundwater Basin (Raymond Basin), which is located within the Los Angeles-San Gabriel Hydrologic Unit. Stream flows that collect in Devil's Gate reservoir and also flows that are diverted to the adjacent City's Arroyo Seco Spreading Grounds contribute to groundwater recharge of the Raymond Basin.

Due to the depth of the groundwater table, groundwater is not expected to be a major source of water for the mitigation areas, except for larger trees such as cottonwood, willow, and velvet ash, which are expected to eventually develop roots that reach the average groundwater depth. Any fluctuations in the groundwater table should not affect the long-term survival of vegetation growing in the mitigation areas. There may be a season, or multiple seasons, of vegetation die-back due to drought conditions however once rainfall returns to average or close to average, then the mitigation areas will rebound. If extreme drought was to occur over more than 10 years then adaptive management would be employed and could include the introduction of supplemental irrigation from reclaimed water sources, for example. Triggers that would result in supplemental irrigation include the following: 1) annual plant mortalities that are not offset by natural recruitment/volunteers of the same species; 2) a negative trend in native species tree cover for a three year period; and 3) slow growth of tree species (e.g., less than 2.5 feet of vertical growth per year, on average, for tree species.

2.4.2 Topography

South of the San Gabriel Mountains, the mitigation areas are located in the upper portion of the Arroyo Seco watershed. The mitigation areas are located along an approximately 4,754-foot linear section of the Arroyo Seco drainage and alluvial fan, which is an area subject to change and disturbance due to erosion, runoff, and sediment movement. Devil's Gate Dam was built in 1920, following the floods of 1914 and 1916, for the purposes of flood control and water conservation. Once the dam was complete, sediment accumulation behind the dam from mountain runoff raised the ground surface, creating a broad plain between the walls of the Arroyo Seco Canyon. This floodplain slopes gently from the San Gabriel Mountains at approximately 1,100 feet above mean sea level (amsl) in the northern portion of the mitigation areas to approximately 985 feet (amsl) at the dam. Topography within the reservoir has been affected by erosion, sediment accumulation, and historical excavation, resulting in irregular patterns. Few areas have level or nearly level terrain. Shallow ridge crests, alluvial fan slopes, and riparian areas can be found within the floodplain.

2.5 Soils

The mitigation site is located within an alluvial wash near the southern margin of the Transverse Ranges Geomorphic Province with the San Gabriel Mountains and Foothills to the north, the San Rafael Hills to the south, and the La Cañada Valley to the east and west. The mitigation areas lie over quaternary age alluvium consisting of silts, sands, and gravel. Soils found in the mitigation areas have been previously described in the *Jurisdictional Delineation Report, Devil's Gate Reservoir Sediment Removal and Management Project* (Chambers Group 2013a). As described in the report, soils throughout the mitigation areas consist of Ramona Sandy Loam, Hanford Gravely Sandy Loam, and various problematic soils that are result of sediment entering the reservoir.

Ramona Sandy Loam soil consists of fine, well-drained, sandy loam soil formed from the breakdown of granite rock. This type of soil has moderately slow permeability and is typically observed on terraces and in alluvial fans with flat to slightly sloped topography at elevations ranging from 250 feet amsl to 3,500 feet amsl. Hanford Gravelly Sandy Loam consists of well-drained soil typically found on stream bottoms, floodplains, and alluvial fans on slopes from 0 to 15 percent. This soil forms at elevations ranging from 150 feet amsl to 3,500 feet amsl are primarily from granite and other quartz containing rock. Problematic soils consisted of soil profiles with gravel and or fill material such as the excess sediment built up in the Devil's Gate Reservoir.

2.6 Existing Easements

The LACFCD holds property rights over the reservoir and all mitigation areas as recorded through easements granted in May of 1919 and March of 1965 (Figure 2-5). The City is the owner of the underlying lands within Devil's Gate Reservoir where the mitigation areas are located. The City has granted an easement to the LACFCD with the right to construct, reconstruct, inspect, maintain, repair, and operate Devil's Gate Dam, its spillway, reservoir, bypasses, tunnels, and other support facilities as may be necessary for the construction and maintenance of a reservoir capable of impounding waters of the Arroyo Seco for the purposes of storage and control, and to control such waters as may be necessary in the prevention of damage by flood (City of Pasadena 1919/1965).

The HWPMP, which was adopted in 2003, encompasses approximately 300 acres and includes Devil's Gate Dam and Reservoir. The HWPMP establishes a visionary framework for recreation, water resources, flood management, habitat restoration, and cultural resources in Hahamongna Watershed Park.

The City is in agreement with implementation of the proposed mitigation within the reservoir and the Hahamongna Watershed Park. The City has stated they will not be implementing development of any facilities within the areas proposed for mitigation by LACFCD.

The total acres of easements overlaying the mitigation site is 2.55 acres. Southern California Edison maintains overhead lines within a 0.69-acre easement along the western and a 0.35-acre easement along the northeastern edges of the mitigation areas and over four mitigation areas (DG-1, DG-4, DG-4A, DG-9). The mitigation areas are not anticipated to conflict with Southern California Edison's tree trimming requirements. However, individual trees may need to be trimmed in some cases to comply with Southern California Edison's requirements.

Figure 2-5.
Existing Easement Map

Map Features

- Project Footprint [1]
- Flood Control Easement [1]
- SCE Overhead Power Easement [1]
- PWP Overhead Power Line [1]
- Exisitng Gas Utility Easement [1]
- Existing Water Utility [1]

Mitigation Areas

- DG-1
- DG-1 WOUS
- DG-2
- DG-2 New Channels
- DG-2 WOUS
- DG-2A
- DG-2B
- DG-3A
- DG-4
- DG-4 Drainage
- DG-4 Sheetflow
- DG-4 WOUS
- DG-4 WOUS Connections
- DG-4A
- DG-4B
- DG-4C
- DG-5
- DG-7 (Temp Impacts)
- DG-8 (Temp Impacts)
- DG-9 (Temp Impacts)
- DG-SF-1
- DG-SF-2
- DG-W-1 (Johnson Field)
- DG-W-2 (Mining Pit)
- DG-W-2 (Mining Pit Outlet)

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Scale in Feet
0 300 600 900

Photo Source: NAIP 2016
[1] LADPW

Map Date: 7/31/2018

Pasadena Water and Power maintains an overhead line along the eastern portion of the mitigation areas and over four mitigation areas (DG-1 WOUS, DG-4, DG-7, and DG-8). The mitigation areas are not anticipated to conflict with Pasadena Water and Power's tree trimming requirements. However, individual trees may need to be trimmed in some cases to comply with Pasadena Water and Power requirements.

The City has an easement containing one water line, a 12″ galvanized steel standard screw end line, within the mitigation areas boundary. The easement is not expected to affect mitigation efforts. However, should maintenance be required within the easement, mitigation efforts may be temporarily impacted.

Southern California Gas Company has a 1.2-acre easement within the mitigation areas containing a 12-inch natural gas line. The easement occurs in the same general area as the 12″ water line. The easement is not expected to affect mitigation efforts. However, should maintenance be required within the easement, mitigation efforts may be temporarily impacted.

Los Angeles County Sewer District has an easement which contains a sewer main along the southwestern edge of the mitigation areas. The easement is not expected to affect mitigation efforts as it occurs outside the mitigation areas.

The Land Manager will coordinate with the easement holders on the timing and extent of tree trimming that may be required within the easements. If the easement holders determine that tree trimming is necessary during the bird nesting season, then the Land Manager will implement minimization and avoidance measures (surveys and monitoring) to identify if nesting birds and more specifically, nesting least Bell's vireos, would be affected by the activities. The measures include pre-construction surveys, focused surveys for least Bell's vireos and other nesting birds and monitoring during the tree-trimming activities. The purpose of the measures is to ensure that least Bell's vireos and other nesting birds are not affected and the habitat in the mitigation areas is not damaged by the tree-trimming activities.

2.7 Adjacent Land Use

The mitigation areas are located within Devil's Gate Reservoir and the City's HWP. All of the areas are within existing natural areas in the reservoir, along the banks of the Arroyo Seco, to the north of the mitigation areas, and on the eastern edge of the Oak Grove Area of HWP. The area to the north of the mitigation areas includes the natural vegetation in the Arroyo Seco channel. To the west of the mitigation areas is the Oak Grove Park Area of HWP. The City has future improvement plans for portions of HWP, including upgrading portions of the Oak Grove Area, relocation of portions of the disc golf course, and drainage improvements at Berkshire Creek but in general, the existing character and uses of the Oak Grove Area will remain the same as they are currently. All future improvements planned by the City for HWP will occur outside of the mitigation site and are not expected to impact the mitigation site. Hiking and equestrian trails are present around the perimeter of the mitigation site and ongoing monitoring and management of impacts resulting from unauthorized trails use will be conducted (Figure 2-6). The areas to the east and northwest of the mitigation areas are urbanized with residential communities and the Jet Propulsion Laboratory facility. Areas downstream of Devil's Gate Dam are generally urbanized, however patches of native vegetation do occur adjacent to the channel in a few areas within the Central and Lower Arroyo Seco.

Figure 2-6.
Proposed Trail Map

Map Features

- Initial Sediment Removal Footprint [1]
- Permanent Maintenance Footprint [1]
- Arroyo Seco Trail
- Seasonal Trail
- Barriers to Access
- Proposed Sign Location

Mitigation Areas

- DG-1
- DG-1 WOUS
- DG-2
- DG-2 New Channels
- DG-2 WOUS
- DG-2A
- DG-2B
- DG-3A
- DG-4
- DG-4 Drainage
- DG-4 Sheetflow
- DG-4 WOUS
- DG-4 WOUS Connections
- DG-4A
- DG-4B
- DG-4C
- DG-5
- DG-7 (Temp Impacts)
- DG-8 (Temp Impacts)
- DG-9 (Temp Impacts)
- DG-SF-1
- DG-SF-2
- DG-W-1 (Johnson Field)
- DG-W-2 (Mining Pit)
- DG-W-2 (Mining Pit Outlet)

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Scale in Feet
0 600

Photo Source: NAIP 2016
[1] LADPW

Map Date: 7/31/2018

Two short sections of soft bottom channel are present downstream of the dam: (1) immediately downstream of the dam face, and (2) between Holly Street and W Colorado Boulevard in the City of Pasadena.

3.0 HABITAT AND SPECIES DESCRIPTIONS

3.1 Biological Resources in the Mitigation Areas

3.1.1 Mitigation Site Vegetation Communities

The vegetation communities present in the mitigation site following the achievement of the performance standards are depicted in Figure 3-1. Table 3-1 lists the acres of the vegetation communities in the mitigation site that will be managed for the long-term.

Table 3-1. Mitigation Site Vegetation Communities

Vegetation Community	Riparian	Upland	Upstream RAFSS	Side Slopes	Total
Artemisia californica – Eriogonum fasciculatum Shrubland Alliance		3.27			3.27
Eriogonum facsciculatum Shrubland Alliance/*Lepidospartum squamatum* Shrubland Alliance		5.00			5.00
Lepidospartum squamatum Shrubland Alliance/*Baccharis salicifolia* Shrubland Alliance			14.09	7.34	21.43
Quercus agrifolia Woodland Alliance		1.15			1.15
Baccharis salicifolia Shrubland Alliance	17.87				17.87
Salix gooddingii Woodland Alliance	30.75				30.75
TOTAL:	48.62	9.42	14.09	7.34	79.47

The acreages and representation of vegetation communities in this section are anticipated results. The as-built report prepared after the mitigation project is completed will serve as the actual baseline conditions that will be used for the management activities outlined in this LTMP. The mitigation site baseline conditions outlined in the as-built report will set the standards that will need to be met during the long-term management of the site. If the as-built condition reflects a change in the acres of each vegetation community from what is listed in Table 3-1, then the Land Manager will coordinate with the regulatory agencies (USFWS, USACE, and CDFW) to determine if this LTMP will need to be amended to reflect the new anticipated conditions.

3.1.2 Wildlife

A total of 76 species of wildlife have been documented on the Project site and in immediately surrounding areas during wildlife surveys, which includes the mitigation areas (Chambers Group 2014a). The mitigation areas provide a large block of natural habitat in the middle of an area dominated by urban and commercial development. As a result, the mitigation areas are expected to support a relatively high diversity of resident and migratory wildlife species.

Figure 3-1.
Vegetation Communities In The Mitigation Site

Map Features

Initial Sediment Removal Footprint [1]

Permanent Maintenance Footprint [1]

Post-Construction Vegetation

- Artemisia californica - Eriogonum fasciculatum Shrubland Alliance (AcEfSA)
- Baccharis salicifolia Shrubland Alliance (BssA)
- Eriogonum fasciculatum Shrubland Alliance / Lepidospartum squamatum Shrubland Alliance (EfSA/LsSA)
- Lepidospartum squamatum Shrubland Alliance/ Baccharis salicifolia Shrubland Alliance (LsSA/BsSA)
- Quercus agrifolia Woodland Alliance (QaWA)
- Salix gooddingii Woodland Alliance (SgWA)

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Scale in Feet
0 600

Photo Source: NAIP 2016
[1] LADPW

Map Date: 7/23/2018

Species commonly observed throughout the Project site include western toad (*Anaxyrus boreas*), American bullfrog (*Lithobates catesbeianus*), common side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis catenifer*), California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), northern rough-winged swallow (*Stelgidopteryx serripennis*), desert cottontail (*Sylvilagus audubonii*), and California ground squirrel (*Otospermophilus beecheyi*).

A number of special-status wildlife species have been observed or have been determined to have a potential to occur on the Project site. According to the Final EIR for the Project (Chambers Group 2014a), which occurs within or adjacent to the mitigation areas, and focused surveys conducted in 2015 (Chambers Group 2015a; J. Griffith personal communication, October 8, 2015), the special-status wildlife species that have been documented on the Project site during various general and focused surveys included least Bell's vireo, southwestern willow flycatcher, yellow warbler (*Setophaga petechia*), two-striped garter snake (*Thamnophis hammondii*), and coast patch-nosed snake (*Salvadora hexalepis virgultea*). Other species of concern that were determined to have a moderate to high potential to occur within the Project site include coast range newt (*Taricha torosa*) and southwestern pond turtle (*Actinemys pallida*) (Chambers Group 2014a). During focused surveys conducted in 2016 and 2017, two special status species were observed on the Project site, including yellow warbler and yellow-breasted chat (*Icteria virens*).

The reservoir area provides important habitat for wildlife and essential habitat connectivity between Flint Wash and the Arroyo Seco located downstream of the dam, Hahamongna Watershed Park, and areas located upstream in the Angeles National Forest. The habitats in the reservoir area and the adjacent Hahamongna Watershed Park function act as a critical linkage in a highly developed area. Not only do wildlife species reside in the area because the native vegetation provides the necessary cover, forage, and shelter, but wildlife species also use the area for juvenile dispersal, seasonal migration, and home range connectivity. The riparian habitats in the mitigation site are considered sensitive habitats because they are critical for the successful nesting of least Bell's vireos and other sensitive wildlife species. The RAFSS, coastal sage scrub, and oak woodlands in the mitigation site are also important because they act as buffer habitats for the riparian habitat.

3.2 Summary of the Mitigation Site

The jurisdictional areas are shown on Figure 3-2 and Table 3-2 summarizes the acres. Approximately 2.13 acres of wetlands and approximately 8.36 acres of non-wetland WOUS will be managed and maintained outside of the Permanent Maintenance Area. Table 3-3 lists the acres of riparian, upland, and side slope buffers as well as the temporary impact areas that will also be monitoring and maintained for the long-term. Approximately 52.79 acres of riparian and upland buffer habitats, 7.34 acres of side slope buffer habitat, and 16.17 acres of riparian and RAFSS habitats will be managed and maintained within the mitigation site. Closure of unnecessary trails and maintenance of barrier plantings along trails will be conducted to limit human encroachment into the habitats within the mitigation site. Additional methods that will be conducted to protect the habitats from human encroachment for the long-term include maintenance of signage and fencing, placement of large rocks and other natural barriers, and public outreach.

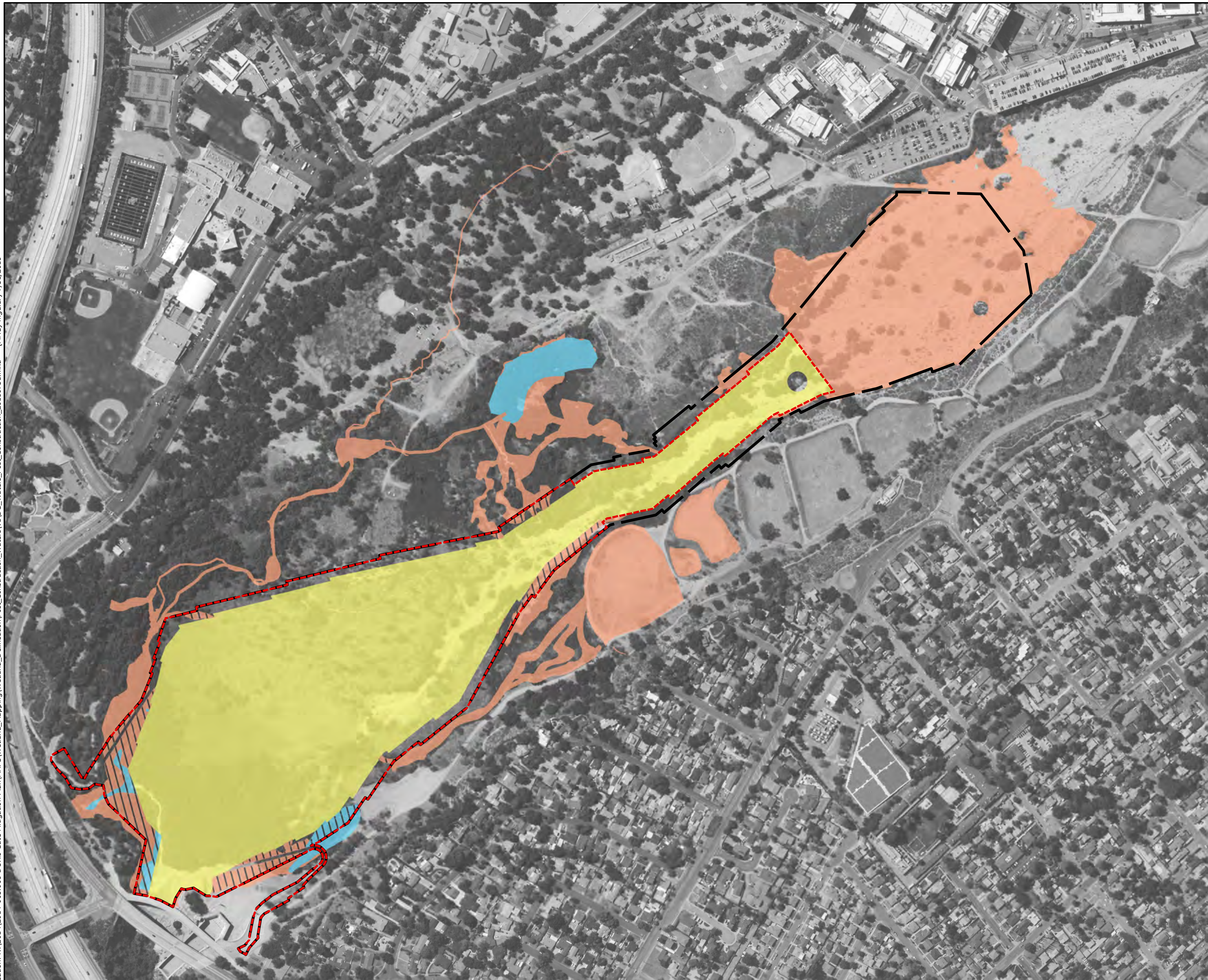

Figure 3-2.
Mitigation Site Jurisdictional Areas

Map Features

- Initial Sediment Removal Footprint [1]
- Permanent Maintenance Footprint [1]

Post-Restoration Waters

- Wetland Waters of the U.S.
- Wetland Waters of the U.S. (Side Slopes)
- Non-wetland Waters of the U.S.
- Non-wetland Waters of the U.S. (Side Slopes)
- Potential Non-wetland Waters of the U.S.

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Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\Wetland_Mapping\Wetland_Delineation\Post_Construction_Waters\V1\DG_Waters_Post_Construction_20180731.mxd (MAG)-mguidry 7/31/2018

Scale in Feet
0 600

Photo Source: NAIP 2016
[1] LADPW

Map Date: 7/31/2018

Table 3-2 Acres of Onsite Wetlands and Non-Wetlands WOUS

WOUS Type	Re-Establishment	Rehabilitation	Enhancement		Total
Wetlands	0.00	2.13	0.00		2.13
Non-Wetland WOUS	4.62	1.35	2.39		8.36
Total WOUS	4.62	3.48	2.39		10.49

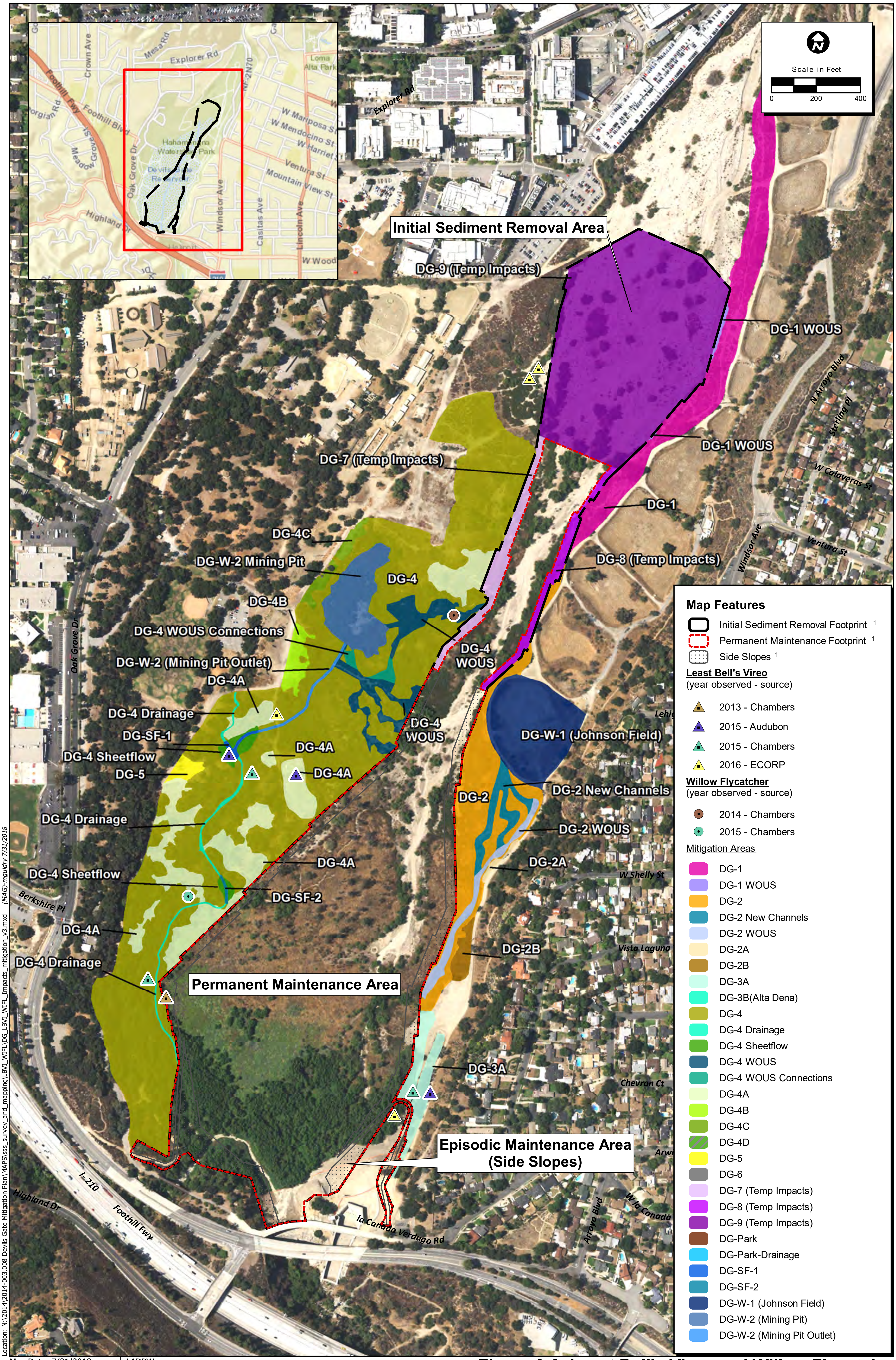
Table 3-3 Acres of WOUS Buffer Habitats

Buffer Type	Re-establishment	Rehabilitation	Enhancement	Buffer	Total
Riparian Buffer Areas	0.00	5.72	32.23	2.62	40.57
Upland Buffer Areas	0.00	0.00	4.88	0.00	4.88
Side Slope Buffers	0.00	7.34	0.00	0.00	7.34
Total Buffer Areas	0.00	13.06	37.11	2.62	52.79
Temporary Impact Areas	16.17	0.00	0.00	0.00	16.17
Total Buffer - Temporary Impact Areas	16.17	13.06	37.11	2.62	68.96

The potential non-wetland WOUS designation on the Figure 3-2 shows the area within the reservoir where annual sediment removal activities will be conducted. The stream flows are expected to migrate and change course within this annual sediment removal area based on the frequency and volume of flows in the arroyo. As a result, non-wetland WOUS may form anywhere within the annual sediment removal area and may change location during the rainy season. The locations of wetland and non-wetland WOUS within the side slopes are also shown with a hatch pattern on Figure 3-2. The USACE considered the side slopes as a permanent impact area. The flows paths from wetlands and non-wetland WOUS located outside of the side slopes will continue in their current or similar locations after the side slopes are formed. The potential non-wetland WOUS within the annual sediment removal area and the WOUS that develop on the side slopes will not be managed or maintained by the Land Manager.

3.3 Endangered and Threatened Species

Past biological surveys have documented the presence of migratory least Bell's vireo and willow flycatcher within the reservoir and the mitigation site will be managed and maintained to support suitable nesting habitat for these species. No other federally or state-listed species have been documented or are expected to occur in the mitigation areas. Figure 3-3 shows the locations of all listed species observations in the mitigation site prior to the restoration activities.



Location: N:\2014\2014-003.008 Devils Gate Mitigation Plan\MAPS\sss_survey_and_mapping\LBVI_WIFL\DG_LBVI_WIFL_Impacts_mitigation_v3.mxd (MAG)-mguidry 7/31/2018

Map Date: 7/31/2018
Photo Source: NAIP 2014

[1] LADPW
[2] Chambers Group

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Figure 3-3. Least Bell's Vireo and Willow Flycatcher Observations and Mitigation Areas

2014-003.008 Devils Gate Mitigation Plan

3.4 Rare Species and Species of Special Concern

Rare plant surveys were initially conducted on the Project site for eight special-status plant species that have potential to occur due to presence of suitable habitat: Nevin's barberry (*Berberis nevinii*), Plummer's mariposa lily (*Calochortus plummerae*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), slender-horned spineflower (*Dodecahema leptoceras*), mesa horkelia (*Horkelia cuneata* ssp. *puberula*), white-rabbit tobacco (*Pseudognaphalium leucocephalum*), Parish's gooseberry (*Ribes divaricatum* var. *parishii*), and Graeta's aster (*Symphyotrichum greatae*). None of these species were observed during the focused surveys (Chambers Group 2014a).

Additional wildlife species that are not state- and/or federally listed but have a special-status designation with CDFW have been documented on the Project site include burrowing owl, yellow warbler, two-striped garter snake, and coast patch-nosed snake. Other species of concern that were determined to have a moderate to high potential to occur within the Project site included coast range newt and southwestern pond turtle (Chambers Group 2014a).

4.0 MANAGEMENT AND MONITORING

The goal of this plan is to describe the measures that will be implemented by LACFCD to manage and maintain the on-site mitigation areas in perpetuity and in conjunction with the operation of the flood control facility at Devil's Gate Reservoir. Routine monitoring and maintenance tasks described below are intended to ensure the mitigation areas continue to function as intended, they continue to provide habitat for wildlife, and they continue to be protected for the long-term. Biological inspections will be conducted on an annual basis and the results of the inspections will be documented on a standardized inspection form that will be created by the Land Manager. The biological inspection forms will be included in the annual reports. The following paragraphs describe the types and frequency of monitoring and maintenance activities that will be conducted to determine the stability and ongoing trends of the WOUS, including wetlands, riparian habitats, and the least Bell's vireos and potentially southwestern willow flycatchers that may inhabit the mitigation areas.

4.1 Biological Resources

The components of the Plan to manage and monitor biological resources are designed to reduce the impacts of human presence on the mitigation areas, to ensure the mitigation areas continue to function as intended, and to protect the wildlife that reside in the habitats within the mitigation areas. Biological resources within the mitigation site will be surveyed quantitatively and qualitatively to monitor the habitat function and value at each area. The results of these surveys will be compared to the performance standards achieved at the time permitting agencies deemed that habitat mitigation is complete. The Year-5 Performance Standards for the mitigation areas are summarized in 4.1. These performance standards will be the target standards to maintain during the long-term management period.

Table 4-1 contains a generalized description of each category that will be assessed during the quantitative and qualitative surveys.

Table 4-1 Performance Standards Categories

Category	Performance Standard	Description
Physical-1	Structural Patch Richness	The number of structural patch types present within the mitigation site at the time habitat mitigation completion is accepted.
Physical-2	Sediment/Topographic Stability	Formation of substantial rills and gullies is minimized and normal sheet flow during inclement weather does not cause substantial sediment transport to lower elevations.
Fauna-1	Wildlife Use Monitoring	Maintain equivalent number of riparian and aquatic species present at the time habitat mitigation completion is accepted.
Flora-2	Native Plant Cover	Total cover of native species (tree, shrub, and herb strata). Least Bell's Vireo Habitat – 100% of reference site Other riparian habitats – percent cover at the time habitat mitigation completion is accepted Upland habitats and RAFSS – 90% of reference site at 10 Years Oak Woodland – 70% of reference site at 10 Years
Flora-3	Nonnative Plant Cover	Total cover of nonnative species (tree, shrub, and herb strata). 10% annual herbaceous species/grasses; 5% woody species/perennial herbs; 0% Cal-IPC Moderate or High Threat invasive species
Flora-4	Native Plant Species Richness	Equivalent native species richness (tree, shrub, and herb strata) as at the time habitat mitigation completion is accepted.

4.1.1 Wetland Waters of the U.S. Mitigation Areas (WWUS)

Objective WWUS-1: Ensure that the functions and values attributable to the mitigation areas containing wetland waters of the United States remain at the levels identified in the HMMP performance standards and meet Category Physical-2 and Fauna-1.

Task Mitigation Area (MA)-1: Biological Inspections. A general and biological inspection will be conducted annually by the Monitoring Biologist to assess the integrity of all mitigation areas and to ensure that the areas are maintained in perpetuity. The purpose of these inspections will be to qualitatively monitor specific aspects of the habitats in the mitigation areas, such as general habitat condition, erosion, hydrology, survivorship of container plantings, and newly introduced exotic species or populations of exotic species that are being monitored.

During the inspections, the monitoring biologist will survey the perimeter of the mitigation areas and walk meandering transects throughout the mitigation areas. Observations of plant and wildlife species during field visits will be recorded to ensure that the habitats within the mitigation areas continue to support a diverse, native flora and fauna. The presence of areas where new or more extensive populations of nonnative plant species are located will be assessed and appropriate corrective actions will be recommended, as needed. A map of nonnative plant populations will be developed during the first inspection and will be assessed and updated after each inspection. Issues observed during inspections will be documented, evaluated, and mapped.

If it is determined during the inspection that unusual drainage patterns are causing erosion or sedimentation levels that greatly exceed normal processes, then standard erosion control measures (such as the installation of wattles) may be installed/implemented. If significant erosion/sedimentation problems occur that threaten the integrity of the mitigation areas or the existing habitat for listed species, then LACFCD would be consulted, an appropriate course of action would be determined, and adaptive management measures would be developed.

The mitigation areas will also be examined and qualitatively evaluated for wildlife use. A list of species observed will be recorded during each field visit (including inspections, annual quantitative surveys, maintenance visits, focused wildlife surveys, and incidental field visits). Species lists will be compared to previous lists to evaluate trends and determine if changes in wildlife use in the mitigation areas is occurring.

The inspections will generally be timed to occur after the storm season each year. Annual inspections will be conducted for three years and at the end of the third year, the frequency of annual inspections will be evaluated based on the condition of the mitigation areas. LACFCD will work with the regulatory agencies to reevaluate the frequency of surveys and will provide the regulatory agencies the recommended changes to survey frequency based on site conditions. If problems are consistently identified during the inspections, a plan will be developed to more closely monitor and track these problems and to ensure that remedial actions are effective, which may include more frequent inspections.

Objective WWUS-2: Ensure that target wetland habitats continue to persist, thrive, and meet Categories Physical-1, Flora-1, Flora-2, and Flora-4 of the HMMP performance standards.

Task MA-2: Qualitative and Quantitative Monitoring. A qualitative and quantitative evaluation of all mitigation areas will be conducted to examine structural patch richness, native plant cover, native species richness, and nonnative plant cover. Quantitative monitoring events will assist with determining if mitigation areas continue to meet the performance standards. Quantitative monitoring will be conducted during the first year of the implementation of this Plan, and every third year thereafter. Frequency of the quantitative monitoring events will be reevaluated after year 6. LACFCD will work with the regulatory agencies to reevaluate the frequency of monitoring and will provide the regulatory agencies the recommended changes to monitoring frequency based on site conditions. Data collected during quantitative monitoring events will include structural patch richness, native plant cover (tree, shrub and herb strata), nonnative plant cover (tree, shrub and herb strata), and native plant species richness. If any oak trees (*Quercus* sp.) are installed during the 5-year monitoring period, then the survivorship and cover of these trees will also be monitored under this task.

Native and nonnative plant cover determinations will be ascertained using the point-line intercept method collected along established transect lines (California Native Plant Society (CNPS) 2007). Photos will also be taken at established photo points at each transect location whenever data is collected and a photo documentation record will be maintained. A comparative, qualitative analysis will be conducted of successive photos to determine changes in vegetation. Quantitative monitoring will occur concurrently at established reference sites to compare the reference site conditions with the conditions at the wetlands mitigation areas. If new methods for conducting quantitative habitat assessments are developed by CNPS or another industry-recognized native plant organization, then this methodology would be modified accordingly.

A qualitative assessment of nonnative invasive and weed species will be performed. Following each biological inspection, the nonnative plant compendium documented during the biological inspection will be compared to the lists of invasive and exotic plants maintained on the California Invasive Plant Council (Cal-IPC) website. Nonnative invasive plants and weed species will be targeted specifically and according to the most appropriate eradication/control methods. Management and control methods will change as necessary to increase the success of each of the maintenance efforts. Due to the high prevalence of perennial pepper weed, poison hemlock, mustards, and wild radish in the mitigation areas prior to the restoration of those areas, these species will be specifically targeted and controlled by mechanical removal (using weed whips or manual removal by hand) and herbicide application. Efforts will be focused on controlling these species prior to the flowering stage to prevent the spread of these populations into other areas on-site; however, all growth stages of these species will be treated when encountered during the maintenance visits.

Data from two local groundwater monitoring wells at locations north (Jet Propulsion Laboratory monitoring wells) and east (City monitoring wells) of the mitigation areas as well as data collected by LACFCD regarding the flow of water entering Devil's Gate Reservoir, the elevation levels where water is held behind the dam, and the duration of inundation at various elevation levels will be monitored each year by LACFCD. During the annual quantitative monitoring, a qualified biologist will dig representative soil pits to test for hydric soils where wetland conditions are targeted as part of the restoration. The quantitative evaluation will serve to assess habitat function to ensure that the habitats within the mitigation areas continue to support a diverse, native flora and fauna.

Task MA-3: CRAM Assessments. During the first year of the implementation of this Plan, and every third year thereafter, a certified CRAM practitioner will conduct assessments in appropriate locations in the wetland WOUS mitigation areas. Frequency of the CRAM assessments will be reevaluated after year 6 based on the condition of the wetland WOUS in the mitigation areas. LACFCD will work with the regulatory agencies to reevaluate the assessment frequency and will provide the regulatory agencies the recommended changes to assessment frequency based on site conditions. Assessment Areas (AA) will be established during the first year of implementation and will be revisited when CRAM assessments are conducted. CRAM assessments will be conducted during the same timeframe each year that they are conducted. CRAM scores obtained during these monitoring events will be compared to baseline CRAM scores taken in 2015 and used to track habitat establishment and function. Individual CRAM metrics such as Structural Patch Richness can also be used separate from the overall score to track the progress of specific area ecological functions. CRAM monitoring will be conducted at wetland and non-wetland WOUS mitigation areas to compare the mitigation areas to the baseline CRAM values and to ensure the mitigation areas continue to meet the projected CRAM values for the post-Project condition.

Task MA-4: Jurisdictional Delineation. In order to evaluate the presence and acreage of wetland and non-wetland features in the mitigation areas, a jurisdictional delineation will be performed the first year of Plan implementation and every 10 years after that. After year 10, LACFCD will work with the regulatory agencies to reevaluate the frequency of delineations and will provide the regulatory agencies the recommended changes to delineation frequency based on site conditions. The results of the jurisdictional delineation will be compared to the as-built conditions after the implementation was completed to identify changes and determine whether additional maintenance or remedial actions are necessary to ensure the acreage of wetland and non-wetland features are consistent with the requirements that were identified in the HMMP. If the delineation shows a loss of wetland or non-wetland features, the causes for the losses will be identified and a plan will be developed to address the loss. If it is possible to conduct adaptive management to restore the acreages of wetlands and non-wetlands to the as-built conditions, then the adaptive management measures will be proposed to the resources agencies for review and approval. The plan will be implemented immediately after resources agency approvals. If conditions in the reservoir or the adjacent watersheds have changed, and it isn't possible to restore wetlands and non-wetland waters in their original or similar locations, or if the required amount of acreage cannot be restored, then coordination with the resources agencies will be conducted to determine if an offsite location is needed to offset the impacts of the original Project.

Objective WWUS-3: *Ensure that nonnative plant cover in wetland habitats remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5: Maintenance Efforts. Maintenance efforts will be conducted at all mitigation areas annually to address nonnative plant issues, perform necessary maintenance, remove trash, and address other issues that have been documented during the monitoring inspections. Maintenance efforts will be scheduled to occur after the inspection site visits (MA-1) and will be performed at each of the mitigation areas, the episodic maintenance areas, and the permanent maintenance areas; however, activities conducted within each of these areas may vary based on the results of the monitoring inspections. The frequency of maintenance efforts will be tied to the frequency of the inspection site visits (MA-1). Nonnative plant removal methods will include manual (by hand), mechanical (using gas- or electric-powered hand-held tools), or herbicide application (agency-approved herbicides). When possible, maintenance activities will be conducted outside the nesting bird season to minimize potential disturbances to nesting birds. If maintenance activities are planned for the nesting bird season, or if a sensitive biological resource is identified in or within a 300-foot buffer of the work areas, then a pre-activity survey will be conducted by a qualified biological monitor. The biological monitor will remain on site during the maintenance activities to ensure no impacts occur to active nests or sensitive biological resources within or adjacent to the work areas. If nesting birds are found, then the biological monitor will establish a suitable buffer around the nest based on the species, response to disturbance and commonly used buffer size. Maintenance activities will not be conducted within the buffer until the birds have fledged from the nest or the nest has failed. The biological monitor will give a brief training to the maintenance crews regarding nesting birds and sensitive biological resources prior to the start of each maintenance effort.

4.1.2 Non-Wetland Waters of the U.S. Mitigation Areas (NWWUS)

Objective NWWUS-1: Ensure that the functions and values attributable to the mitigation areas containing non-wetland waters of the United States remain at the levels identified in the HMMP performance standards and meet Category Physical-2 and Fauna-1.

Task MA-1 will meet this objective.

Objective NWWUS-2: *Ensure that target non-wetland waters habitats continue to persist, thrive, and meet Categories Physical-1, Flora-1, Flora-2, and Flora-4 of the HMMP performance standards.*

Tasks MA-2, MA-3, and MA-4 will meet this objective.

Objective NWWUS-3: *Ensure that nonnative plant cover in non-wetland waters of the U.S. habitats remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5 will meet this objective.

4.1.3 Riparian Buffer Mitigation Areas (RIP)

Objective RIP-1: *Ensure that target riparian buffer habitats continue to persist, thrive, and meet Categories Physical-1, Physical-2, Flora-1, Flora-2, and Flora-4 of the HMMP performance standards.*

Tasks MA-1, MA-2, and MA-3 will meet this objective.

Objective RIP-2: *Ensure that the structural patch richness of the riparian buffer habitats is such that the habitats will continue to provide suitable habitat for the least Bell's vireo and meet Categories Physical-1 and Fauna-1 of the HMMP performance standards.*

Task MA-6: Habitat Suitability Assessment. Data collected during the quantitative monitoring in Task MA-2 will be examined and the percent native cover and structural diversity results will be evaluated to ensure that habitat suitability for least Bell's vireo is maintained. These results will be compared to literature for the species and values for these habitat criteria in habitats known to be occupied by least Bell's vireo in southern California.

Objective RIP-3: *Ensure that nonnative plant cover in riparian buffer habitats remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5 will meet this objective.

Objective RIP-4: *Ensure that the riparian buffer habitats continue to support wildlife diversity in accordance with the Fauna-1 Category of the HMMP performance standards.*

Task MA-1 will meet this objective.

4.1.4 Alluvial Scrub and Upland Buffer Mitigation Areas (UPL)

Objective UPL-1: *Ensure that target alluvial scrub and upland buffer habitats continue to persist, thrive, and meet Categories Physical-1, Physical-2, Flora-1, Flora-2, and Flora-4 of the HMMP performance standards.*

Tasks MA-1 and MA-2 will meet this objective.

Objective UPL-2: *Ensure that nonnative plant cover in alluvial scrub and upland buffer habitats remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5 will meet this objective.

Objective UPL-3: *Ensure that the alluvial scrub and upland buffer habitats continue to support wildlife diversity in accordance with the Fauna-1 Category of the HMMP performance standards.*

Task MA-1 will meet this objective.

4.1.5 Episodic Maintenance Areas (EMA)

Objective EMA-1: *Ensure that nonnative plant cover in episodic maintenance areas remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5 will meet this objective.

4.1.6 Permanent Maintenance Areas (PMA)

Objective PMA-1: *Ensure that nonnative plant cover in permanent maintenance areas remains below the threshold outlined in Category Flora-3 of the HMMP performance standards.*

Task MA-5 will meet this objective.

4.1.7 Threatened Endangered Wildlife Species Monitoring (TEW)

Objective TEW-1: *Monitor the presence of least Bell's vireo to ensure that the mitigation areas continue to provide suitable habitat for these species and other sensitive wildlife species in accordance with Fauna-1 of the HMMP performance standards.*

Task TEW-1: Focused Riparian Bird Surveys. Habitat for least Bell's vireo and will be assessed for suitability under Task MA-6. Focused surveys for least Bell's vireo and will be performed by biologists experienced with the identification, calls, and behavior of these species and, for, a biologist in possession of the appropriate permit to conduct surveys for the species. Surveys will be conducted during the first year of Plan implementation and then every third year thereafter. In year 6 the frequency of surveys will be reevaluated. LACFCD will work with the regulatory agencies to reevaluate the frequency of surveys and will provide the regulatory agencies the recommended changes to survey frequency based on site conditions. The surveys will document suitable habitat within and adjacent to the mitigation areas, as well as use of the mitigation areas by vireos. Results of the surveys will be compared to the results of focused surveys previously conducted at the mitigation areas to determine whether these species are a) using the restored habitat within the mitigation areas, b) occupying new habitat, and c) nesting on site. Surveys will be conducted according to the most recent, industry-accepted survey protocols.

Task TEW-2: Brown-Headed Cowbird Trapping. If adaptive management is implemented and/or mitigation activities are re-initiated in order to get a mitigation area back up to success standards following an adverse change in condition, then brown-headed cowbird trapping may be implemented during the long-term management of the mitigation site. If trapping is conducted as part of the long-term management of the mitigation site, then brown-headed cowbird trapping will be conducted by biologists experienced with trapping protocol and avian identification according to the Brown-Headed Cowbird Trapping Protocol (Griffith Wildlife Biology 1994) or the most updated, standard protocol available and accepted by the regulatory agencies.

Objective TEW-2: *Manage the riparian habitat such that it continues to provide the necessary structural and species diversity to support least Bell's vireo as outlined in Physical-1 and Flora-4 of the HMMP performance standards.*

Tasks MA-1, MA-2, and MA-5 will meet this objective. Maturation of the riparian vegetation to a community dominated by large overstory trees without a dense understory of mulefat and willows is not considered suitable for supporting least Bell's vireos, which is a species targeted in the management of the mitigation areas. If any of the mitigation areas are found to be maturing into old growth riparian vegetation without a dense understory of native vegetation, then remediation actions such as vegetation trimming may be implemented to increase the amount of sunlight and space between plants, encouraging new recruits to re-establish the vegetative understory.

Objective TEW-3: *Monitor the presence of slender-horned spineflower if the species was found to be present prior to implementation of the mitigation project.*

Task TEW-3: Focused Slender-Horned Spineflower Surveys. Presence-absence surveys for the slender-horned spineflower will be conducted prior to the mitigation implementation phase in mitigation areas DG-7, DG-8, and DG-9. If this species was found during focused surveys prior to mitigation implementation, then focused surveys would continue during the long-term management of the mitigation site. Focused surveys for slender-horned spineflower will be performed by botanists/biologists experienced with the identification and ecology of the species during the appropriate blooming period (April through June). Surveys will be conducted during the first year of Plan implementation and then every third year thereafter. In year 6 the frequency of surveys will be reevaluated. LACFCD will work with the regulatory agencies to reevaluate the frequency of surveys and will provide the regulatory agencies the recommended changes to survey frequency based on site conditions. The surveys will document presence of individuals and suitable habitat within and adjacent to the mitigation areas. A known reference population of slender-horned spineflower will be visited by the surveyors prior to conducting the surveys in the Project area to determine the blooming status of the species. Surveys will be conducted according to the most recent, industry-accepted survey protocols.

4.1.8 Nonnative Invasive Species (NNI)

Objective NNI-1: *Monitor and maintain control over nonnative invasive species, including but not limited to perennial pepper weed and poison hemlock, that diminish the quality of the mitigation areas in accordance with Flora-3 of the HMMP performance standards. The land manager will reference the plants ranked as High or Moderate by the California Invasive Plant Council (Cal-IPC) for guidance on what species may threaten the area and on the specific management of those species.*

Tasks MA-1, MA-2, and MA-5 will meet this objective.

4.1.9 Vegetation Management (VM)

Adaptive management measures and monitoring are included to ensure the mitigation areas continue to function as planned for the long-term. If a condition arises that is not specifically addressed by this plan (i.e., an adaptive management trigger), then adaptive management methods will be developed and implemented to address the condition. Adaptive management triggers may adjust the management and monitoring needs depending on the threats and stressors identified at the mitigation areas. The triggers may also suggest the need to perform additional studies to further identify and describe the threats or stressors in order to develop the appropriate remediation. Adaptive management will not take place where declines in habitat within both the mitigation areas and reference sites occur due to natural conditions. Adaptive management triggers may include, but are not limited to:

- Unexplained steady decrease of target wildlife species populations in the mitigation areas
- Prolonged inundation due to repeated or large storm events
- Extended periods of drought
- Natural disaster (fire, flood, earthquake, emergency personnel access)
- Unexplained steady increase of nonnative plant cover

Objective VM-1: *Identify trends and triggers for adaptive management to maintain the biological integrity of the mitigation areas. Implement adaptive management methods as necessary to address changes in mitigation area conditions. Protect vegetation and nesting birds if easement holders need to conduct tree-trimming activities within their easements.*

Document conditions observed at the mitigation areas, new or existing, during the biological inspections discussed in MA-1. The results of the most recent biological inspection will be compared to previous biological inspection results to determine whether concerning patterns or deleterious changes are occurring to the mitigation areas. If certain conditions are found to be threatening the function or quality of the mitigation areas, then LACFCD, in conjunction with the Monitoring Biologist, will determine a course of action to address the condition changes. If necessary, LACFCD will consult with USACE on any proposed deviations from this plan.

Task VM-1: Assess Effectiveness of Monitoring. LACFCD will review the vegetation management and monitoring methods and techniques outlined in this plan after each quantitative monitoring effort to ensure continued effectiveness at maintaining the quality and function of the vegetation at the mitigation areas.

Task VM-2: Prolonged Inundation. Prolonged inundation due to heavy and/or repeated storm events can pose a risk to many of the mitigation areas because it could potentially cause vegetation die-off that is unrelated to the monitoring and management activities. If any of the mitigation areas are experiencing prolonged inundation above 1,020 feet elevation for a period of 15 days or more and there is an observable plant die-off, then the damage would be assessed and a plan would be developed to restore the area. The plan would then be implemented and monitoring and maintenance of the areas would be performed to ensure the success and survival of the habitat.

Task VM-3: Prolonged Drought. Due to the arid climate of southern California, prolonged drought conditions at the mitigation areas may also occur, which could also result in plant die-off that is unrelated to the monitoring and management activities. If prolonged drought conditions are causing plant die-off at any of the mitigation areas, then the damage would be assessed and a plan would be developed to restore the area. The plan would then be implemented and monitoring and maintenance of the areas would be performed to ensure the success and survival of the habitat.

Task VM-4: Damage from Natural Events. In the event that an unforeseen natural event causes damage to all or some of the mitigation areas, such as catastrophic flooding or fire, then a damage assessment will be performed to document the nature and extent of the damage to the mitigation areas. The need for adaptive management will also be assessed to facilitate the recovery of the mitigation areas. A plan to address the damage would be developed and implemented. Monitoring and management of the areas would be performed to ensure the success and survival of the habitat.

Task VM-5: As-Needed Vegetation Maintenance. Prior to the initiation of annual sediment management activities, which will occur outside of the nesting bird season, the vegetation along the access roads will be assessed for maintenance needs, such as trimming. If trimming or other maintenance needs associated with the access roads are found to be necessary, then a plan will be developed and implemented to address the maintenance needs.

Task VM-6: Tree-Trimming within Easements. Prior to the initiation of tree-trimming by easement holders, the LACFCD will coordinate with the easement holders about the timing and extent of tree-trimming that may be required. If tree-trimming is necessary during the nesting season, then LACFCD will implement the pre-construction surveys, focused surveys for least Bell's vireos and other nesting birds and monitoring during the tree-trimming to ensure the activities do not impact least Bell's vireos or nesting birds. In addition, the LACFCD will monitor the tree-trimming activities to ensure the habitats in the mitigation site are not unnecessarily damaged.

4.2 Security, Safety, and Public Access

4.2.1 Trash and Trespass

Objective TT-1: *Monitor sources and prevalence of trash, trespass, and vandalism in the mitigation areas.*

Task TT-1: Document Trash and Trespass Issues. Evidence of trash, trespass, and vandalism at the mitigation areas will be documented during each field visit (including inspections, annual quantitative surveys, maintenance visits, focused wildlife surveys, and incidental field visits). Locations of documented issues, including unauthorized trail creation, will be recorded. The type of trash/vandalism, location of issue, and recommended actions will be determined by the biologist during the field visit.

Objective TT-2: *Rectify trespass impacts and collect and remove trash from mitigation areas.*

Task TT-2: Trash Clean-Up. Trash will be cleaned up and removed from the mitigation areas during the regular maintenance visits. If necessary, a plan for addressing trespassing impacts (such as vegetation cutting/trimming, graffiti, or unauthorized trail use) to the mitigation areas will be prepared and implemented in order to rectify impacts observed from trespassing.

Task TT-3: Unauthorized Trail Closure. Unauthorized trails will be closed. In order to close trails, a combination of methods may be used, such as signage, fencing (such as post and cable), placement of large rocks and other natural barriers, planting of selective plants at trail closure points (cactus, poison oak, wild rose, stinging nettle, and other barrier plants), using plant debris/vertical mulch to block trails, and public education. Trails that have been closed will be monitored during subsequent biological inspections to ensure they are not continuing to be used by recreational users.

Objective TT-3: *Monitor and maintain the trash entrapment device at the West Altadena Stormdrain.*

Task TT-4: Monitor Trash Entrapment Device. The trash entrapment device that was installed at the West Altadena Stormdrain during mitigation area implementation will be monitored during the biological inspections and following storm events by the LACFCD. Blockages, excessive amounts of trash, and other maintenance issues pertaining to the entrapment device will be documented.

Task TT-5: Maintenance of Trash Entrapment Device. Trash will be removed as necessary from the trash entrapment device at the West Altadena Stormdrain as part of LACFCD's ongoing maintenance program.

4.2.2 Vector Control (VC)

Objective VC-1: *Monitor and assist in addressing vector control issues at mitigation areas.*

Task VC-1: Vector Control. LACFCD will work with the City and San Gabriel Valley Mosquito and Vector Control District (Vector Control) to develop and implement a vector control program on-site. Standing water is not a goal of the restoration activities in the mitigation areas. However, there is a potential that low spots may naturally develop and temporarily hold water in some of the mitigation areas. LACFCD has an on-going contract with Vector Control to treat their facilities to control the mosquitos and to minimize the spread of disease via mosquitos and other vectors. Vector Control will utilize control methods that are safe in areas where sensitive or listed species of aquatic and terrestrial wildlife occur to avoid harming those species, including the least Bell's vireo. Vector Control will not be allowed to cut any vegetation to gain access to areas that need treatment. The LACFCD will ensure that low areas that temporarily hold water are accessible to Vector Control so they can treat the areas for mosquitos and other vectors without the need to cut vegetation and to avoid harming sensitive wildlife. LACFCD will coordinate with Vector Control to determine a schedule for when they would plan to do treatments in the mitigation site. If treatments area scheduled to occur during the breeding season, then Vector Control will be required to contact the County (or Land Manager) prior to entering the mitigation site. The LACFCD (or Land Manager) will request a map of the locations where Vector Control is planning to conduct treatments to determine if the areas are located near active nests or if the Vector

Control staff will need to traverse areas where active nests are located. If so, the LACFCD will arrange to have a Qualified Biological Monitor, who is familiar with the active nesting locations, accompany the Vector Control staff to and from the areas where the treatments will be conducted.

4.2.3 Fire Hazard Reduction

The mitigation areas will not be actively managed for fire (e.g., mowing fire breaks or constructing permanent access for emergency personnel) due to the sensitive nature of the plant and wildlife species; however, the mitigation areas will be made available to fire and emergency personnel in the event of a fire or other emergency situation.

4.3 Infrastructure and Facilities

4.3.1 Fences and Gates

The installation of fences or gates is not included in the HMMP; therefore, there will be no need to monitor any such structures. If installation of fencing or gates is deemed necessary in the future, then a plan will be developed and implemented for monitoring and maintaining fence and gate structures.

4.3.2 Signs (S)

Objective S-1: *Monitor and maintain the condition of signs installed for mitigation area security purposes (i.e., to prevent trespass and vandalism of the mitigation areas).*

Task S-1: Monitor Sign Conditions. The condition of the signs installed for mitigation area security purposes will be documented during all site visits.

Task S-2: Sign Maintenance. Necessary maintenance for the signs will be performed during the regular maintenance visits.

4.4 Public Outreach and Education (OER)

Objective OER-1: *Continue public outreach and education efforts regarding the mitigation areas and sensitive biological resources.*

Task OER-1: Community Meetings, Presentations, and Newsletters. Periodic presentations and/or community meetings will be held for regulatory agencies, City personnel, advisory groups, and the general community members to update them on the monitoring and maintenance activities being conducted at the mitigation areas. Adaptive management measures, if any were taken, will be discussed, in addition to ongoing issues that are consistently observed. LACFCD will also prepare an annual newsletter that will be circulated to agencies, City personnel, advisory groups, and interested members of the public to update them on the monitoring and maintenance activities being conducted at the mitigation areas.

Task OER-2: Educational Opportunities. LACFCD will engage local school groups, including participants from the Tom Sawyer Camp, regarding volunteer and educational opportunities. Some volunteer and educational opportunities may include participating in restoration activities, wildlife inventories, nature walks, or trails cleanup efforts.

4.5 Reporting and Administration

4.5.1 Annual Report (AR)

Objective AR-1: *Provide an annual report summarizing all tasks conducted and the area conditions observed during each field visit.*

Task AR-1: Annual Report. An annual report summarizing the status of the mitigation areas, results of the inspections, quantitative monitoring visits, focused surveys, and all major actions taken since the last assessment shall be prepared and provided to LACFCD and the USACE no later than February 15 of the following year. The report shall be concise and focus on methods, results of the annual quantitative and qualitative surveys, discussion of correlations and management triggers, changes in monitoring and management methods, and recommendations for adaptive management measures. The biological inspection forms shall be included in the annual report. This annual report shall include a discussion of the following:

1. Summary of management and monitoring tasks and issues addressed during the previous year;
2. Overall health of the mitigation areas, including changes to the health or distribution of sensitive species, hydrological changes, damage resulting from natural or anthropogenic causes, problems with invasive species, trespass, dumping, etc.
3. Results of qualitative and quantitative monitoring and CRAM assessments, and comparison to previous monitoring results;
4. Problems encountered, and recommendations for management and monitoring identified for the upcoming year;
5. Management triggers and adaptive management tasks identified.

Table 4-2 below contains a summary of the activities that will be performed at the mitigation areas, responsible parties, and the general timeframe of each visit to monitor the conditions at the mitigation areas and the reference sites.

Table 4-2 Summary of Activities, Tasks, Timing, and Responsibilities

Task	Objectives Fulfilled	Timing	Responsibility
MA-1: Biological Inspections	WWUS-1 NWWUS-1 RIP-1 RIP-4 UPL-1 UPL-3 TEW-2 NN-1 VM-1	Annually for first three years, frequency will be reevaluated thereafter	Monitoring Biologist
MA-2: Qualitative and Quantitative Monitoring	WWUS-2 NWWUS-2 RIP-1	Every third year, frequency will be reevaluated after year 6	Monitoring Biologist

Table 4-2 Summary of Activities, Tasks, Timing, and Responsibilities

Task	Objectives Fulfilled	Timing	Responsibility
	UPL-1 TEW-2 NN-1		
MA-3: CRAM Assessments	WWUS-2 NWWUS-2 RIP-1	Every third year, frequency will be reevaluated after year 6	Monitoring Biologist
MA-4: Jurisdictional Delineation	WWUS-2 NWWUS-2	Every 10 years, frequency will be reevaluated after year 10	Monitoring Biologist
MA-5: Maintenance Efforts	WWUS-3 NWWUS-3 RIP-3 UPL-2 EMA-1 PMA-1 TEW-2 NN-1	Annually, frequency will be tied to MA-1	Landscaper, LACFCD, Monitoring Biologist
MA-6: Habitat Suitability Assessment	RIP-2 TEW-1	After each quantitative monitoring effort	Monitoring Biologist
TEW-1: Focused Riparian Bird Surveys	TEW-1	Every third year, frequency will be reevaluated after year 6	Monitoring Biologist
TEW-2: Brown-Headed Cowbird Trapping	TEW-1	As-needed	Monitoring Biologist
TEW-3: Focused Slender-Horned Spineflower Surveys	TEW-3	Every third year if the species was detected prior to mitigation implementation, frequency will be reevaluated after year 6	Monitoring Biologist
VM-1: Assess Effectiveness of Monitoring.	VM-1	After each quantitative monitoring effort	Monitoring Biologist, LACFCD
VM-2: Prolonged Inundation	VM-1	After periods of prolonged inundation	Monitoring Biologist, LACFCD
VM-3: Prolonged Drought	VM-1	After periods of prolonged drought	Monitoring Biologist, LACFCD
VM-4: Damage from Natural Events	VM-1	After unforeseen natural event	Monitoring Biologist, LACFCD
VM-5: As-Needed Vegetation Maintenance	VM-1	As-needed	Monitoring Biologist, Landscaper, LACFCD
VM-6: Tree-Trimming within Easements	VM-1	As-needed	Monitoring Biologist, LACFCD
TT-1: Document Trash and Trespass Issues.	TT-1	Conducted during inspections, site visits, and surveys	Monitoring Biologist
TT-2: Trash Clean-Up	TT-2	During regular maintenance visits	LACFCD

Table 4-2 Summary of Activities, Tasks, Timing, and Responsibilities

Task	Objectives Fulfilled	Timing	Responsibility
TT-3: Unauthorized Trail Closure	TT-2	As-needed	LACFCD
TT-4: Monitor Trash Entrapment Device	TT-3	Conducted during inspections and after storm events	Monitoring Biologist, LACFCD
TT-5: Maintenance of Trash Entrapment Device	TT-3	As-needed during regular maintenance visits	LACFCD
VC-1 Vector Control	VC-1	As-needed	LACFCD
S-1: Monitor Sign Conditions	S-1	Conducted during inspections, site visits, and surveys	Monitoring Biologist, LACFCD
S-2: Sign Maintenance	S-1	As-needed during regular maintenance visits	LACFCD
OER-1: Community Meetings, Presentations, and Newsletters	OER-1	As-needed	LACFCD
OER-2: Educational Opportunities	OER-1	As-needed	LACFCD
AR-1: Annual Report	AR-1	Annually, due February 15 of the following year.	LACFCD, Monitoring Biologist

5.0 TRANSFER, REPLACEMENT, AMENDMENTS, AND NOTICES

5.1 Transfer

Any subsequent transfer of responsibilities under this long-term management plan to a different land manager, such as a different public agency or non-governmental organization, shall be requested by the LACFCD or subsequent land manager in writing to the USACE. The transfer shall require written approval by the USACE and shall be incorporated into this long-term management plan by amendment. The subsequent land manager shall assume the responsibilities described in this long-term management plan, unless otherwise amended in writing by the USACE.

5.2 Replacement

If LACFCD or a subsequent land manager fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by the USACE, LACFCD or the land manager shall have 90 days to cure such failure. If failure is not cured within 90 days, LACFCD or the land manager may request a meeting with the USACE to resolve the failure. Such a meeting shall occur within 30 days or a longer period if approved by the USACE. Based on the outcome of the meeting, or if no meeting is requested, the USACE may designate a replacement land manager in writing by amendment of this long-term management plan. If LACFCD or the land manager fails to designate a replacement land manager, then such public or private land or resource management organization acceptable to and as directed by the USACE may enter the Project site in order to fulfill the purposes of this long-term management plan.

If LACFCD or the City proposes any change in the management activity or uses of the mitigation areas that results in an incompatible use with the mitigation areas, then LACFCD and the City will need to develop a plan to provide alternative compensatory mitigation that is acceptable to USACE.

5.3 Amendments

The LACFCD or subsequent land manager, property owner, and the USACE may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the habitat and conservation values of the mitigation areas. Any proposed changes to the long-term management plan shall be discussed with the USACE and the LACFCD or land manager. Any proposed changes will be designed with input from all parties. Amendments to the long-term management plan shall be approved by the USACE in writing shall be required management components and shall be implemented by the LACFCD or land manager.

If the CDFW or USFWS determine, in writing, that continued implementation of the long-term management plan would jeopardize the continued existence of a state or federally listed species, any written amendment to this long-term management plan, determined by either the CDFW or USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the LACFCD or land manager.

5.4 Notices

Any notices regarding this long-term management plan shall be directed as follows:

Land Manager

Los Angeles County Flood Control District
900 S. Fremont Avenue
Alhambra, California 91803
Telephone: (626) 458-6100
Fax: (626) 979-5436

Property Owner

City of Pasadena
100 North Garfield Avenue
Pasadena, California 91109
Telephone: (626) 744-4000
Fax: (626) 405-3921

USACE

U.S. Army Corps of Engineers
Los Angeles District, Regulatory Division
915 Wilshire Blvd., Suite 1101
Los Angeles, California 90017
Attn: Chief, Regulatory Branch
Telephone: (213) 452-3372
Fax: (213) 452-4214

If any action is planned to void or modify the long-term management plan or long-term protection, including transfer of title to, or establishment of any other legal claims over, the compensatory mitigation areas, then the District Engineer must be notified 60 days prior to when this action is scheduled to occur.

Should changes in statute, regulation, or agency needs or mission results in an incompatible use on public lands originally set aside for compensatory mitigation, LACFCD is responsible for providing alternative compensatory mitigation that is acceptable to the district engineer for any loss in functions resulting from the incompatible use.

6.0 FUNDING AND TASK PRIORITIZATION

6.1 Funding

As a public agency, LACFCD cannot enter into the typical funding arrangement, such as an endowment fund, that would typically be used to ensure monies are available to implement the measures in this Plan. LACFCD has the ability to budget the necessary funding to conduct the required long-term maintenance and monitoring of the mitigation areas. The budget will be allocated by LACFCD division, and by labor and contract costs for each task.

The annual maintenance and monitoring costs for long-term management will be allocated in the budget annually, using the same budget line item designation for the Devil's Gate Reservoir Habitat Mitigation Project. Any required additional funding will be reallocated during the fiscal year to meet contract costs and future budgeting will include funding to cover increased costs as determined by expenditure reports. This is consistent with how LACFCD budgets annual maintenance costs for their Big Tujunga Wash Mitigation Area and the Santa Anita Oak Woodland Habitat Revegetation/Mitigation Program. LACFCD has demonstrated their commitment to maintaining their mitigation areas, and will continue to monitor, maintain, protect, and preserve all mitigation areas, including the mitigation within Devil's Gate Reservoir.

LACFCD has the financial resources to undertake the mitigation and sustained long-term management of the mitigation areas. The LACFCD's primary sources of funding are the ad valorem property tax for the Flood Control District and the Flood Control Benefit Assessment. LACFCD has an average annual budget of approximately $240 million and a Bond Rating of AAA+. LACFCD has the ability and is committed to making a discrete line item in its annual budgets for the required mitigation and long-term management of the mitigation areas for the Project.

Tables 6-1 through 6-4 summarize the anticipated costs of the implementation of the long-term management of the mitigation areas. These costs include estimates of time and funding needed to conduct the biological inspections, quantitative monitoring, CRAM assessments, focused surveys, basic monitoring site visits and reporting, nonnative plant and weed control, maintenance of the mitigation areas, trail closures, trash removal, and public outreach. In addition, a contingency fund has been included in the cost estimate to address actions that may be required after an unexpected event, such as a natural disaster. At this point, estimating costs for unexpected events or adaptive management activities is not possible because the scope of those tasks is unknown at this point. However, the contingency fund would be utilized in those scenarios.

6.2 Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The LACFCD or land manager and the USACE shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the USACE and as authorized by the USACE in writing.

Table 6-1 Annual Management and Monitoring Activities Costs

Task Name	Description	Responsibility	Frequency	Schedule	Level of Effort	Cost per Unit*	Cost	Annual Cost
MA-1: Biological Inspections	Walk-through general and biological inspection to assess integrity of mitigation areas. Activities include: qualitative monitoring of habitats, erosion, exotic species, inventory of plants and wildlife, and identifying any issues requiring follow-up management.	Monitoring Biologist	Annually for first three years, frequency will be reevaluated thereafter	Following storm season	Biologist: 24 hours GIS: 4 hours	$100/hour $100/hour	$2,400 $400	$2,800
MA-5: Maintenance Efforts	Maintenance efforts to address nonnative plant issues, perform necessary maintenance, remove trash, and address other issues that have been documented during the monitoring inspections.	Monitoring Biologist	Annually	Spring – Schedule may shift as needed.	Biologist: 100 hours	$100/hour	$10,000	$257,950
		Landscaper	Annually	Spring – Schedule may shift as needed.	15 days	$16,530	$247,950	
TT-1: Document Trash and Trespass Issues.	Evidence of trash, trespass, and vandalism at the mitigation areas will be documented during each field visit (including inspections, annual quantitative surveys, maintenance visits, focused wildlife surveys, and incidental field visits).	Monitoring Biologist	Conducted during inspections, site visits, and surveys	N/A	$0	N/A	$0	$0
TT-2: Trash Clean-Up	Trash will be cleaned up and removed from the mitigation areas during the regular maintenance visits.	LACFCD	During regular maintenance visits	N/A	$0	N/A	$0	$0
TT-4: Monitor Trash Entrapment Device	The trash entrapment device that was installed at the West Altadena Stormdrain will be monitored during the biological inspections and following storm events by the LACFCD.	Monitoring Biologist, LACFCD	Conducted during inspections and after storm events	N/A	$0	N/A	$0	$0
TT-5: Maintenance of Trash Entrapment Device	Trash will be removed as necessary from the trash entrapment device at the West Altadena Stormdrain as part of LACFCD's ongoing maintenance program.	LACFCD	As-needed during regular maintenance visits	N/A	$0	N/A	$0	$0
S-1: Monitor Sign Conditions	The condition of the signs installed for mitigation area security purposes will be documented during all site visits.	Monitoring Biologist, LACFCD	Conducted during inspections, site visits, and surveys	N/A	$0	N/A	$0	$0
S-2 Sign Maintenance	Necessary maintenance for the signs will be performed during the regular maintenance visits.	LACFCD	As-needed during regular maintenance visits	N/A	$0	N/A	$0	$0
OER-1: Community Meetings, Presentations, and Newsletters	Periodic presentations and/or community meetings will be held for regulatory agencies, City personnel, advisory groups, and the general community members to update them on the monitoring and maintenance activities being conducted at the mitigation areas. LACFCD will also prepare an annual newsletter to update interested parties on the monitoring and maintenance activities being conducted at the mitigation areas.	LACFCD, Monitoring Biologist	Annually	N/A	Biologist: 60 hours	$100/hour	$6,000	$12,000
					LACFCD: 60 hours	$100/hour	$6,000	
OER-2: Educational Opportunities	LACFCD will engage local school groups, including participants from the Tom Sawyer Camp, regarding volunteer and educational opportunities. Some volunteer and educational opportunities may include participating in restoration activities, wildlife inventories, nature walks, or trails cleanup efforts.	LACFCD	Annually	N/A	Biologist: 20 hours	$100/hour	$2,000	$6,000
					LACFCD: 40 hours	$100/hour	$4,000	
AR-1: Annual Report	Produce an annual report summarizing the status of the mitigation areas, results of the annual surveys, and all major actions taken since the last assessment.	LACFCD, Monitoring Biologist	Annually	Due February 15 of the following year	Biologist: 80 hours GIS: 10 hours	$100/hour $100/hour	$8,000 $1000	$11,000
					LACFCD: 20 hours	$100/hour	$2,000	
Contingency Fund	To address remedial actions that may be required after an unexpected event.	LACFCD	Annually, as needed	N/A	1	N/A	20% of costs	$57,950
							GRAND TOTAL	$347,700

*This is an average assumed rate; costs would likely go up over time based on cost of living increases

Table 6-2 Three-Year Management and Monitoring Activities Costs

Task Name	Description	Responsibility	Frequency	Schedule	Level of Effort	Cost per Unit*	Cost	3-Yr Cost
MA-2: Qualitative and Quantitative Monitoring	Quantitative evaluation of mitigation areas including: photo documentation at photo points, determining native and nonnative plant cover, assessing plant community structure, and testing for hydric soils.	Monitoring Biologist	Every third year, frequency will be reevaluated after year 6	Spring	Biologist: 140 hours GIS: 10 hours	$100/hour $100/hour	$14,000 $1,000	$15,000
MA-3: CRAM Assessments	Conducting CRAM assessments at the wetlands and non-wetlands waters of the U.S. mitigation areas.	Monitoring Biologist	Every third year, frequency will be reevaluated after year 6	Spring	Biologist: 50 hours GIS: 4 hours	$120/hour $100/hour	$6,000 $400	$10,000
MA-6: Habitat Suitability Assessment	Data collected during the quantitative monitoring will be examined evaluated to ensure that habitat suitability for least Bell's vireo in riparian areas is maintained.	Monitoring Biologist	Every third year, after each quantitative monitoring effort, frequency will be reevaluated after year 6	Summer	Biologist: 10 hours	$100/hour	$1,00	$1,000
TEW-1: Focused Riparian Bird Surveys	Perform focused protocol surveys for least Bell's vireo.	Monitoring Biologist	Every third year, frequency will be reevaluated after year 6	Spring and Summer	Biologist: 120 hours GIS: 16 hours	$100/hour $100/hour	$12,000 $1,600	$13,600
TEW-3: Focused Slender-Horned Spineflower Surveys	If this species was found during focused surveys prior to mitigation implementation, then focused surveys would continue during the long-term management of the mitigation site.	Monitoring Biologist	Every third year if the species was detected prior to mitigation implementation, frequency will be reevaluated after year 6	April – June	Biologist: 54 hours GIS: 4 hours	$100/hour $100/hour	$5,400 $400	$5,800
VM-1: Assess Effectiveness of Monitoring.	The vegetation management and monitoring methods and techniques will be reviewed after each quantitative monitoring effort to ensure continued effectiveness at maintaining the quality and function of the vegetation at the mitigation areas.	Monitoring Biologist, LACFCD	Every third year, after each quantitative monitoring effort, frequency will be reevaluated after year 6	Summer-Fall	Biologist: 8 hours	$100/hour	$800	$800
TT-1: Document Trash and Trespass Issues.	Evidence of trash, trespass, and vandalism at the mitigation areas will be documented during each field visit (including inspections, annual quantitative surveys, maintenance visits, focused wildlife surveys, and incidental field visits).	Monitoring Biologist	Conducted during inspections, site visits, and surveys	N/A	$0	N/A	$0	$0
Contingency Fund	To address remedial actions that may be required after an unexpected event.	LACFCD	Every third year, as needed	As needed	1	N/A	20% of costs	$6,800
							GRAND TOTAL	$40,800

*This is an average assumed rate; costs would likely go up over time based on cost of living increases

Table 6-3 Ten-Year Management and Monitoring Activities Costs

Task Name	Description	Responsibility	Frequency	Schedule	Level of Effort	Cost per Unit*	Cost	10-Yr Cost
MA-4: Jurisdictional Delineation	Updated jurisdictional delineations will be performed periodically in order to evaluate the presence and acreage of wetland and non-wetland features in the mitigation areas.	Monitoring Biologist	Every 10 years, frequency will be reevaluated after year 10	Spring - Fall	Biologist: 80 hours GIS: 8 hours	$120/hour $100/hour	$9,600 $800	$10,400
TT-1: Document Trash and Trespass Issues.	Evidence of trash, trespass, and vandalism at the mitigation areas will be documented during each field visit (including inspections, annual quantitative surveys, maintenance visits, focused wildlife surveys, and incidental field visits).	Monitoring Biologist	Conducted during inspections, site visits, and surveys	N/A	$0	N/A	$0	$0
Contingency Fund	To address remedial actions that may be required after an unexpected event.	LACFCD	Every ten years, as needed	As needed	1	N/A	20% of costs	$2,080
							GRAND TOTAL:	$12,480

*This is an average assumed rate; costs would likely go up over time based on cost of living increases

Table 6-4 As-Needed and Adaptive Management and Monitoring Activities Costs

Task Name	Description	Responsibility	Frequency	Schedule	Level of Effort	Cost per Unit*	Cost	Total Cost
TEW-2: Brown-Headed Cowbird Trapping	If adaptive management is implemented and/or mitigation activities are re-initiated in order to get a mitigation area back up to success standards following an adverse change in condition, then brown-headed cowbird trapping may be implemented during the long-term management of the mitigation site.	Monitoring Biologist	As-needed	Spring-Summer	Biologist: 440 hours (one season of trapping)	$100/hour	$44,000	$44,000 (one season of trapping)
VM-2: Prolonged Inundation	If any of the mitigation areas are experiencing prolonged inundation above 1,020 feet elevation for a period of 30 days or more and there is an observable plant die-off, then the damage would be assessed and a plan would be developed to restore the area. The plan would then be implemented and monitoring and maintenance of the areas would be performed to ensure the success and survival of the habitat.	Monitoring Biologist	After periods of prolonged inundation	N/A	N/A	N/A	N/A	N/A
VM-3: Prolonged Drought	If prolonged drought conditions are causing plant die-off at any of the mitigation areas, then the damage would be assessed and a plan would be developed to restore the area. The plan would then be implemented and monitoring and maintenance of the areas would be performed to ensure the success and survival of the habitat.	Monitoring Biologist	After periods of prolonged drought	N/A	N/A	N/A	N/A	N/A
VM-4: Damage from Natural Events	In the event that an unforeseen natural event causes damage to all or some of the mitigation areas then a damage assessment will be performed to document the nature and extent of the damage to the mitigation areas. The need for adaptive management will also be assessed to facilitate the recovery of the mitigation areas. A plan to address the damage would be developed and implemented. Monitoring and management of the areas would be performed to ensure the success and survival of the habitat.	Monitoring Biologist	After unforeseen natural event	N/A	N/A	N/A	N/A	N/A
VM-6 Tree-Trimming within Easements	If easement holders need to conduct tree-trimming within their easements, then LACFCD will ensure that least Bell's vireos, other nesting birds, and habitats within the easements will not be affected. LACFCD will coordinate with the easement holders and will conduct pre-construction surveys, focused surveys for least Bell's vireos, and nesting birds and will conduct monitoring during the tree-trimming activities.	LACFCD, Monitoring Biologist	As-needed	N/A	N/A	N/A	N/A	N/A
TT-3: Unauthorized Trail Closure	Closure of unauthorized trails using a combination of methods.	LACFCD, Monitoring Biologist	As-needed	N/A	N/A	N/A	N/A	N/A
VC-1: Vector Control	LACFCD will work with the City and San Gabriel Valley Mosquito and Vector Control District (Vector Control) to develop and implement a vector control program on-site. LACFCD has an on-going contract with Vector Control to treat their facilities to control the mosquitos and to minimize the spread of disease via mosquitos and other vectors.	LACFCD	As-needed	N/A	N/A	N/A	N/A	N/A
As-Needed Management	Identify and address issues that are found to be threatening the function or quality of the mitigation areas. Potential issues include but are not limited to: inundation, drought, and catastrophic natural events.	LACFCD	As-needed	N/A	N/A	N/A	N/A	N/A

*This is an average assumed rate; costs would likely go up over time based on cost of living increases

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APPENDIX A

Devil's Gate Dam and Reservoir Sediment Management Plan

DEVIL'S GATE DAM AND RESERVOIR
SEDIMENT MANAGEMENT PLAN

NOVEMBER 2018

DEVIL'S GATE DAM AND RESERVOIR
SEDIMENT MANAGEMENT PLAN

Introduction:

Annual maintenance of the Devil's Gate Reservoir will occur in accordance with the Devil's Gate Reservoir Sediment Removal and Management Project and associated Final Environmental Impact Report. The Devil's Gate Reservoir Sediment Removal and Management Project consists of two phases: (1) the sediment removal phase, and (2) the reservoir management phase. The sediment removal phase, the Devil's Gate Dam and Reservoir Sediment Removal Project, includes: 1) the construction of a new access road into the reservoir, and the upgrade of an existing access road, anticipated to be initiated in November 2018 and completed by January 2019; 2) the removal of vegetation from a 65.5-acre footprint, anticipated to be initiated in November 2018 and completed by January 2019; and 3) the excavation of 1.7 million cubic yards (cy) of sediment from behind Devil's Gate Dam in order to restore capacity within Devil's Gate Reservoir and minimize the level of flood risk to downstream communities along the Arroyo Seco. Sediment removal and hauling is anticipated to be initiated in April 2019 and completed by November 2022. The Devil's Gate Dam and Reservoir Sediment Removal Project is expected to result in a reservoir configuration and access to facilitate future routine annual management and sediment removal.

The reservoir management phase is expected to start in 2023, after the completion of the sediment removal phase. After the initial proposed sediment removal activities, the reservoir will be managed through vegetation maintenance, sediment excavation and trucking offsite, and Flow-Assisted Sediment Transport (FAST). The access roads will also be maintained to provide proper road width for access. The purpose of the proposed annual management activities, described below, is to reduce buildup of sediment in the reservoir management area over time and eliminate or substantially reduce the frequency of subsequent large-scale sediment removal projects.

A. Proposed Annual Maintenance Activities

The reservoir configuration shown in Attachment 1 will be maintained with the approximate cut and elevation levels established with the Devil's Gate Dam and Reservoir Sediment Removal Project. The area to be annually maintained through vegetation clearance and sediment removal is approximately 42 acres. The entire 49-acre permanent maintenance basin (42-acre basin and 7-acre side slope area) will be kept clear of non-native/exotic vegetation.

1. Dam Operations & Flow-Assisted Sediment Transport

Dam operations are dependent on the forecasted and existing rainfall/inflows, watershed conditions including expected sediment inflows, and dam and downstream conditions. Following the Devil's Gate Dam and Reservoir Sediment Removal Project, dam operations are expected to return to a regime consistent with operations prior to the

Station Fire. The lowest elevation valve would be generally left open prior to the first significant rain event of the season, to utilize Flow-Assisted Sediment Transport (FAST). During a FAST operation, natural flows will pass finer grain size sediment through the reservoir and downstream of the dam. FAST operations have been routinely used at Devil's Gate Reservoir and result in relatively small amounts of finer grained sediment passing through the reservoir. A FAST operation uses the storm runoffs throughout the storm season to flush the sediment out of the reservoir. This is a passive method that does not use any mechanical agitation or assistance. This method works effectively when sediment deposition behind the dam is minimal. A FAST operation, if performed regularly, can be used to reduce sediment accumulation in the reservoir and thus help maintain capacity. The amount of sediment that will be removed through FAST operations is limited by the amount of storm runoff received into the reservoir.

It is anticipated that the majority of these FAST operations will be similar to historic FAST operations and that fine sediment discharged during FAST operations will be transported to the Pacific Ocean via Arroyo Seco Channel and the Los Angeles River, either via discharge flow or subsequent storm flows.

During a rain event, if water pools and the water surface elevation continues to rise, the lowest elevation valve is closed and water is ponded behind the dam to create a pool that prevents sediment and debris from damaging or blocking the valves and gates of the dam. Two larger slide gates are then operated to manage the reservoir elevation, control outflow, and prevent flows from overwhelming the downstream channel. Depending on storm conditions and forecasts, the pool may remain throughout the storm season. If weather, hydrological forecasts, and reservoir conditions indicate that water held behind the dam may inundated the mitigation site, then the Dam Operator, in consultation with the Operations Section of the Stormwater Engineering Division of LACDPW, will take the steps necessary (including release of water at the maximum possible rate as safe to do so to protect downstream communities), to prevent or to reduce, to the extent possible, the amount of time the mitigation site is inundated.

Devil's Gate Reservoir is routinely drained each Spring, at the end of the storm season. At the end of each storm season, the lowest elevation valve is opened to release any remaining water that may be pooled behind the dam. Therefore, non-routine draining, or dewatering, of this facility will not be required as part of annual maintenance. As a part of routine dam operations, the reservoir will be empty prior to the start of annual maintenance activities.

2. Vegetation Maintenance

Vegetation within the reservoir configuration will be mowed or removed and grubbed annually. These activities will occur Monday through Friday over an estimated three-week period in the late summer or early fall. All native vegetation outside the Annual Reservoir Maintenance footprint, as shown in Attachment 1, will be allowed to naturally re-establish and/or remain in place. All non-native/exotic vegetation within the 49-acre permanent maintenance baseline will be removed following the on-site Habitat Mitigation and

Monitoring Plan (HMMP) schedule to ensure such non-native vegetation growing in the basin does not compromise the success of the on-site permittee-responsible compensatory mitigation. As with the initial sediment removal phase, all vegetation and organic debris will be separated from the sediment and hauled to Scholl Canyon Landfill located in the City of Glendale.

3. Sediment Excavation/Trucking Offsite

Depending on the efficiency of the FAST operations, some mechanical excavation and trucking offsite will be required for removal of accumulated sediment. Sediment excavation/trucking offsite will use the same methods and trucking routes as the initial sediment removal phase. The need for future sediment removal will depend on future storm activity and associated sediment accumulation.

It is estimated, based on past storm events with an unburned watershed, that sediment excavation/trucking offsite will be required to typically remove approximately 13,000 cy of sediment annually. Based on an estimated removal of a maximum of 4,800 cy per day, it is expected at least a two-week work period, Monday through Friday, would be needed. This removal activity will take place during the late summer/early fall following the vegetation maintenance. Removal of the sediment, vegetation, trees, and organic debris is expected to require an average of 50 truck round trips per hour, with an estimated 200 to a maximum of 300 truck round trips per day during excavation activities.

Moderately large sediment deposits have the potential to occur during a storm season, but it is anticipated that even with this type of event the newly deposited sediment could be removed in one season. A moderately large sediment removal event, anticipated to involve around 170,000 cy, could take place over an estimated 12-week period during the late summer/early fall following the vegetation maintenance.

4. Episodic Maintenance

Episodic Maintenance within the 7-acre side slopes surrounding the Annual Reservoir Maintenance Area, as shown in Attachment 1, will initially include planting with appropriate native plants. The maintenance activities related to sediment removal and repair of the side slopes will only occur after large storm events that damage portions of the side slopes or when erosion compromises a section of the side slopes. The maintenance activities will be limited to the locations where sediment has accumulated and will only consist of the removal of accumulated sediment and repair of the side slopes. The vegetation buried by sediment may be removed when the side slopes are recontoured. LACFCD does not anticipate that all 7.34 acres of the side slopes will need to be repaired in the same season or that repair will be necessary on a frequent basis. The primary purpose of the Episodic Maintenance is not to remove vegetation but only to repair the side slopes so they can revegetate with native plant species.

Regular maintenance on the side slopes will include the removal of non-native and invasive plant species to limit the spread of these species throughout the mitigation areas.

Regular maintenance will be conducted at the same time that maintenance activities are conducted in the mitigation areas. Regular maintenance will typically occur on a quarterly basis and will include the use of string-trimmers, herbicides, and hand-pulling. A Restoration Monitor will be present during the maintenance activities in the mitigation areas and on the side slopes. The intended vegetation on the side slopes is riparian scrub (mulefat and other shrubby species) and RAFSS, which will provide foraging opportunities for least Bell's vireos and other wildlife species and will create a buffer between the annual maintenance area and the mitigation areas. The Restoration Monitor will ensure that the Landscape Contractor's crew only remove species that are appropriate for removal (i.e., nonnative and invasive plant species).

If recontouring of any portion of the side slopes is necessary, the Restoration Specialist will evaluate the need to reseed the side slopes after the recontouring is completed. The vegetation that grows on the side slopes is expected to provide a good seed bank in the soils so after the recontouring is completed, the non-native and invasive plants will be controlled to allow the native plants to revegetate naturally. If the vegetation on the side slopes does not successfully germinate and grow, then reseeding of the side slopes may be conducted. The Restoration Specialist will monitor the repaired portions of the side slopes to evaluate if reseeding is necessary and when it would be appropriate.

B. Best Management Practices (BMPs)

The following environmental safeguards will be implemented as part of annual sediment management:

- No project equipment-related materials (i.e., waste, spills, or residue) will be discharged from the project site to streets, drainage facilities, receiving waters, or adjacent property by wind or runoff.
- Non-stormwater runoff from equipment, vehicle washing, or any other activity will be contained within the project site using appropriate BMPs.
- Debris generated from construction activities will be properly contained.
- Grading will be scheduled so the majority of the work in the reservoir is completed during the dry season or during clear weather forecasts. Erosion susceptible slopes resulting from project activities will be protected through design/construction techniques such as proper grading, planting, covering, or other BMPs.

C. Environmental Protections

LACFCD will comply with all conditions set forth in the permits obtained for the Devil's Gate Reservoir Sediment Removal and Management Project, including: United States Army Corps of Engineers Section 404 permit (SPL-2014-00591-BLR), Regional Water Quality Control Board 401 Water Quality Certification (15-053), California Department of Fish and Wildlife Section 1600 Lake and Streambed Alteration Agreement (1600-2015-0263-R5), and California Department of Fish and Wildlife Incidental Take Permit (2081-

2016-031-05). Permits will be sought prior to expiration in order to continue maintenance within Devil's Gate Reservoir.

Prior to maintenance during any year or season, a designated biologist will survey the proposed work area to verify the presence or absence of federally-listed endangered or threatened species. If federally-listed endangered or threatened species are found within the work area, LACFCD will coordinate with the Army Corps of Engineers to conduct Endangered Species Act consultation for any federally-listed endangered or threatened species.

LACFCD is the agency responsible for implementation of the mitigation measures identified in the Final Environmental Impact Report (EIR), certified November 12, 2014, and the Recirculated Portions of the Final EIR, certified November 7, 2017. The EIR mitigation measures pertaining to the sediment management phase are detailed in the Mitigation Monitoring and Reporting Program (Attachment 2).

LACFCD will also implement the following conservation measures as part of annual sediment management to avoid and minimize impacts to the federally endangered species, least Bell's vireo:

1. Carlsbad Fish and Wildlife Office (CFWO)-approved biological monitor(s) will be retained by the LACDPW to conduct activities as specified in the measures below. The biological monitor(s) will be a trained ornithologist with at least 40 hours of supervised experience locating vireo and mapping their locations in the field. At least 7 days prior to initiating project activities, the LACFCD will submit to the CFWO, in writing, the name(s), any permit numbers, and resumes of all proposed biological monitors. Proposed activities will not begin until a biological monitor has been approved by the CFWO. The biological monitor will have the authority to halt/suspend all activities that do not adhere to the construction related Conservation Measures (1-7).

2. The biological monitor will conduct orientation meetings for construction personnel to review: a) a description of vireo and its habitat on the project site, b) construction limits, and c) the conservation measures that will be implemented in conjunction with project construction (i.e., Conservation Measures 1-7).

3. Under the supervision of the biological monitor, all preserved riparian vegetation adjacent to the outer limits of disturbance (Attachment 1) will be delineated by bright orange plastic fencing, stakes, flags, or markers that are clearly visible to personnel on foot and in heavy equipment. No vegetation removal, grading, or deposition of waste dirt/rubble will occur in riparian vegetation outside of the outer limits of disturbance.

4. All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities will be restricted to designated disturbed/developed areas. These designated areas will not be located within waterways or riparian areas and will be located in such a manner as to prevent runoff from entering existing native vegetation areas and will be clearly designated on the construction plans.

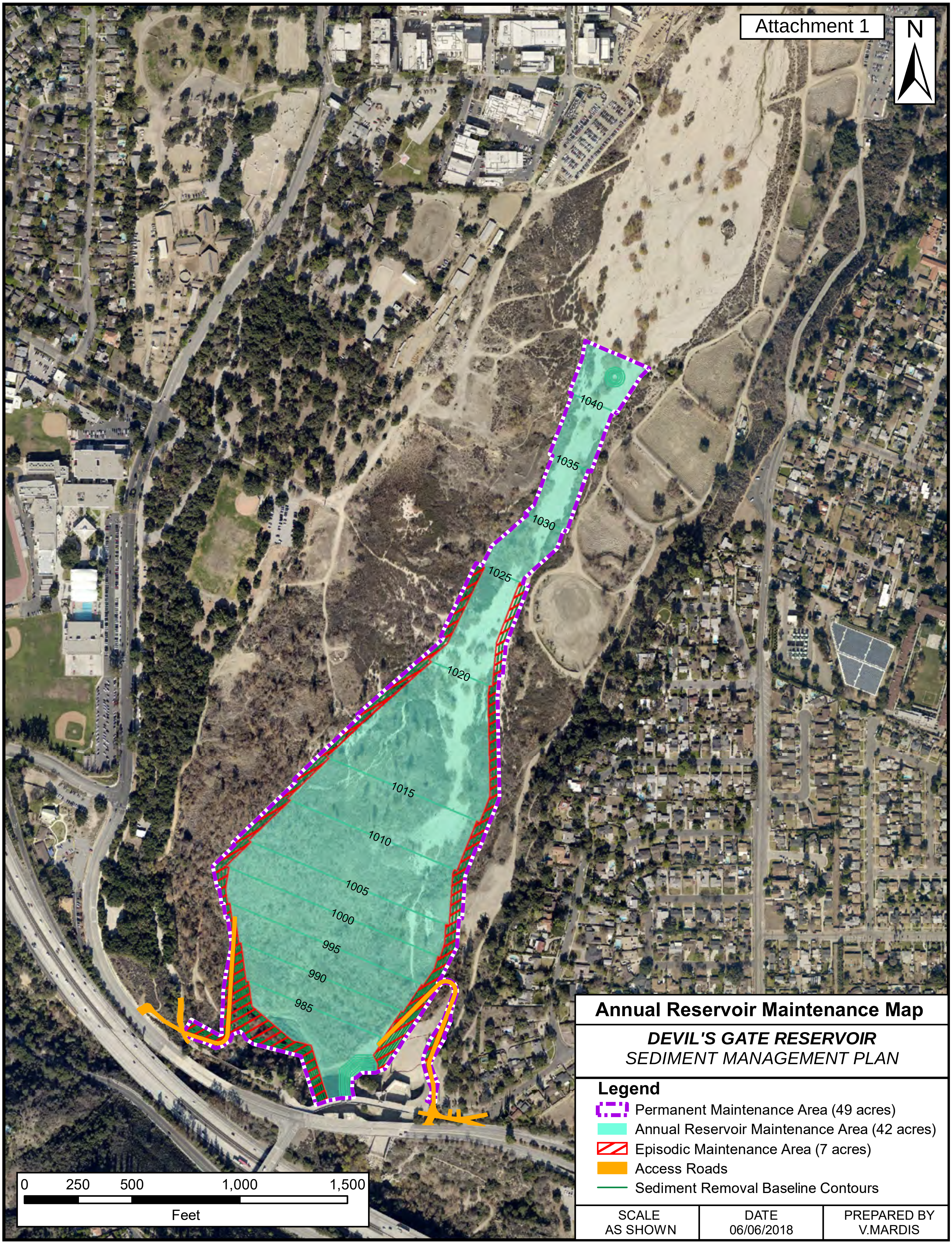
5. All activities involving the removal of riparian vegetation will occur outside of the vireo breeding and nesting season (March 15 to August 31).

6. If construction occurs between September 1 to March 14 (outside of the vireo breeding and nesting season), a designated construction monitor will conduct twice weekly inspections of the project site and will have the authority to halt/suspend all activities that do not adhere to the construction-related Conservation Measures (3 to 5). The construction monitor will report impacts to vegetation beyond the outer limits of disturbance immediately to the CFWO and will provide, on a monthly basis to the CFWO, a brief summary (including photos) of project activities completed.

7. Sediment removal activities, including the initial reconfiguration of the basin and annual maintenance, will be scheduled between September 1 to March 14 (outside the vireo breeding and nesting season) to the extent possible; however, if sediment removal is conducted between March 15 and August 31 (during the vireo breeding and nesting season):

a. Nest buffer: Surveys by the biological monitor will be conducted a minimum of three times on separate days to determine the presence of vireo nest building activities, egg incubation activities, or brood rearing activities within 300 feet of the project area. These surveys will be conducted within the week prior to the initiation of project activities. One survey will be conducted the day immediately prior to the initiation of project activities. If no nests, nesting behavior, or brood rearing activities are detected within 300 feet of the project area, work may commence. If nesting vireos are detected, nest monitoring will be initiated and work will be postponed within 300 feet of the nesting pair(s) until the nest is determined either a success or failure by the biological monitor and CFWO agrees that work may proceed.

b. Noise buffer: Construction noise levels will be restricted to below 60 dBA Leq hourly at 100 feet from areas occupied by the vireo. Twice weekly surveys for the vireo will be conducted by the biological monitor in areas of suitable habitat within 500 feet of proposed construction activities to determine the presence of vireo nest building activities, egg incubation activities, or brood rearing activities. If vireos are present, noise monitoring will be conducted weekly and must demonstrate that noise levels are less than 60 dBA Leq hourly at specified monitoring locations, no less than 100 feet from the active nest(s) as determined by the biological monitor. Weekly survey reports will be prepared during the nesting season and sent electronically to the CFWO each week that vireos are detected. The weekly reports will identify the location of vireo nest sites and territories within 500 feet of the project.


Attachment 1
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Feet
Annual Reservoir Maintenance Map
DEVIL'S GATE RESERVOIR
SEDIMENT MANAGEMENT PLAN
Legend
Permanent Maintenance Area (49 acres)
Annual Reservoir Maintenance Area (42 acres)
Episodic Maintenance Area (7 acres)
Access Roads
Sediment Removal Baseline Contours
SCALE
AS SHOWN
DATE
06/06/2018
PREPARED BY
V.MARDIS

Attachment 2

REVISIONS TO THE MITIGATION MONITORING AND REPORTING PROGRAM

DEVIL'S GATE RESERVOIR SEDIMENT REMOVAL AND MANAGEMENT PROJECT PASADENA, CA (LOS ANGELES COUNTY)

State Clearinghouse No. 2011091084

Prepared for:

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
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Prepared by:

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ENVIRONMENTAL CONSULTANTS

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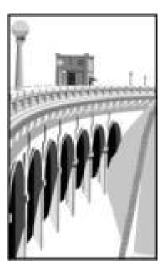
October 2017



MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
Mitigation Measure	**Implementation Phase***	**Monitoring Phase***	**Enforcement Agency**	**Level of Significance After Mitigation**	**Verification of Compliance**		
					Initial	**Date**	**Remarks**
AIR QUALITY							
MM AQ-1: LACFCD shall require all construction contractors during the sediment removal phase of the Proposed Project to use only sediment removal dump trucks that meet the EPA's emission standards for Model Year 2010 ~~2007~~ or later.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
MM AQ-2: LACFCD shall require all construction contractors during the sediment removal phase of the Proposed Project to use off-road equipment that meets, at a minimum, EPA's emission standards for Tier 3 equipment.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
BIOLOGICAL RESOURCES							
MM BIO – 1: A qualified biological monitor shall be present during initial ground- or vegetation-disturbing project-related activities to provide measures and monitor for wildlife in harm's way. This includes initial ground- or vegetation-disturbing project-related activities at the annual start of each year of sediment removal or maintenance activities. Following initial project-related activities, a qualified monitoring biologist shall be present as necessary to maintain the implemented protection measures and monitor for additional species in harm's way. These protection measures shall include, as appropriate: redirecting wildlife, identifying areas that may require exclusionary devices (e.g., fencing), or capturing and relocating wildlife outside the work area. Any captured species shall be relocated to adjacent appropriate habitat that is contiguous to adjacent habitat and not impacted by project-related disturbance activities.	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
MM BIO – 2: Within 90 days prior to ground-disturbing activities, a sensitive species educational briefing shall be conducted by a qualified biologist for construction personnel. The biologist will identify all sensitive resources that may be encountered onsite, and construction personnel will be instructed to avoid and report any sightings of sensitive species to LACFCD or the monitoring biologist. Educational briefings shall be repeated annually for the duration of the sediment removal.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
MM BIO – 3: Within 90 days prior to ground-disturbing activities, a preconstruction survey shall be conducted by a qualified biologist for the presence of any sensitive species in harm's way, including coast range newt, the southwestern pond turtle, and the two-striped garter snake. If sensitive species are observed in harm's way, the qualified biologist will develop and implement appropriate protection measures for that species. These protection measures shall include, as appropriate: redirecting the species, constructing exclusionary devices (e.g., fencing), or capturing and relocating wildlife outside the work area. Preconstruction surveys shall be repeated annually for the duration of the sediment removal. Observations of special status species made during these surveys shall be recorded onto a CNDDB field data sheet and submitted to CDFW for inclusion into the CNDDB.	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
Mitigation Measure	Implementation Phase*	Monitoring Phase*	Enforcement Agency	Level of Significance After Mitigation	Verification of Compliance		
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MM BIO – 4: LACFCD, in consultation with a qualified biologist, will employ bird exclusionary measures (e.g., mylar flagging) prior to the start of bird breeding season to prevent birds nesting within established boundaries of the project. Prior to commencement of sediment removal activities within bird breeding season (March 1-August 31), a preconstruction bird nesting survey shall be conducted by a qualified biologist for the presence of any nesting bird within 300 feet of the construction work area. The surveys shall be conducted 30 days prior to the disturbance of suitable nesting habitat by a qualified biologist with experience in conducting nesting bird surveys. The surveys shall continue on a weekly basis with the last survey being conducted no more than 3 days prior to the initiation of clearance/construction work. Preconstruction surveys shall be repeated annually for the duration of the sediment removal. If an active nest is found, the qualified biologist will develop and implement appropriate protection measures for that nest. These protection measures shall include, as appropriate, construction of exclusionary devices (e.g., netting) or avoidance buffers. The biologist shall have the discretion to adjust the buffer area as appropriate based on the proposed construction activity, the bird species involved, and the status of the nest and nesting activity; but shall be no less than 30 feet. Work in the buffer area can resume once the nest is determined to be inactive by the monitoring biologist.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM

Devil's Gate Reservoir Sediment Removal and Management Project

Mitigation Measure	Implementation Phase*	Monitoring Phase*	Enforcement Agency	Level of Significance After Mitigation	Verification of Compliance		
					Initial	Date	Remarks
MM BIO – 5: Within 30 days prior to commencement of vegetation or structure removal activities, a preconstruction bat survey shall be conducted by a qualified biologist for the presence of any roosting bats. Acoustic recognition technology shall be used if feasible and appropriate. If either a bat maternity roost or hibernacula (structures used by bats for hibernation) are present, a qualified biologist will develop and implement appropriate protection measures for that maternity roost or hibernacula. These protection measures shall include, as appropriate: safely evicting non-breeding bat hibernacula, establishment of avoidance buffers, or replacement of roosts at a suitable location. These measures shall also include as appropriate: • To the extent feasible, trees that have been identified as roosting sites shall be removed or relocated between October 1 and February 28. • When trees must be removed during the maternity roost season (March 1 to September 30), a qualified bat specialist shall conduct a preconstruction survey to identify those trees proposed for disturbance that could provide hibernacula or nursery colony roosting habitat for bats. • Trees identified as potentially supporting an active nursery roost shall be inspected by a qualified biologist no greater than 7 days prior to tree disturbance to determine presence or absence of roosting bats. • Trees determined to support active maternity roosts will be left in place until the end of the maternity season (September 30). • If bats are not detected in a tree, but the qualified biologist determined that roosting bats may still be present, trees shall be removed as follows: o Pushing the tree down with heavy machinery instead of felling the tree with a chainsaw o First pushing the tree lightly 2 to 3 times with a pause of 30 seconds in between each nudge to allow bats to become active, and then pushing the tree to the ground slowly. o Allowing the tree to remain in place for 24 to 48 hours until inspected by the qualified biologist for presence or absence of roosting bats. • The qualified biologist shall document all bat survey, monitoring, and protection measure activities and prepare a summary report for LACFCD.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
MM BIO – 6: Riversidean Alluvial Fan Sage Scrub habitat shall be restored and/or enhanced at a 1:1 ratio by acreage. LACFCD, with the help of professional restoration ecologists, will develop the means and methods of successful restoration and enhancement of this sensitive habitat. Measures to achieve not less than a 1:1 replacement, or no net loss, of Riversidean Alluvial Fan Sage Scrub shall include but not be limited to the following: • Conduct a vegetation survey within the impact area prior to commencement of vegetation removal activities to verify the impact acreage of Riversidean Alluvial Fan Sage Scrub. • Identify and map the selected mitigation ~~A~~areas where Riversidean Alluvial Fan Sage Scrub will be enhanced or restored ~~shall be mapped~~ using aerial photographs. Priority for mitigation site locations shall be onsite, offsite within Arroyo Seco subwatershed, and offsite within the greater Los Angeles	Reservoir Management • Prepare Habitat Restoration Plan • Identify/Map Mitigation Sites • Install Plant Materials • Monitor Installation • Install Irrigation, if Necessary • Prepare As-Built Report • Conduct Maintenance • Prepare Monitoring Reports	Reservoir Management • Identify Reference Sites • Conduct Qualitative and Quantitative Monitoring • Conduct Maintenance • Implement Adaptive Management Measures, if Necessary • Prepare Monitoring Reports • Prepare Annual Reports • Achieve Mitigation Site Sign-Off	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
Mitigation Measure	Implementation Phase*	Monitoring Phase*	Enforcement Agency	Level of Significance After Mitigation	Verification of Compliance		
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River watershed. • Select offsite reference sites where Riversidean Alluvial Fan Sage Scrub is the established plant community. The reference sites will be used to establish the necessary performance standards to which the mitigation site will be measured. Performance standard parameters will include percent cover of native plant species, percent cover of nonnative and invasive plant species, and native plant species richness (number of different plant species). • Prepare and implement a site-specific Habitat Restoration Plan that will result in the successful restoration and enhancement at the selected mitigation sites. The Habitat Restoration Plan, at a minimum, shall include guidelines and specifications for the following: o Site-specific container plant (if applicable) and seed palettes, o Irrigation plan, o Nonnative and invasive plant species removal, o Maintenance and monitoring schedule, o Qualitative and quantitative monitoring methodologies, o Selection criteria of reference sites, o Performance standards of the mitigation sites, o Monitoring reports and annual reports schedule, o Mitigation long-term management plan, and o Funding description for implementation and long-term management. • Prepare an as-built plan after the installation of the plant and seed materials has been completed to document the acreage of each restored or enhanced plant community on the mitigation sites and to show that not less than a 1:1 replacement of sensitive habitats has been achieved. • Quantitatively monitor the mitigation sites until the performance standards have been met and restoration and enhancement of not less than 1:1 replacement of Riversidean Alluvial Fan Sage Scrub has been achieved. • Implement adaptive management measures if, during monitoring, the mitigation sites do not demonstrate measurable progress toward achieving the necessary performance standards or if unforeseen circumstances damage the mitigation sites. Adaptive management measures will include but not be limited to: o Correctively re-grade areas if hydrologic or other conditions negatively affect the mitigation sites, o Add soil amendments if problem soils may be inhibiting plant growth, o Replant if plant survival is low or to increase plant species cover or diversity, o Install different plant species for plant species which are not surviving, and							

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
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					Initial	**Date**	**Remarks**
o Close trails or install barriers if human caused impacts are damaging the mitigation sites. • Implement and monitor the required mitigation at alternative sites, chosen based on same priority methodology, if the mitigation sites do not achieve the performance standards after the implementation of adaptive management measures. LACFCD shall conduct qualitative and annual quantitative monitoring and prepare annual monitoring reports until the established performance standards are achieved. • Ensure the allocation and encumbrance of the funding necessary to implement the Habitat Restoration Plan, adaptive management measures, alternative mitigation sites (if necessary), and long-term management and protection of the mitigation sites.							
MM BIO – 7: Within 90 days prior to ground-disturbing activities, a qualified biologist shall conduct a tree survey within the project footprint to identify native city-protected trees that would ~~will~~ be removed or potentially affected by the Proposed Project, ~~and~~ native city-protected trees that can be avoided, and native city-protected trees that will require root zone protection. LACFCD would ~~will~~ replace native city-protected trees that cannot be avoided. The replacement is expected to be at a ~~up to~~ 1:1 ratio by canopy acreage. The biological monitor shall implement measures to protect the root zone of oak trees that may be impacted immediately adjacent to the project site and along access roads. The acreage occupied by the canopies of the native city-protected trees to be removed will determine the appropriate level of tree replacement. LACFCD shall identify tree replacement areas that are no less than the acreage of the native city-protected tree canopies to be removed. Priority for tree replacement locations shall be onsite, offsite within Arroyo Seco subwatershed, and offsite within the greater Los Angeles River watershed. The number of replacement trees installed by LACFCD will be greater than the number of trees to be removed should the replacement tree be smaller and younger than the tree to be removed. LACFCD shall monitor the survival of the replacement trees for 5 years and replace those that do not survive within the monitoring period, ensuring that not less than 1:1 ratio of replacement, or no net loss, has been achieved.	Pre-Sediment Removal; Sediment Removal; Reservoir Management • Conduct Tree Survey • Identify and Protect Oak Tree Root Zones • Identify/Map Mitigation Sites • Prepare Habitat Restoration Plan • Install Plant Materials • Monitor Installation • Install Irrigation, if Necessary • Prepare As-Built Report • Conduct Maintenance • Prepare Monitoring Reports	Pre-Sediment Removal; Sediment Removal; Reservoir Management • Identify Reference Sites • Conduct Qualitative and Quantitative Monitoring • Conduct Maintenance • Implement Adaptive Management Measures, if Necessary • Prepare Monitoring Reports • Prepare Annual Reports • Achieve Mitigation Site Sign-Off	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM

Devil's Gate Reservoir Sediment Removal and Management Project

Mitigation Measure	Implementation Phase*	Monitoring Phase*	Enforcement Agency	Level of Significance After Mitigation	Verification of Compliance Initial	Mitigation Measure Date	Implementation Phase* Remarks
MM BIO – 8: A combination of onsite and offsite habitat restoration, enhancement, and exotic plant removal shall be implemented by LACFCD at a 1:1 ratio for impacted riparian habitat, sensitive natural communities, ~~habitat~~ and jurisdictional waters. Habitat restoration/enhancement shall include use of willow cuttings and exotic plant species removal. Non-native, weedy habitats within the basin shall be utilized whenever possible as mitigation sites. LACFCD, with the help of professional restoration ecologists, will develop the means and methods of successful restoration and enhancement of riparian habitat, sensitive natural communities, and jurisdictional waters. Measures to achieve not less than a 1:1 replacement, or no net loss, of riparian habitat, sensitive natural communities, and jurisdictional waters shall include but not be limited to the following: • Conduct a vegetation survey within the impact area prior to commencement of vegetation removal activities to verify the impact acreages of riparian habitat (Riparian Woodland and Mule Fat Thickets), sensitive natural communities (Coastal Sage Scrub), and jurisdictional waters (federally protected wetlands). • Identify and map the selected mitigation areas where riparian habitat, sensitive natural communities, and federally protected wetlands will be enhanced or restored. Priority for mitigation site locations shall be onsite, offsite within Arroyo Seco subwatershed, and offsite within the greater Los Angeles River watershed. • Select offsite reference sites where riparian habitats (Riparian Woodland and Mule Fat Thickets) and sensitive natural communities (coastal sage scrub) are the established plant communities and where federally protected wetlands are present. The reference sites will be used to establish the necessary performance standards to which the mitigation site will be measured. Performance standard parameters will include percent cover of native plant species, percent cover of nonnative and invasive plant species, native plant species richness (number of different plant species), structural patch richness, and wildlife use. • Prepare and implement a site-specific Habitat Restoration Plan that will result in the successful restoration and enhancement at the selected mitigation sites. The Habitat Restoration Plan, at a minimum, shall include guidelines and specifications for the following: o Site-specific container plant and seed palettes, o Irrigation plan, o Nonnative and invasive plant species removal, o Maintenance and monitoring schedule, o Qualitative and quantitative monitoring methodologies, o Selection criteria of reference sites, o Performance standards of the mitigation sites, o Monitoring reports and annual reports schedule, o Mitigation long-term management plan, and o Funding description for implementation and long-term management. • Prepare an as-built plan after the installation of the plant and seed materials has	Reservoir Management • Prepare Habitat Restoration Plan • Identify/Map Mitigation Sites • Install Plant Materials • Monitor Installation • Install Irrigation, if Necessary • Prepare As-Built Report • Conduct Maintenance • Prepare Monitoring Reports	Reservoir Management • Identify Reference Sites • Conduct Qualitative and Quantitative Monitoring • Conduct Maintenance • Implement Adaptive Management Measures, if Necessary • Prepare Monitoring Reports • Prepare Annual Reports • Achieve Mitigation Site Sign-Off	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
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been completed to document the acreage of each restored or enhanced plant community on the mitigation sites to show that the sites contain not less than a 1:1 replacement of riparian habitats, sensitive natural communities, and federally protected wetlands has been achieved.
• Quantitatively ~~This mitigation measure shall be~~ monitor~~ed for success for five years following implementation~~ the mitigation sites until the performance standards have been met and restoration and enhancement of not less than 1:1 replacement of riparian habitats, sensitive natural communities, and federally protected wetlands has been achieved.
  • Implement adaptive management measures if, during monitoring, the mitigation sites do not demonstrate measurable progress achieving the necessary performance standards or if unforeseen circumstances damage the mitigation sites. Adaptive management measures will include but not be limited to:
    o Correctively re-grade areas if hydrologic or other conditions negatively affect the mitigation sites,
    o Add soil amendments if problem soils may be inhibiting plant growth,
    o Replant if plant survival is low or to increase plant species cover or diversity,
    o Install different plant species for plant species which are not surviving, and
    o Close trails or install barriers if human caused impacts are damaging the mitigation sites.
  • Implement and monitor the required mitigation at alternative sites if the mitigation sites do not achieve the performance standards after the implementation of adaptive management measures. LACFCD shall conduct qualitative and annual quantitative monitoring and prepare annual monitoring reports until the established performance standards are achieved.
  • Ensure the allocation and encumbrance of the funding necessary to implement the Habitat Restoration Plan, adaptive management measures, alternative mitigation sites (if necessary), and long-term management and protection of the mitigation sites.
  • Submit a ~~A~~ report of the monitoring results ~~shall be submitted~~ annually~~,~~ ~~during the five years~~ following implementation of the restoration and enhancement activities at the mitigation sites, to resource agencies as required by the Section 401 Certification, Section 404 permit, and a Streambed Alteration Agreement until the mitigation sites have met the performance standards.							

CULTURAL RESOURCES							
MM CUL-1: If sediment removal or reservoir management activities exceed the depth of the historic flood deposits and encounter native sediments, these activities will be monitored by a qualified archaeologist. In the event this occurs and historic or archaeological materials are observed, the excavation in the proximity of the	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal;	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
Mitigation Measure	Implementation Phase*	Monitoring Phase*	Enforcement Agency	Level of Significance After Mitigation	Verification of Compliance		
					Initial	Initial	Initial
discovery should be diverted until a qualified archaeologist and/or paleontologist evaluates the discovery.	Reservoir Management						
MM CUL-2: If sediment removal or reservoir management activities exceed the depth of the historic flood deposits and encounter native sediments, these activities will be monitored by a qualified paleontologist. In the event that this occurs and paleontological materials are observed, the excavation in the proximity of the discovery should be diverted until a qualified paleontologist evaluates the discovery.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
MM CUL-3: In the event human remains are discovered, all work in the area must be halted until the County Coroner identifies the remains and makes recommendations regarding their appropriate treatment pursuant to PRC Section 5097.98.	Final Plans and Specifications; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
LAND USE AND PLANNING							
MM LAN-1: Temporary impacts to designated recreational facilities and trails shall be minimized through advance communication and redirection to the nearest facility in the vicinity of the Proposed Project. Prior to completion of final plans and specifications, the LACFCD shall review the plans and specifications to ensure that they contain proper language requiring that signs be posted at the nearby parking lots and trailheads at least one month in advance of sediment removal activities.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Pre-Sediment Removal; Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			
NOISE/VIBRATION							
MM N-1: The LACFCD shall restrict the operation of any off-road construction equipment that is powered by a greater than 200-horsepower engine from operating within 180 feet of any offsite residential structure. Equipment that is not performing any earth-moving activities and is solely operating for entering or leaving the site via the access roads to the reservoir is exempted from this requirement.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Less than significant			

MITIGATION MONITORING AND REPORTING PROGRAM Devil's Gate Reservoir Sediment Removal and Management Project							
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					Initial	**Date**	**Remarks**
TRANSPORTATION/TRAFFIC							
MM TRA-1: Proposed Project haul trucks will not deliver to the Vulcan Material Reliance Facility during the PM peak period.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Implementation of mitigation measures would reduce impacts but not to a level of less than significant			
MM TRA-2: Proposed Project haul trucks will not deliver to the Boulevard Pit during the PM peak period.	Final Plans and Specifications; Pre-Sediment Removal; Sediment Removal; Reservoir Management	Sediment Removal; Reservoir Management	Los Angeles County Flood Control District	Implementation of mitigation measures would reduce impacts but not to a level of less than significant			

*The Implementation and Monitoring phases are broken down into four categories: Final Plans and Specifications; Pre- Sediment Removal; Sediment Removal; and Reservoir Management. "Final Plans and Specifications" indicates that the mitigation measure must be incorporated into the final approved design, plans, and specifications for the project. "Pre- Sediment Removal" refers to measures that are required prior to the start of the sediment removal phase. "Sediment Removal" refers to all aspects of the Sediment Removal phase. "Reservoir Management" refers to all aspects of the Reservoir Management phase.

APPENDIX O

Budget Line Item

DEPARTMENT OF PUBLIC WORKS
FLOOD FUND
FY 2017-18 BUDGET
DESIGNATIONS

PROJECTS	2016-17 ADOPTED BUDGET	ESTIMATED PROJECT COST	2017-18 RECOMMENDED BUDGET	ANTICIPATED ADVERTISE DATE
A. Sediment Removal Projects				
1. Cogswell Reservoir Sediment Removal Project	$ 25,000,000	$ 20,000,000	$ 20,000,000	FY 18-19
2. SR - Big Tujunga Reservoir Post-Fire Sediment Removal Project	$ 25,000,000	$ 33,000,000	$ 25,000,000	FY 17-18
3. SR - Devil's Gate Reservoir Sediment Removal Project	$ 60,000,000	$ 83,000,000	$ 51,000,000	FY 17-18
4. Eaton Wash Reservoir Sediment Removal Project	$ 9,000,000	$ 9,000,000	$ 9,000,000	FY 18-19
5. Morris Reservoir Sediment Removal Project	$ 7,000,000	$ 7,000,000	$ 7,000,000	FY 20-21
6. San Gabriel Reservoir Sediment Removal Project	$ 16,624,000	$ 16,624,000	$ 16,624,000	FY 18-19
7. SR - Devil's Gate Reservoir Sediment Removal Mitigation	$ -	$ 14,000,000	$ 14,000,000	TBD
Subtotal for Sediment Removal Projects	**$ 142,624,000**	**$ 182,624,000**	**$ 142,624,000**	
B. Pacoima Dam Sediment Removal	**$ 26,000,000**	**$ 80,000,000**	**$ 26,000,000**	FY 18-19
Total for Sediment Removal Projects (A+B)	**$ 168,624,000**	**$ 262,624,000**	**$ 168,624,000**	
C. Infrastructure and Facility Improvements				
1. Hancock Park Regional Relief	$ 30,000,000	$ 30,000,000	$ 30,000,000	FY 18-19
2. Crenshaw Relief Drain	$ 17,300,000	$ 17,300,000	$ 17,300,000	FY 19-20
3. Future EWMP Projects	$ 24,082,000	$ 25,000,000	$ 24,082,000	TBD
Total for Infrastructure and Facility Improvements	**$ 71,382,000**	**$ 72,300,000**	**$ 71,382,000**	
D. Sun Valley Watershed				
1. Sun Valley Watershed Upper Storm Drain, Phase 1	$ 6,800,000	$ 6,800,000	$ 6,800,000	FY 17-18
2. Sun Valley Watershed Upper Storm Drain, Phase 2	$ 20,400,000	$ 25,400,000	$ 20,400,000	FY 18-19
3. Sun Valley Watershed Upper Storm Drain, Phase 3	$ 14,600,000	$ 14,600,000	$ 14,600,000	FY 18-19
4. Rory M. Shaw Wetlands Park (Demolition), Phase 1	$ 1,500,000	$ 1,500,000	$ 1,500,000	FY 17-18
5. Rory M. Shaw Wetlands Park (Crushing and Grading), Phase 2	$ 20,500,000	$ 20,500,000	$ 20,500,000	FY 17-18
6. Rory M. Shaw Wetlands Park (Above Ground Improvements), Phase 3	$ 30,000,000	$ 30,000,000	$ 30,000,000	FY 18-19
Total for Sun Valley Watershed	**$ 93,800,000**	**$ 98,800,000**	**$ 93,800,000**	
E. Committed for Capital Assets (Equipment Replacement)	**$ 2,945,000**	**$ 2,945,000**	**$ 2,945,000**	TBD
F. Litigation and Disaster Response Costs	**$ 5,000,000**	**$ 5,000,000**	**$ 5,000,000**	TBD
TOTAL	**$ 341,751,000**	**$ 441,669,000**	**$ 341,751,000**	