(This page intentionally left blank)

TULE I WIND
DRAFT HABITAT MITIGATION AND MONITORING PLAN

APPLICANT:
Tule Wind, LLC.
1125 NW Couch Street, Suite 700
Portland, Oregon 97209
Contact: Jesse Gronner

PREPARED BY:
ICF International
525 B Street, Suite 1700
San Diego, CA 92101
Contact: Lindsay Teunis
Lindsay.Teunis@icf.com
(858) 444-3928

October 2016

ICF International. 2016. Tule I Wind Habitat Mitigation and Monitoring Plan. Draft. October (ICF 00567.15) San Diego, CA. Prepared for Tule Wind, LLC.

Contributors

ICF Jones & Stokes
Lindsay Teunis, and Matt Kedziora
525 B Street, Suite 1700
San Diego, CA 92101
lindsay.teunis@icf.com (858) 444-3906
matt.kedziora@icf.com (858) 444-3921

Distribution List

U.S. Army Corps of Engineers
Contact: Andreas Polis
Email Address: Andreas.Polis@usace.army.mil
Phone: (760) 602-4832

State Water Resources Control Board
Contact: Cliff Harvey
Email Address: Clifford.Harvey@waterboards.ca.gov
Phone: (916) 558-1709

California Department of Fish and Wildlife
Contact: Eric Weiss
Email Address: Eric.Weiss@wildlife.ca.gov
Phone: (858) 467-4289

Contents

Tables

Figures

Acronyms and Abbreviations

A-72	Agriculture
AA	Assessment Area
ACEC	Area of Critical Environmental Concern
BLM	Bureau of Land Management
BMP's	Best Soil Management Practices
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNLM	Center for Natural Lands Management
CRAM	California Rapid Assessment Method
EA	Environmental Assessment
ESDRMP	Eastern San Diego County Resource Management Plan
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
GPS	global positioning system
HMMP or Plan	Habitat Mitigation and Monitoring Plan
ICF	ICF International
LF	linear feet
LTM	Long Term Management Plan
MVCLWMA	McCain Valley Cooperative Land and Wildlife Management Area
NPDES	National Pollution Discharge Information System
OBL	obligate wetland
PAR	Property Analysis Record
PBHS	Peninsular bighorn sheep
PCA	Pest Control Advisors
PEP	plant establishment period
Project	Tule I Wind Project
QCB	Quino checkerspot butterfly
RL-80	Rural Lands
SDHC	San Diego Habitat Conservancy
Site	mitigation site
SWRCB	State Water Resources Control Board
Tule Wind LLC	property owners
USACE	U.S. Army Corps of Engineers

This page intentionally left blank.

Chapter 1
Project Description

1.1 Project Summary

The Habitat Mitigation and Monitoring Plan (HMMP or Plan) is intended for use as compensatory mitigation for unavoidable impacts on jurisdictional waters of the U.S. (U.S. Army Corps of Engineers [USACE] jurisdiction), waters of the State (State of California jurisdiction), California Department of Fish and Wildlife (CDFW) jurisdiction, and associated habitats due to the implementation of the Tule I Wind Project (Project). This HMMP provides direction for implementing a program to enhance and preserve native habitats within the identified Mitigation Parcel and the Preservation Parcels located in eastern San Diego County, north of Boulevard and Mount Tule (Figure 1 and Figure 2). The enhancement and preservation will provide offsite mitigation for permanent impacts on jurisdictional resources from the Project. This HMMP was prepared by ICF International (ICF) staff serving as consultants to Tule Wind, LLC. The representative contacts at ICF is Lindsay Teunis, Restoration Team Manager and Devon Muto, San Diego Office Manager

1.2 Compensatory Mitigation

The HMMP has identified a mitigation site (Mitigation Parcel; Site) to offset impacts on jurisdictional features associated with the Project. Table 1-1 provides a summary of the total jurisdictional features permanently affected by the Project while Table 1-2 is broken out further by vegetation community. Impact estimates are based on the most current project footprints but are subject to change as a result of project refinements. Table 1-3 summarizes the jurisdictional features for the proposed mitigation site separated out between the Mitigation Parcel (where enhancement will occur) and the Preservation Parcels. The enhancement and preservation is proposed to offset permanent impacts on federal and state jurisdictional features. Please note that no impacts on federal or state wetlands will occur as a result of the mitigation and preservation described in this Plan. Management of the Preservation parcels will also be addressed by a Long Term Management Plan.

The Mitigation Parcel supports over 4,500 linear feet of ephemeral stream drainages as well as 0.08 acre of federal wetlands (Figure 3). Portions of the primary drainage (Drainage 1), upstream of the confluence with Drainage 2, include large tamarisk (*Tamarisk ramosissima*) shrubs. Field mapping estimated 6-8 areas with large shrubs totaling approximately 0.036 acre along a 1,575-foot reach of the drainage (Figure 4). Although currently at low densities, these shrubs have the potential to disperse large quantities of seed into the Site, risking further degradation of the native vegetation. In addition, this parcel is at the headwaters to a sensitive wetland area that supports bighorn sheep and other desert species; as such, the spread of this species downstream along the lower watershed and into the Carrizo Plain represents a serious risk to the health of the watershed, which has historically been infested with this highly invasive species. Efforts in the Mitigation Parcel will treat and remove tamarisk or other problematic non-native species within Drainage 1 and 2. Detailed methods for treatment of problematic non-native species are included in Chapter 5 Implementation Plan. Additional efforts to improve watershed health will include closure, erosion control

installation and re-vegetation of OHV access routes within the Mitigation Parcel. Details of these processes are also included in Chapter 5.

In addition to the Mitigation Parcel, three additional, adjacent parcels (Preservation Parcels) will be acquired and preserved to further offset impacts on jurisdictional features and other impacts, such as those on species and sensitive habitat (permitted separately) (Figures 1, 2, and 4). Within the Preservation Parcels, jurisdictional features have been estimated using the National Hydrography Dataset and conservative estimates of width based on similar features delineated by ICF staff. As no formal delineation has been done for these parcels, it is assumed no wetlands exist. Additionally further field reconnaissance of these parcels completed in July 2016 did not document any wetlands. Based on National Hydrography Dataset data, the Preservation Parcels will set aside 10,665 linear feet of first- and second-order ephemeral streams with an estimated 1.2 acres of USACE jurisdiction and 2.4 acres of CDFW jurisdiction. Activities to take place in the Preservation Parcels include presence-absence monitoring for problematic species, as described by California Invasive Plant Council (Cal-IPC) and in Chapter 5 Implementation Plan. Additional activities within the Preservation Parcels will include access-point closure of OHV access routes leading into the Site. It should be noted that installation of access routes and turbines are planned for portions of the Preservation Parcels, but those features are at least ½ mile west of the Mitigation Parcel and not near any jurisdictional features mapped within the Preservation Parcels

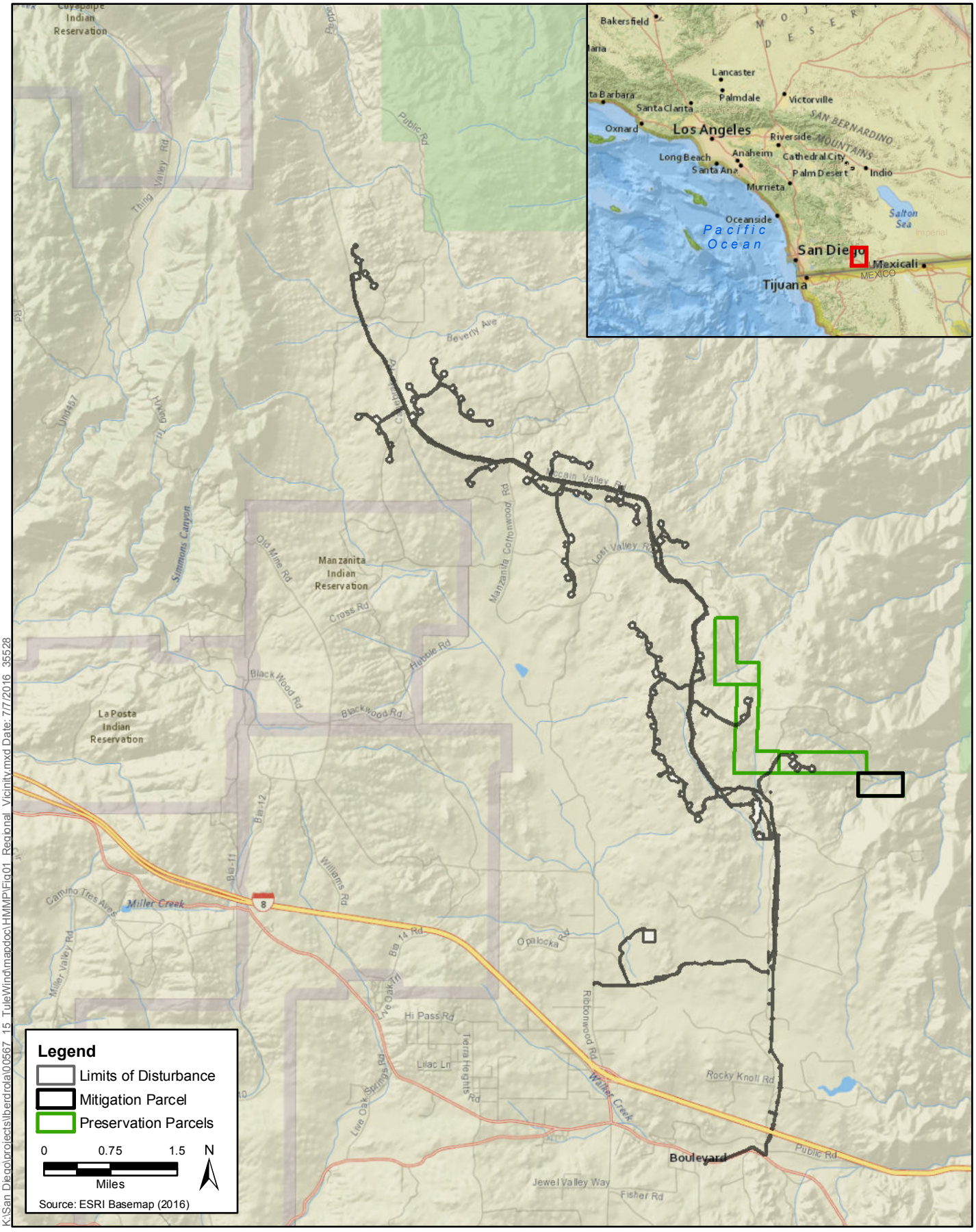
This Plan proposes to enhance the Mitigation Parcel drainages by treating and removing the existing tamarisk and any other nonnative species within the drainages and will further treat the Site for 5 years. Efforts described in this Plan will eliminate existing populations of target non-native species and further remove any newly germinated (seed bank-associated) individuals, which will reduce the seed bank of this invasive species and others as identified. It should be noted that upstream portions of the Upper Carrizo Creek watershed could contain propagules of problematic weed species which could affect health of the Site, however efforts to monitor and eliminate any new populations will be made. Determination of problematic species-management assumptions, made on a species by species basis, will allow for adaptive management to occur, in coordination with relative Agencies. These assumptions will consider proposed long term management goals (i.e. regional goals related to long term property management).

In addition to stream enhancement, the Plan will preserve an additional 3,000 linear feet (LF) of ephemeral drainage as well as 0.08 acre of wetlands within the Mitigation Parcel, along with intact upland resources that serve as buffer to the wetland and further support high wetland condition. Furthermore, the Project will be acquiring three additional parcels that adjoin the Mitigation Parcel and include additional jurisdictional drainages (10,665 LF or 1.2 acres) that will be preserved and managed in perpetuity. Although the focus of this Plan is on the Mitigation Parcel the preservation amount for the Preservation Parcels has been included as mitigation.

Table 1-1. Permanent Impacts on Jurisdictional Features Associated with the Project

Permanent Jurisdictional Impacts	USACE/SWRCB	CDFW
Acreage	0.121	0.23
Linear Feet	2,100	2,100

USACE = U.S. Army Corps of Engineers
SWRCB = State Water Resources Control Board
CDFW = California Department of Fish and Wildlife



K:\San Diego\projects\lberdrola\00567_15_TuleWind\mapdoc\HMMP\Fig01_Regional_Vicinity.mxd Date: 7/7/2016 35528

Figure 1
Regional Vicinity Map
Tule HMMP

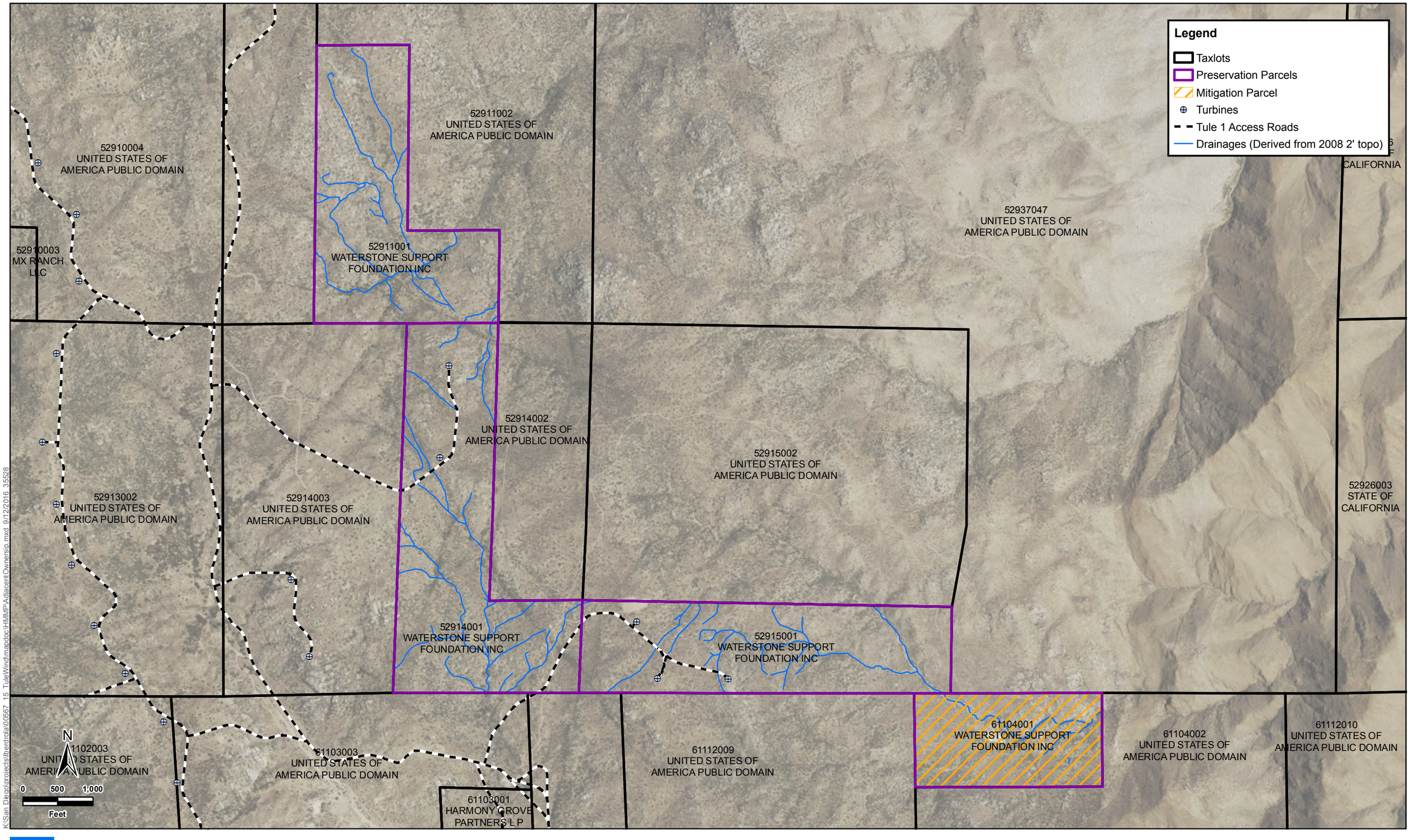


Figure 2
Preservation Parcels and Adjacent Ownership
Tule 1 Wind Project HMMP

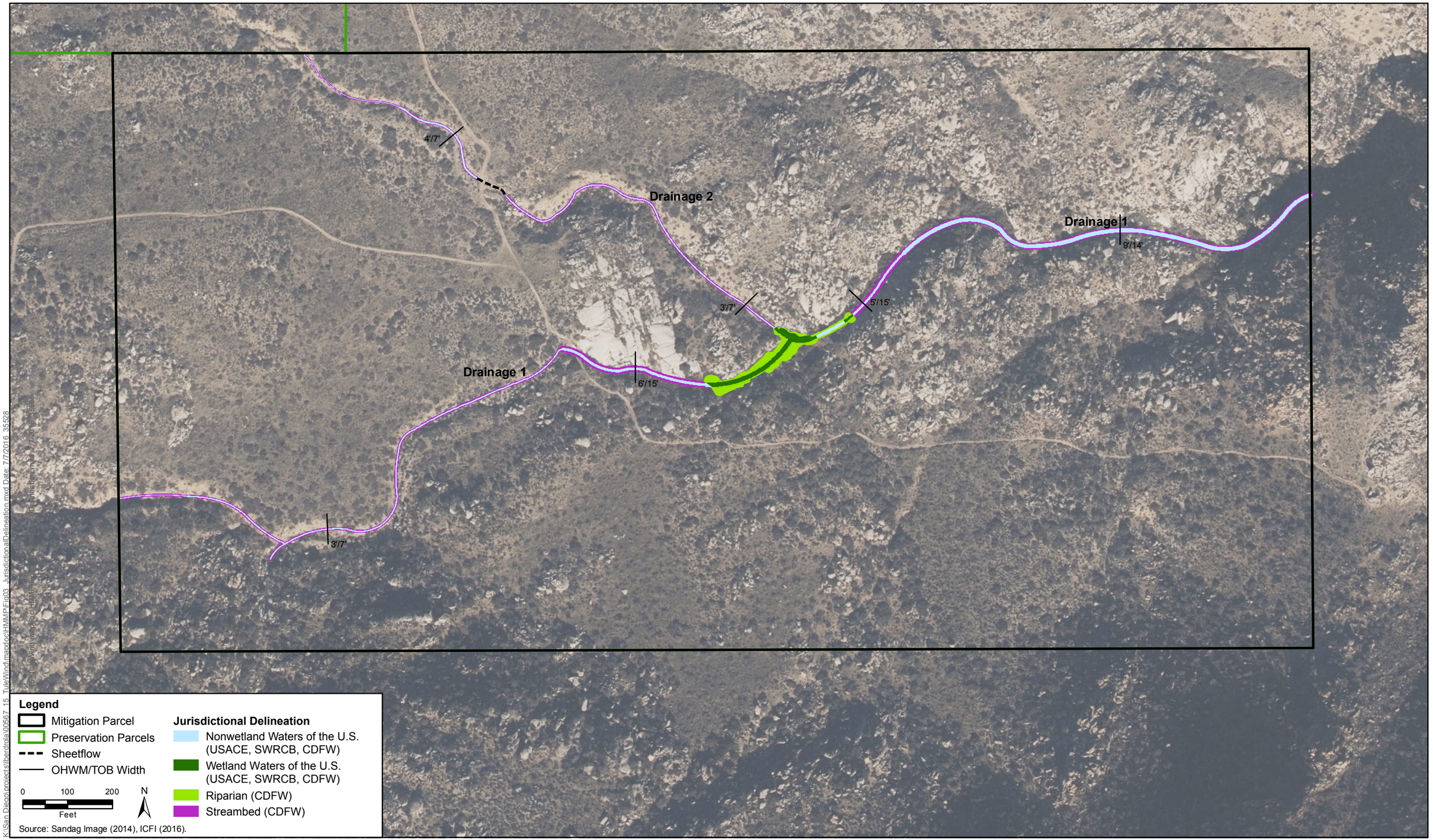
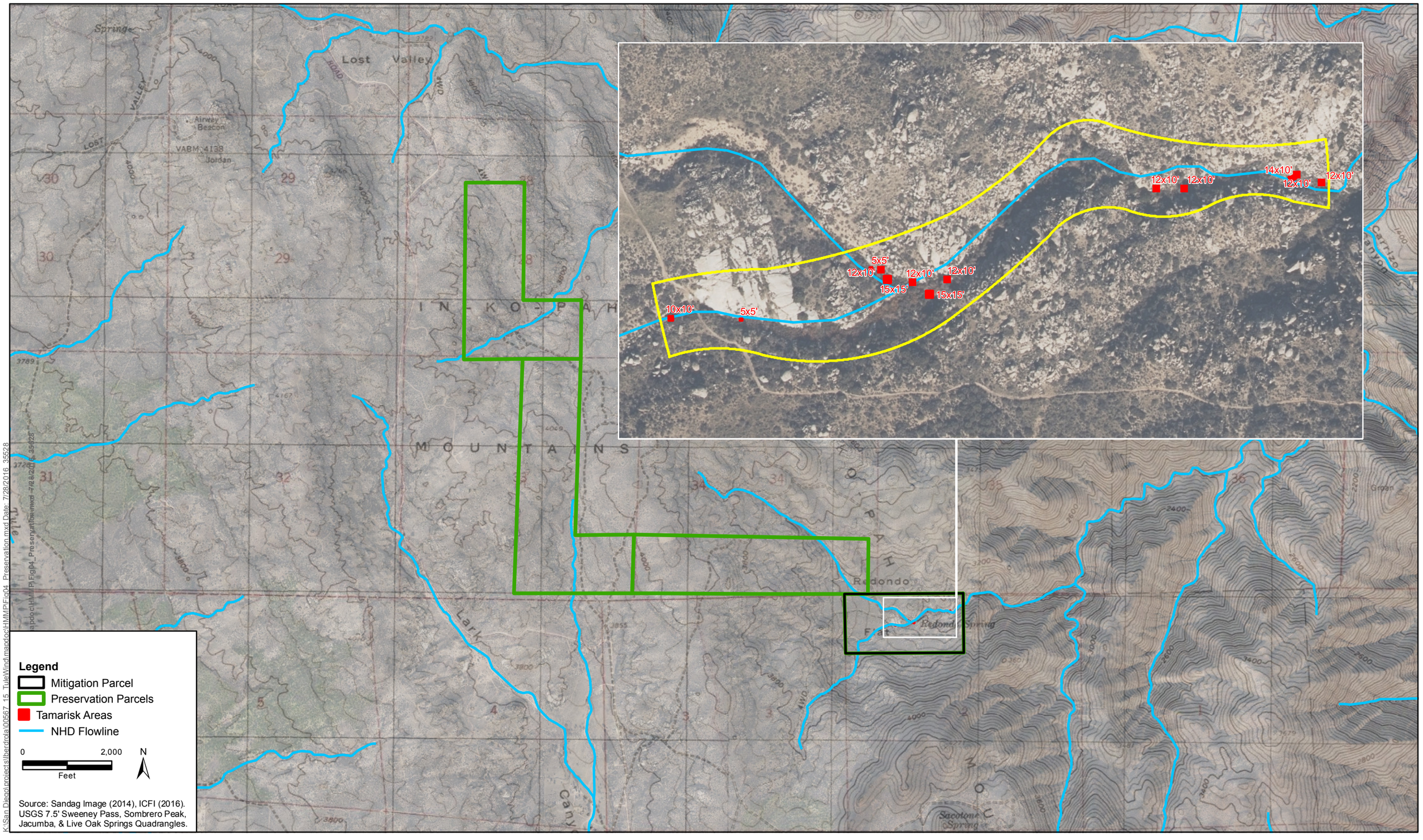


Figure 3
Jurisdictional Delineation
Tule HMMP



K:\San Diego\projects\Iberdrola\00567.15_TuleWind\mapdoc\HMMP\Fig04_Preservation.mxd Date: 7/28/2016 35528

Figure 4
Preservation and Enhancement
Tule HMMP

Table 1-2. Permanent Impacts on Jurisdictional Features by Vegetation Types

	Permanent Jurisdictional Impacts[1]	
Vegetation Type	Linear Feet	Acreage
Big Sagebrush Scrub	269	0.011
Dense Coast Live Oak Woodland	-	0.013
Disturbed Habitat	78	0.027
Montane Buckwheat Scrub	54	0.004
Open Coast Live Oak Woodland	102	0.006
Redshank Chaparral	67	0.013
Scrub Oak Chaparral	200	0.041
Semi Desert Chaparral	696	0.027
Upper Sonoran Subshrub Scrub	634	0.087
Total	2,100	0.23

[1] Acreages of impacts on jurisdictional features by vegetation type provided in this table are those that occur within the CDFW jurisdictional limits, which includes the USACE/SWRCB jurisdiction but also extends out to the top of bank or edge of riparian canopy.

Table 1-3. Compensatory Mitigation Acreage Quantities by Restoration Type for HMMP

			USACE/SWRCB		CDFW	
Drainage #	Mitigation Type	Stream Length (linear feet)	Non-Wetland (acres)[1]	Wetland (acres)[1]	Streambed (acres)[1]	Riparian (acres)[1]
Mitigation Parcel						
1	Enhancement[2]	1,575	0.036	-	0.036	-
1	Preservation	1,654	0.334	0.08	0.674	0.25
2	Preservation	1,374	0.09	-	0.20	-
Total		4,603	0.46	0.08	0.91	0.25
Preservation Parcels[3]						
	Preservation	10,665	1.2	NA	2.4	NA
Mitigation Summary						
	Enhancement	1,575	0.036	-	0.036	-
	Preservation	13,693	1.624	0.08	4.184	0.25

[1] Total acreage may not add up to the total shown; total is reflective of rounding geographic information system (GIS) raw data in each category.

[2] Enhancement acreage is based on an estimated coverage of tamarisk (10%) within the enhancement stream reach.

[3] The Preservation Parcels have not been formally delineated. All jurisdictional estimates are conservative lows based on the narrow delineated width of the Mitigation Parcel.

USACE = U.S. Army Corps of Engineers

SWRCB = State Water Resources Control Board

CDFW = California Department of Fish and Wildlife

1.3 Responsible Parties, Roles, and Responsibilities

Ultimately, Tule Wind, LLC and its contractors are responsible for installation, maintenance, and monitoring in accordance with this HMMP to successfully complete the mitigation program. Their roles and responsibilities, as well as those of other involved parties, are summarized below. Additional details for each role are discussed throughout the document, where applicable.

Owner/Responsible Party: Tule Wind, LLC will be the party financially responsible for (1) all negotiations and costs associated with the mitigation implementation, (2) the 5-year maintenance period and monitoring of the Parcels for a term of 5 years or until target non-native success criteria and road re-vegetation are achieved, and (3) the costs associated with the perpetual monitoring and management of the mitigation property as defined in this HMMP. At this time the individual representative for Tule Wind, LLC is Jesse Gronner.

Tule Wind, LLC will be responsible for contracting a qualified habitat restoration ecologist and a licensed landscape contractor(s) for installation, maintenance, and monitoring to carry out the provisions of this HMMP. Tule Wind, LLC may select separate contractors for the installation and maintenance phases. Both contractors will meet the minimum requirements described below. Tule Wind, LLC will establish contractual mechanisms to ensure the completion of installation, maintenance, and monitoring activities delineated in this HMMP. Tule Wind, LLC may, with sole discretion, replace any of these parties.

Restoration Ecologist: The restoration ecologist will be an individual or team of individuals with a degree in botany, ecology, or related field, and a minimum of 10 years of experience in Southern California with successful wetland restoration (preferably riverine). The lead restoration ecologist must have knowledge of vegetation management and focal species of concern (native and non-native), and landscape construction. The Restoration Ecologist must hold a Landscape Contractor's license (C-27) and Qualified Applicator's or Pest Control Advisor's license with the California Department of Pesticide Regulation. The restoration ecologist, in coordination with the contractor, will oversee protection of existing biological resources, nonnative plant removal, maintenance and monitoring, as well as reporting.

The restoration ecologist will be responsible for the following.

- Supervision of nonnative species removal and final installation inspection and approvals as delineated in this HMMP
- Supervision of OHV road-closure in Mitigation Parcel (erosion control installation and application of re-vegetation materials, vertical mulching, fencing, rock placement or gate installation)
- Identification of locations for OHV road closure (vertical mulching, fencing, rock placement or gate installation)
- Halting work by the installation contractor at any point where the provisions of this HMMP are not being adhered to until such time as the inconsistency is resolved with Tule Wind, LLC

After installation, the restoration ecologist will be responsible for monitoring and making remedial recommendations (regarding weeding, erosion control, etc.) for ongoing maintenance activities performed by the maintenance contractor after HMMP installation, as specified herein.

The restoration ecologist will be responsible for carrying out the biological monitoring and reporting program described in this HMMP. The program will include the following tasks: agency notification (as needed), qualitative and quantitative data collection as required to measure success progress, photo documentation, post-installation monitoring reports documenting progress, and a final assessment of success at the end of the 5-year maintenance and monitoring program.

Installation Contractor: The installation and maintenance contractor will be a qualified firm (or more than one firm) with successful experience in Southern California and direct experience installing and maintaining native habitat mitigation projects. The contractor must hold a Landscape Contractor's license (C-27). The installation contractor will be responsible for riparian nonnative species management, OHV road access closures, and re-seeding of Mitigation Parcel OHV roads, in accordance with the provisions of this Plan and as approved by the restoration ecologist. The responsibilities of the installation contractor will end with the completion of the requirements for the 120-day plant establishment period.

The installation contractor will verify in writing to Tule Wind, LLC prior to starting work the following minimal qualifications: a C-27, certification and a California Pest Control Advisors (PCA). A Qualified Applicator License may substitute for a PCA. Previous successful experience with at least three prior native habitat restoration project installations of similar size and scope, and knowledge of local flora and fauna is required

Maintenance Contractor: After the 120-day plant establishment period, a separate maintenance contractor may be hired by Tule Wind, LLC to maintain the restoration site for the remaining

balance of the 5 years according to the provisions of this HMMP. Tule Wind, LLC may choose to use the same contractor for both installation and post-installation maintenance if the contractor meets both sets of qualifications. Prior to starting work, the maintenance contractor will demonstrate the same qualifications as the installation contractor, including demonstrating past maintenance experience with habitat restoration projects, previous successful experience maintaining at least three native restoration projects, and knowledge of local flora and fauna.

1.4 Regulatory Requirements and Compliance

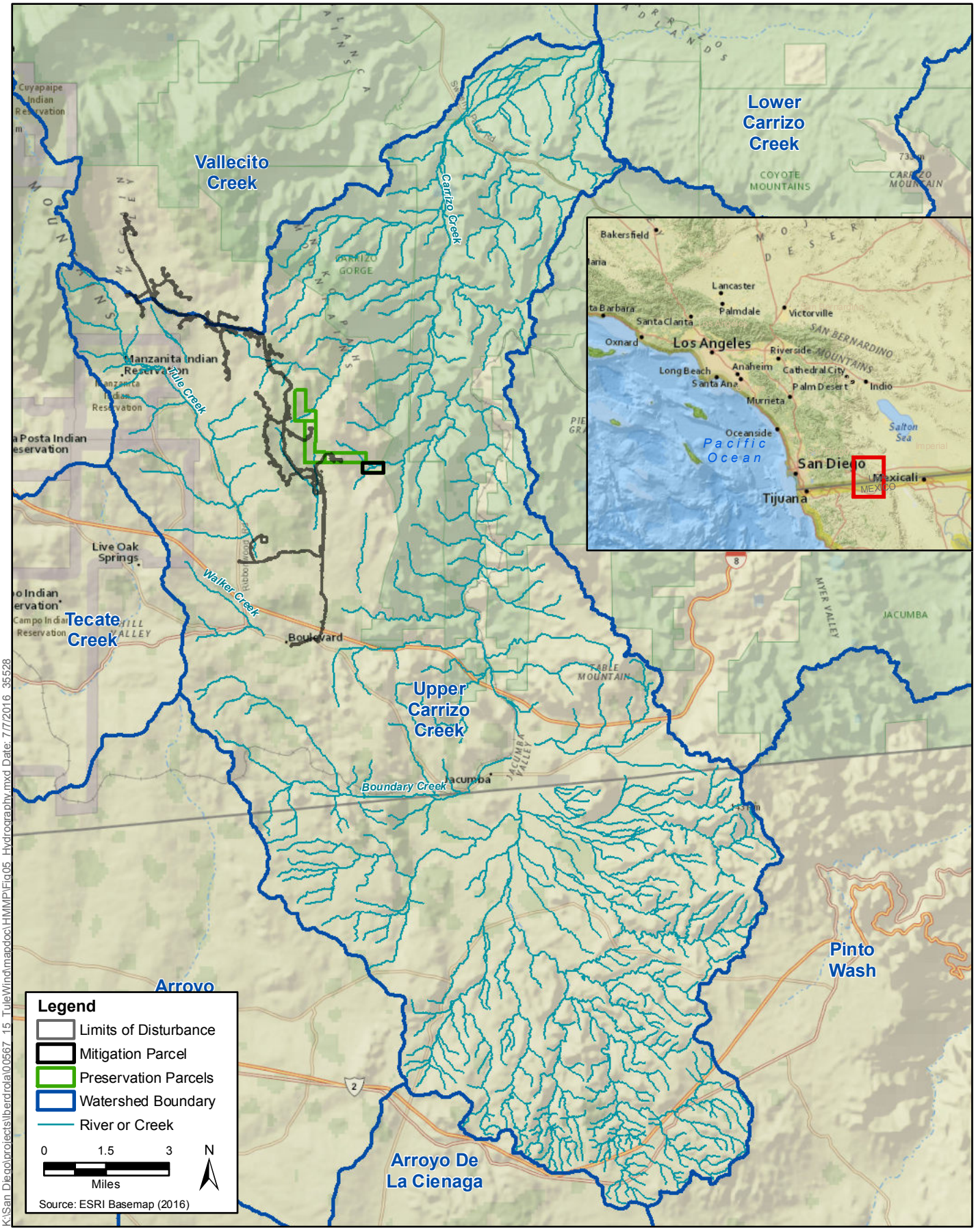
This HMMP has been prepared in accordance with the guidelines recommended in the *Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division U.S. Army Corps of Engineers* (USACE 2015) and addresses waters of the U.S. and wetland impacts regulated by the federal Clean Water Act, the California Fish and Game Code, and California's Porter-Cologne Water Quality Control Act. This Plan will support applications for issuance of a USACE 404 permit, a CDFW 1602 streambed alteration agreement, and a State Water Resources Control Board (SWRCB) 401 water quality certification. The Plan will additionally outline the mitigation strategies designed to fulfill the regulatory requirements of the federal Clean Water Act and the California Fish and Game Code. USACE, SWRCB, and CDFW will be involved with the Plan throughout the review and permitting phases and the implementation and 5-year monitoring.

1.5 Mitigation Site Location

The Project is in the McCain Valley area of southeastern San Diego County, near the unincorporated communities of Jacumba and Boulevard (Figure 1 and Figure 2). The project area is bounded by the Laguna Mountains to the west and is within the In-Ko-Pah Mountains, with rural dwellings and private land holdings interspersed. The Site is in eastern McCain Valley on private land largely undisturbed, except for minor off-highway vehicle trails and light grazing use historically. The Site is located in the Upper Carrizo Creek Watershed and is occupied largely by chaparral- and desert-scrub-covered hills, and the presence of surface rock and boulders is a dominant landscape feature. The regional, transitional vegetation represents communities of coastal mountain influences to the west and the Sonoran desert to the east. An interspersed selection of dry/ephemeral streams and/or drainages proceeds largely from west to east, draining into the Carrizo River gorge in the eastern portion of the Site (Figure 5).

1.6 Mitigation Area Ownership Status

The Tule Wind Project sites and the HMMP mitigation properties are on the U.S. Geological Survey's Jacumba West 15-minute and 7.5' Jacumba quadrangles. The mitigation properties are by Waterstone Support Foundation, Inc. (Figure 2 and Table 1-4).



K:\San Diego\projects\lberdrola\00567_15_TuleWind\mapdoc\HMMP\Fig05_Hydrography.mxd Date: 7/7/2016 35528

Figure 5
Upper Carrizo Creek Watershed
Tule HMMP

Table 1-4. Mitigation Area Ownership Parcels

Parcel Number	Owner	Project Components
611-040-01	Waterstone Support Foundation, Inc.	Ephemeral drainage enhancement and ephemeral drainage preservation
529-150-01	Waterstone Support Foundation, Inc.	Ephemeral drainage preservation
529-140-01	Waterstone Support Foundation, Inc.	Ephemeral drainage preservation
529-110-01	Waterstone Support Foundation, Inc.	Ephemeral drainage preservation

This page intentionally left blank.

Chapter 2
Mitigation Goals and Objectives

The overall goal of this Plan is to fulfill the mitigation requirements for the Project related to unavoidable impacts on jurisdictional waters of the U.S., waters of the State, and associated habitats. The primary goal for the enhancement is to assist in functional dynamics of self-sustaining wetland that is resilient to a range or natural disturbances (e.g., drought, flood). The following are the objectives of the Plan.

- Enhance 1,575 linear feet of existing ephemeral stream channel by treatment and removal of noxious vegetation species such as existing tamarisk (*Tamarisk ramosissima*). The proposed enhancement areas are riparian areas whose natural habitat functions and services may be compromised and degraded due to the presence of this species in the drainage corridor. The proposed enhancement areas contain portions of locally dense tamarisk, as well as other nonnative species.
- Preserve functions and values associated with ephemeral streams near the head waters of Tule Creek and Carrizo Creek in both the Mitigation and Preservation Parcels.
- Enhance watershed health through OHV access closures in Preservation Parcel and OHV access route restoration (Mitigation Parcel)
- Maximize approach to buffer conditions by preserving adjacent upland habitat through site selection process (acquisition of multiple parcels adjacent to Mitigation Parcel)
- Maximize sustainability of the Site by removing the invasive seed sources and vegetative propagule sources.
- Maximize wildlife use opportunities including for sensitive species, including hydrologic features to be potentially utilized by Peninsular bighorn sheep and upland Quino checkerspot butterfly habitat, which has potential to support host and nectar plants

This page intentionally left blank.

Chapter 3
Mitigation Site Baseline Information

3.1 Mitigation Site Background Information

The 81.6-acre Mitigation Parcel and the remaining 520-acre Preservation Parcels are located in McCain Valley, surrounded primarily by the Bureau of Land Management (BLM) McCain Valley Conservation Area and mixed private and state holdings. The landscape is transitional from the Laguna Mountains to the west of the valley to the eastern, low Sonoran desert, traversing rugged and exposed terrain (Figure 1 and Figure 2). The eastern side of the project site descends into the Carrizo Gorge, within the In-Ko-Pah Mountains and Carrizo Gorge Wilderness Area.

The Site is generally between 4,100 feet above mean sea level on the western portion of the Site and—at the easternmost area, where large boulders are present in the drainage corridor—3,100 feet above mean sea level. Two main drainages exist on site, as well as other ephemeral/intermittent tributaries to Carrizo Gorge. The drainages are cut into flatter bench-like areas, surrounded by higher foothills and exposed rock along boulder, dominated by semi-desert scrub-like vegetation. Representative photos of the Mitigation Parcel and the drainages are shown in Appendix A.

3.2 Watershed

The project region is within the Upper Carrizo Creek Watershed (Figure 5), in the 1,000-square-mile (640,000-acre) Anza Borrego Hydrologic Unit. Elevations in the Anza Borrego hydrologic unit range from 230 feet below sea level to almost 6,000 feet in mountains on the west end of the unit. Annual precipitation within the hydrologic unit ranges from 3 inches along the eastern border to approximately 25 inches per year in the mountainous portions to the west (SWRCB 2006). Typical runoff in the region relies on winter precipitation in the higher elevations or summer precipitation during monsoonal influences in the region.

The mitigation Site is situated east of the Tecate Divide, and drainage generally flows through the Carrizo Gorge immediately to the east to the Salton Trough and ultimately the Salton Sea. Two main dry washes and other ephemeral features exist in the mitigation Site, generally flowing east to west into the Carrizo Creek, located in the Carrizo Gorge. Episodic flow in the Site is related to brief periods of rain in the region.

The San Diego Regional Board's Basin Plan identifies erosion and sediment control programs that move to minimize soil and erosion. Soil runoff and erosion, potential results from activities similar to the construction of Tule Wind, can be managed to enhance watershed health. Property owners such as Tule Wind, LLC. can implement Best Soil Management Practices (BMP's). Goals of the Erosion and Sediment Control Program (Resolution No. 87-91) include "protection of water quality through the reduction and prevention of accelerated (man-made) erosion…" (SDRWQCB 2016). Principals identify property owners (Tule Wind LLC) as responsible for BMP's to reduce erosion and (as it relates to the Site) and protect watershed with an integrated strategy for the watershed scale and basin-wide scale beneficial uses, such as preservation and enhancement identified in this Plan.

Watershed improvements and efforts to consider basin-wide erosion management is identified in section 5.2.3.

3.3 Existing Hydrological Conditions

Existing hydrology on the Site is natural, as the Site is surrounded by open space. The drainages are the headwaters of the Carrizo Creek Watershed, with the origination of most occurring within the parcel boundaries. Minor impacts on hydrology occur at the narrow road crossings, used for access to the Site, but these effects are limited. Water is delivered to the Site as a result of rainfall and seepage from the granite outcroppings that flank many of the hillsides and drainages.

3.4 Land Uses

The Mitigation Parcel and Preservation Parcel have a General Plan land use designation under the County of San Diego General Plan (August 3, 2011) as Rural Lands (RL-80), and a Zoning designation of General Agriculture (A-72). Therefore the proposed Mitigation Area allows for the following:

- Rural type development, residential uses, agricultural uses, and other ancillary uses permitted by right
- Permitted uses under the County's Zoning Ordinance
- Other conditional uses subject to review and approval of a Minor or Major Use Permit (i.e., Major Impact Services and Utility, similar to the Tule Wind Project)

In addition to Tule Wind's previously proposed development of these lands, the landowner (Rough Acres Ranch) intended to use a portion of the proposed mitigation area to construct a large home and ancillary facilities. If not set aside for preservation, the proposed Mitigation Area would remain available for use and development such as grazing, mining and development. Under this Plan, the parcel would be preserved from development in perpetuity through a conservation mechanism, such as a conservation easement or deed restriction, subject to agency approval.

Surrounding land use designations includes the McCain Valley Cooperative Land and Wildlife Management Area (MVCLWMA) and the In-Ko-Pah Mountains Area of Critical Environmental Concern (ACEC). Adjacent land use designations also include the Carrizo Gorge Wilderness Area (immediately to the east and within the MVCLWMA) and Jacumba Wilderness Area, approximately 8 miles to the southeast (Figure 6). These designated areas are administered under the Eastern San Diego County Resource Management Plan (ESDRMP), in coordination with the BLM El Centro Field Office. The ESCDCRMP is reviewed for consistency in relation to goals of the MVCLWMA (ESDRMP 2008).

Goals and objectives of this Plan coordinate with those of ACEC Management Actions, providing protection of important values and resources (watershed health). In addition, the Site will provide for "…acquisitions of inholdings and edge-holdings" (ACEC Management Action ACC-03) and treatment of non-native invasive species (ACEC Management Action ACC-04).

The Carrizo Gorge Wilderness Area is managed under a principal of non-degradation. These principals include provision for monitoring, signing and restoration as necessary (Wilderness Area

McCain Valley Nat'l Co-op Land & Wildlife Management Area

Carrizo Gorge Wilderness

Site Location

In-Ko-Pah Mountains ACEC

Jacumba Wilderness

Anza-Borrego Desert State Park

Manzanita Indian Reservation

Campo Indian Reservation

Ocotillo

Coyote Wells

Boulevard

Bankhead Springs

Boulder Park

Jacumba

Jacumba Airport

Ejido Jacumé

Blue Angels Peak

Imperial Hwy

Old Highway 80

Dos Cabeza Rd

Painted Gorge Rd

Evan Hewes Hwy

Sweeney Pass Rd

Canebrake Rd

Campo Rd

Clark Ln

Coyote 2 Rd

Legend

- Wilderness Areas
- HMMP Site Location
- In-Ko-Pah Mountains ACEC
- McCain Valley Nat'l Co-op Land & Wildlife Management Area

0 2 4 Miles

N

Source: Bing Aerials (2010), ICFI (2016).

K:\San Diego\projects\iberdrola\00567_15_TuleWind\mapdoc\HMMP.Fig00_WMA_ACECs.mxd Date: 9/9/2016 37937

Figure 5
Adjacent Land Use Parcels
Tule HMMP

Management Action DWA-04), as well as performing restoration treatments where damage has occurred or where it will reduce vehicle incursions (Wilderness Area Management Action DWA-08).

3.5 Soil Characteristics

Soils found within the project area are predominantly loamy, coarse sand and rocky, coarse, sandy loam, typical of the region. The two classified soil types are Mottsville loamy coarse sand and Tollhouse rocky coarse sandy loam (U.S. Department of Agriculture 1973). Mottsville is a loamy coarse sand, identified primarily in the western portion of the project site. The soil series is well drained and typically occurs in valleys and alluvial plains, and is present within slopes from 2 to 9 percent in the project vicinity. Soils in the Mottsville series are generally targeted for range use.

Tollhouse series soils are excessively drained, consisting of shallow, coarse, sandy loams. These soils are primarily in the eastern, steeper portion of the Site, as the topography plunges into the Carrizo Gorge. The soils are typically found in mountains and exist on much steeper slopes, generally 30–65 percent in the project area. A higher percentage of exposed rock is associated with these soils.

3.6 Vegetation Community

The general vegetation community found within the Site includes semi-desert chaparral, a scrub-like and transitional vegetation community. It is found on eastern escarpments of the Peninsular ranges in San Diego County. The community description is based on County of San Diego's Semi-Desert Chaparral (Element Code 37400) (Oberbauer et al. 2008). The community type typically supports a mosaic of desert transitional chaparral species, and is similar to northern mixed chaparral but exhibits a more open canopy with smaller shrub stature. Representative taxa include chamise (*Adenostoma fasciculatum*), flat-topped buckwheat (*Eriogonum fasciculatum* var. *polifolium*), scrub oaks (*Quercus cornelius–mulleri* or other desert scrub oaks, sometimes hybridized), ephedra (*Ephedra* spp.), and desert apricot (*Prunus fremontii*). Understory of the community is generally sparse and sometimes rocky, but includes an assortment of nonnative winter annual grasses and filaree (*Erodium cicutarium*), yarrow (*Eriophyllum confertiflorum*), threadleaved eriastrum (*Eriastrum filifolium*), and chia (*Salvia columbariae*). A flora list is available in Appendix B.

3.7 Sensitive Species

Sensitive species known to be found near or within the mitigation Site are described below. These species are based on the CDFW California Natural Diversity Database (CDFW 2009 and 2011) and previous reports on the Site.

3.7.1 Flora

The Mitigation and Preservation Parcels are expected to contain similar sensitive plant species as those found within the entire project area due to their proximity and similar vegetation types. The Site is known to support sticky geraea (*Geraea viscida*), desert beauty (*Linanthus bellus*), Payson's jewel flower (*Caulanthus simulans*), Jacumba milkvetch (*Astragalus douglasii* var. *perstrictus*), Jacumba monkeyflower (*Mimulus aridus*), Palmer's monkeyflower (*Mimulus palmeri*), Tecate

tarplant (*Deinandra floribunda*), and Mountain Springs bush lupine (*Lupinus excubitus* var. *medius*). Based on observations in the immediate vicinity of the Proposed Mitigation Area and the presence of suitable habitat, the Site has high potential to support oceanblue larkspur (*Delphinium parishii* var. *subglobosum*). The Site also has potential to support Laguna Mountain alumroot (*Heuchera brevistaminea*), San Diego sunflower (*Hulsea californica*), and Southern jewel flower (*Streptanthus campestris*) based on the presence of suitable habitat, although these species were not recorded in the immediate vicinity of the Mitigation and Preservation Parcels.

3.7.2 Fauna

Quino Checkerspot Butterfly (*Euphydryas editha quino*) – Federally Listed as Endangered

The Quino checkerspot butterfly (QCB) prefers open grassland and sunny openings within chaparral and coastal sage shrublands that contain its larval host plant and adult nectar sources. The principal larval host plant is dot-seed plantain (*Plantago erecta*); however, the larvae may also use desert Indian wheat (*Plantago ovata*), woolly plantain (*Plantago patagonica*), Coulter's snapdragon (*Antirrhinum coulterianum*), purple owl's clover (*Castilleja exserta*), thread-leaved bird's-beak (*Cordylanthus rigidus*), and Chinese houses (*Collinsia* sp.) (USFWS 2002, 2009). These plants grow in or near grasslands and may extend into upland shrub communities of sparse chaparral and coastal sage scrub. In the chaparral and coastal sage scrub habitats where this species survives, it is most likely to be found at sites where high densities of the host plants occur. Within such areas, the QCB may preferentially select sites where exposure to winter sun is the greatest. The elevational distribution of this butterfly has historically ranged from near sea level to about 3,000 feet.

Historically, the geographic range of the QCB extended from Point Dume in Los Angeles County to northern Baja California. At the time of listing, there were only seven or eight known extant populations in the U.S. The surviving U.S. populations occur in southwestern Riverside County and San Diego County.

The life cycle of the QCB includes the following key stages. The adult flight season occurs from mid-January to late April and peaks between March and April. The eggs hatch in about 10 days, and the larvae begin to feed immediately. They feed until summer, when their primary host plant, dot-seed plantain, dies. The larvae undergo diapause during the dry season and the winter. The larvae develop through four instars, then pupate, and emerge as adults in early spring of the following year. The adults live from 4 to 8 weeks. The Mitigation Parcel and Preservation Parcels contain suitable QCB habitat and are geographically close to the 2010 QCB single observation associated with the Tule Wind project surveys (HDR 2011). In addition, two potential host plants for QCB—Coulter's snapdragon and Chinese houses (*Collinsia heterophylla*)—were observed during site reconnaissance in 2010 (HDR 2011).

Bell's Sage Sparrow (*Amphispiza belli belli*) – CDFW Watch List Species and USFWS Birds of Concern Species

The Bell's sage sparrow occurs as a non-migratory resident of the western slope of the central Sierra Nevada Range, and in the coastal ranges of California southward from Marin County to Trinity County, extending into north-central Baja California, Mexico (County of Riverside 2008). The range of Bell's sage sparrow overlaps with that of at least one other subspecies of sage sparrow (County of Riverside 2008).

The sage sparrow occupies semi-open habitats with evenly spaced shrubs that are 3.3 to 6.6 feet high (County of Riverside 2008). For site selection, specific shrub species may be less important than overall vertical structure, habitat patchiness, and vegetation density (Wiens and Rotenberry 1981). Bell's sage sparrow is uncommon to fairly common in dry chaparral and coastal sage scrub along the coastal lowlands, inland valleys, and lower foothills of the mountains within its range.

Southern California Rufous-Crowned Sparrow (*Aimophila ruficeps canescens)* – CDFW Watch List Species

The rufous-crowned sparrow is a resident of the southwest region of the United States. Southern California populations of rufous-crowned sparrow are increasingly restricted due to urbanization and agricultural development in Los Angeles, Orange, Riverside, San Diego, and San Bernardino counties (Collins 1999). Island populations have suffered significant declines although it appears that members of the species have colonized Anacapa Island in the Channel Islands in recent years (Power 1994). Rufous-crowned sparrows (*A. r. obscura*) have not been observed on Santa Catalina Island since 1863 (Grinnell and Miller 1944), and populations on Todos Santos Island in Baja California have not been observed since the 1970s (Collins 1999). Rufous-crowned sparrows have not been observed on Baja California's Islas de San Martin since they were first detected there in the early 1900s (Collins 1999). No true migratory movements have been recorded, though limited movements to lower elevations in some areas have been reported during especially severe winters (Collins 1999).

Rufous-crowned sparrows require open coastal scrub and chaparral on medium to steep slopes, at elevations ranging from 180 to 8,000 feet. This species will abandon areas where sage scrub or chaparral has become too dense or uniform. They nest in shrubs such as California sagebrush (*Artemisia californica*), manzanita (*Arctostaphylos* spp.), and poison oak (*Toxicodendron diversiloba*), as well as morning glory (*Calystegia macrostegia*) and native bunch grasses. Edge effects do not appear to have an impact on reproductive success of rufous-crowned sparrows; however, birds apparently avoid edges and small fragments of habitat (Bolger 2002).

Peninsular Bighorn Sheep (*Ovis canadensis nelsoni*) – Federally Listed as Endangered and California State-listed as Threatened and Fully Protected Species

The Peninsular bighorn sheep (PBHS) is found in the Peninsular Ranges from the San Jacinto and Santa Rosa Ranges south into Mexico. The ranges start at sea level and climb to 10,000 feet, but Peninsular bighorn sheep are rarely found above 5,000 feet. Desert bighorn sheep inhabit rocky slopes and cliffs, canyons, washes and alluvial fans. Like other bighorn sheep, they prefer rugged and open habitat and use their climbing abilities, vigilance, and excellent vision to detect and escape from predators. They are generalist herbivores and eat a wide variety of desert plants, including cacti. In summer, the distribution of desert bighorn sheep is often associated with scarce water sources. Female bighorn sheep (ewes) live in groups with their offspring, and have smaller home ranges than males (rams). Males move between female groups, joining them during the fall breeding season. Most lambs are born in spring when desert plant productivity is highest. Designated critical PBHS habitat is known to occur along the eastern boundary of the Site, thus establishing the potential for PBHS to utilize hydrologic resources on the property.

3.8 Jurisdictional Delineation

A jurisdictional delineation was performed by ICF biologists within the mitigation Site on May 4, 2016. Prior to beginning the field delineation, aerial photography, U.S. Geological Survey topographic maps, and National Wetland Inventory maps were analyzed to determine the locations of potential areas of USACE, SWRCB, and CDFW jurisdiction. Based on the pre-field analysis and previous reconnaissance of the Site, it was determined that both wetland and non-wetland features had the potential to occur within the plan area.

Potential jurisdictional features were evaluated for the presence of a definable channel and/or wetland vegetation, soils, and hydrology. The plan area was analyzed for potential wetlands using the methodology set forth in the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008a). Lateral limits of non-wetland waters were identified using field indicators (e.g., ordinary high water mark) (USACE 2008b). While in the field, potential jurisdictional features were recorded onto a 100-foot-scale color aerial photograph using visible landmarks and mapped using a Trimble hand-held global positioning system (GPS) unit with sub-meter accuracy. Vascular plants were identified using *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012) and *The National Wetland Plant List* (Lichvar et al. 2014).

A total of two drainages were delineated on site, which included two ephemeral/intermittent tributaries to Carrizo Gorge, which in turns flows directly to the Salton Sea. Table 3-1 presents the acreage and linear feet for each drainage delineated. Figure 3 shows the location and extent of USACE/SWRCB and CDFW jurisdiction. Below is a brief description of each delineated drainage.

Drainage 1 is an intermittent drainage that enters the Site from the west (flowing east). This drainage begins a few hundred feet upstream of the mitigation boundary. A smaller drainage begins near the bottom of a rock outcrop and flows for approximately 50 feet northeast before draining into Drainage 1 near the western boundary. The upstream portion of Drainage 1 within the mitigation boundary is sparsely vegetated; however, wetland habitat occurs within its defined ordinary high water mark at and near the confluence with Drainage 2. These areas support an understory dominated by yerba mansa (*Anemopsis californica*; obligate wetland [OBL]) with patches of Mexican rush (*Juncus mexicanus*; facultative wetland [FACW]) and a tree layer dominated by arroyo willow (*Salix laesiolepis*; FACW). At the confluence of Drainage 1 and 2, the wetland area functions more as a depressional wetland, lacking a defined channel or low-flow channels within this area. Hydrology indicators observed were sediment deposits as well as meeting the facultative (FAC)-neutral test. Downstream of the wetlands, Drainage 1 is primarily dominated by desertbroom (*Baccharis sarothroides;* facultative upland [FACU]).

Drainage 2 is an ephemeral drainage, flowing in a southeastern direction for approximately 1,374 linear feet before entering Drainage 1. This drainage is sparsely vegetated and does not support wetland or riparian habitat until its confluence with Drainage 1.

Table 3-1. Existing Mitigation Area Wetlands and Waters

		USACE/SWRCB		CDFW	
Drainage #	Stream Length (linear feet)	Non-Wetland (acres)[1]	Wetland (acres)[1]	Streambed (acres)[1]	Riparian (acres)[1]
1	3,229	0.37	0.08	0.71	0.25
2	1,374	0.09	-	0.20	-
Total	4,603	0.46	0.08	0.91	0.25

[1] Total acreage may not add up to the total shown; total is reflective of rounding geographic information system (GIS) raw data in each category.
USACE = U.S. Army Corps of Engineers
SWRCB = State Water Resources Control Board
CDFW = California Department of Fish and Wildlife

3.9 Existing Functions and Values

Current wetland conditions of the enhancement area were assessed using the Riverine module of the California Rapid Assessment Method (CRAM). The standard Riverine module was utilized for this effort. It may be appropriate however, to use the Episodic Streams module, expected for beta release in 2016. The Episodic Module, when further developed, can be used as a monitoring tool for the monitoring efforts, when methods are refined and publicly available. Other tools currently in testing include the Stressor Index, which has the ability to measure introduced stresses to the mitigation Parcel, if minimal. The conditions at the Mitigation Site are close to being near reference standard, and data gathered during the period of this Plan and the Long Term Management Plan (LTM) will be good resources for regional monitoring efforts.

This information will be used to evaluate baseline (ambient) conditions and to compare to a future score to ensure the Site remains at or above its current state. In addition, this information will be used to inform adaptive management decisions throughout the 5-year monitoring program as well as during long-term management. CRAM measures ambient conditions of a wetland and has been in development over the last 10 years in collaboration with resource agencies and scientists throughout California. The overall goal of CRAM is to "*provide rapid, scientifically defensible, standardized, cost-effective assessments of the status and trends in the condition of wetlands and related policies, programs and projects throughout California*" (CWMW 2013a).

The final CRAM score for each Assessment Area (AA) is composed of four main attribute scores (buffer and landscape context, hydrology, physical structure, and biotic structure), which are based on the metric and submetric scores (a measurable component of an attribute) (Table 3-2). The anticipated relationships between the CRAM attributes and metrics, and various ecological services expected from conceptual models of wetland form and function, are presented in Table 3-3. The CRAM practitioners assign a letter rating (A–D) for each metric/submetric based on a defined set of condition brackets ranging from an "A" as the theoretical best case achievable for the wetland class across California to a "D," the worst case achievable. Each metric condition level (A–D) has a fixed numerical value (A=12, B=9, C=6, D=3), which, when combined with the other metrics, results in a score for each attribute. Each metric/submetric condition level (letter rating) has a fixed numerical value, which, when combined with the other metrics, results in a raw score for each attribute. That number is then converted to a percentage of the maximum score achievable for each attribute and

represents the final attribute score ranging from 25 to 100 percent. The final overall CRAM score is the sum of the four final attribute scores, ranging from 25 to 100 percent.

Table 3-2. CRAM Attributes and Metrics

Attributes		Metrics and Submetrics
Buffer and Landscape Context		Aquatic Area Abundance Buffer: Percentage of Assessment Area with Buffer Average Buffer Width Buffer Condition
Hydrology		Water Source Hydroperiod Hydrologic Connectivity
Structure	Physical	Structural Patch Richness Topographic Complexity
	Biotic	Plant Community Composition: Number of Plant Layers Number of Codominant Species Percentage Invasion Horizontal Interspersion and Zonation Vertical Biotic Structure

Table 3-3. Expected Relationship among CRAM Attributes, Metrics, and Key Services

Attributes		Buffer and Landscape Context	Hydrology			Physical Structure		Biotic Structure				
Metrics or Submetrics		Buffer and Landscape Connectivity Metrics	Water Source	Hydroperiod	Hydrologic Connectivity	Structural Patch Richness	Topographic Complexity	Number of Plant Layers	Number of Codominant Species	Percentage Invasion	Horizontal Interspersion	Vertical Biotic Structure
Key Services	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	√		√	√	√	√	√	√	√	√	√

A summary of the metric, attribute, and overall CRAM score is provided in Table 3-4. For a complete worksheet, refer to Appendix C. The overall CRAM score for the enhancement area was 77.5. A discussion of the scoring factors at the attribute level is described below. As the enhancement proposed is not expected to change the CRAM score, no projected scores are provided.

Table 3-4. Summary of CRAM Metric and Attribute Scores for Enhancement Area in Mitigation Parcel

Attributes	CRAM Metrics and Sub-metrics	AA 1
Buffer and Landscape Context	Aquatic Area Abundance	A (12)
	Percent of Assessment Area with Buffer	A (12)
	Average Buffer Width	A (12)
	Buffer Condition	A (12)
	Attribute Score (Raw/Final)	24/100%
Hydrology	Water Source	A (12)
	Channel Stability	B (9)
	Hydrologic Connectivity	A (12)
	Attribute Score (Raw/Final)	33/91.7%
Physical Structure	Structural Patch Richness	C (6)
	Topographic Complexity	B (9)
	Attribute Score (Raw/Final)	15/62.5%
Biotic Structure	Number of Plant Layers (sub-metric)	B (9)
	Number of Codominant Species (sub-metric)	D (3)
	Percent Invasion (sub-metric)	A (12)
	Plant Community Sub-metric Score	8
	Horizontal Interspersion	C (6)
	Plant Life Forms	C (6)
	Attribute Score (Raw/Final)	20/55.6%
	Overall AA Score*	77.5

Attribute 1, Buffer and Landscape Context: The site is located in a remote area at the bottom of steep boulder laden slopes with little to no development nearly. As such the site receives reference condition scores for landscape metrics. Including an A for Riparian Corridor Continuity as there are no breaks upstream or downstream within 500 meters. In addition, buffer sub-metrics scored high, with 100 percent buffer surrounding the area and extending the maximum evaluated length of 250-meters supporting primarily native species with little soil disturbance or human visitation. .

Attribute 2, Hydrology: Once again, the site is located in a remote area at the bottom of steep boulder laden slopes with little to no development nearby. This location in the landscape results in little to no impacts to the hydrology attribute. Other than Channel Stability, both Water Source and Hydrologic Connectivity metrics score an A. The Channel Stability metric was scored a B with evidence of aggradation in the AA, although not severe and likely common for this type of a drainage in the upper watershed of a highly erodible area.

Attribute 3, Physical Structure: Both physical structure metrics scored moderate to low but all within the range of what would be considered natural for an ephemeral stream in the headwaters of this system. Five patches were observed within the AA resulting in a score of C. Topographic complexity scored a B even though the benches were difficult to discern, the channel was very complex with granite outcroppings, vegetation, woody debris and other macro and micro topographic features.

Attribute 4, Biotic Structure: The AA supported three plant layers including short (wetland species), tall (shrubs) and very tall (willow trees). Even with three layers, the site is overall

characterized by low species richness with four codominant species observed. Although none of the dominant species were nonnative or invasive it was noted that mature tamarisk shrubs occurred in the AA and pose a risk to the overall biotic metric.

This page was intentionally left blank.

Chapter 4
Mitigation Design

4.1 Site Selection Process

The Site was selected after evaluating five sites in the McCain Valley region of the In-Ko-Pah Mountains. Sites were analyzed for available enhancement, preservation, and ability to rehabilitate or re-establish quality aquatic resources that have potential to satisfy project requirements. Selection of the Site, considered preservation by the USACE criteria, was ideal due to the following:

- Remote siting east of McCain Valley Road, with rugged landscape of Carrizo Gorge to the east, allowing for minimization of unlawful encroachment or off-highway vehicle activity
- Proximity to In-Ko-Pah ACEC and Carrizo Gorge Wilderness Area
- Primarily high-quality habitat with identified locations of nonnative or invasive vegetation influencing local hydrology and availability of aquatic resources to wildlife
- Headwaters of the drainage system, key to protecting downstream wetlands and drainages, including recently restored Carrizo Marsh
- Privately owned, which potentially increases future degradation possibilities, related to ranching or other development of the Site
- Support of designated critical habitat for peninsular bighorn sheep
- Potential for Quino checkerspot butterfly habitat

4.2 Mitigation Design

This HMMP is designed to enhance and preserve hydrological processes, vegetation communities, and wildlife habitats that will be self-sustaining and can adjust to dynamic natural processes. The Plan will preserve and enhance existing ephemeral stream channels and adjacent upland habitat through the removal of nonnative or invasive species and OHV trail closures and/or re-vegetation. These goals will serve to improve hydrological conditions and reduce the significant invasive species seed source. Following restoration activities, it will also result in the protection of functions and services that, if left on the current trajectory, would likely decrease in condition as tamarisk cover increases.

4.3 Rationale for Expecting Implementation Success

The mitigation is expected to be successful because of the location of the Site and because of its proximity to other open space areas including BLM lands administered as ACEC or WMA's (Figure 6). In addition, the isolation and rugged terrain reduces the likelihood of authorized uses including active recreation. The Site's likelihood of success will be furthered by a robust monitoring and maintenance program during the 5 years following installation combined with a comprehensive

Long-Term Management Plan. The Long Term Management Plan (in Draft) will provide guidance management for the ultimate long term property manager

Chapter 5
Implementation Plan

5.1 Schedule

The compensatory mitigation program, which provides mitigation for permanent impacts to jurisdictional features, is contingent upon the approval of this conceptual mitigation plan by the resource agencies and local jurisdictions and the acquisition of the related permits. Upon appropriate approvals, implementation of the mitigation program could begin in the fall of 2016 beginning with land acquisition and treatment of invasive species. This will be followed by restoration ecologist visits, maintenance visits, and annual monitoring.

5.2 Installation

5.2.1 Site Preparation

Site preparation will include multiple available techniques for enhancement and preservation of the focal mitigation areas within the parcel. These areas include two drainages which were delineated on site, and included two ephemeral/intermittent tributaries. Methods to enhance desired plant comminutes within jurisdictional features and protect watershed health, as well as timing for implementation activities are described below.

5.2.2 Control of Invasive Exotic Plant Species

Removal of nonnative or invasive vegetation within jurisdictional features will allow for additional hydrologic resources to be available to native components of the community assemblage. Invasive species are identified as those regarded by the California Invasive Plant Council (Cal-IPC) to have a competitive advantage and ability to affect natural areas and associated function and value of the land it occupies.

Cal-IPC manages an inventory that categorizes plants as "High, Moderate, or Limited," which is a determination of the described ability to disrupt ecological processes or alter biological communities (Cal-IPC 2010). By definition, the Cal-IPC inventory sub-categorizes *non-natives* as "species introduced to California after European contact and as a direct or indirect result of human activity" and *invasive* plants as those that alter biological communities or ecosystem processes. Thus, performance standards identified in Table 7-1 are divided into both non-native and invasive species.

Treatment methods for management of target vegetation are described below:

Manual (hand removal) of weeds is the most effective when targeting problematic annual vegetation that is fruiting or present in a limited area. Use of manual treatment methods may also be useful when encountering small perennial tamarisk seedlings that can be hand removed, ensuring the entire root system is captured. The treatment technique is also utilized when chemical means (described below) are unavailable for use. For this mitigation effort, manual methods of removal will

be used in limited capacity, such as on difficult terrain where transport of chemicals or water would not be feasible, or where small seedlings are present in loose soil, where entire root structure can be confirmed to be removed. Other manual methods for treatment include "cut and paint" methods, where the first step is to use loppers or pruners to cut basal stems prior to chemical treatments. Larger trunks of older tamarisk may require chainsaws, as described in mechanical methods below.

Mechanical methods of treating target nonnative invasive vegetation include use of gas-powered weed eaters or chainsaws. Due to the robust nature of tamarisk trunks/stems however (root systems can extend multiple meters deep), gas-powered weed eaters will not be effective. Alternative mechanical methods of treatments include chainsaws, which may be used in limited duration if basal trunk diameter in in excess of 4 inches. Chainsaws will be utilized to remove above-ground biomass, exposing a fresh cut "stump" that will be treated in combination with chemical means, as described below.

Chemical methods of treatment include the application of a permitted herbicide. Chemicals (herbicides) utilized for non-native vegetation treatments are included in the Environmental Assessment (EA) for the Weed Management Plan, Tule Wind, San Diego County CA (BLM 2015). These herbicide "active ingredients" accepted for use during chemical treatment of target species include imazapyr, triclopyr, and glyphosate. Furthermore, only aquatic-approved herbicides will be allowed for use in proximity to water or in any jurisdictional feature. Any herbicide treatments must be applied under the supervision of a licensed Pest Control Advisor or holder of a valid Qualified Applicator License. The contractor will be responsible for the safe and effective use and applicable reporting to county agricultural commissioners as to the use of any chemical product. Enrollment in the National Pollution Discharge Information System (NPDES) permit system will be required.

Imazapyr, triclopyr, and glyphosate are the active ingredients in numerous trade products related to chemical treatment of selected vegetation. They are post-emergent, unrestricted herbicides that uses plant growth regulators as their mode of action. The mode of action disrupts the target species' ability to grow and photosynthesize, if applied at rates recommended by the U.S. Environmental Protection Agency registered/approved label, and at the correct stage of the plant's phenology. Typical application periods include growing seasons (typically late fall through spring).

Vegetation for target treatment in the Mitigation Parcel includes *Tamarix ramosissima* (tamarisk, or salt cedar), a multi-branched or tree-like shrub with deep taproots. Tamarisk is categorized as "High" by Cal-IPC, noting its *invasive* potential to establish in riparian and desert washes or seeps. Tamarisk is found throughout California and has potential to be present anywhere standing or sub-surface water resources are found. It has the potential to alter hydrology and soil chemistry locally, using deep taproots to monopolize available water resources. The species is a prolific seeder and has roots that have the ability to re-sprout advantageously.

Goals of tamarisk treatment include (1) removal and/or treatment above ground biomass and (2) avoidance of seed dispersal (if present). Methods for treatment and removal of this and other target nonnative or invasive vegetation may include manual, mechanical, or chemical methods of treatment, as described above.

Following removal of above-ground biomass (with hand-held loppers or chainsaws as needed and described above), chemical treatments will be "painted" directly on the cut stump portion. It is important that the herbicide application be coordinated and completed immediately after the removal of the above-ground biomass, to ensure maximum uptake of the chemical into the below-

ground root structure. All vegetative biomass will be removed from the mitigation Site and transported to an approved green-waste facility, ensuring no seed, propagules, or cuttings remain, as tamarisk has the ability to re-generate vegetative.

Due to the robust nature of the rooting structure, which can be 10–20 feet into the ground, multiple applications or chemical treatments using herbicide are expected. Monitoring for and potential re-treatments will be conducted by the restoration ecologist in subsequent project periods as described in Sections 6.3 and 6.4.

5.2.3 OHV Road Closures and Rehabilitation

Methods of OHV road closure and restoration (within the Mitigation Parcel) will be conducted in accordance to the ESDRMP's Management Actions. OHV routes of travel into/within the Site are incorporated into the ESDRMP as those that do not improve access to public lands and are considered not available for motorized use. Routes within the Site are to be blocked at Site boundaries within the Preservation Parcels or restored to enhance watershed health within the Mitigation Parcel. These routes include OHV route ID#78, 79, 80 and 84 (Figure 7). These routes, among other unnamed routes lead to the In-Ko-Pah ACEC and are categorized as "non-motorized routes/not available for motorized use" according to the ESDCMP (BLM 2008). Re-vegetation of the OHV routes within the Mitigation Parcel will be achieved by hand seeding, installation of micro-habitat and erosion control methods described below.

OHV Road Closure (All Parcels)

OHV closure within the Preservation Parcels will focus on limiting access and do not include revegetation. These same procedures will also be applied to the Mitigation Parcel to limit access during the revegetation process. Route closure will be facilitated via installation of fences and or gates and/or placing of boulders (BLM 2007). Preliminary Cost estimates for the entire plan are provided in Table 8-1. Available cactus segments will also be scattered behind boulder barriers within all OHV routes. Construction materials utilized for this effort will be provided by Tule Wind LLC during activates related to installation of permanently impacted sites associated with the Project, including roads and turbines, and in particular for those facilities that will be installed within the Preservation Parcels. Specifically, turbines H1, H2, J J2, and J3, constructed within the Preservation Parcels, will supply construction materials for OHV access blockage. Access closure will include lining boulders along permitted Tule Wind turbine access roads. The linear width of the boulder placement along the access road (at entrance of OHV road) will up to three times wider than the entry width, typically 12 feet. Thus approximately 36 feet of rock exclusion will be installed at each closure (those that are adjacent to permitted turbine access routes) by Tule Wind LLC during construction. A breakdown of total acreage related to the closures will be provided in the long term management plan.

OHV Road Re-vegetation (Mitigation Parcel)

Revegetation of portions of OHV access routes will be completed in select areas of the Mitigation Parcel, as noted in Figure 7. The re-vegetation process will incorporate application of seed resources following gate closure or blockages at Site boundaries. A total of 904 linear feet will be revegetated (equaling 10,848 square feet, or 0.43 acres), as listed in Table 5.1.

Prior to re-vegetation, certified weed-free straw wattle will be installed along topographical contours along the targeted OHV road closure area (Appendix F). Wattle will be trenched in at every 100-foot point or as needed in areas where sediment outflow is present or has potential to do so. Wattle installation will extend beyond the width of the road.

Microhabitats will then be created utilizing vegetative materials, such as scattered woody debris, scattered, salvaged cactus segments or small cobble. Microhabitat will use methods, as described by (Bainbridge 2007) for brush weirs, coil fabric and fish-scale straw installation. All methods will be conducted considering moisture retention, minimizing soil loss and water runoff, and minimize effects of wind erosion, in order to establish increased native vegetative cover, to enhance the watershed.

Vegetation materials will available as excess vegetation materials (salvaged prior to erection of turbines J1, J2 and J3) or by collection of woody debris or cobble adjacent to the closed OHV route. Staging of vegetation materials related to turbine construction will be provided to the Installation Contractor by Owner (Tule Wind LLC) and the Restoration Ecologist. The Installation Contractor will work with the Restoration Ecologist to identify vegetative materials targeted for use.

Vegetation materials will work to minimize erosion and sediment movement in the targeted area (Bainbridge 2007). The effort also reduces visibility of OHV trails and creates wildlife perches, adding habitat value while working to enhance watershed health. Vegetation materials will be transported from staging areas to the Mitigation parcel by the Installation Contractor overland via approved Mitigation Parcel Access (Figure 7) in an OHV-style transport.

Following application of vegetative debris (microhabitat creation), seed will be hand-broadcasted onto the targeted area of OHV road closure. Pitting areas will also be utilized to capture precipitation and enhance efforts for seed germination. Manual seeding and pitting applications reduces cost in remote areas and allows for specific targeting of installed microhabitats. The native seed pallette for OHV road re-vegetation is identified in Appendix D. Seed will be sourced from eastern San Diego County and be ecologically appropriate for application in targeted vegetation communities (semi-desert chaparral; Section 3.6) and work to enhance potential QCB habitat with inclusion of host plants and nectar sources. Seed will be applied at 50 pounds/acre. Final approval of seed source and potential shortages or species substitutes will be determined by the Restoration Ecologist in coordination with the Installation Contractor.

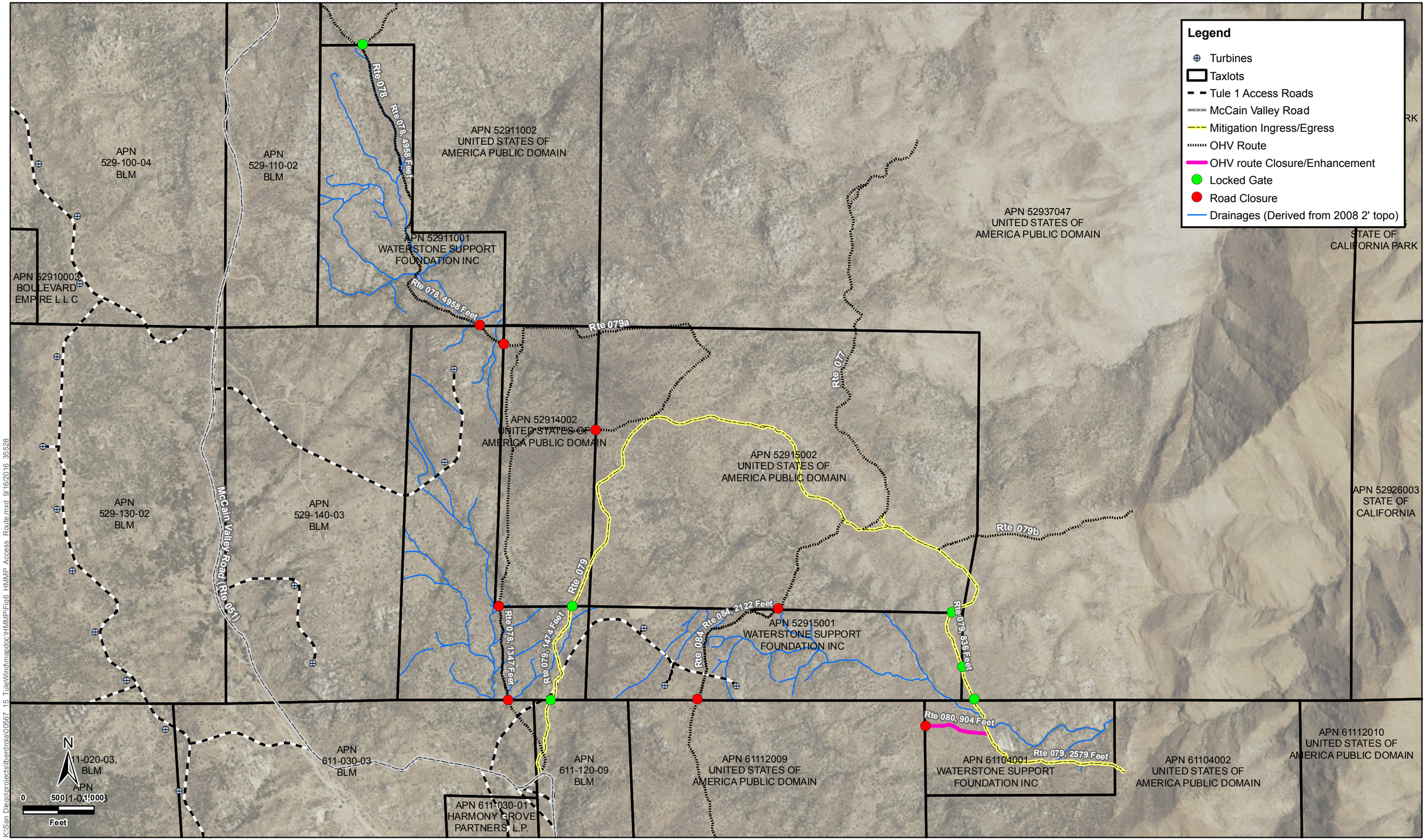


Figure 6
HMMP Access Route Management
Tule 1 Wind Project HMMP

Chapter 6
Site Maintenance

The goal of the Plan is to enhance and maintain a natural, self-sustaining wetland system requiring minimal follow-up maintenance. The maintenance program will begin when implementation has been completed and will be concentrated on the first few seasons of growth to control target nonnative invasive vegetation, which will aid in recovery of natural vegetative and hydrologic functions in the mitigation area. Detailed Performance Standards related to Site Maintenance activities are available in Table 7-1.Timing for Site Maintenance activities will correspond to Project construction activities and phenology of target non-native species, in coordination with the Restoration Ecologist. The contractor will be responsible for maintenance during the 120-day plant establishment period (PEP), and the contractor will be responsible for the remainder of the scheduled 5-year maintenance and monitoring period, which will begin after the 120-day PEP is complete.

As a guideline, the contractor is expected to perform maintenance (as needed) approximately once a month during the first 4 months (i.e., 120-day PEP). As needed, the contractor is also expected to perform maintenance approximately monthly during Year 1; every 2 months during Year 2; and quarterly during Years 3, 4, and 5. Maintenance may be needed more frequently to perform remedial measures (e.g., weed abatement, erosion control). The contractor will coordinate with the restoration ecologist on a regular basis to determine priority maintenance activities during different periods of the Plan.

6.1 Maintenance Duration

Short-term maintenance will take place for 5 years following completion of installation activities. If success standards are not being met, the maintenance period may be extended. The maintenance duration of 5 years will allow for eradication of existing and newly emergent target, invasive species (tamarisk or those described in Section 5.2.2). Additional maintenance of OHV road closure will repair erosion control materials installed during Implementation in Mitigation Parcel and maintain condition of gates or OHV road closures installed in both the Mitigation and Preservation Parcels. Following signoff by the agencies, the Site will enter a long-term maintenance period.

6.2 Responsible Parties

Short-term Site maintenance (through the 5 years or project sign-off) will be the responsibility of Tule Wind, LLC. As part of the Long Term Management Plan (currently being drafted) a fee/title holder, long-term manager/steward, and easement holder will be identified. One entity may be two of the three responsible parties but cannot hold all three roles as a checks and balances is required.

Long-term management (after project sign-off) will be the responsibility of Tule Wind, LLC until a new fee/title holder is identified. Potential fee/title holders include CDFW, San Diego County Parks, Center for Natural Lands Management (CNLM), and San Diego Habitat Conservancy (SDHC), conversations are currently underway to identify interested parties in order to present a final

recommendation to the permitting entities for the project. A property manager or steward will also be identified by the new fee/title holder and may include themselves if preferred. A conservation easement holder will also be identified and approved by the appropriate parties.

6.3 Implementation Phase

After implementation (at the completion of nonnative invasive vegetation treatments, OHV road erosion control and OHV road closure and re-seeding in Mitigation Parcel), the contractor will request an inspection by the restoration ecologist. The restoration ecologist will ensure all target vegetation was effectively treated by the contractor. Once confirmation of treatments is completed, the restoration ecologist will recommend that the implementation phase is complete and that the 5-year maintenance period has begun.

6.4 Weed Control

During the 5-year maintenance period, the contractor will provide regular maintenance of the Mitigation Parcel Preservation Parcel (as needed), including trash removal or erosion control and any additional treatments of target nonnative invasive vegetation. Nonnative weed control will consist of controlling populations of invasive weeds within the mitigation Site by the following methods: (1) manual, (2) mechanical and (3) chemical treatments, as described in Section 5.2.2

The contractor will perform maintenance visits and activities in accordance with the goals presented in this HMMP. The number of maintenance visits will vary depending on the amount of work necessary for the mitigation area to meet its success standards on schedule. Treatment will include all the target nonnative invasive vegetation and any additional problematic species identified by the restoration ecologist. It is expected that re-sprouting tamarisk may be identified, and re-treatment will be necessary. Re-sprouting tamarisk may be chemically treated with foliar applications of aquatic approved versions of triclopyr (Rodeo® or similar), glyphosate (Round Up Custom® or similar) or imazapyr (Arsenal® or similar) at label-recommended rates.

Weed species should be controlled before they set seed and before they shade and out-compete native vegetation. With consent of the Restoration Ecologist, string trimmers may be used in certain instances. Chemical control will be used for control of perennial weed species. The contractor will coordinate with the Plan's Restoration Ecologist to identify specific areas where chemical herbicides may be used. Any herbicide treatment must be have oversight and reporting by a licensed or certified Qualified Applicator. Any herbicide application in proximity to or within jurisdictional features c will be approved for aquatic use by the U.S. Environmental Protection Agency as having been reviewed and considered compatible with the aquatic environment when used according to label directions.

Within jurisdiction drainages and their immediate adjacent uplands (5 meters), less than 5 percent total cover of non-native weed species and a less than 1 percent cover of invasive species will be tolerated at the end of the 5-year maintenance period. Within closed OHV trails (Mitigation parcel), no non-native weed species cover standards apply, as success will be evaluated qualitatively and include total native cover.

6.5 Debris and Trash Removal

Leaf litter and deadwood of native trees and shrubs will not be removed from the mitigation Site. The decomposition of deadwood and leaf litter is essential for the replenishment of soil nutrients and minerals, and deadwood and snags provide valuable habitat for invertebrates, reptiles, small mammals, and birds. Human-made trash and debris will be removed from the Site by hand as needed for the first 6 months and quarterly thereafter for 5 years.

6.6 Schedule of Maintenance

Weed removal inspection will be conducted by the maintenance contractor monthly for the first 6 months and quarterly thereafter. Thereafter, the biological monitor will conduct maintenance inspections on a quarterly basis during Years 1 through 5. Recommendations for maintenance efforts will be based upon the biological monitor's site inspections, which will occur monthly for the first 6 months and quarterly thereafter.

This page was intentionally left blank.

Chapter 7
Site Monitoring

This chapter outlines the monitoring program from installation to completion including qualitative and quantitative monitoring. In addition, primary and secondary success standards are proposed.

7.1 Implementation Monitoring

The restoration ecologist will coordinate with the contractor to monitor the Project's implementation, as described in Chapter 5, *Implementation Plan*, and the 120-day PEP establishment period, to ensure that implementation is performed in accordance with this HMMP. During this period, the restoration ecologist will prepare periodic memoranda as needed that review progress, which will be submitted to Tule Wind, LLC. The contractor will be responsible for the 120-day PEP after implementation is complete to ensure that the Site meets defined success criteria (Table 7-1) and is established in a desirable manner prior to the start of the 5-year maintenance and monitoring program. The contractor will receive approval from the restoration ecologist and Tule Wind, LLC, indicating successful implementation and 120-day PEP before the start of the 5-year maintenance and monitoring program. In addition, the implementation process may require the restoration ecologist to support, inspect or approve progress at the following times:

- During demarcation of the enhancement area boundaries
- During and following weed abatement activities to ensure effective treatments and methods.
- If the Installation Contractor requests logistical support related to implementation
- When the contractor requests inspection to determine if implementation is complete or if the Installation Contractor requests

In addition, the restoration ecologist will be available to coordinate with the contractor for the following:

- Schedule upcoming maintenance as needed based on the maintenance needs and priorities.
- Walk the restoration areas to identify any problem issues, including erosion issues or new occurrences of problematic nonnative or invasive species, and potential human impacts such as OHV activity or vandalism.
- Provide support to field maintenance crews in the identification of common native and nonnative species.

7.2 Monitoring

A restoration ecologist with the qualifications specified in Section 1.3 will supervise all monitoring. This will allow for adaptive management decisions to be made, if necessary, as well as allow site progress to be tracked. All adaptive management methods will be approved by applicable permitting agencies and reported through the HMMP reporting process.

7.2.1 Photo-Documentation

Permanent stations for photo-documentation will be established prior to the implementation period using a GPS unit. Five photo stations will be identified; however, others may be added during implementation to maximize the capture of changes on site. All photo point locations will be approved by interested agencies and reported with annual reporting submissions. These locations and directions will be mapped and reported during annual monitoring efforts. The photos will be used to document the installation process in addition to the vegetation establishment. Permanent stations will ensure photographs will be taken from the same photo-point, at the same time of year, and in the same compass direction each year. Photos will be taken twice a year (June and December) at these fixed locations and catalogued to be included in the annual reports. Photographs will reflect material discussed in the annual monitoring report and will document the progress of the Site. Representative Site photographs and proposed photo points are available in Appendix A.

7.2.2 Horticultural (Qualitative) Monitoring

The restoration ecologist will direct the Plan's horticultural (qualitative) monitoring program. The goal of this monitoring is to proactively assess site conditions to address issues before they challenge the goals of the Plan. Horticultural monitoring will include review of the results from contractor weed abatement efforts and identify new sources of nonnative invasive species (or other problematic vegetation). An important feature of the horticultural monitoring is effective coordination with the contractor to exchange information, provide feedback, and agree on priority maintenance items and potential remedial measures as needed. The restoration ecologist will perform qualitative horticultural monitoring throughout the implementation period and the 5-year maintenance and monitoring program. Each horticultural visit will focus on presence of native and nonnative plant species, erosion problems, unauthorized off-highway vehicle ingress or unlawful encroachment, presence of trash, and capture of qualitative representative photographs.

The restoration ecologist will qualitatively monitor the restoration areas bi-monthly during the first year of the 5-year maintenance and monitoring program and then quarterly during Years 2, 3, 4, and 5. In addition, the restoration ecologist will conduct a site visit following any significant rain events (<.25 inches) during winter or summer monsoonal periods of precipitation. Following each horticultural site visit, the restoration ecologist will prepare a short memorandum. These memoranda will focus on any issues as described above and will include representative photographs of identified issues.

7.2.3 Wetland Condition

No wetland condition success standards are proposed, as the limited enhancement is not expected to substantially influence wetland condition scores as measured by CRAM. However, a CRAM analysis will be used to provide an evaluation of the ambient conditions of the enhanced channel within the restoration area and inform adaptive management decisions. The assessment will follow the protocols found in the latest version of the *California Rapid Assessment Method for Wetlands Riverine Wetlands Field Book* (CWMW 2013b) unless it is determined that the Episodic Field Book is adequate at the time of the Year 1 quantitative assessment. The same version will be used for the 5-year maintenance and monitoring period. Representative AAs will be established within the primary drainage (Drainage 1) to measure the change in ecosystem functions and services over the course of

the monitoring program. Up to two CRAM Riverine AAs will be established. Because the Site is expected to be wadable at all times, two-sided AAs are planned for the episodic stream assessments.

7.3 Performance Standards

Performance standards have been established for the enhancement area. These performance standards have been designed specifically for this HMMP as a means of monitoring the progress and performance of the mitigation Site. The criteria include multiple measures of the Plan's performance and final success, and include nonnative and invasive species cover goals as well as a functional assessment as shown in Table 7-1. Plan performance will be evaluated annually during regularly scheduled monitoring visits unless otherwise specified. If the Plan at any time does not appear to be on a trajectory to meet final success standards, the biological monitor will recommend remedial actions (adaptive management) to ensure conformance to the HMMP's goals and schedule.

Table 7-1. Performance Standards for Mitigation Parcel

Enhancement Component	Performance Standard	Year 1	Year 2	Year 3	Year 4	Year 5
Drainages	Percentage absolute cover of nonnative species[1]	NA	<20%	<10%	<10%	<5%
Drainages	Percentage absolute cover of invasive species[1]	NA	<Year 1	<5%	<5%	<1%
Drainages	Wetland condition (CRAM)	>/= Baseline	>/= Year 1	>/= Year 2	>/= Year 3	>/= Year 4
OHV road access closures (Mitigation Parcel)	Percentage absolute cover of native species[1]	NA	<5%	<10%	<15%	<20%

[1] Based on qualitative ocular estimates

7.4 Annual Reports

Annual monitoring reports will be submitted to the appropriate resource agencies as specified by agency permits or by the end of each calendar year following the completion of that year's monitoring activities. The annual report will include a description of the activities performed, a comparison of the Site to performance standards, and recommendations for future management actions. It will also include a vicinity map, compensatory mitigation map, mitigation treatments, photographs, transect locations, and other monitoring locations.

7.5 Adaptive Management Plan

Pursuant to Code of Federal Regulations (CFR), Title 33, Section 332.7(c) of the 2008 Mitigation Rule (33 CFR 325 and 332, and 40 CFR 230), the Plan must include an adaptive management strategy to account for unforeseen problems in the implementation, short-term development, and overall success of the mitigation program. Tule Wind, LLC staff will ensure that an experienced restoration

ecologist who is familiar with the mitigation goals is on site during each phase of the HMMP. The most critical time for adaptive management will be during implementation. Correcting problems at this early stage should reduce potential problems during site development. During implementation, the restoration ecologist will be responsible for early detection of problems with the proposed site elevations and contours and will adapt the Plan as needed.

Interim performance standards are crucial to ensuring mitigation performance follows a trajectory to attain final mitigation success. Although not anticipated, if these interim performance standards are not achieved during annual monitoring, the restoration ecologist will work with the mitigation team and regulatory agencies if these problems require substantial action. Minor problems, such as trash, vandalism, isolated instances of plant mortality, or small-scale weed or pest infestations, will be rectified as they are discovered during routine site monitoring and maintenance and included in annual reporting.

Chapter 8
Mitigation Cost and Financial Assurances

Pursuant to 33 CFR 332.3(n)(2) of the Mitigation Rule, Tule Wind, LLC will provide financial assurances in the form of a performance bond, letter of credit, or escrow account providing USACE contingency funding in the event that the mitigation Site cannot be obtained or the mitigation successfully implemented.

The first financial assurance is the estimated amount of acquiring replacement lands within the watershed or region in the event that the Site cannot be successfully purchased. The second is equal to the costs of planning, implementation, short-term monitoring (5-year monitoring period), and contingency funds for implementation.

8.1 Total Estimated Mitigation Implementation Cost

The total cost for the compensatory mitigation, including the implementation and required short-term maintenance and monitoring (20 percent contingency), is estimated to be approximately $1,450,249 (Table 8-1). Cost estimates will be refined by the selected long term manager prior to executing the financial assurances and prior to implementation. For convenience, the tasks have been categorized into property acquisition and protection, restoration planning and permitting, and implementation.

Table 8-1. Preliminary Cost Estimate for Entire Plan

Restoration Phase/Item	Total Cost	Assumptions
Site Acquisition and Protection		
Real Estate Costs	$49,735	Mitigation occurring on private property owned by applicant, cost based on CDFW estimate of [4.21 acres + 10 acres (buffer)] x $3,500.00 per acre for acquisition
Long-Term Endowment	$1,032,000	Annual costs of $36,120 (30 years)[1]
Restoration Planning and Permitting		
Design	$10,000	Includes concept design, detailed design, and hydraulic analysis
Site Preparation	$12,000	Wetland delineation/CRAM
Environmental Review	$30,000	CEQA/NEPA
Mitigation and Monitoring Plan	$10,000	Includes baseline vegetation surveys, CRAM, and jurisdictional delineation
Permitting	$25,000	Consultations and permitting for Tule
Implementation		
Invasive Species Treatment, OHV Closures and BMP Installation	$100,914	Kickoff, implementation of road closures (gates and fencing), BMP's and hand-seeding, and vegetation treatments (initial treatments), and follow-up treatments during 120-day PEP2

Restoration Phase/Item	Total Cost	Assumptions
Post-Construction Performance Monitoring and Maintenance (5-year)	$180,600	5 years of post-construction performance monitoring and site maintenance
Total	$1,450,249	

[1] Endowment total includes 20% contingency per year and is estimated at a return rate of 3.5%
[2] Total cost for 5 years estimated at 484.095 in addition to 20% contingency

8.1.1 Financial Assurances

The financial assurance will be provided in the format agreed to by Tule Wind, LLC, SWRCB and CDFW, and other regulatory agencies as necessary. Financial assurances will be provided to CDFW and SWRCB in the amount estimated in Table 8-1 unless adjusted by the identified long term manager or new site information and as approved by CDFW and SWRCB. Financial assurances will be provided using Agency templates if available and posted using the present standards for financial guarantees to warrantee mitigation requirements pursuant to the Mitigation Rule.

Chapter 9

Long-Term Management and Protection of the Site

9.1 Long-Term Management Plan

Pursuant to 33 CFR 332.7(a) of the Mitigation Rule, Tule Wind, LLC will prepare a specific long-term management plan that will govern the management of the Site in perpetuity after all performance standards have been met. Although one goal of the mitigation program is to enhance self-sustaining native habitat, some level of long-term management will be required to ensure that target functions and services are maintained. The purpose of the long-term management plan will be to maintain control over factors that could adversely affect the Site, such as invasive species, trespassing, and OHV or grazing encroachment. Tule Wind, LLC will evaluate the potential factors that could adversely affect the Site in light of the location, the condition of riparian/wetland areas surrounding the mitigation Site, and the proposed mitigation program, including the ecological performance standards described previously. The long-term management plan will be a "living" document and will include a provision to be updated every 5 years so that changes in the physical or anthropogenic environments can be adequately addressed. The long-term management plan will include identification of financing mechanism(s) for long-term management and identification of responsible party(ies), such as a third-party land manager. The draft long-term management plan will be submitted to the regulatory agencies for review and approval. A draft outline for the long-term management plan is provided in Appendix F and additional details are provided below.

9.2 Site Protection Mechanism

The Site will be protected through recordation of a real estate instrument such as a conservation easement, deed restriction, or covenant that will run with the land and will obligate Tule Wind, LLC or its successor or assigns to retain the Site as preserved land in perpetuity. The protection mechanism will ensure that the Site is protected for the primary purpose of maintaining natural aquatic resource functions and services as targeted through the ecological performance standards in Chapter 7, *Site Monitoring*. The protection mechanism will establish an appropriate third party to hold the easement with the right to enforce site protections and provide the property manager the financial resources necessary to monitor and enforce the site protections. The following are terminology related to site protection mechanisms:

- Fee title holder- Entity that owns the land and holds the physical title
- Endowment holder- Responsible for investing the endowment and managing toward returns (in interest) on the fund, to be used in perpetuity to fund property management needs
- Property manager- Paid by the endowment fund to monitor, manage, and report on the property, and to Long Term Management Plan
- Easement holder – Holds the property easement, which restricts what can be done with property and prevents future development on the parcel.

Tule Wind, LLC will draft the long-term protection mechanism using USACE's approved template document, if available. The mechanism will identify a third-party easement holder and a third-party

land manager. The conservation mechanism will preclude establishment of fuel modification zones, road crossings, paved public trails, maintained public trails, maintenance access roads, and future easements within USACE jurisdiction other than those identified in the existing restoration plans.

9.3 Management Plan Preparation Requirement

Tule Wind, LLC will prepare a specific long-term management plan utilizing the draft outline provided in Appendix E, which was based on the California templates for Mitigation Banks developed by San Francisco, Sacramento, and Los Angeles Districts of USACE and their respective Interagency Review Teams. The long-term management plan will govern the management of the mitigation Site following successful implementation of the restoration program and achievement of the 5-year ecological performance standards. The long-term management plan will summarize the management goals and objectives, identify responsible parties, characterize the baseline conditions, and define management and monitoring tasks and schedules, reporting requirements, and contingencies for adaptive management.

Following successful completion of the mitigation program (i.e., achievement of performance standards) and written concurrence by USACE and other regulatory agencies as needed, management of the mitigation Site will be transferred along with the long-term management plan to the third-party land manager. The land manager will be funded in perpetuity on an annual basis through the non-wasting endowment described below.

9.4 Funding Mechanisms/Schedule

Tule Wind, LLC will fund the long-term management and monitoring of the mitigation Site by establishing a financial instrument such as a non-wasting endowment or other mechanism approved by USACE for the purposes of fulfilling the long-term responsibilities described in the long-term management plan. The amount of the endowment will be based on a Property Analysis Record (PAR) or PAR-equivalent analysis accounting for all the required management responsibilities, including monitoring, reporting, and a contingency to account for unforeseen adaptive management needs.

The PAR and PAR-like analysis relies upon assumptions regarding capitalization rate, market rate of labor, equipment, materials, monitoring, and maintenance requirements. Tule Wind, LLC and its consultant will work collaboratively with USACE to ensure clear, consistent, and well-substantiated evaluation and accurate outputs of projected costs. The non-wasting endowment will be provided to an approved financial institution. A legal agreement between Tule Wind, LLC, USACE, and the endowment manager will be developed if necessary to govern how the endowment is managed and when monies will be released to the long-term land manager.

Chapter 10
Completion of Compensatory Mitigation

10.1 Notification of Completion

Upon achievement of the 5-year ecological performance standards and completion of the 5-year maintenance and monitoring period, Tule Wind, LLC and its restoration ecologist will prepare a Final Monitoring Report and Notice of Completion. The final report will detail whether all the requirements of the mitigation program have been met and make any necessary recommendations for modifications to the long-term management plan or initial funding amount. An updated long-term management plan and PAR or PAR-equivalent analysis will be provided if required.

The final report will be submitted to the regulatory agencies for verification of successful completion and final acceptance, and Tule Wind, LLC will extend an invitation for a final agency site visit. Pursuant to Section 7.5, *Adaptive Management Plan*, the restoration ecologist will consult with regulatory agencies annually if substantial remedial actions are needed to achieve performance standards. Should any of the restoration areas fail to meet the long-term management plan's final performance standards at the end of the 5-year maintenance and monitoring period, Tule Wind, LLC will consult with the resource agencies to determine if any additional actions are needed to attain the 5-year ecological performance standards or if alternative mitigation options need to be pursued.

10.2 Agency Confirmation of Site Performance

Upon receipt of the final report, the regulatory agencies will be requested to either confirm that the required performance standards have been met or to accept an invitation for a site visit. If regulatory agency personnel reject terminating the 5-year monitoring and maintenance program, reasons for the objection should be clearly stated so that corrective measures may be immediately scheduled. Tule Wind, LLC will schedule a meeting to resolve agency concerns, which may include implementing additional adaptive management measures or arranging to extend the monitoring period. Upon acceptance of the termination of the 5-year monitoring and maintenance program, Tule Wind, LLC will request a letter verifying the successful completion of the mitigation Plan and transfer responsibilities to the long-term manager.

This page intentionally left blank.

Chapter 11
References

Bainbridge, David A. 2007. A Guide for Desert and Dryland Restoration: New Hope for Arid Lands. Island Press.

Baldwin, Bruce G, Douglas Goldman, David J. Keil, Robert Patterson, Thomas J. Rosatti, and Dieter Wilken (eds.). 2012. *The Jepson Manual: Vascular Plants of California, Thoroughly Revised and Expanded*. University of California Press. January.

Bolger D. T. 2002. Habitat fragmentation effects on birds in southern California: contrast to the "top-down" paradigm. In T. L. George and D. S. Dobkin, eds. Stud. Avian Biol. 25: 141–157.

California Invasive Plant Council (Cal-IPC). 2010. Berkeley, California. Plant Profiles. Available at http://www.cal-ipc.org. Accessed on October 14, 2010.

California Department of Fish and Wildlife (CDFW). 2009. California Natural Diversity Database. Rarefind. Version 3.0.5. Computer database. April 6, 2009.

California Department of Fish and Wildlife (CDFW). 2011. California Natural Diversity Database. Rarefind Version 3.0.5. Computer database. June 7, 2011.

California Regional Water Quality Control Board, San Diego Region (SDRWQCB). 1994 (Amended 2016). Water Quality Control Plan for the San Diego Basin (9).

California Wetland Monitoring Workgroup (CWMW). 2013a. California Rapid Assessment Method (CRAM) for Wetlands. User's Manual, Version 6.1. pp. 67.

California Wetland Monitoring Workgroup (CWMW). 2013b. California Rapid Assessment Method (CRAM) for Wetlands. Riverine Wetlands Field Book. Version 6.1. pp. 46.

Collins, P. W. 1999. "Rufous Crowned Sparrow (*Aimophila ruficeps*). "In Distribution and Habitat Associations of Six Bird Species of Special Concern at Vandenberg Air Force Base, Santa Barbara, California." Santa Barbara Museum of Natural History Monographs Number 1. Studies in Biodiversity Number 1.

County of Riverside. 2008. "Bell's Sage Sparrow." Understanding the Plants and Animals of the Western Riverside County MSHCP (Multiple Species Habitat Conservation Plan).

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. January. Available: http://www.cpe.rutgers.edu/Wetlands/1987-Army-Corps-Wetlands-Delineation-Manual.pdf.

Grinnell, J. and A. H. Miller. 1944. "The Distribution of the Birds of California." *Pacific Coast Avifauna* Number 27. Berkeley, California: Copper Ornithological Club. Reprinted in Lee Vining, California: Artemissia Press. April 1986.

HDR. 2011. Draft Biological Technical Memorandum, Tule Wind Project. February.

Lichvar, Robert W., Mary Butterwick, Norman C. Melvin, and William N. Kirchner. 2014. *The National Wetland Plant List: 2014 Update of Wetland Ratings*. Available: http://www.phytoneuron.net/2014Phytoneuron/41PhytoN-2014NWPLupdate.pdf.

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge. 2008. Draft Vegetation Communities of San Diego County. March. Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California," Robert F. Holland, Ph.D., October 1986.

Power, D. M. 1994. Avifaunal change on California's coastal islands. Stud. Avian Biol. 15: 75–90

State Water Resource Control Board (SWRCB). 2006. Water Quality Control Plan, Colorado Basin – Region 7. Available: http://www.waterboards.ca.gov/rwqcb7/publications_forms/publications/docs/basinplan_2006.pdf

U.S. Army Corps of Engineers (USACE). 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. Available: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/trel08-28.pdf.

U.S. Army Corps of Engineers (USACE). 2008b. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. Available: http://www.spk.usace.army.mil/Portals/12/documents/regulatory/pdf/Ordinary_High_Watermark_Manual_Aug_2008.pdf

U.S. Bureau of Land Management. 2015. Environmental Assessment. Weed Management Plan for Tule Wind Project. San Diego County, CA. EA # DOI-BLM-CA-D070-2014-0090. Available: http://www.blm.gov/style/medialib/blm/ca/pdf/elcentro/nepa/tule.Par.28277.File.dat/2015%20Tule%20Weed%20EA%20052715%20CLEAN%20Dudek%20508%20final%20complete.pdf

U.S. Department of Agriculture. 1973. Soil Survey San Diego Area, California. United States Department of Agriculture, Soil Conservation and Forest Service, in cooperation with University of California Agricultural Experiment Station; United States Department of the Interior, Bureau of Indian Affairs; and Department of the Navy, United States Marine Corps. December. Available: http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/CA638/0/part1.pdf.

U.S. Department of Interior Bureau of Land Management (BLM). 2007. Burned Area Emergency Stabilization and Rehabilitation Handbook. http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.52739.File.dat/h1742-1.pdf

U.S. Department of Interior Bureau of Land Management (BLM). 2008. Eastern San Diego County Resource Management Plan and Record of Decision. El Centro Field Office.

U.S. Fish and Wildlife Service (USFWS). 2002. Quino Checkerspot Butterfly (*Euphydryas editha quino*), Survey Protocol Information. Available: https://www.fws.gov/ventura/docs/species/protocols/qcbf/qchkrsptbfly_survprotocols.pdf

U.S. Fish and Wildlife Service (USFWS). 2009. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Quino Checkerspot butterfly (*Euphydryas editha quino*); Final Rule. June.

Wiens, J. A and J. T Rotenberry. 1981. "Habitat Associations and Community Structure of Birds in Shrubsteppe Environments.".

Appendix A

Representative Photos of the Mitigation Parcel

Tule Mitigation Site Photos Taken May 4, 2016

	Direction: East Description: Looking upstream at Drainage 1 as it enters the site.
	Direction: West Description: Looking upstream at Drainage 1 near the dirt road crossing and rock outcrop.
	Direction: East Description: Looking downstream at Drainage 1 at the rock outcrop. Riparian and wetland habitat begins within this area.

Tule Mitigation Site Photos Taken May 4, 2016

	Direction: Southeast Description: Looking downstream near the confluence of Drainges 1 and 2. Wetland habitat delineated support a Salix canopy and Anemopsis understory.
	Direction: East Description: Looking downstream at Drainge 1. Photo taken downstream of the confluence of Drainages 1 and 2.
	Direction: Northwest Description: Looking upstream of Drainage 2. Photo taken upstream of the dirt road crossing.

Tule Mitigation Site Photos Taken May 4, 2016

	Direction: Northwest Description: Looking upstream of Drainage 2. Photo taken just upstream of the confluence of Drainage 1 and 2.

Appendix B

Reconnaissance-Level List of Plant Species Observed at the Tule Wind I Mitigation Site

Family	Scientific name	Common Name	Native	Life form
Anacardiaceae	*Rhus ovata*	sugarbush	yes	Perennial
Asparagaceae	*Hesperoyucca whipplii*	chaparral yucca	yes	Perennial
Asteraceae	*Achillea millefolium*	yarrow	yes	Perennial
	Anisocoma acaulis	scale-bud	yes	Annual
	Artemesia ludoviciana ssp. *albula*	silver wormwood	yes	Perennial
	Artemesia tridentata	big sagebrush	yes	Perennial
	Baccharis salicifolia	mulefat	yes	Perennial
	Baccharis sarothroides	desertbroom baccharis	yes	Perennial
	Chaenactis fremontii	desert pincushion	yes	Annual
	Corethrogyne filaginifolia	sand aster	yes	Perennial
	Encelia actoni	Acton encelia	yes	Perennial
	Encelia farinosa	brittlebush	yes	Perennial
	Ericameria brachylepis	boundary goldenbush	yes	Perennial
	Gutierrezia californica	matchweed	yes	Perennial
Boraginaceae	*Cryptantha* sp.	popcorn flower	yes	Annual
	Eriodictyon trichocalyx	yerba santa	yes	Perennial
Cactaceae	*Cylindropuntia ganderi*	gander cholla	yes	Perennial
	Echinocereus engelmannii	hedgehog cactus	yes	Perennial
Cleomaceae	*Peritoma arborea*	bladderpod	yes	Perennial
Crassulaceae	*Dudleya lanceolata*	lance-leaf dudleya	yes	Perennial
Cupressaceae	*Juniperus californica*	California juniper	yes	Perennial
Ephedraceae	*Ephedra californica*	ephedra	yes	Perennial
Ericacea	*Arctostaphylos* sp.	manzanita	yes	Perennial
Fabaceae	*Acacia greggii*	cat claw	yes	Perennial
	Acmispon glaber	deer weed	yes	Perennial
Fagaceae	*Quercus cornelius-mulleri*	Nuttall scrub oak	yes	Perennial
Geraniaceae	*Erodium cicutarium*	filaree	no	Annual
Grossulariaceae	*Ribes quercetorum*	golden gooseberry	yes	Perennial
Juncaceae	*Juncus mexicanus*	Mexican rush	yes	Perennial
Lamiaceae	*Salvia apiana*	white sage	yes	Perennial
	Salvia columbariae	chia	yes	Annual
Liliaceae	*Calochortus concolor*	mariposa lily	yes	Perennial
Nyctaginaceae	*Mirabilis multiflora var. pubescens*	giant four-o'clock	yes	Perennial
Onagraceae	*Eulobus californicus*	California primrose	yes	Annual
Plantaginaceae	*Pennstemon centranthifolius*	scarlet bulgar	yes	Perennial
Poaceae	*Avena barbata*	wild oats	no	Annual
	Bromus diandrus	ripgut brome	no	Annual
	Bromus madritensis	foxtail brome	no	Annual
	Bromus tectorum	cheat grass	no	Annual
	Schismus barbatus	Mediterranean grass	no	Annual
	Poa secunda	one-sided bluegrass	yes	Perennial
	Stipa coronata	giant stipa	yes	Perennial
Polemoniaceae	*Eriastrum densifolium*	montane woolly-star	yes	Annual
Polygonaceae	*Eriogonum fasciculatum* var. *polifolium*	buckwheat	yes	Perennial
	Eriogonum sp.	buckwheat	yes	Perennial
	Eriogonum thomasii	Thomas buckwheat	yes	Annual

	Eriogonum whighttii	foothill buckwheat	yes	Perennial
Ranunculaceae	*Delphinium parishii*	Parry larkspur	yes	Perennial
Rhamnaceae	*Ziziphus parryi*	desert jujube	yes	Perennial
Rosaceae	*Prunus fremontii*	desert apricot	yes	Perennial
Salicaceae	*Salix lasiolepis*	arroyo willow	yes	Perennial
Saururaceae	*Anemopsis californica*	yerba mansa	yes	Perennial
Simmondsiaceae	*Simmondsia chinensis*	jojoba	yes	Perennial
Solanaceae	*Datura wrightii*	jimson weed	yes	Perennial
Tamaricaceae	*Tamarisk ramosissima*	salt cedar	no	Perennial

Nonnative Species

Appendix C

California Rapid Assessment Method (CRAM) Datasheet

SUBMIT FORM

Basic Information Sheet: Riverine Wetlands

Assessment Area Name: Tule Wind, Mitigation Parcel	
Project Name: Tule Wind	
Assessment Area ID #: AA1	
Project ID #:	**Date:** 5-4-16

Assessment Team Members for This AA:

Lindsay Teunis, Lanika Cervantes

Average Bankfull Width: 5

Approximate Length of AA (10 times bankfull width, min 100 m, max 200 m)**:** 100

Upstream Point Latitude: 32°43'27.51"N **Longitude:** 116°14'17.89"W

Downstream Point Latitude: 32°43'28.49"N **Longitude:** 116°14'13.77"W

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

Photo Identification Numbers and Description: See Appendix A photo log

	Photo ID No.	Description	Latitude	Longitude	Datum
1		Upstream			
2		Middle Left			
3		Middle Right			
4		Downstream			
5					
6					
7					
8					
9					
10					

Site Location Description:

Ephemeral drainage located in Tule Mitigation Parcel. AA completed upstream of confluence with small tributary (Drainage 2 on JD). Steep granite exposed slopes and narrow drainage with upland and riparian vegetation.

Comments:

Scoring Sheet: Riverine Wetlands

AA Name: AA1				**Date:** 5-4-16	
Attribute 1: Buffer and Landscape Context (pp. 11-19)				**Comments**	
Stream Corridor Continuity (D)			Alpha. A	Numeric 12	
					No breaks
Buffer:					
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12			100% buffer
Buffer submetric B: Average Buffer Width	A	12			250m, no major breaks
Buffer submetric C: Buffer Condition	A	12			hgh % native, low use, low NN cover
Raw Attribute Score = D+[C x (A x B)½]½				24	**Final Attribute Score = (Raw Score/24) x 100** 100.00%
Attribute 2: Hydrology (pp. 20-26)					
Water Source			Alpha. A	Numeric 12	Headwaters all natural
Channel Stability			B	9	Minor aggregation at confluence
Hydrologic Connectivity			A	12	1.9 ratio
Raw Attribute Score = sum of numeric scores				33	**Final Attribute Score = (Raw Score/36) x 100** 91.67%
Attribute 3: Physical Structure (pp. 27-33)					
Structural Patch Richness			Alpha. C	Numeric 6	5 patches
Topographic Complexity			B	9	very complex but benching limited
Raw Attribute Score = sum of numeric scores				15	**Final Attribute Score = (Raw Score/24) x 100** 62.50%
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			3 layers
Plant Community submetric B: Number of Co-dominant species	D	3			4 species
Plant Community submetric C: Percent Invasion	A	12			No invasive species dominant
Plant Community Composition Metric *(numeric average of submetrics A-C)*				8	
Horizontal Interspersion			C	6	minimally complex vegetation
Vertical Biotic Structure			C	6	
Raw Attribute Score = sum of numeric scores				20	**Final Attribute Score = (Raw Score/36) x 100** 55.56%
Overall AA Score (average of four final Attribute Scores)					77.43%

Worksheet for Stream Corridor Continuity Metric for Riverine Wetlands

Lengths of Non-buffer Segments For Distance of 500 m Upstream of AA			Lengths of Non-buffer Segments For Distance of 500 m Downstream of AA		
Segment No.	Length (m)		Segment No.	Length (m)	
	1-side	2-side		1-side	2-side
1			1		
2			2		
3			3		
4			4		
5			5		
Upstream Total Length	0		Downstream Total Length	0	

Percent of AA with Buffer Worksheet

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See aerial

Percent of AA with Buffer: 100 **%**

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	250
F	250
G	250
H	250
Average Buffer Width ***Round to the nearest integer***	250

Worksheet for Assessing Channel Stability for Riverine Wetlands

Condition	Field Indicators (check all existing conditions)
Indicators of Channel Equilibrium	☑ The channel (or multiple channels in braided systems) has a well-defined bankfull contour that clearly demarcates an obvious active floodplain in the cross-sectional profile of the channel throughout most of the AA. ☐ Perennial riparian vegetation is abundant and well established along the bankfull contour, but not below it. ☐ There is leaf litter, thatch, or wrack in most pools (if pools are present). ☑ The channel contains embedded woody debris of the size and amount consistent with what is naturally available in the riparian area. ☐ There is little or no active undercutting or burial of riparian vegetation. ☐ If mid-channel bars and/or point bars are present, they are not densely vegetated with perennial vegetation. ☐ Channel bars consist of well-sorted bed material (smaller grain size on the top and downstream end of the bar, larger grain size along the margins and upstream end of the bar). ☐ There are channel pools, the spacing between pools tends to be regular and the bed is not planar throughout the AA ☐ The larger bed material supports abundant mosses or periphyton.
Indicators of Active Degradation	☐ The channel is characterized by deeply undercut banks with exposed living roots of trees or shrubs. ☐ There are abundant bank slides or slumps. ☐ The lower banks are uniformly scoured and not vegetated. ☐ Riparian vegetation is declining in stature or vigor, or many riparian trees and shrubs along the banks are leaning or falling into the channel. ☐ An obvious historical floodplain has recently been abandoned, as indicated by the age structure of its riparian vegetation. ☐ The channel bed appears scoured to bedrock or dense clay. ☐ Recently active flow pathways appear to have coalesced into one channel (i.e. a previously braided system is no longer braided). ☐ The channel has one or more knickpoints indicating headward erosion of the bed.
Indicators of Active Aggradation	☐ There is an active floodplain with fresh splays of coarse sediment (sand and larger that is not vegetated) deposited in the current or previous year. ☐ There are partially buried living tree trunks or shrubs along the banks. ☑ The bed is planar (flat or uniform gradient) overall; it lacks well-defined channel pools, or they are uncommon and irregularly spaced. ☐ There are partially buried, or sediment-choked, culverts. ☑ Perennial terrestrial or riparian vegetation is encroaching into the channel or onto channel bars below the bankfull contour. ☐ There are avulsion channels on the floodplain or adjacent valley floor.
Overall	☐ **Equilibrium** ☐ **Degradation** ☑ **Aggradation**

Riverine Wetland Entrenchment Ratio Calculation Worksheet

The following 5 steps should be conducted for each of 3 cross-sections located in the AA at the approximate midpoints along straight riffles or glides, away from deep pools or meander bends. An attempt should be made to place them at the top, middle, and bottom of the AA.				
Steps	**Replicate Cross-sections** ⟶	**TOP**	**MID**	**BOT**
1 Estimate bankfull width.	This is a critical step requiring familiarity with field indicators of the bankfull contour. Estimate or measure the distance between the right and left bankfull contours.	5.00	4.50	6.00
2: Estimate max. bankfull depth.	Imagine a level line between the right and left bankfull contours; estimate or measure the height of the line above the thalweg (the deepest part of the channel).	1.00	1.50	0.75
3: Estimate flood prone depth.	Double the estimate of maximum bankfull depth from Step 2.	2.00	3.00	1.50
4: Estimate flood prone width.	Imagine a level line having a height equal to the flood prone depth from Step 3; note where the line intercepts the right and left banks; estimate or measure the length of this line.	8.00	11.00	10.00
5: Calculate entrenchment ratio.	Divide the flood prone width (Step 4) by the bankfull width (Step 1).	1.60	2.44	1.67
6: Calculate average entrenchment ratio.	Calculate the average results for Step 5 for all 3 replicate cross-sections. Enter the average result here and use it in Table 13a or 13b.			1.90

Structural Patch Type Worksheet for Riverine wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in Table below. In the case of riverine wetlands, their status as confined or non-confined must first be determined (see page 6) to determine with patches are expected in the system (indicated by a "1" in the table below). Any feature onsite should only be counted once as a patch type. If a feature appears to meet the definition of more than one patch type (i.e. swale and secondary channel) the practitioner should choose which patch type best illustrates the feature. Not all features at a site will be patch types.

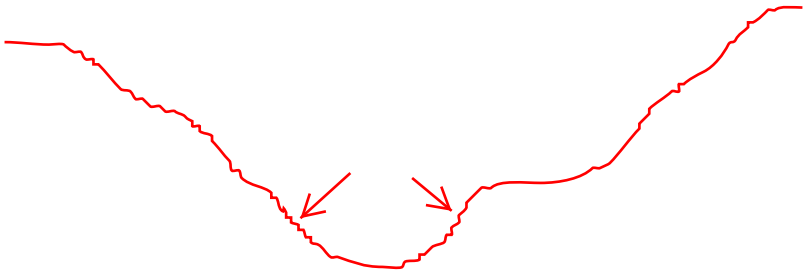
****Please refer to the CRAM Photo Dictionary at www.cramwetlands.org for photos of each of the following patch types.***

STRUCTURAL PATCH TYPE (circle for presence)	**Riverine (Non-confined)**	**Riverine (Confined)**
Minimum Patch Size	**3 m^2**	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain	☐	☑
Bank slumps or undercut banks in channels or along shoreline	☐	☐
Cobbles and/or Boulders	☐	☑
Debris jams	☐	☐
Filamentous macroalgae or algal mats	☐	☐
Large woody debris	☐	☐
Pannes or pools on floodplain	☐	**N/A**
Plant hummocks and/or sediment mounds	☐	☐
Point bars and in-channel bars	☐	☐
Pools or depressions in channels (wet or dry channels)	☐	☑
Riffles or rapids (wet or dry channels)	☐	☐
Secondary channels on floodplains or along shorelines	☐	**N/A**
Standing snags (at least 3 m tall)	☐	☑
Submerged vegetation	☐	**N/A**
Swales on floodplain or along shoreline	☐	**N/A**
Variegated, convoluted, or crenulated foreshore (instead of broadly arcuate or mostly straight)	☐	☑
Vegetated islands (mostly above high-water)	☐	**N/A**
Total Possible	**17**	**12**
No. Observed Patch Types (enter here and use in Table 14 below)	0	5

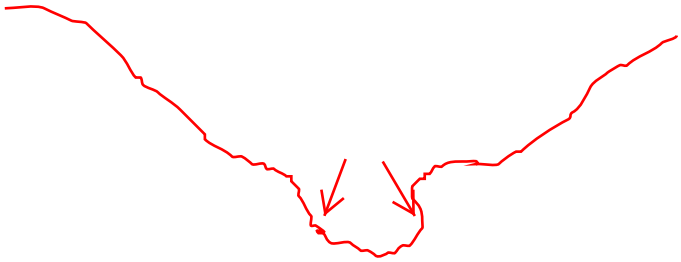
Worksheet for AA Topographic Complexity

At three locations along the AA, make a sketch of the profile of the stream from the AA boundary down to its deepest area then back out to the other AA boundary. Try to capture the benches and the intervening micro-topographic relief. To maintain consistency, make drawings at each of the stream hydrologic connectivity measurements, always facing downstream. Include the water level, an arrow at the bankfull contour, and label the benches. Based on these sketches and the profiles in Figure 10, choose a description in Table 16 that best describes the overall topographic complexity of the AA.\

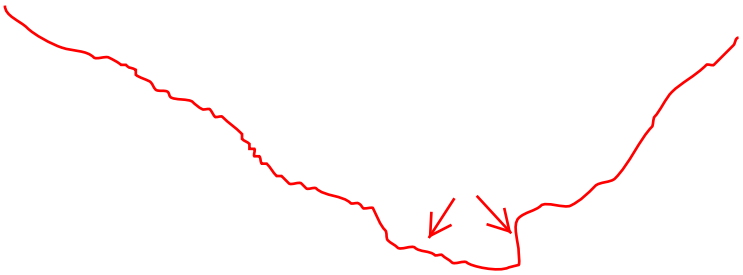
Profile 1



Profile 2



Profile 3



Plant Community Metric Worksheet: Co-dominant species richness for Riverine wetlands
(A dominant species represents ≥10% *relative* cover)

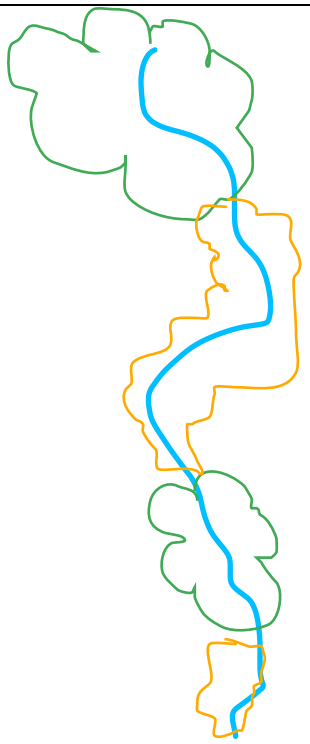
Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming (non-confined only)	Invasive?	Short (<0.5 m)	Invasive?
No layer	☐	Anemopsis californica (yerba mansa)	☐
	☐		☐
	☐		☐
	☐		☐
	☐		☐
	☐		☐
	☐		☐
Medium (0.5-1.5 m)	**Invasive?**	**Tall (1.5-3.0 m)**	**Invasive?**
No layer	☐	Baccharis sarithroides	☐
	☐	Baccharis salicifolia (mulefat)	☐
	☐		☐
	☐		☐
	☐		☐
	☐		☐
Very Tall (>3.0 m)	**Invasive?**	**Total number of co-dominant species for all layers combined (enter here and use in Table 18)**	4
Salix lasiolepis (arroyo willow)	☐		
	☐		
	☐	**Percent Invasion *Round to the nearest integer* (enter here and use in Table 18)**	0
	☐		
	☐		

Horizontal Interspersion Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Based on the sketch, choose a single profile from Figure 12 that best represents the AA overall.



Assigned zones:

1) Trees, willow

2) Shrub mix

3)

4)

5)

6)

Worksheet for Wetland disturbances and conversions

Has a major disturbance occurred at this wetland?	Yes X	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other X (drought)
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type? No	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)	☐	☐
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	☐	☐
Flow diversions or unnatural inflows	☐	☐
Dams (reservoirs, detention basins, recharge basins)	☐	☐
Flow obstructions (culverts, paved stream crossings)	☐	☐
Weir/drop structure, tide gates	☐	☐
Dredged inlet/channel	☐	☐
Engineered channel (riprap, armored channel bank, bed)	☐	☐
Dike/levees	☐	☐
Groundwater extraction	☐	☐
Ditches (borrow, agricultural drainage, mosquito control, etc.)	☐	☐
Actively managed hydrology	☐	☐
Comments No obvious stressors to hydrology attribute		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**	☐	☐
Grading/ compaction **(N/A for restoration areas)**	☐	☐
Plowing/Discing **(N/A for restoration areas)**	☐	☐
Resource extraction (sediment, gravel, oil and/or gas)	☐	☐
Vegetation management	☐	☐
Excessive sediment or organic debris from watershed	☐	☐
Excessive runoff from watershed	☐	☐
Nutrient impaired (PS or Non-PS pollution)	☐	☐
Heavy metal impaired (PS or Non-PS pollution)	☐	☐
Pesticides or trace organics impaired (PS or Non-PS pollution)	☐	☐
Bacteria and pathogens impaired (PS or Non-PS pollution)	☐	☐
Trash or refuse	☐	☐
Comments No obvious stressors to physical attribute		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)	☐	☐
Excessive human visitation	☐	☐
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)	☐	☐
Tree cutting/sapling removal	☐	☐
Removal of woody debris	☐	☐
Treatment of non-native and nuisance plant species	☐	☐
Pesticide application or vector control	☐	☐
Biological resource extraction or stocking (fisheries, aquaculture)	☐	☐
Excessive organic debris in matrix (for vernal pools)	☐	☐
Lack of vegetation management to conserve natural resources	☐	☐
Lack of treatment of invasive plants adjacent to AA or buffer	✔	☐
Comments tamarisk present in channel, known problem species for the lower watershed		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	☐	☐
Industrial/commercial	☐	☐
Military training/Air traffic	☐	☐
Dams (or other major flow regulation or disruption)	☐	☐
Dryland farming	☐	☐
Intensive row-crop agriculture	☐	☐
Orchards/nurseries	☐	☐
Commercial feedlots	☐	☐
Dairies	☐	☐
Ranching (enclosed livestock grazing or horse paddock or feedlot)	☐	☐
Transportation corridor	☐	☐
Rangeland (livestock rangeland also managed for native vegetation)	☐	☐
Sports fields and urban parklands (golf courses, soccer fields, etc.)	☐	☐
Passive recreation (bird-watching, hiking, etc.)	✔	☐
Active recreation (off-road vehicles, mountain biking, hunting, fishing)	✔	☐
Physical resource extraction (rock, sediment, oil/gas)	☐	☐
Biological resource extraction (aquaculture, commercial fisheries)	☐	☐
Comments minor recreational uses, site is remote enough to minimize		

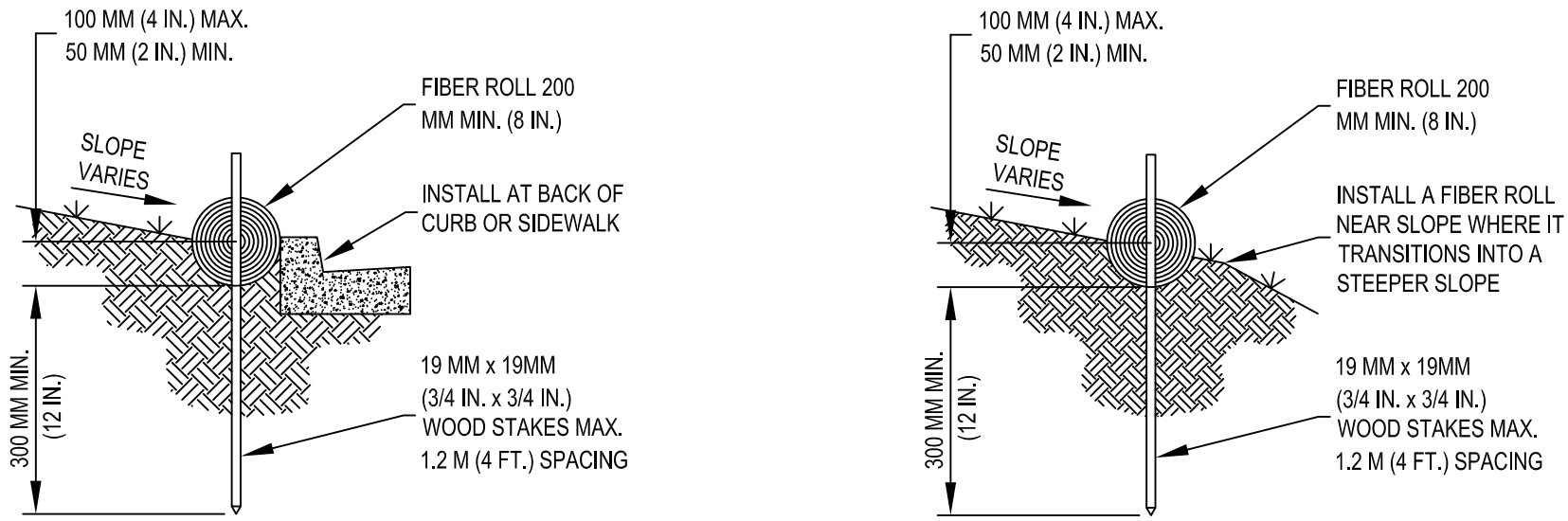
Appendix D

Native Seed Palette for Erosion Control and QCB

SCIENTIFIC NAME	COMMON NAME	POUNDS PER ACRE
Acmispon glaber var. *brevialatus*	short-wing deerweed	2
Amsinckia intermedia	common fiddleneck	1
Antirrhinum coulterianum	Coulter's snapdragon	2
Camissonia strigulosa	sandysoil sun-cup	1
Chaenactis artemisiifolia	white pincushion	2
Cordylanthus rigidus	thread-leaved bird's beak	4
Corethrogyne filaginifolia	California-aster	2
Cryptantha intermedia	nievitas cryptantha	2
Cryptantha micrantha	purple-rooted cryptantha	2
Ephedra californica	California ephedra/Mormon tea	1
Eriastrum densifolium ssp. *elongatum*	chaparral woolly-star	5
Eriogonum fasciculatum var. *polifolium* [2]	mountain buckwheat	5
Eriophyllum confertiflorum var. *confertiflorum*	long-stem golden-yarrow	3
Gutierrezia californica	California matchweed	3
Lasthenia gracilis	common goldfields	3
Layia glandulosa	white tidytips	2
Nemophila menziesii	baby blue eyes	1
Phacelia cicutaria var. *hispida*	caterpillar phacelia	1
Plantago erecta	dot-seed plantain	5
Salvia columbariae	chia	3

Appendix E

Erosion Control BMP Installation Specification Sheet



STRAW WATTLE DETAIL

k:\irvine\gis\projects\sce_trtp\0013_10\mapdoc\hmmp\fig08_straw_wattle_detail.ai SM (05-12-10

Appendix F

Long-Term Management Plan Template

Long-Term Management Plan Template

Tables and Figures