DRAFT

MACPHERSON PRESERVE RESOURCE MANAGEMENT PLAN

PREPARED FOR:

Orange County Transportation Authority
550 S Main Street
Orange, California 92863
Contact: Lesley Hill

PREPARED BY:

ICF International
525 B Street, Suite 1700
San Diego, California 92101
Contact: Patrick Atchison

November 2015

ICF International. 2015. MacPherson Preserve Resource Management Plan. Draft. November. San Diego, CA. Prepared for Orange County Transportation Authority, Orange, CA.

Contents

Page

Tables and Figures

Acronyms and Abbreviations

ASA	Archaeological Sensitivity Assessment
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRAM	California Rapid Assessment Method
EMP	Environmental Mitigation Program
EOC	Environmental Oversight Committee
EPA	U.S. Environmental Protection Agency
ESLs	environmentally sensitive lands
FMP	Fire Management Plan
FR	Federal Register
FTSP	Foothill/Trabuco Specific Plan
IA	Implementing Agreement
IPM	integrated pest management
Msl	mean sea level
NCCP/HCP	Natural Community Conservation Plan/Habitat Conservation Plan
NROC	Nature Reserve of Orange County (renamed Natural Communities Coalition)
OCFA	Orange County Fire Authority
OC Parks	Orange County Parks
OCTA	Orange County Transportation Authority
OSC	Open Space Conservation District
PAR	Property Analysis Report
PCAs	Priority Conservation Areas
Regulatory Agencies	USACE, SWRCB, and CDFW
RMP	Resource Management Plan
SWRCB	State Water Resources Control Board
TCR	Trabuco Canyon Residential District
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
Wildlife Agencies	USFWS and CDFW

Executive Summary

In 2006, Orange County voters approved the renewal of Measure M, effectively extending the half cent sales tax to provide funding for transportation projects and programs in the county. As part of the renewed Measure M (or Measure M2), a portion of the M2 freeway program revenues were set aside for the M2 Environmental Mitigation Program (EMP) to provide funding for programmatic mitigation to offset impacts from the 13 freeway projects covered by Measure M2. The Orange County Transportation Authority (OCTA) prepared the M2 Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP or Plan) as a mechanism to offset potential project-related effects on threatened and endangered species and their habitats in a comprehensive manner. A key component of the Plan conservation strategy has included the identification and acquisition of habitat Preserves to offset habitat impacts.

The MacPherson Preserve (Preserve), purchased by OCTA in December 2013, is one of seven properties acquired by OCTA as part of the M2 EMP. Currently the Preserve is being managed by OCTA, but a long-term Preserve Manager is anticipated to be in place within the next five years. The Preserve Manager is responsible for the implementation of management and monitoring tasks as outlined in this long-term Resource Management Plan (RMP). This RMP will be reviewed at least every five years and updated as necessary to prioritize management actions based on the changing Preserve needs. The RMP, including subsequent revisions, must be reviewed and approved by the Wildlife Agencies. For the purposes of this RMP, "Wildlife Agencies" is defined as the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) as the implementing agencies of the NCCP/HCP..

Key issues addressed and management actions set forth in this RMP include:

- **Public Access** – A goal of this RMP is to provide for managed public access and passive recreational opportunities within the Preserve that are compatible with the protection of biological resources. The RMP identifies trails within the Preserve approved for passive recreational use based on an evaluation of biological resources as well as coordination with the Wildlife Agencies. The Preserve Manager will implement a public access program that allows for access during limited, designated docent-led events. The current configuration of approved trails connects to other trails on County of Orange open space lands managed by Orange County Parks (OC Parks). OCTA recognizes that opportunities to connect to regional trails and planning for regional trail networks will evolve and change over time. Therefore, OCTA, and the subsequent Preserve Manager, will participate in regional trails planning efforts to evaluate other possible trail connections and anticipate how (and if) future trail connections could be made.
- **Invasive Species Control** – Invasive plants have been identified as a threat to natural communities and sensitive species on the Preserve, and invasive plant control is expected to be a long-term, ongoing management issue. The Preserve Manager will contract with a Restoration Ecologist to prepare an invasive plant treatment plan within two years of RMP adoption for review and approval. The treatment plan will prioritize invasive species for control; specify goals (eradication versus control); identify treatment locations, timelines (including potential re-treatments), and removal methods; provide realistic, measurable success criteria and monitoring methodology; and identify areas that may need post-treatment restoration.

- **Fire Management Plan** – The Orange County Fire Authority (OCFA) is responsible for fire control within the Preserve, and its first priority will be to protect life and property. The Preserve Manager will work closely with the OCFA to identify fire management guidelines. Within two years from adoption of the RMP, the Preserve Manager, in coordination with OCTA and OCFA, will develop a Fire Management Plan (FMP) that establishes policies and approaches to maximize protection of biological resources during fire suppression activities, to the degree feasible. Prior to adoption of the FMP, fire management in the Preserve will consist primarily of conducting regular maintenance of weeds along existing fire roads and maintaining safe access for firefighters on existing fire roads.
- **Public Outreach and Education** – The RMP sets forth the objective to develop and implement a public outreach and education program to inform and engage the public on Preserve values, goals, and guidelines to promote stewardship of biological resources and compliance with Preserve rules and regulations. If the public is properly informed of the biological values, goals, and activity restrictions within the Preserve, it is more likely that management goals and guidelines will be respected and followed.
- **Biological Monitoring and Management** – The RMP sets forth Preserve-specific management objectives and actions to ensure the long-term viability of natural communities and Covered Species by protecting, managing, and enhancing populations and suitable habitat on the Preserve. Biological monitoring will be used to determine status, threats, and populations trends of Covered Species and their habitats within the Preserve.
- **Adaptive Management** – Adaptive management provides a strategy to improve future management actions through monitoring to evaluate management effectiveness. Where success criteria are not met, adaptive management provides a structured approach to improve management outcomes. Monitoring and adaptive management on the Preserve will be a cooperative effort between OCTA, the Preserve Manager, the Wildlife Agencies, and other parties with technical expertise or information to inform monitoring and adaptive management. Bi-annual meetings will be scheduled where both policy and technical expertise can be integrated into the process of revising goals and objectives, refining conceptual models, adjusting management and/or monitoring activities, or determining the allocation of funding.
- **Funding** – The RMP describes and outlines the financial requirements for start-up expenditures, ongoing Preserve management, adaptive management, effectiveness biological monitoring, and responding to changed circumstances. Using funds from the M2 EMP, OCTA will establish a permanent, non-wasting endowment to provide funding for the commitments of Preserve management and monitoring in perpetuity.

Chapter 1
Introduction

The long-term Resource Management Plan (RMP) described herein provides guidelines for the management and monitoring of the MacPherson Preserve in accordance with the goals and objectives set forth in the Orange County Transportation Authority's (OCTA's) M2 Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP or Plan). The MacPherson Preserve RMP provides guidance for the ongoing protection, preservation, and adaptive management of the natural resources found within the Preserve, including control of site-specific encroachment activities, while addressing fire protection issues and accommodating safe access and recreational use of the site by the general public.

Implementation of the RMP will be handled by an approved entity with sufficient natural land management experience to meet the Wildlife Agencies requirements. The implementation of the RMP will be funded in perpetuity ("life of the RMP") through establishment of a non-wasting endowment held and distributed by a financial institution approved by the Wildlife Agencies. If the financial institution shows signs of mismanagement or poor appropriation of funds or enters into bankruptcy, endowment funds will be redirected to another financial institution upon approval from the Wildlife Agencies.

1.1 MacPherson Preserve Acquisition

The MacPherson Preserve was purchased by OCTA as part of the M2 Environmental Mitigation Program (EMP) in December 2014. Located in the eastern part of unincorporated Orange County (Figures 1 and 2), the MacPherson Preserve is a component of the overall strategy of the EMP to provide comprehensive mitigation to offset the environmental impacts of OCTA's 13 M2 freeway improvement projects. The EMP program is spearheaded by the Environmental Oversight Committee (EOC), which is made up of two OCTA Board of Directors members and representatives from the California Department of Transportation (Caltrans), Wildlife Agencies, USACE, environmental groups, and public members.

Instead of mitigating the natural resource impacts of M2 freeway projects on a project-by-project basis, the EMP presents a comprehensive mitigation approach that provides not only replacement habitat within preserved open space areas, but also provides the opportunity to improve the overall functions and value of sensitive biological resources on a regional basis throughout Orange County (i.e., Plan Area) by the enhancement of connectivity between EMP open space areas and other existing open space areas and preserves. Working collaboratively with the CDFW[1] and USFWS , OCTA ultimately decided that the preparation of an NCCP/HCP would best serve as the EMP's main implementation tool.

[1] The California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW) effective January 1, 2013.

K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig01_MacPherson_Regional_Vicinity.mxd Date: 10/5/2015 34153

Figure 1
Regional Vicinity Map
MacPherson Resource Management Plan

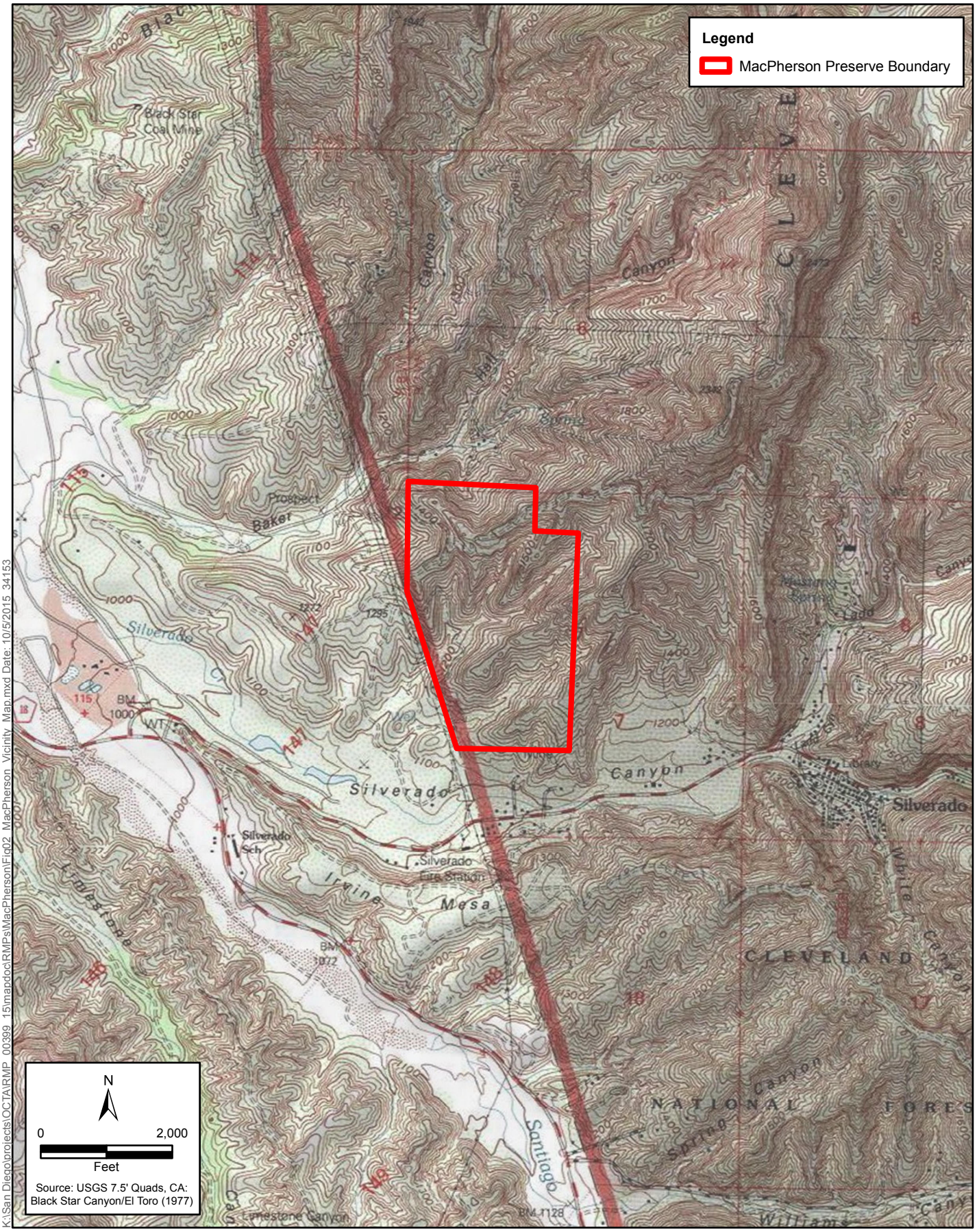


Figure 2
Preserve Vicinity Map
MacPherson Resource Management Plan

The M2 NCCP/HCP will complement the existing NCCP and HCPs in Orange County, which include the Central and Coastal NCCP/HCP and the Southern Subregion HCP. In support of the goals and objectives listed below, large blocks of unprotected land that are located outside the habitat reserves established by these NCCP and HCPs will be protected by the M2 NCCP/HCP through the acquisition of these parcels and incorporation into the M2 Preserve Area. The Preserve Area includes the MacPherson Preserve and is comprised of the open space parcels acquired by OCTA as part of the EMP (Figure 3).

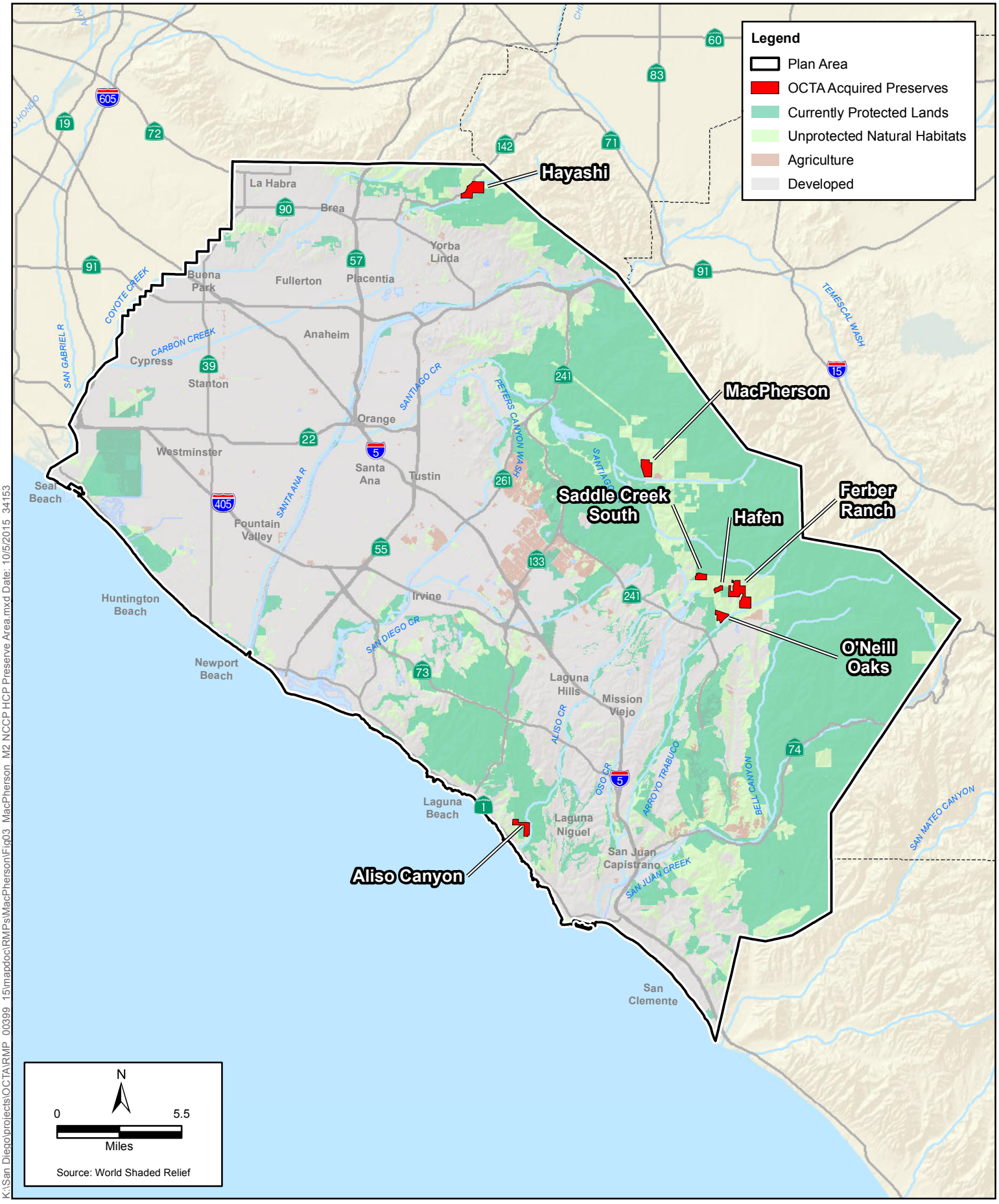
Based on the evaluation of opportunities throughout the Plan Area, Priority Conservation Areas (PCAs) were identified as part of the open space acquisition process and include candidate parcels and properties that could be managed as preserved open space for mitigation purposes (CBI 2009). A standardized criteria and prioritization process was also developed to facilitate property evaluation and assessment. Properties for acquisition and restoration/preservation were selected based on some of the criteria listed below:

- Contains habitats impacted by the freeway projects.
- Contains habitat for Covered Species.
- Enhances natural lands connectivity, including significant wildlife corridors.
- Has potential to mitigate Covered Activities.
- Adjacent to or in close proximity to already conserved lands.

Through this process, the MacPherson Preserve was selected and acquired. This Preserve satisfies many of the property acquisition criteria that was utilized to evaluate potential fits for the OCTA EMP program including being identified as a PCA; supporting Covered Species and associated natural communities; contributing to regional biological connectivity; and containing a diversity of high quality habitat types, including coastal sage scrub, chaparral, coast live oak woodland, riparian forest, and grassland.

1.1.1 OCTA M2 NCCP/HCP Goals and Objectives Relevant to the MacPherson Preserve

The M2 NCCP/HCP contains a broad set of biological goals and objectives at the landscape, natural community, and species levels that describe how the conservation actions would occur within areas important for regional conservation purposes. Goals are based on the conservation needs of the resources. Biological objectives describe in more detail the conservation or desired conditions to be achieved and have been designed to collectively achieve the biological goals. The biological goals and objectives indicate how the additional conservation of large blocks of habitat will benefit the biodiversity, natural communities, and habitat connectivity throughout key portions of the Plan Area, and provide for conservation and management of Covered Species. Biological goals for Covered Species are required by USFWS's 5-Point Policy to be included in HCPs (*Federal Register* (FR), Volume 65, Page 35242, June 1, 2000). The NCCP Act (Section 2810 of the Fish and Game Code) specifies the inclusion of conservation goals and objectives in the Planning Agreement. The following biological goals and objectives (documented in the M2 NCCP/HCP) are specifically applicable to the MacPherson Preserve:



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig03_MacPherson_M2 NCCP HCP Preserve Area.mxd Date: 10/5/2015 34153

Figure 3
M2 NCCP/HCP Preserve Area
MacPherson Resource Management Plan

Landscape Goal 1: Protect, manage, and enhance natural landscapes that result in conservation of areas large enough to support ecological integrity and sustainable populations of Covered Species, and are linked to each other and/or other areas of protected habitat in or adjacent to the Plan Area.

Landscape Objective 1.1: OCTA will conserve, enhance, and manage natural landscape within core and linkage areas contiguous with existing protected lands.

Landscape Goal 2: Protect and enhance natural and semi-natural landscapes important to maintain wildlife movement within the Plan Area.

Landscape Objective 2.1: OCTA will acquire, protect, and manage natural landscapes that secure wildlife movement corridors and provide landscape connectivity.

Landscape Goal 3: OCTA will protect, enhance, and/or restore natural landscapes within a range of environmental gradients and contiguous to other protected areas to allow for shifting species distributions in response to catastrophic events (e.g., fire, prolonged drought) or changed circumstances (e.g., climate change).

Landscape Objective 3.1: OCTA will acquire and/or restore natural landscapes within elevation ranges (0–500, 500–1,000, 1,000–1,500, 1,500–2,000 feet). The conservation and restoration of Covered Species habitat in or contiguous with existing Preserve lands will benefit potential shifting species distributions in response to catastrophic events and changed circumstances.

Landscape Goal 4: Protect and enhance habitat in geographically distinct areas across the Plan Area to conserve species and genetic diversity.

Landscape Objective 4.1: OCTA will acquire and/or restore natural landscapes within all the major watersheds (Los Angeles/San Gabriel River, Santa Ana River, San Juan Creek) and a majority of core and linkage areas contributing to the conservation of genetic diversity within these areas.

Natural Community Goal 1: Protect, manage, and enhance natural communities to promote native biodiversity.

Natural Community Objectives: OCTA will acquire and/or restore chaparral, grassland, riparian, scrub, and woodland habitat to promote conservation of native biodiversity and connectivity that benefit Covered Species of these natural community types.

Natural Community Goal 2: Maintain and enhance riparian and wetland function and values to benefit Covered Species and promote native biodiversity.

Natural Community Objective 2.1: OCTA will acquire, restore and/or enhance areas with aquatic resources (per CDFW jurisdiction). These conservation actions will protect riparian and wetlands functions and values by improving the condition and integrity of the physical streambed, aquatic and riparian habitat, and hydrology.

Species Goal 1: Provide conservation of intermediate mariposa lily within the Plan Area and minimize and mitigate impacts associated with Covered Projects and Activities.

Species Objective 1.1: OCTA will acquire Preserves with occurrences of intermediate mariposa lily. OCTA will ensure that appropriate management and monitoring actions are incorporated into the RMPs for each Preserve to support sustainable populations of intermediate mariposa lily.

Species Goal 5: Provide conservation of coast horned lizard within the Plan Area and minimize and mitigate impacts associated with Covered Projects and Activities.

Species Objective 5.1: OCTA will acquire natural habitat that includes areas with loose, fine soils with high sand fraction, open areas with limited overstory for basking, and other features known to support coast horned lizard.

Species Goal 6: Provide conservation of orangethroat whiptail within the Plan Area and minimize and mitigate impacts associated with Covered Projects and Activities.

Species Objective 6.1: OCTA will acquire Preserves that have documented occurrences of orangethroat whiptail. OCTA will ensure that appropriate management actions to protect and enhance habitat for orangethroat whiptail are implemented according to requirements to be incorporated into the RMPs for each Preserve.

Species Goal 12: Provide conservation of bobcat within the Plan Area and minimize and mitigate impacts associated with Covered Projects and Activities.

Species Objective 12.1: OCTA will acquire natural habitat that includes a combination of land cover types important for wildlife movement of large mammals such as bobcat.

Species Goal 13: Provide conservation of mountain lion within the Plan Area and minimize and mitigate impacts associated with Covered Projects and Activities.

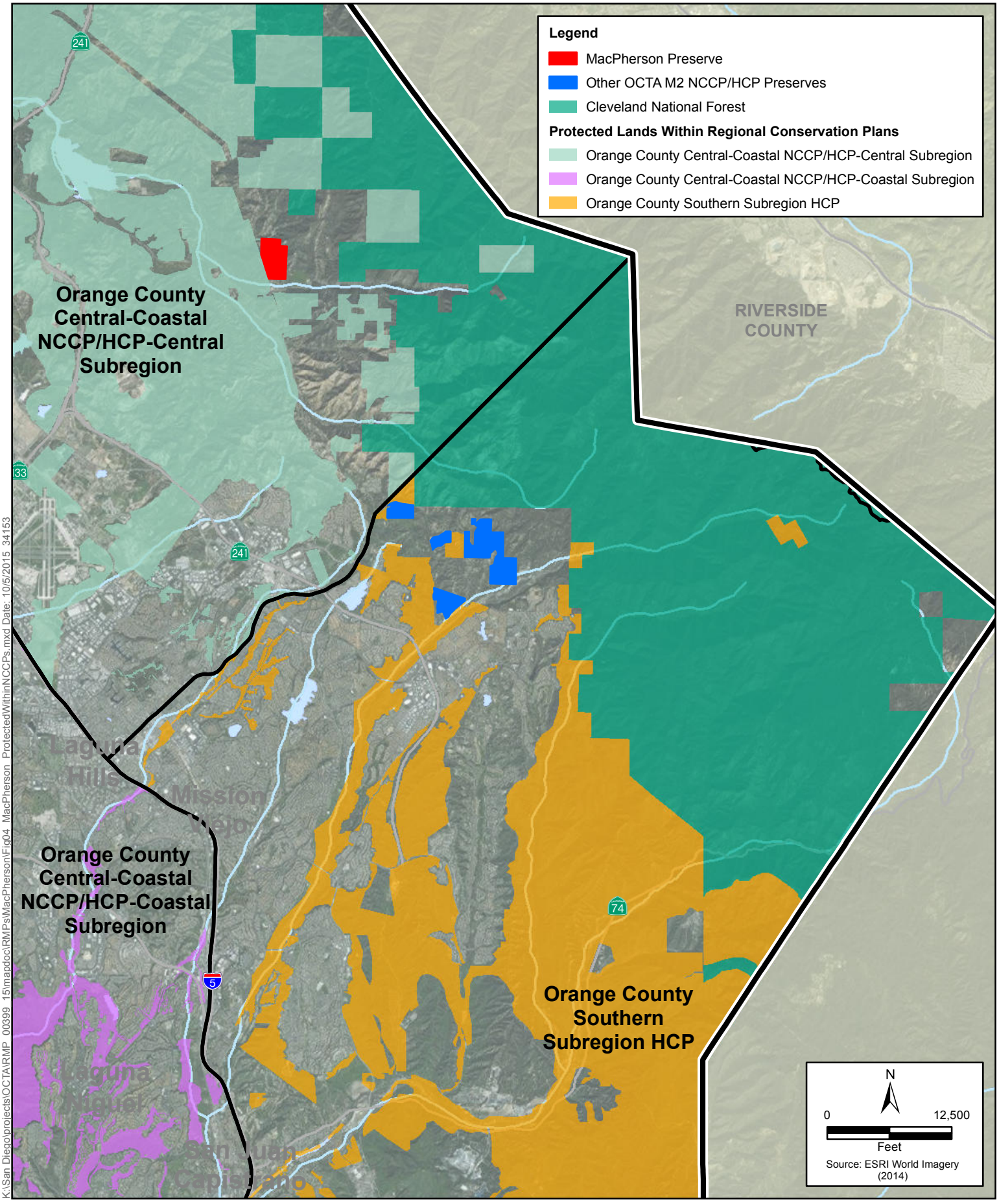
Species Objective 13.1: OCTA will acquire natural habitat that includes a combination of land cover types important for wildlife movement of large mammals such as mountain lion.

1.2 Relevant Conservation Plans

A primary reason for selecting the MacPherson Preserve for acquisition was its local and regional biological connectivity with conserved OC Parks open space areas immediately west of the Preserve. In addition, Cleveland National Forest and other conserved open space lands (part of the Central and Coastal NCCP/HCP reserve) are in close proximity to the north, east, and south. Figure 4 provides a regional perspective of how the MacPherson Preserve is located within the network of open space lands, and Figure 5 depicts the other reserve areas in the nearby vicinity of the MacPherson Preserve. Additionally, the Preserve is located within the *Silverado-Modjeska Specific Plan* (County of Orange 1997) area. The following section provides a summary of the conservation plans that are relevant to the Preserve.

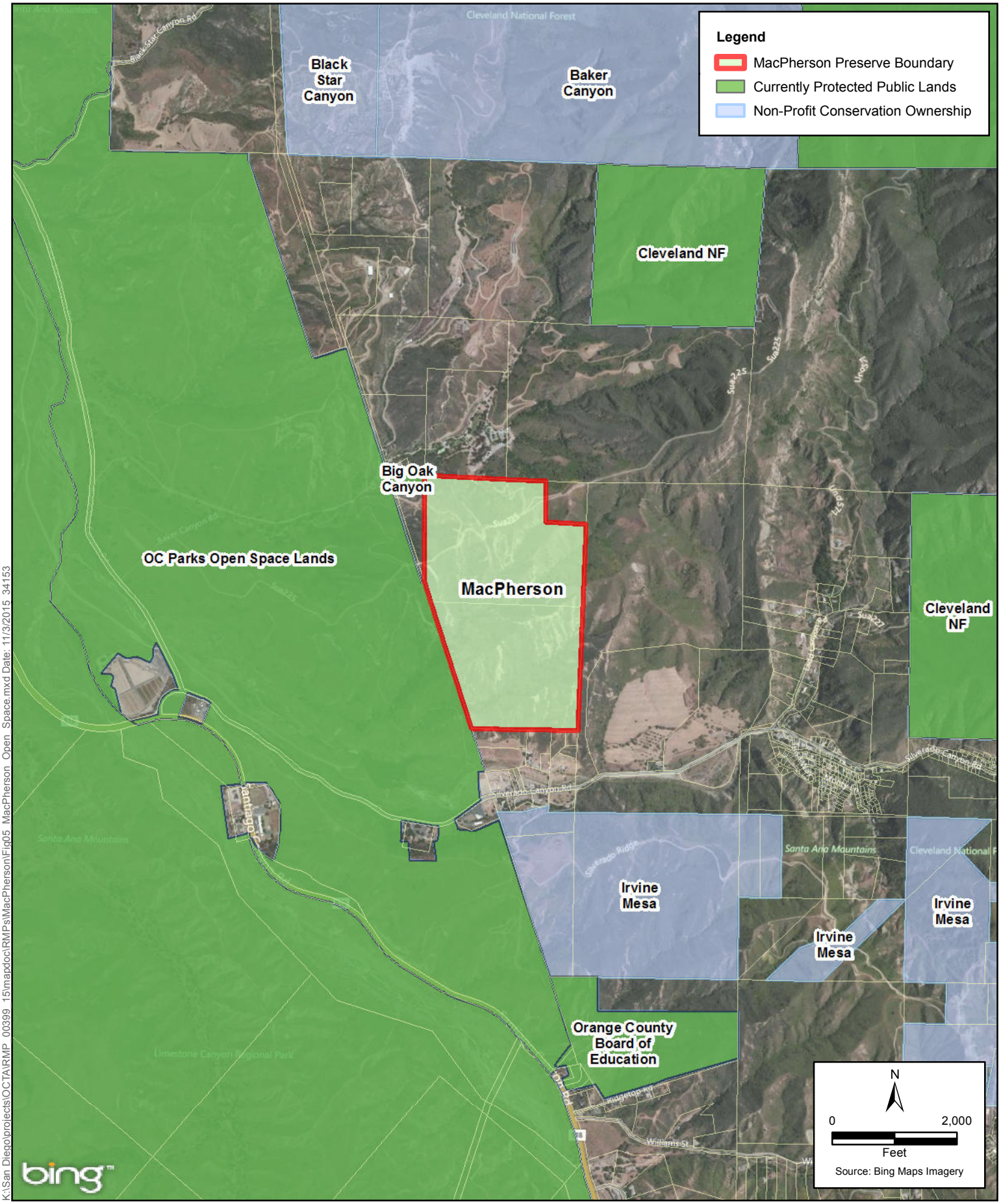
1.2.1 Silverado-Modjeska Specific Plan

The Silverado-Modjeska Specific Plan (SMSP) was adopted in 1997 by the Orange County Board of Supervisors to establish regulations for development that would “ensure the preservation of the rural environment and lifestyle of the area while providing for reasonable development”. The MacPherson property rural residential land use designation of 1 dwelling units per 20 acres would have allowed the construction of approximately up to 10 - 15 dwelling units; however, OCTA’s acquisition of this Preserve ensures this core segment of the SMSP area will be preserved in perpetuity as open space.



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig04_MacPherson_ProtectedWithinNCCPs.mxd Date: 10/5/2015 34153

Figure 4
Protected Lands in Boundaries of Regional Conservation Plans
MacPherson Resource Management Plan



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig05_MacPherson_Open_Space.mxd Date: 11/3/2015 34153

Figure 5
Open Space in Vicinity of MacPherson Preserve
MacPherson Resource Management Plan

1.2.2 Other Existing Conservation Programs

Currently, there are two completed subregional plans in Orange County: the Central-Coastal NCCP/HCP and the Southern Subregion HCP. The Central Coastal NCCP/HCP and the Southern Subregion HCP are two large-scale conservation programs designed to protect substantial amounts of open space that serve as habitat reserves for sensitive species and habitats in the Plan Area. In addition to the formal subregional plans, a substantial land area has been set aside as open space as part of individual land planning efforts in the county. This includes open space areas within large planned communities, some parks and open space managed by cities, and lands that are outside of the Central Coastal NCCP/HCP Reserve System that have been conserved by The Irvine Company. Other focused HCPs in the Plan Area include the Coyote Hills East HCP and Shell-Metropolitan Water District HCP. In addition, Chino Hills State Park is located in the northern portion of the Plan Area and extends into adjacent Riverside and San Bernardino Counties. The Cleveland National Forest is located in the southeastern portion of the Plan Area and extends into adjacent Riverside County. The Cleveland National Forest land holdings are located north and east of the MacPherson Preserve.

The M2 NCCP/HCP will complement the conservation efforts of these existing programs and open space areas by identifying and contributing key properties within core habitats and/or linkages that have not been permanently protected. Acquisition of lands for permanent protection and restoration of open space areas will occur under the EMP by specifically targeting areas that would support and expand existing conservation plans in the Plan Area. The M2 NCCP/HCP conservation strategy included the purchase of seven preserves: MacPherson, Hafen (48 ac), Saddle Creek South (84 ac), O'Neill Oaks (119 ac), Hayashi (296 ac), Ferber Ranch (397 ac), and Aliso Canyon (151 ac). The Ferber Ranch, Hafen, Saddle Creek South, and O'Neill Oaks are located in the Trabuco Canyon area (Figure 3). The Hayashi Preserve is located within the City of Brea and is adjacent to Chino Hills State Park and the Aliso Canyon Preserve is located within the City of Laguna Beach. The MacPherson Preserve, located within Silverado Canyon, is within the Central Subregion of the Central-Coastal NCCP/HCP.

1.3 Permitted Activities and Threats to Conservation

The management program set forth in this document addresses identified permitted activities (i.e. Covered Activities). A review of historic aerial photographs of the property shows that, in general, vegetation communities have not been significantly altered since 1946. Low density development along Silverado Canyon Road is present in aerial photographs as early as 1946, though development along Baker Canyon Road has occurred since 1952. Buildings or otherwise significant structures are not identified in the historic aerials on the property.

The property is currently used by hikers and mountain bikers; multiple informal trails cross the property. There is some evidence that target practice occurs on the property. An old car was abandoned in the canyon bottom in the southern portion of the property. A short rebar and cinderblock column was observed along the access road at the northeast corner of the property. Relatively little trash was observed during the reconnaissance surveys and included old barbed wire, portions of cans, and a brush. Evidence of grazing is not present on this property.

Management of the MacPherson Preserve as part of the OCTA NCCP/HCP must address potential threats to conserved biological resources, including Covered Species and sensitive habitats. These threats may include the following.

- Introduction and spread of invasive, nonnative plant and wildlife species
- Damage and clearing of native vegetation
- Erosion caused by vegetation removal and the creation of unauthorized trails and/or unauthorized use of closed trails
- Impacts to water quality and habitat in onsite streams and other aquatic resources
- Wildfire
- Harassment of wildlife species, including disturbance of nesting bird species
- Wildlife poaching
- Disruption of wildlife movement.

The Preserve RMP addresses these potential threats by providing guidance for the ongoing protection and preservation of the natural resources found within the Preserve, including Covered Species and sensitive habitats, while addressing fire protection issues and accommodating safe access and recreational use of the site by the general public.

1.4 Preserve Specific Management Objectives and Actions

The Preserve was purchased as part of the EMP because it supports the conservation strategy/biological goals of the M2 NCCP/HCP by providing high quality mitigation for M2 freeway impacts on biological resources. Conservation of the MacPherson Preserve ensures the preservation and enhancement of regional biological connectivity and the protection of Covered Species and their associated natural habitats. As identified in Section 1.1, *MacPherson Preserve Acquisition*, there are a number of Plan Goals of the M2 NCCP/HCP that specifically apply to the MacPherson Preserve. In addition to the broader Plan Goals, this RMP also identifies Preserve specific management objectives and actions that support the broader Plan Goals. The Preserve-specific management objectives and actions are summarized in Table 1-1 and described in more detail in Chapter 3, *Preserve Management* and Chapter 4, *Biological Monitoring and Management.* A summary checklist and annual schedule of ongoing preserve management and biological monitoring actions is included as Appendix A.

Table 1-1. Preserve Specific Management Objectives and Actions

Category/Goal	Management Objectives	Management Actions
Preserve Management (Chapter 3)		
Public Access (Section 3.1)	Offer managed public access and recreational opportunities within the Preserve that are compatible with the protection of biological resources.	• Identify approved trails for recreation use based on an evaluation of biological resources and land use opportunities and constraints. • Define and implement a managed access program that allows for public access during limited, designated docent led events. • Install gates, signage, and obstructions, as appropriate, to control public access. • Monitor and control permitted activities and unauthorized activities (e.g., use or creation of unauthorized trails). • Implement a public education and outreach program to communicate and regularly reinforce the value and purpose of the Preserve and importance of self-monitoring behavior within it.
Invasive Species Control Plan (Section 3.2)	Implement an invasive plant species control program to protect natural communities and Covered Species habitat.	• The Preserve Manager will contract with a Restoration Ecologist to prepare an invasive plant treatment plan within two years of RMP adoption for review and approval by the Wildlife Agencies. The treatment plan will prioritize invasive species for control; specify goals (eradication versus control); identify treatment locations, timelines (including potential re-treatments), and removal methods; provide realistic, measurable success criteria and monitoring methodology; and identify areas that may need post-treatment restoration. • Prior to implementation of the invasive plant treatment plan, the Preserve Manager will map priority invasive species during general stewardship and biological monitoring efforts. • Establish and implement a monitoring schedule to evaluate the success of invasive plant control efforts for five years following implementation or until eradication is maintained for one year without follow-up control activities.

Category/Goal	Management Objectives	Management Actions
Habitat Restoration (Section 3.3)	Restore closed trails to 70 percent of native habitat cover.	• During the first five years after adoption of the RMP, the Preserve Manager will monitor conditions of trails identified to be decommissioned using photo monitoring methods to track progress of passive restoration. • After five years, the Preserve Manager, in consultation with the Restoration Ecologist, may determine the need for active (versus passive) restoration, including invasive plant control and supplemental seeding, to improve the cover and quality of native habitat on closed trails.
Vegetation Management (Section 3.4)	Minimize impacts to native plants and wildlife habitat resulting from management, maintenance, or other activities on the Preserve.	• Pruning, cutting, or clearing of native vegetation will generally be avoided except for maintenance along access roads and approved recreation trails and installation of erosion control measures, if necessary. • The clearing of natural vegetation on the Preserve will be required to comply with the Nesting Bird Policy included in the OCTA M2 NCCP/HCP.
Fire Management (Section 3.5)	Develop a Fire Management Plan (FMP) for the Preserve that maximizes protection of biological resources during fire suppression activities, to the degree feasible.	• Within two years from adoption of the RMP, the Preserve Manager, in coordination with OCTA and the OCFA, will develop a Fire Management Plan (FMP) that establishes policies and approaches to maximize protection of biological resources during fire suppression activities, to the degree feasible. • Identify and map environmentally sensitive lands to be included in FMP. • If a fire occurs on the Preserve, the Preserve Manager will inventory the condition of natural communities following the fire, and will coordinate with the Monitoring Biologist, Wildlife Agencies, and Regulatory Agencies as necessary, to determine if habitat restoration is warranted. • Prior to implementation of the FMP, the Preserve Manager will conduct regular maintenance of weeds along existing fire roads, and maintain existing roads in a condition that will provide safe access for firefighters.

Category/Goal	Management Objectives	Management Actions
Nonnative Animal Species Management (Section 3.6)	Control invasive (nonnative) animal species that are known to impact native wildlife species and habitats.	• The Preserve Manager will work towards controlling the spread of invasive ant species. • The Preserve Manager will monitor and address other potential infestations of invasive insects and other pathogens that can threaten native habitat. • Implement and enforce feral and domestic animal restrictions and control.
Property Management (Section 3.7)	Implement routine and ongoing property management activities to ensure that the Preserve is maintained in good condition.	• Collect and dispose of trash and debris regularly to maintain the Preserve in good condition for visitors and minimize impacts to Covered Species and natural communities. • Implement of the public access plan and ensuring operational activities within the Preserve avoid or minimize impacts on Covered Species and natural communities from lighting or noise. • Monitor and maintain fencing and gates to control public access and trespassing. • Install and maintain signs at key access points to provide visitors with information on Preserve rules, recreational features (including trails), and biological and cultural resources (as appropriate). • Inspect and identify situations requiring erosion control.
Land Uses within the Preserve (Section 3.8)	Allow selected activities on the Preserve that can be managed to minimize impacts to protected biological resources and facilitate ongoing resource preservation.	• Identify and allow only land uses within the Preserve that are conditionally allowed if it can be assured that the activity minimizes or avoids impacts on biological resources and ecosystem functions. • Conduct monitoring of the Preserve to ensure prohibited uses are not occurring with the Preserve.

Category/Goal	Management Objectives	Management Actions
Lands Uses Adjacent to the Preserve (Section 3.9)	Monitor and address negative edge effects from existing land uses adjacent to the Preserve.	• The Preserve Manager will monitor land uses adjacent to the Preserve to identify situations in which edge effects can negatively affect biological resources within the Preserve. • The Preserve Manager will regularly monitor the interface of the Preserve with adjacent land uses. The Preserve Manager will identify situations in which adjacent land uses create negative effects on biological resources and maintain a dialogue with adjacent landowners to discuss and address edge effect issues. • To the extent practicable, the Preserve Manager and OCTA will coordinate with local land use authorities (e.g., for the CEQA public review process) to ensure that new developments adjacent to the Preserve adhere to the following adjacency guidelines.
Management of Cultural Resources (Section 3.10)	Manage the Preserve in a manner that does not impact sensitive archeological resources.	• Preserve Manager will follow directives set forth in Archeological Sensitivity Assessment (ASA) of how and where cultural resources need to be protected, and the Preserve Manager will use this information to help ensure that activities on the Preserve do not impact any sensitive cultural resources.
Public Outreach and Education (Section 3.11)	Develop and implement a public outreach and education program to inform and engage the public on Preserve values, goals, and guidelines to promote stewardship of biological resources and compliance with Preserve rules and regulations.	• Hold public meetings. • Develop and maintain website. • Provide educational and interpretative materials. • Develop outreach and volunteer program. • Develop an educational/outreach program focused on adjacent landowners to communicate information regarding Preserve management and obtain information regarding observations or concerns from adjacent landowners. • Encourage trail user groups to participate in “self-monitoring and policing” programs.

Category/Goal	Management Objectives	Management Actions
Biological Monitoring and Management (Chapter 4)		
Covered Plant Species (Section 4.1.1) **Plants** Plan Species Goal 1 and Species Objective 1.1	Ensure the long-term viability of Covered Plants by protecting, managing, and enhancing populations and suitable habitat on the Preserve.	• Identify status, threats, and population trends • Identify anthropogenic conflicts • Maintain database of population size of Covered Plants on Preserve • Protect Covered Plants during property maintenance and/or from public access and recreational activities • Protect Covered Plants during fire suppression activities • Augment populations
Covered Animal Species (Section 4.1.2) **Reptiles** Plan Species Goal 5 and Species Objective 5.1 and Species Goal 6 and Species Objective 6.1	Ensure the long-term viability of Covered Reptiles by protecting, managing, and enhancing suitable habitat on the Preserve.	• Identify status, threats, and population trends • Identify anthropogenic conflicts • Protect Covered Reptiles and habitat during property maintenance and/or from public access and recreational activities
Covered Animal Species (Section 4.1.2) **Birds** Plan Species Goal 8 and Species Objective 8.1 and 8.3, and Species Goal 9 and Species Objective 9.1 and 9.3 (applicable if Preserve is determined to be occupied)	Protect and enhance potential habitat of Covered Birds on the Preserve.	• Identify status, threats, and population trends • Identify anthropogenic conflicts • Protect potential habitat of Covered Birds during property maintenance and/or from public access and recreational activities • Protect potential habitat of Covered Birds during fire suppression activities

Category/Goal	Management Objectives	Management Actions
Covered Animal Species (Section 4.1.2) **Mammals** Plan Species Goal 12 and Species Objective 12.1 and Species Goal 13 and Species Objective 13.1	Ensure the long-term viability of Covered Mammals by protecting, managing, and enhancing populations and suitable habitat on the Preserve.	• Within one year from adoption of the RMP, the Preserve Manager will set up and monitor wildlife movement cameras to document wildlife movement on the Preserve. A qualified wildlife biologist will assess camera results to determine wildlife movement and connectivity. • Identify status, threats, and population trends • Identify anthropogenic conflicts • Develop a fencing approach that protects the Preserve while facilitating wildlife movement • Protect Covered Mammals from hunting • Protect Covered Mammals from public access and recreational use
Natural Communities (Section 4.1.3) Plan Natural Communities Goal 1 and Natural Communities Objective (1.1-1.5) and Natural Communities Goal 2 and Natural Communities Objective 2.1	Ensure the long-term viability of natural communities by protecting, managing, and enhancing these resources on the Preserve.	• Maintain updated vegetation map • Identify operational or public use conflicts • Establish long-term monitoring plots to identify vegetation condition and trends • Monitor nonnative invasive species eradication efforts and/or enhancement/restoration actions • Control invasive pests or disease • Restore natural communities impacted by altered fire regime or climate change • Protect natural communities from public access and recreational trail use • Protect natural communities from erosion • Protect natural communities from edge effects
Adaptive Management (Section 4.2)	Preserve Manager will manage the MacPherson Preserve in accordance with the principles and procedures for adaptive management.	Key issues for a focused adaptive management approach to address uncertainties of preserve management on the MacPherson Preserve include the following. • Public access and wildlife activity. • Covered Plants and vegetation management. • Trails revegetation.

Category/Goal	Management Objectives	Management Actions
Annual Progress Reports (Section 4.3)	The Preserve Manager will prepare an Annual Progress Report that summarizes the results of research and monitoring activities, provides recommendations for future preserve management activities for the Preserve, and discusses anticipated activities for the upcoming year.	Annual reports will include updates and anticipated activities for the upcoming year and will be provided updates including, but not limited to. • Monitoring of preserved biological resources, including natural communities and Covered Species. • Fire management and control, recreational uses, access, general site maintenance, and encroachment issues. • Habitat restoration and enhancement. • Education and outreach.

Chapter 2
Site Description

This chapter describes the land uses on site and adjacent to the Preserve, as well as physical characteristics and biological resources found on the Preserve. These descriptions are based on a baseline biological survey completed by BonTerra Psomas (2015a). A copy of the 2015 Baseline Biological Surveys Technical Report for the MacPherson Property is included in Appendix B.

2.1 Preserve Setting, Adjacent Property Owners, and Land Uses

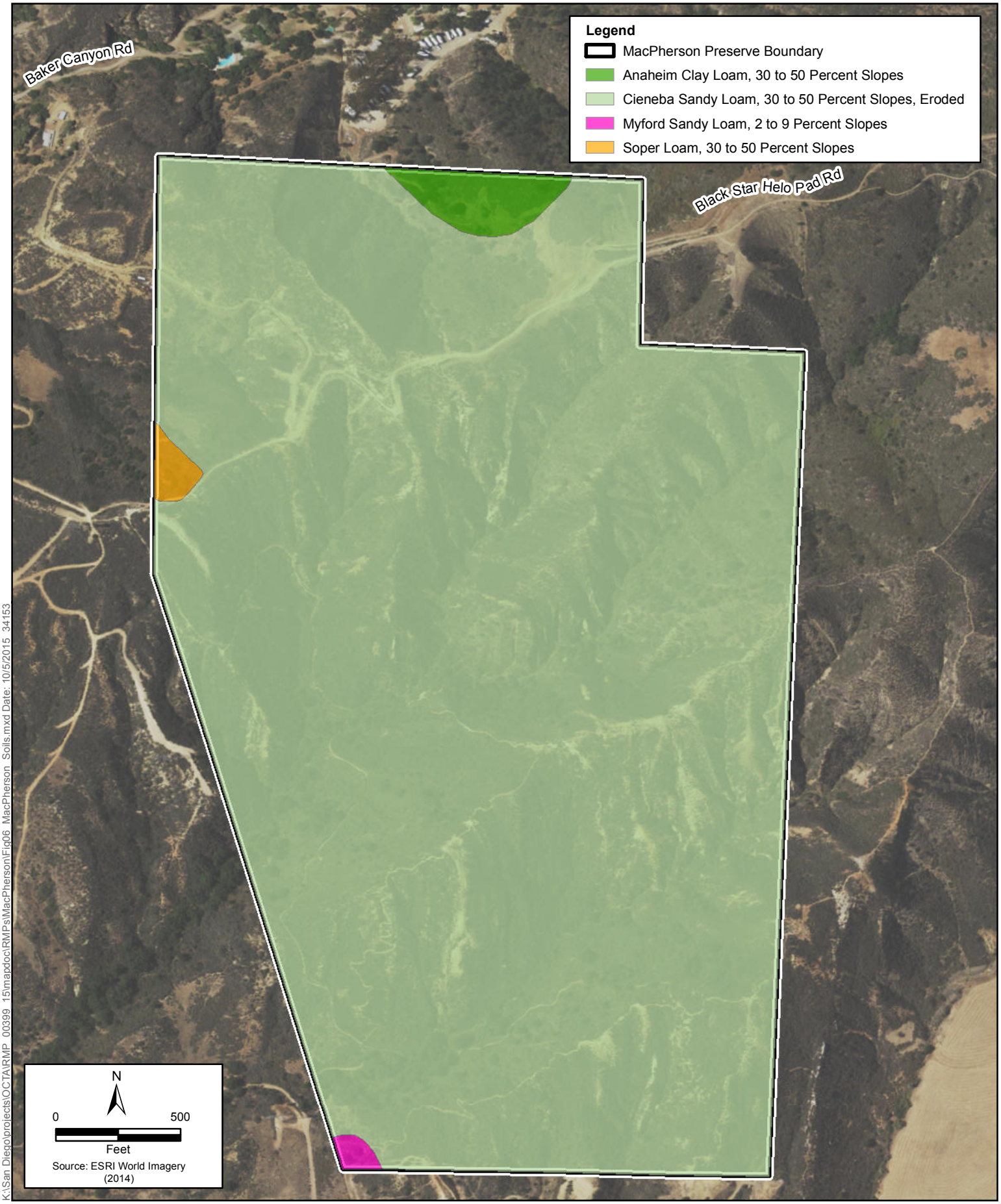
The 204-acre Preserve is located in unincorporated Orange County, east of the cities of Orange and Irvine (Figures 1 and 2). Baker Canyon Road is to the north, Ladd Canyon Road is to the east, Silverado Canyon Road is to the south, and Black Star Canyon Road is to the west. The Preserve is accessed from Black Star Helo Pad Road and Hall Canyon Road in the northwest portion of the site. Both of these roads are dirt roads off of Baker Canyon Road. The property is within the Orange County NCCP/HCP for the Central-Coastal Subregion (Figure 4) and within the Silverado-Modjeska Specific Plan area. The property is within the Cleveland National Forest administrative boundary and Cleveland National Forest land holdings are to the north and east of the Preserve. The western edge of the Preserve is immediately adjacent to County of Orange open space managed by the Irvine Ranch Conservancy (Figure 5). Low density rural residential development occurs along Silverado Canyon Road south of the property, and a recreational vehicle (RV) park occurs to the north along Baker Canyon Road.

The property is currently used by hikers and mountain bikers; multiple informal trails cross the property. It is also believed that target practice occurs on the property. Evidence of grazing is not present on this property.

2.2 Physical Characteristics

Topography on the Preserve is hilly, with the main ridgelines oriented in a northeast to southwest direction. Elevations range from approximately 1,135 to 1,678 feet above mean sea level (msl). No blueline streams occur on the Preserve, but multiple drainage features are present in the canyon bottoms. Soil types mapped on the Preserve consist of Anaheim clay loam (30 to 50 percent slopes), Cieneba sandy loam (30 to 75 percent slopes, eroded), Myford sandy loam (2 to 9 percent slopes), and Soper loam (30 to 50 percent slopes) (Figure 6).

The Preserve is located in the cismontane foothills of the Santa Ana Mountains. This area is part of a 31-mile swath of continuous wildlife habitat that spans from the Cleveland National Forest in the south to the west end of the Puente Hills (i.e., above Whittier Narrows) in the north. Specifically, the property occurs between Baker and Hall Canyons to the north, Ladd Canyon to the east, Silverado Canyon to the south, and Santiago Canyon to the west. These canyons are part of the Santiago Hydrologic Subarea of the 1,680-square-mile Santa Ana Watershed. The two main drainages on the property are mapped by the National Wetlands Inventory as freshwater forested/shrub wetland, with the various tributaries mapped as riverine. These drainages flow into Santiago Creek, which is a tributary to the Santa Ana River.



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig06_MacPherson_Soils.mxd Date: 10/5/2015_34153

Figure 6
Soils
MacPherson Resource Management Plan

2.3 Biological Resources

Biological surveys were conducted on the Preserve in spring/summer 2014 to establish baseline biological conditions and assess special-status species, including Covered Species, and their associated natural communities (BonTerra Psomas 2015a). Subsequent ongoing monitoring results will be compared to baseline information to measure change over time. Sub regional and regional monitoring efforts undertaken by other conservation entities, such as the Natural Communities Coalition (formerly Nature Reserve of Orange County), will also be considered when evaluating Preserve-level changes/trends. Baseline biological surveys consisted of the following.

- Vegetation mapping and evaluation of habitat conditions.
- Focused plant and coastal California gnatcatcher (*Polioptila californica californica*) surveys.
- A jurisdictional delineation of riparian and wetland resources.

Refer to Appendix B for the biological technical report for the Preserve (BonTerra Psomas 2015a). The description of biological resources in this section is based on the surveys completed in 2014.

2.3.1 Vegetation

Eleven vegetation types and other areas occur on the Preserve. These include scrub, riparian, chaparral, woodland, grassland, cliff and rock habitat, and disturbed areas. Vegetation communities and other habitats documented in 2014 on the Preserve are summarized in Table 2-1 and shown on Figure 7. Refer to Appendix B for a complete list of plant species observed during 2014 focused plant surveys. A brief description of each vegetation type and other habitat area mapped during 2014 surveys follows Table 2-1.

Table 2-1. Summary of Vegetation Types and Other Areas from 2014 Surveys

Vegetation Types and Other Areas	Acreage
Southern mixed chaparral	123.91
Open southern mixed chaparral	20.78
California sagebrush scrub	8.23
Mixed sage scrub	32.12
Annual grassland	2.27
Ruderal	0.23
Southern coast live oak riparian forest	9.48
Poison oak scrub	0.29
Coast live oak woodland	2.80
Cliff/rock	0.96
Disturbed	2.56

Southern Mixed Chaparral

A total of 123.91 acres of southern mixed chaparral (the *Adenostoma fasciculatum – Ceanothus crassifolius* Shrubland Association occurs on slopes throughout the property. This vegetation type is dominated by a mix of chamise (*Adenostoma fasciculatum*) and hoaryleaf ceanothus (*Ceanothus crassifolius*), with the proportion of each varying across the site. The plant cover is dense, with no understory vegetation except along the margins, where sage scrub species and non-native grasses and herbs extend into the chaparral.

Open Southern Mixed Chaparral

A total of 20.78 acres of open southern mixed chaparral (the *Adenostoma fasciculatum – Ceanothus* crassifolius Shrubland Association) occurs on steep, eroding slopes and ridgelines throughout the property. The vegetation composition is similar to that of southern mixed chaparral, but the density of shrubs is much lower. Bare ground occurs between the shrubs.

California Sagebrush Scrub

A total of 8.23 acres of the California sagebrush scrub (the *Artemisia californica* Shrubland Alliance) occurs on north-facing slopes at the northern edge of the property. This vegetation type is dominated by California sagebrush (*Artemisia californica*). Some slopes contain scattered blue elderberry (*Sambucus nigra* ssp. *caerulea*) or toyon (*Heteromeles arbutifolia*).

Mixed Sage Scrub

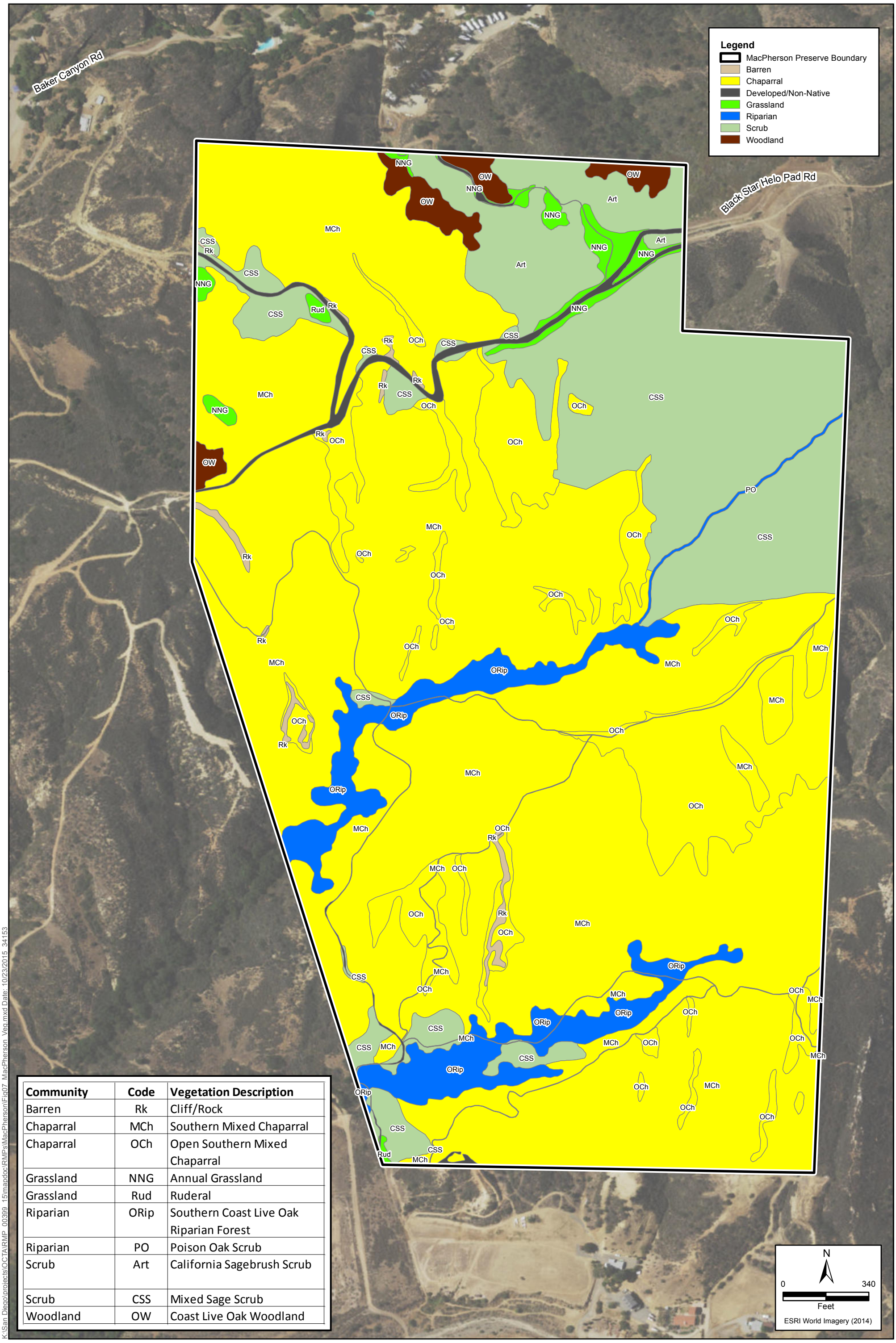
A total of 32.12 acres of mixed sage scrub (the *Artemisia californica – Eriogonum fasciculatum – Salvia mellifera* Association) occurs on slopes in the northeast corner of the property and in scattered patches in the southern portion of the property. This vegetation type is dominated by a mix of coastal sage scrub species, primarily black sage (*Salvia mellifera*), California sagebrush, and California buckwheat (*Eriogonum fasciculatum*). Some areas of mixed sage scrub contain needlegrass (*Stipa* sp.) or stands of laurel sumac (*Malosma laurina*) and toyon.

Annual Grassland

A total of 2.27 acres of annual grassland (the *Deinandra fasciculata* – Annual Grass-Herb Association) occurs along roadsides and in openings of coastal sage scrub and chaparral throughout the property. These areas are dominated by non-native grasses and herbs such as wild oat (*Avena* sp.), ripgut grass (*Bromus diandrus*), black mustard (*Brassica nigra*), and tocalote (*Centaurea melitensis)* with a seasonal component of fascicled tarweed (*Deinandra fasciculata* [*Hemizonia f.*]). Some scattered shrubs, such as California buckwheat, are also present.

Ruderal

A total of 0.23 acre of ruderal (various semi-natural herbaceous stands) occurs in small patches near the northwestern and southwestern corners of the property. This vegetation type is dominated by non-native, weedy herbs such as black mustard, tocalote, redstemmed filaree (*Erodium cicutarium*), and Russian thistle (*Salsola tragus*).



Community	Code	Vegetation Description
Barren	Rk	Cliff/Rock
Chaparral	MCh	Southern Mixed Chaparral
Chaparral	OCh	Open Southern Mixed Chaparral
Grassland	NNG	Annual Grassland
Grassland	Rud	Ruderal
Riparian	ORip	Southern Coast Live Oak Riparian Forest
Riparian	PO	Poison Oak Scrub
Scrub	Art	California Sagebrush Scrub
Scrub	CSS	Mixed Sage Scrub
Woodland	OW	Coast Live Oak Woodland

Figure 7
Vegetation Communities
MacPherson Resource Management Plan

This page intentionally left blank

Southern Coast Live Oak Riparian Forest

A total of 9.48 acres of southern coast live oak riparian forest (the *Quercus agrifolia* Woodland Alliance) occurs in the major drainages bisecting the property. This vegetation type is dominated by a canopy of coast live oak (*Quercus agrifolia*). Understory species are scattered in varying densities and include caterpillar phacelia (*Phacelia cicutaria*), giant wild rye (*Elymus condensatus* [*Leymus c*.]), bush monkeyflower (*Mimulus aurantiacus*), western poison oak (*Toxicodendron diversilobum*), and smilo grass (*Stipa miliacea* [*Piptatherum m*.]).

Poison Oak Scrub

A total of 0.29 acre of poison oak scrub (the *Toxicodendron diversilobum* Shrubland Alliance) occurs along a canyon bottom in the northeast corner of the property. This vegetation type consists of an approximate ten-foot-wide strip of western poison oak.

Coast Live Oak Woodland

A total of 2.80 acres of coast live oak woodland (the *Quercus agrifolia* Woodland Alliance) occurs on upland slopes in the northern portion of the property. This vegetation type is dominated by a canopy of coast live oak.

Cliff/Rock

A total of 0.96 acre of cliff/rock occurs along ridgelines and on steep, eroding slopes. This represents areas of exposed rock face or eroding hillsides that lack vegetation.

Disturbed

A total of 2.56 acres of disturbed areas occur on the property. This represents unpaved roads and dirt trails located throughout the property. No vegetation is present in these areas.

2.3.2 Wildlife

The Preserve provides habitat for a wide variety of wildlife species that are characteristic of scrub habitats, riparian, chaparral, woodland, grassland, cliff and rock habitat, and wetlands. Focused surveys for coastal California gnatcatcher were performed on site by BonTerra Consulting in 2014.

Wildlife species observed or detected on site include reptiles such as western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), Blainville's [coast] horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis* [Cnemidophorus] *hyperythra*), and gopher snake (*Pituophis catenifer*); birds such as California quail (*Callipepla californica*), western scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), Bewick's wren (Thryomanes bewickii), wrentit (*Chamaea fasciata*), California thrasher (*Toxostoma redivivum*), spotted towhee (*Pipilo maculatus*), California towhee (*Pipilo crissalis*), turkey vulture (*Cathartes aura*), red tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*); mammals such as desert cottontail (*Sylvilagus audubonii*) and coyote (*Canis latrans*); and a variety of invertebrate species, including butterflies and moths. Refer to Appendix B (Table A-2) for a complete list of wildlife species observed during 2014 surveys.

Wildlife Movement and Habitat Connectivity

Wildlife movement generally consists of three types of activities: (1) wildlife dispersal, (2) seasonal migration of wildlife species, and (3) wildlife movement related to home range activities. Below are definitions of the terms used to describe the different landscape and physical features that wildlife use to travel from one area to another.

Travel Route: This is a landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) in a larger natural habitat area that is used frequently by wildlife for local or regional travel and to provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred by wildlife species because it provides the least amount of topographic resistance in moving from one area to another; it supplies adequate food, water, and/or cover to wildlife moving between habitat areas and provides a relatively direct link between target habitat areas.

Wildlife Corridor: This is a piece of habitat, usually linear in nature that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bordered by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and facilitate their movement while in the corridor. Larger landscape-level corridors (often referred to as "habitat or landscape linkages") can provide both transitory and resident habitat for a variety of species.

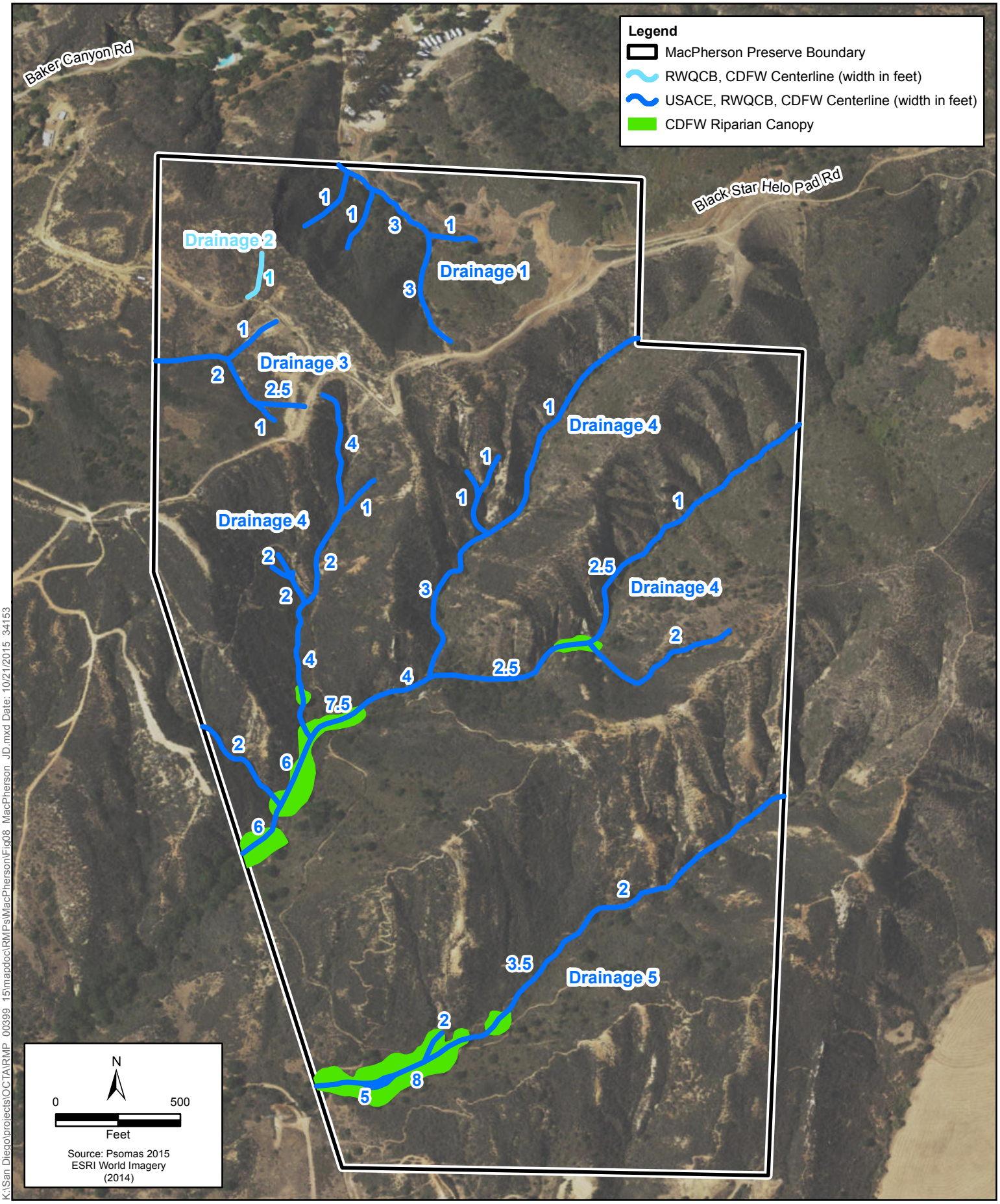
Wildlife Crossing: A wildlife crossing is a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that would otherwise hinder or prevent movement. Crossings typically are human-made and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent "choke points" along a movement corridor.

The Preserve contributes to regional biological connectivity and wildlife movement due to its immediate adjacency to OC Parks open space to the west and close proximity to the Cleveland National Forest and other open space lands to the north, east, and south of the Preserve that are part of the Central-Coastal NCCP reserve areas (Figure 4 and 5). Open space on the property is contiguous with larger areas of open space in the Santa Ana Mountains. Wildlife movement is relatively unhindered to the east of the property, with no major roads or development in that direction. The Preserve serves as an important piece of the regional link among open space areas in southern and central Orange County.

The Preserve contains numerous ridgelines and canyons that provide a variety of travel routes for local wildlife movement. Trails and access roads on site may also be used for movement. Movement on site is expected to occur via these features, as well as between the Preserve and contiguous offsite habitat. Large mammals expected to move across the Preserve include mule deer, mountain lion, bobcats, and coyote. Baseline studies and ongoing Preserve management have detected coyote at the Preserve.

2.3.3 Jurisdictional Resources

A jurisdictional delineation was performed by BonTerra Psomas on July 8, 2015 and copy of the Jurisdictional Delineation Report is included in Appendix C (BonTerra Psomas 2015b). Five separate drainage areas were identified on the Preserve and are shown on Figure 8. Drainages 4 and 5 are the largest and are tributaries of Silverado Creek. Drainages 1 and 3 convey flow to the Baker



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig08_MacPherson_JD.mxd Date: 10/21/2015 34153

Figure 8
Jurisdictional Resources
MacPherson Resource Management Plan

Canyon drainage, which is a tributary of Silverado Creek. Silverado Creek conveys flow to Santiago Creek, which flows through the Santiago Creek Reservoir, Santiago Creek Recharge Basin, and into the Santa Ana River, which discharges into the Pacific Ocean between Huntington Beach and Newport Beach. Therefore, Drainages 1, 3, 4, and 5 and their tributaries would be considered under the jurisdiction of the USACE.

Drainage 2 Drainages 1 and 3 convey flow to the Baker Canyon drainage, which is a tributary of Silverado Creek. Silverado Creek conveys flow to Santiago Creek, which flows through the Santiago Creek Reservoir, Santiago Creek Recharge Basin, and into the Santa Ana River, which discharges into the Pacific Ocean between Huntington Beach and Newport Beach. Therefore, these Drainages (i.e., 1, 3, 4, and 5) and their tributaries would be considered under the jurisdiction of the USACE.

The limits of non-wetland "waters of the U.S." were defined by the presence of the ordinary high water mark (OHWM). Evidence of an OHWM for the drainages consists of a break in bank slope, change in vegetation cover and average sediment texture, and the presence of drift deposits. Based on the field observations and data collected, a total of approximately 0.814 acre of non-wetland "waters of the U.S." occurs on the property. No wetland "waters of the U.S." are present on the Preserve.

The RWQCB has authority to take jurisdiction over the drainages that are also under the jurisdiction of the USACE as well as any isolated drainages. Therefore, a total of approximately 0.819 acre of "waters of the State" under the jurisdiction of the RWQCB occur on the Preserve.

The limits of CDFW jurisdiction on the Preserve were mapped according to the top of the stream bank for most drainages; the largest drainage features on the property contained riparian vegetation, and CDFW jurisdiction extends to the outer dripline in these areas. A total of approximately 4.334 acres of waters under the jurisdiction of the CDFW occurs on the Preserve. Table 2-2 summarizes the jurisdictional resources on the Preserve.

Table 2-2. Summary of Jurisdictional Resources on the Preserve

Drainage Area	USACE Acres	Isolated Acres	RWQCB Acres[a]	CDFW Acres
Drainage 1	0.082	–	0.082	0.082
Drainage 2	–	0.005	0.005	0.005
Drainage 3	0.036	–	0.036	0.036
Drainage 4	0.514	–	0.514	2.139
Drainage 5	0.182	–	0.182	2.072
Total	**0.814**	**0.005**	**0.819**	**4.334**

Notes:

–: not present in this drainage

[a] RWQCB jurisdictional boundaries are defined as those determined for the USACE under "waters of the U.S."; however, the RWQCB also takes jurisdiction over isolated waters.

2.3.4 Special-Status Biological Resources

This section summarizes the special-status biological resources that were observed, reported, or have the potential to occur on the MacPherson Preserve. Special-status biological resources include plant and wildlife species, as well as vegetation types and habitats, that have been afforded special status and/or recognition by the Wildlife Agencies (e.g., USFWS, CDFW, and CDFW's California Natural Diversity Database [CNDDB]), as well as private conservation organizations (e.g., California Native Plant Society [CNPS]). In addition to special-status biological resources, all Covered Species with the potential to occur on the Preserve are addressed in this section. In general, the principal reason an individual taxon (species, subspecies, or variety) is given such recognition is the documented or perceived decline of its population size or geographical extent and/or distribution resulting from habitat loss or degradation or other threats. Protection of special-status biological resources in compliance with State and Federal Wildlife Agencies, as well as local and private conservation organizations, must be addressed during Preserve management activities. Additionally, biological resource protection measures addressed in the M2 NCCP/HCP apply to the ongoing management of special-status resources on the Preserve.

The following biological evaluations have been conducted on the Preserve by BonTerra Psomas in 2014.

- Vegetation and habitat mapping (BonTerra Psomas in 2014).
- Focused surveys for coastal California gnatcatcher (BonTerra Psomas in 2014).
- Focused special-status plant surveys (BonTerra Psomas in 2014).

BonTerra Psomas prepared a comprehensive Biological Technical Report (Appendix B) for the baseline surveys completed in 2014 (BonTerra Psomas 2015a).The following sub-sections summarize the special-status biological resources identified during the evaluations performed by BonTerra Psomas.

Special-Status Species

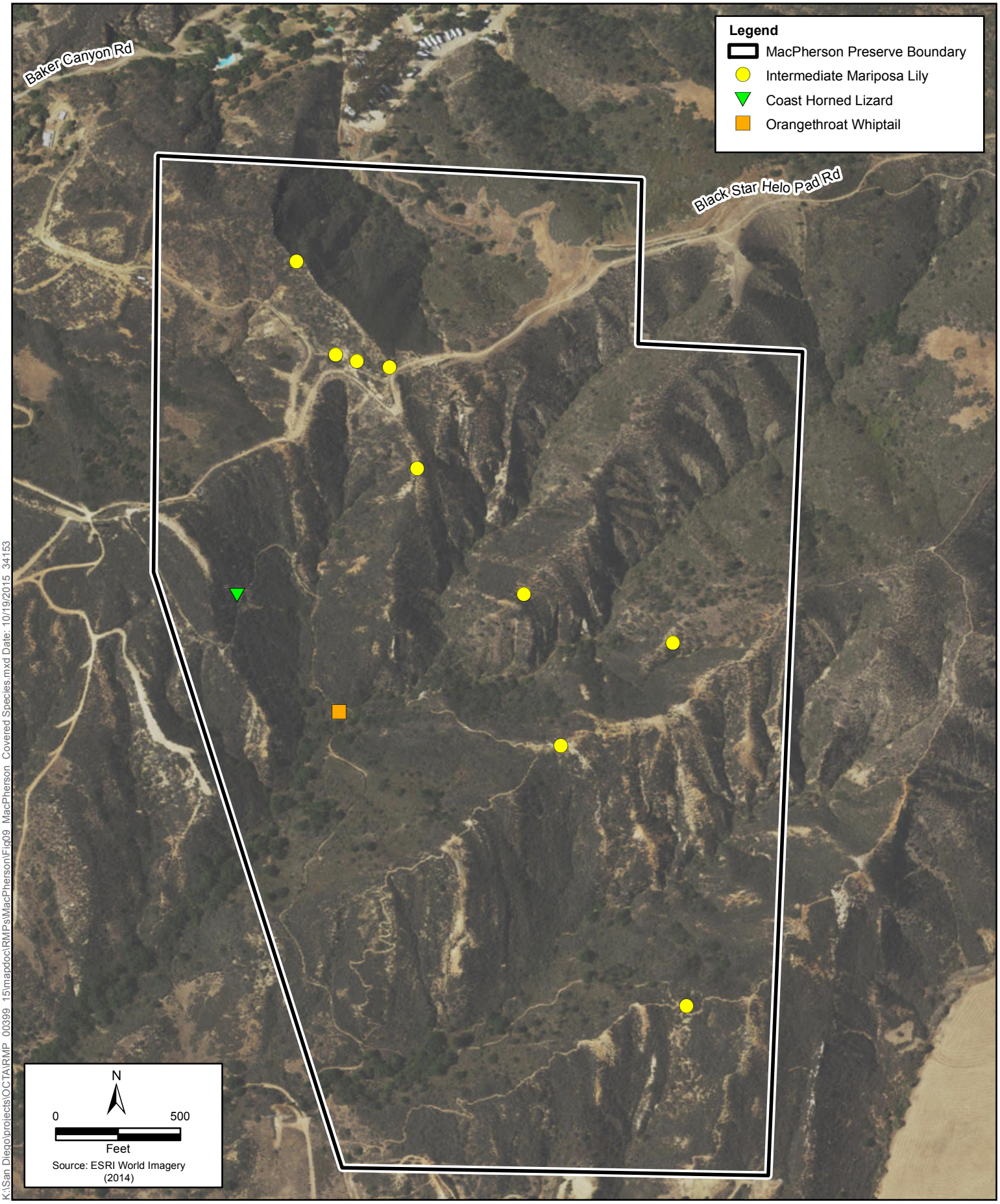
Special-status plant species documented at the Preserve in 2014 include intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), paniculate tarplant (*Deinandra paniculata* [formerly in *Hemizonia*]), and chaparral nolina (*Nolina cismontana*).

Special-status wildlife species documented at the Preserve in 2014 include Blainville's [coast] horned lizard (*Phrynosoma blainvillii*) and orangethroat whiptail (*Aspidoscelis* [Cnemidophorus] *hyperythra*).

Tables 2-3 and 2-4 summarize the listed status of these species and provide notes on observations or potential for occurrence. Refer to Appendix B for additional information on special-status plant and wildlife species known to occur in proximity to the Preserve.

Covered Species

The term "Covered Species" refers to the 13 species included in the permits issued to OCTA by State and Federal governments as part of the M2 NCCP/HCP. The locations of Covered Species known occurrences observed during the baseline surveys are displayed on Figure 9. For each Covered Species, a summary of whether the species has been observed/detected on site, has potential to occur, status of suitable habitat, and potential threats and stressors within the Preserve is included in Table 2-5.



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig09_MacPherson_Covered Species.mxd Date: 10/19/2015 34153

Figure 9
Covered Plants & Animals
MacPherson Resource Management Plan

Table 2-3. Special-Status Plant Species Observed On Site during 2014 Surveys

Species	Status				Comments
	USFWS	CDFW	CRPR	M2 NCCP/HCP Covered Species	
Calochortus weedii var. *intermedius* Intermediate mariposa lily	None	None	1B.2	Yes	Suitable habitat is present on the MacPherson Preserve. Observed during baseline surveys.
Deinandra paniculata Paniculate tarplant	None	None	4.2	No	Suitable habitat is present on the MacPherson Preserve. Observed during baseline surveys.
Nolina cismontana Chaparral nolina	None	None	1B.2	No	Suitable habitat is present on the MacPherson Preserve. Observed during baseline surveys.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank

Legend

CRPR

1B Plants Rare, Threatened, or Endangered in California and Elsewhere

4 Plants of Limited Distribution – A Watch List

CRPR Threat Code Extensions

.2 Fairly Threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)

.3 Not Very Threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Table 2-4. Special-Status Wildlife Species Observed On Site during 2014 Surveys

Species	Status			Comments
	USFWS	CDFW	M2 NCCP/HCP Covered Species	
Aspidoscelis hyperytha [*Cnemidophorus hyperythra*] Orangethroat whiptail	None	SSC	Yes	Observed on the Preserve.
Phrynosoma blainvillii Coast horned lizard	None	SCC	Yes	Observed on the Preserve. Expected to occur for burrowing.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife

Legend

State (CDFW) Federal (USFWS)

SSC Species of Special Concern

Table 2-5. M2 NCCP/HCP Covered Species

Common / Scientific Name	Observed/ Detected On Site	Potential to Occur/ Status of Suitable Habitat On Site	Potential Threats / Stressors within Preserve
Plants			
Intermediate mariposa lily / *Calochortus weedii* var. *intermedius*	Yes. Detected in 9 locations (1–5 plants/location) during 2014 baseline surveys (total of 18 individual plants).	High quality habitat within the Preserve with known occurrences. Additional individuals/populations may be present.	Response to fire and fire frequency, vegetation management along access roads, direct and indirect impacts (trampling, erosion) from public access and recreational trail use, competition from nonnative plant species.
Southern tarplant / *Centromadia parryi* ssp. *australis*	None detected during 2014 baseline surveys.	No suitable habitat and not expected to occur on this Preserve.	Not applicable.
Many-stemmed dudleya / *Dudleya multicaulis*	None detected during 2014 baseline surveys.	Suitable habitat within the Preserve. Could be established on this site.	Response to fire and fire frequency, direct and indirect impacts (trampling/disturbance) from public access and recreational trail use, competition from nonnative plant species.
Fish			
Arroyo chub / *Gila orcutti*	None detected during 2014 baseline surveys.	No suitable habitat and not expected to occur on this Preserve.	Not applicable.
Amphibians and Reptiles			
Coast horned lizard / *Phrynosoma blainvillii*	Observed during 2014 baseline surveys.	Suitable habitat on site with open areas of friable soils within grassland and scrub habitats.	Invasive species, direct impacts (trampling, disturbance) from recreational trail use, illegal off-road vehicle activity, Argentine ant infestations.

Common / Scientific Name	Observed/ Detected On Site	Potential to Occur/ Status of Suitable Habitat On Site	Potential Threats / Stressors within Preserve
Orangethroat whiptail / *Aspidoscelis hyperythra beldingi*	Observed during 2014 baseline surveys.	Suitable habitat on site with open areas of friable soils within grassland and scrub habitats.	Invasive species, direct impacts (trampling, disturbance) from recreational trail use, illegal off-road vehicle activity, Argentine ant infestations.
Western pond turtle / *Emys marmorata*	None detected during 2014 baseline surveys.	No suitable habitat and not expected to occur on this Preserve.	Not applicable.
Birds			
Southwestern willow flycatcher / *Empidonax traillii extimus*	None detected during 2014 baseline surveys.	No suitable habitat and not expected to occur on this Preserve.	Not applicable.
Least Bell's vireo / *Vireo bellii pusillus*	None detected during 2014 baseline surveys.	No suitable habitat and not expected to occur on this Preserve.	Not applicable.
Cactus wren / *Campylorhynchus brunneicapillus sandiegensis*	None detected during 2014 baseline surveys.	Potential suitable habitat existing on the Preserve with patches of cactus within coastal sage scrub.	Response to fire and fire frequency (direct loss of cactus patches), invasive species (loss of foraging habitat), recreational trail use (flushing of nests), predation (nest predation facilitated by taller vegetation adjacent to cactus patches, Cooper's hawk).
Coastal California gnatcatcher / *Polioptila californica californica*	None detected during 2014 baseline surveys.	Suitable habitat is within the Preserve. The coastal sage scrub habitat within the Preserve is high quality and appears undisturbed and is in large enough patches to support pairs. However, this Preserve is near the edge of the elevation range of coastal California gnatcatcher. The location of this Preserve could serve as a habitat refugia from fire and/or a stepping stone for regional connectivity.	Type conversion (reduction of coastal sage scrub habitat due to fire and/or fire frequency), invasive species (out compete native coastal sage scrub), recreational trail use (flushing of nests), cowbird parasitism.

Common / Scientific Name	Observed/ Detected On Site	Potential to Occur/ Status of Suitable Habitat On Site	Potential Threats / Stressors within Preserve
Mammals			
Bobcat / *Lynx rufus*	None detected during 2014 baseline surveys.	Native habitat and topography of the Preserve provides cover for movement along drainages and ridgelines. The Preserve is connected to large blocks of surrounding habitat that function as movement corridors.	Fire and fire frequency (direct loss and loss of habitat cover), habitat fragmentation from fencing, human disturbances from onsite recreational trail use and preserve management activities.
Mountain lion / *Puma concolor*	None detected during 2014 baseline surveys.	Native habitat and topography of the Preserve provides cover for movement along drainages and ridgelines. The Preserve is connected to large blocks of surrounding habitat that function as movement corridors.	Fire and fire frequency (direct loss and loss of habitat cover), habitat fragmentation from fencing, human disturbances from onsite recreational trail use and preserve management activities.

Sensitive Vegetation Types

In addition to providing an inventory of special-status plant and wildlife species, the CNDDB also provides an inventory of vegetation types that are considered special status by State and Federal Wildlife Agencies, academic institutions, and various conservation groups (such as the CNPS), giving them a high priority for conservation on the Preserve. Special-status vegetation types observed on the Preserve consist of the following.

- Chaparral communities, including southern mixed chaparral and open southern mixed chaparral.
- Scrub communities, including California sagebrush scrub and mixed sage scrub.
- Grassland communities, annual grassland and ruderal vegetation.
- Riparian communities, including southern coast live oak riparian forest and poison oak scrub.
- Woodland communities, including coast live oak woodland.
- Jurisdictional areas, including non-wetlands Waters of the U.S. and Waters of the State.

Critical Habitat

All or a portion of the Preserve includes areas designated by the USFWS as critical habitat for the arroyo toad (*Anaxyrus californicus* [*Bufo microscaphus californicus*]), as summarized below (Figure 10).

- On February 9, 2011, the USFWS published a final rule designating critical habitat for arroyo toad. This final rule designates 98,366 acres in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties as critical habitat. The southwestern end of the Preserve is within Unit 8 of the designated critical habitat for arroyo toad.

2.4 Cultural Resources

An Archaeological Sensitivity Assessment (ASA) was conducted by LSA Associates, Inc. on the Preserve in 2014. The assessment included a records search, Native American coordination, field survey, and report. This information will be kept confidential and not included in this RMP. The ASA will be utilized in order to help ensure that activities on the Preserve do not impact any cultural resources.

K:\San Diego\projects\OCTA\RMP 00399 15\mapdoc\RMPs\MacPherson\Fig10 MacPherson CriticalHabitat.mxd Date: 10/15/2015 34153

Figure 10
USFWS Critical Habitat
MacPherson Resource Management Plan

Chapter 3
Preserve Management

The primary purpose of the MacPherson Preserve is to help fulfill the preserve acquisition component of the M2 NCCP/HCP Plan conservation strategy. However, the Preserve may also provide recreational benefits and must accommodate site-specific operational and safety activities. This chapter provides information on the Preserve management activities for the following Preserve elements to ensure that biological resources are protected while allowing for compatible uses:

- Public Access (Section 3.1)
- Invasive Plant Species Control (Section 3.2)
- Habitat Restoration (Section 3.3)
- Vegetation Management (Section 3.4)
- Fire Management (Section 3.5)
- Nonnative Animal Species Management (Section 3.6)
- Property Management (Section 3.7)
- Land Uses within the Preserve (Section 3.8)
- Land Uses Adjacent to the Preserve (Section 3.9)
- Management of Cultural Resources (Section 3.10)
- Public Outreach and Education (3.11)

Roles and Responsibilities

Successful RMP implementation will depend on the cooperation of several management and implementation entities, as outlined below.

- **Implementing Entity**. OCTA is the NCCP/HCP administrator and the entity that will oversee implementation of conservation measures required to offset impacts from M2 freeway improvement projects, including management of the MacPherson Preserve. OCTA will identify a Preserve Manager who will serve as the long-term manager (and potential title holder) for the Preserve. OCTA will record a conservation easement or some other approved land protection instrument for the Preserve that will provide a legal mechanism to ensure each Preserve is maintained and managed in perpetuity as a habitat Preserve. The land protection instrument will be held by appropriate entities, depending upon the type of entity identified as the Preserve Manager.
- **Preserve Manager**. The Preserve Manager will consist of OCTA (interim) or an outside contractor or entity, as determined during RMP implementation. The Preserve Manager will be responsible for day-to-day Preserve management and operations. The Preserve Manager will coordinate with the OCTA NCCP/HCP Administrator and Wildlife Agencies regarding status and substantial changes to management activities. The Preserve Manager will prepare and submit Annual Progress Reports for the NCCP/HCP Administrator that summarize the results of research and monitoring activities, provide recommendations for future preserve management activities for the Preserve, and discuss anticipated activities for the upcoming year.

- **Monitoring Biologist**. The Monitoring Biologist may be a Preserve staff member or independent contractor. OCTA will select an individual or entity to fulfill this role. The Monitoring Biologist will be responsible for monitoring Covered Species and natural communities. The Monitoring Biologist role will be periodic based on the monitoring schedule established in the Plan. Data collection will follow accepted monitoring methods. The Monitoring Biologist will provide OCTA and Preserve Manager with monitoring reports that include data, results, and recommendations.
- **Orange County Fire Authority**. The Orange County Fire Authority (OCFA) will provide oversight regarding fire management activities, such as maintenance of fuel modification zones and fire access roads. OCFA will also respond to active fires to prevent the loss of human life and property and other resources. These activities fall into two categories, regular maintenance activities and emergency activities.
- **Supporting Entities**. Supporting entities may include technical consultants, contractors, and volunteers who will assist with implementing various elements of the RMP. Technical experts will include the following.
    - **Biological Research and Monitoring** – wildlife biologists, botanists, and certified arborists with the appropriate expertise, licenses, and permits (depending on survey requirements).
    - **Restoration** – restoration ecologists will assist with habitat restoration/enhancement planning and monitoring activities. Restoration ecologists and contractors will implement restoration/enhancement programs such as site preparation, plant establishment, and maintenance.
    - **General Maintenance** – Other types of contractors may be retained to implement maintenance activities, including minor road maintenance and erosion control.

      Note that the Preserve Manager may use Preserve staff for restoration and general site maintenance tasks. Additionally, volunteers may be used to assist with monitoring and research tasks, specific restoration tasks (e.g., nonnative plant eradication, planting, site maintenance activities), educational and outreach activities, or site patrols, as appropriate.
- **Wildlife Agencies.** Both the USFWS and CDFW will review and approve the RMP and coordinate with OCTA, the Preserve Manager, and supporting biologists regarding the status of preserved natural resources, ongoing monitoring activities, and adjustments to the management program. The Wildlife Agencies will review and provide comments, if necessary, on Annual Progress Reports for the Preserve, which will be included in the NCCP/HCP annual report.

3.1 Public Access

A goal of this RMP is to provide for managed public access and recreational opportunities within the Preserve that are compatible with the protection of biological resources. The Preserve Manager will be responsible for enforcing access restrictions and biological protection measures as part of ongoing access management.

This section includes a discussion of existing and historic public access on the Preserve, guiding principles for defining a public access plan, elements of the proposed public access and trails system plans, and public education and enforcement guidelines.

3.1.1 History of Public Access on the Preserve

Prior to acquisition by OCTA, this Preserve was privately owned and contained a network of existing dirt roads and trails (Figure 11) which were used by the previous property owner for routine management of the property. It also appears that local mountain bikers have been utilizing and/or cutting unauthorized trails through the habitat on the MacPherson Preserve. Portions of the roads are used by Southern California Edison (SCE). OCFA also utilizes the roads to access vegetation to assess fire danger levels (fuel moisture sampling).

The Preserve is bisected by one main vehicular access road: Black Star Helo Pad Road. Black Star Helo Pad Road is an unpaved utility road utilized by SCE in order to service utility lines that run along the western property boundary of the MacPherson Preserve. Black Star Helo Pad Road extends west of the MacPherson Preserve to Black Star Canyon Road and is utilized by OC Parks and the Irvine Ranch Conservancy (IRC) which currently manage this land for the County. This road also extends east off the MacPherson Preserve onto private property.

There are two smaller unpaved private access roads that enter MacPherson from the northern portion of the Preserve off of Baker Canyon Road. Hall Canyon Road and an unnamed road traverse south onto the MacPherson Preserve. Hall Canyon Road begins on OC Parks land and the unnamed dirt road originates on private property. In addition, a series of dirt trails traverse the Preserve and travel predominantly from east to west.

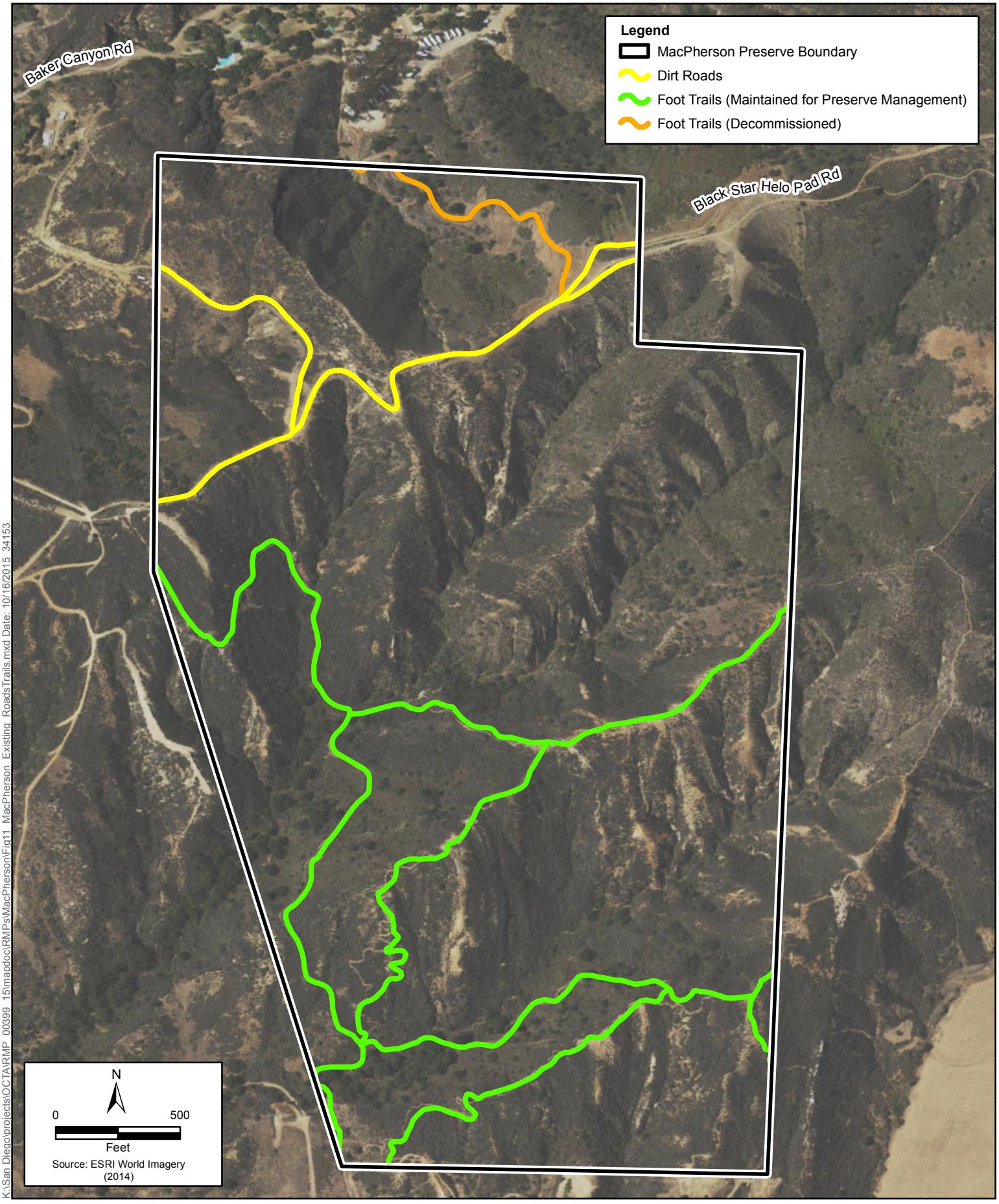
3.1.2 Guiding Principles for Defining a Public Access Plan

During the OCTA M2 NCCP/HCP Draft Environmental Impact Report/Environmental Impact Statement public comment period between November 2014 and February 2015, OCTA received specific comments relating to public access to the Preserves. In order to develop a public access program that took these public comments into consideration, OCTA convened three stakeholder focus group meetings. These focus group meetings resulted in feedback from regional land managers, Preserve neighbors, user groups and environmental stakeholders. General principles for public access were drafted that adhered to the M2 EMP objectives and addressed the need to provide complimentary access opportunities. A general framework for public access on the OCTA Preserves was established as part of this outreach effort. These general principles and framework are outlined below.

Adhere to M2 EMP Objectives

a. The M2 freeway projects will potentially impact protected biological resources. State and Federal laws require that impacts on these resources be mitigated. The M2 sales tax includes funding to mitigate for these impacts. In order to provide this mitigation, OCTA is coordinating with the Wildlife Agencies and developing an NCCP/HCP. Undeveloped properties (Preserves) that possess habitat and biological resources that are similar to those potentially affected by the construction of the M2 freeway projects have been purchased and are integrated into the NCCP/HCP[2] as Preserves. These Preserves will remain undeveloped and will be protected in perpetuity.

[2] The M2 EMP has also funded multiple restoration projects. These public access principles and guidelines do not apply to the restoration project areas as they are owned and managed by separate entities.



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig11_MacPherson_Existing_RoadsTrails.mxd Date: 10/16/2015 34153

Figure 11
Existing Roads and Trails
MacPherson Resource Management Plan

b. OCTA Preserves are conservation properties (required mitigation) that are integrated into the Wildlife Agencies' and regulatory agencies' permitting process to facilitate issuance of permits for the M2 freeway projects.

c. The Preserves will be conserved in perpetuity. The NCCP/HCP and Regulatory Agencies' permits will require that these Preserves have a biologist review the condition of the biological resources (including wildlife movement) on a regular basis to ensure that the resources are protected and that threats are adequately addressed. The biologist will make management recommendations and work with the Wildlife Agencies and Preserve Manager to ensure the resources are not degrading. These required conditions will remain in perpetuity.

d. Permits are anticipated to be issued by the Wildlife Agencies and the regulatory agencies pursuant to the NCCP/HCP and a comprehensive permitting process with the regulatory agencies. These permits will facilitate with the construction of the freeway projects.

Provide Complementary Access Opportunities

- Recreational access is an important co-benefit but not the principle public purpose for which properties are acquired by OCTA under the EMP. Access must be established and managed so as to ensure the permit conditions of the NCCP/HCP and Implementing Agreement, as well as the regulatory permits, are adhered to in perpetuity. The NCCP/HCP stipulates that recreational access be limited to passive activities such as walking, jogging, hiking, bird watching, non-competitive mountain biking, equestrian use, and limited picnicking. Certain inherent dangers exist on the Preserves and include; mountain lions, rattlesnakes, poisonous insects, poison oak, extremes in weather, loose rocks, and steep/rugged terrain.

- Access (including public access programs) should be provided consistent with the constraints of protecting habitat and species resources, historical resources, terrain, surrounding land uses, limits of allowable impacts within Preserves, parking and/or staging area opportunities, suitable trails, access points, management costs, and community support.

- Where public access can be provided while adhering to the goals of the NCCP/HCP, existing fire and utility roads should initially form the core trail system within Preserves while making best efforts to maintain consistency and compatibility with regional trail systems. Trails should be minimized where possible to preserve intact and naturally functioning habitat. Minimizing the amount of trails on the Preserves is important as this will limit the edge effects and the proportion of the property that is exposed to potential disturbance. Single track trails may be utilized if the trail helps to form a core system and/or complete a loop within the Preserve and the use of the trail does not negatively affect sensitive resources. OCTA will be required to ensure that the number, size, and location of the trail system does not increase to more than what is approved by the Wildlife Agencies. Installation of fencing or other barriers may also be necessary along certain trails to discourage off-trail activities. All trails will require maintenance to keep them safe. These tasks will be more realistic to manage if the trail system is smaller and well-defined.

- Partnerships with community and user groups should be developed to help manage and staff access as well as docent activities and responsibilities.

- A robust and sustained public education program should be established to communicate and regularly reinforce the history, purpose and value of the Preserve system. The message should include that preserving these lands in perpetuity not only benefits biological resources, but also provides protection of historical vacant lands and view sheds which add value to the community.

The following is a **Draft Model Public Access Framework** for OCTA Preserves.

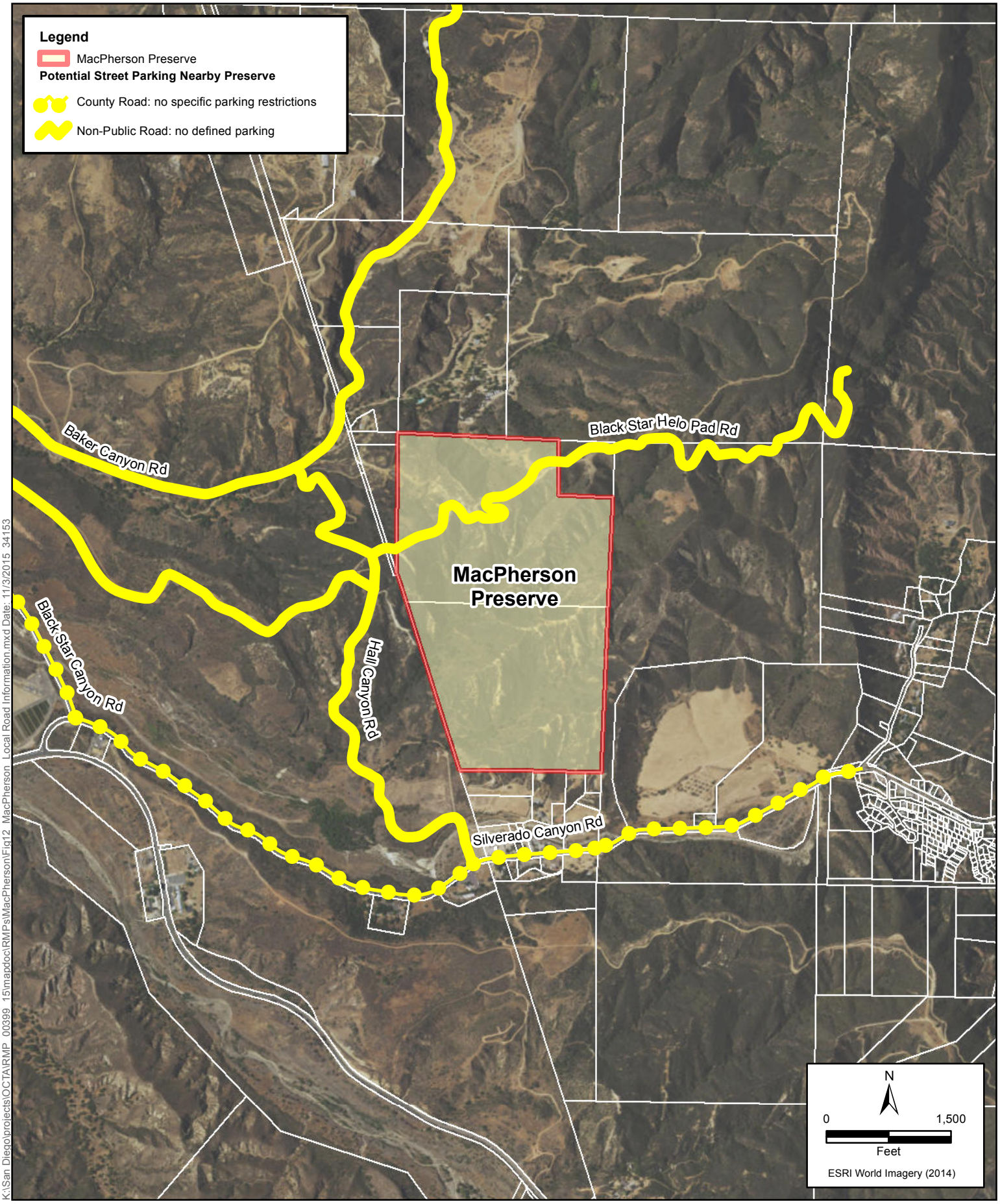
1. The default form of public access is managed or structured access by the Preserve Manager which may include limits on the dates, times, purpose, and amount of access, including some degree of supervision, potentially augmented, as conditions warrant, by:
    a. Docent-led managed access through partnerships with community and user groups;
    b. Self-managed access through partnerships with community and user groups;
    c. A permit system; and/or
    d. Open access days and locations.
2. Public access is scalable and can be actively and adaptively managed by changing the form, frequency, numbers, times of day, days of week and month, and season that activities are conducted depending upon circumstances and status of resource protection, observed impacts, and compatibility of different user groups
3. Some Preserves may have extremely limited public access opportunities because of significant habitat value[3], safety concerns, relative isolation, lack of trails or trail connections, and/or conflicts with surrounding land uses.
4. Enforcement of public access limitations and violations of access rules and policies is progressive and aimed at education and diversion of the activity to other more suitable locations rather than punishment.
5. Repeated violation of access rules and policies and/or evidence of damage or harm to the Preserves may result in fines significant enough to force change in behavior and restricted public access or closures until resource protection can be assured. Fines may vary and, depending on the type and severity of the impact, could result in a per acre cost to restore and offset damage to a Preserve. The Preserve Manager should have the capacity to actively cite repeat violators and pursue damage reimbursements.

3.1.3 MacPherson Public Access Plan

In order to properly assess if access is appropriate, each Preserve needs to be individually analyzed to determine what type(s) of access would be compatible. The intention is that each of the OCTA M2 Preserves would result in a specific access program based on the Draft Model Public Access Framework developed as a result of public input and the public outreach focus groups. The framework needs to be applied to each individual Preserve as each Preserve has its own set of limitations and resources. These considerations were factored into the development of the managed access plan as described in this section.

The MacPherson Preserve is located in Silverado Canyon between three rural roads (Silverado Canyon Road, Black Star Canyon Road, and Baker Canyon Road) within unincorporated Orange County. These roads were not designed for higher volumes of traffic, which could occur if open public access is allowed (Figure 12). The Preserve does not currently include the necessary space for adequate staging areas (parking/restroom facilities) to facilitate open public access.

[3] Significant habitat value can be defined as habitat that imperiled species are reliant upon in order to help prevent their extinction, fragmentation or reduction in range.



K:\San Diego\projects\OCTA\RMP 00399 15\mapdoc\RMPs\MacPherson\Fig12 MacPherson Local Road Information.mxd Date: 11/3/2015 34153

Figure 12
Local Road Information
MacPherson Resource Management Plan

Private property surrounds McPherson to the north, east and south. OC Parks managed County lands (i.e. public lands) located directly to the west do not currently allow open public access (Figure 13), but does offer managed public access. Portions of these County lands are currently incorporated into OC Parks managed access program. Several public events are held a year by OC Parks as part of this managed access program, such as wilderness access days. In order to access the McPherson Preserve, OCTA must first pass through these OC Parks lands. OCTA is currently required to obtain an entry permit from OC Parks in order for OCTA staff or consultants to access through the County gates to reach the MacPherson Preserve.

OCTA is willing to coordinate with OC Parks during these managed events which occur near the MacPherson Preserve. For example, if OC Parks is offering access on a trail/road that continues onto the MacPherson Preserve, OCTA would be willing to potentially extend these routes onto the MacPherson Preserve as part of the OC Parks organized events. This would be in line with the 1(a) of the Draft Model Public Access Framework (Framework). Pursuant to item 2 of the Framework, access is scalable and may increase or decrease from this proposed baseline. Due to the current access and staging constraints surrounding this Preserve, open public access will be prohibited), however, managed events may occur through a partnership with OC Parks.

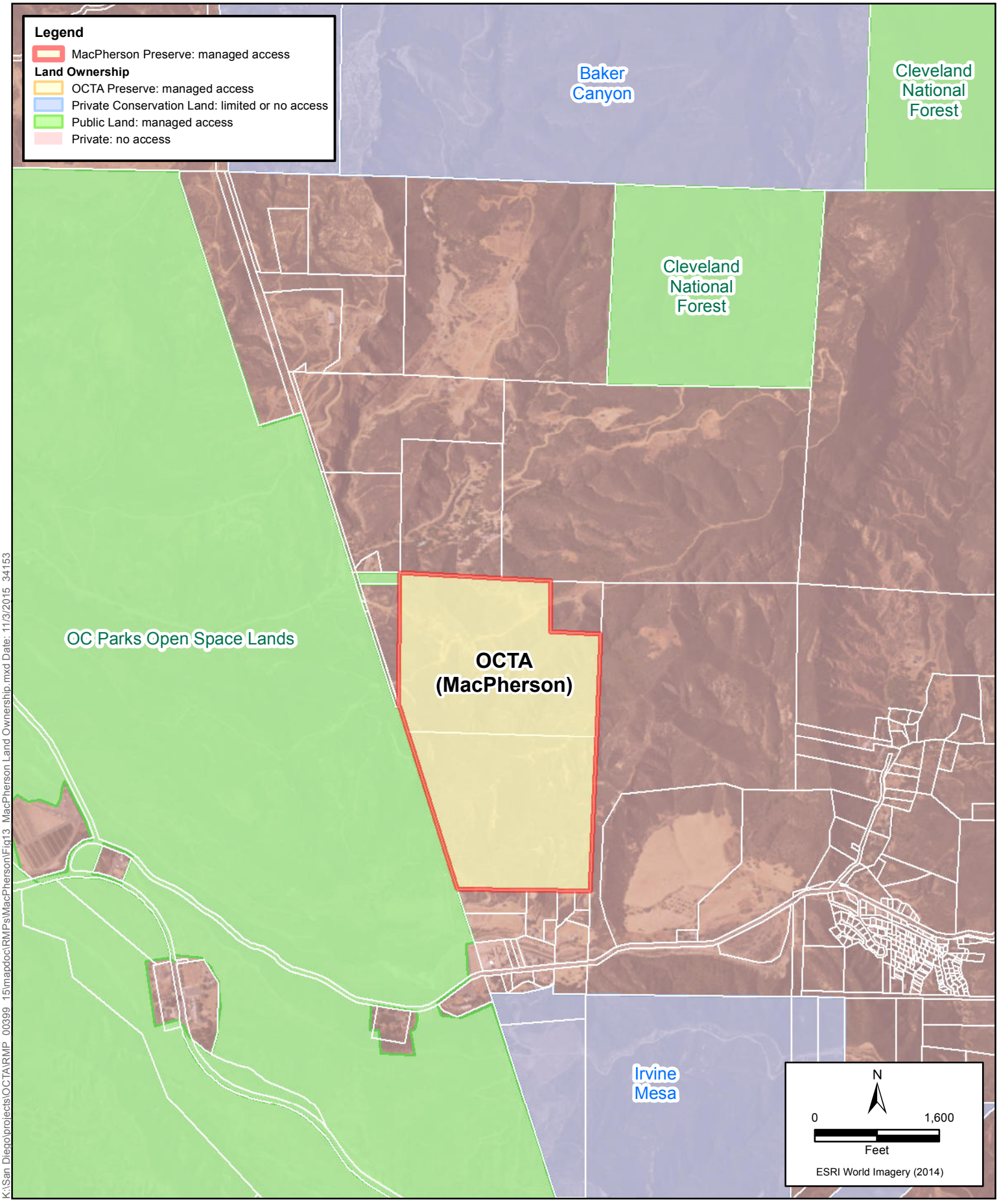
A long-term Preserve Manager is anticipated to be in place within the next five years. Once the long-term Preserve Manager is established, the public access program will be defined and adaptively managed based on the outcome of the previous docent-led activities and Wilderness Access Days. The level of public access may increase or decrease, depending on whether trail conditions (i.e. are trail width, depth and tread) remaining consistent and how biological resources respond to the type, amount, and frequency of access. The public access program will adhere to the Guiding Principles and Framework established in section 3.1.2 and will depend on a variety of factors including the management capabilities of the selected Preserve Manager, as well as community partnerships.

The Preserve Manager will monitor the Preserve related to public access. The intensity (e.g. number of days accessible) of the recreational use at the Preserve will be determined based on the demonstrated ability to implement recreational activities in a manner that does not negatively impact the conserved resources and on the availability of funding and volunteer resources to oversee and monitor the recreational use. The Preserve Manager and OCTA, in coordination with the Wildlife Agencies, will revise the Public Access Plan to ensure compatibility with biological resource goals and objectives, as warranted.

Approved Roads and Trails

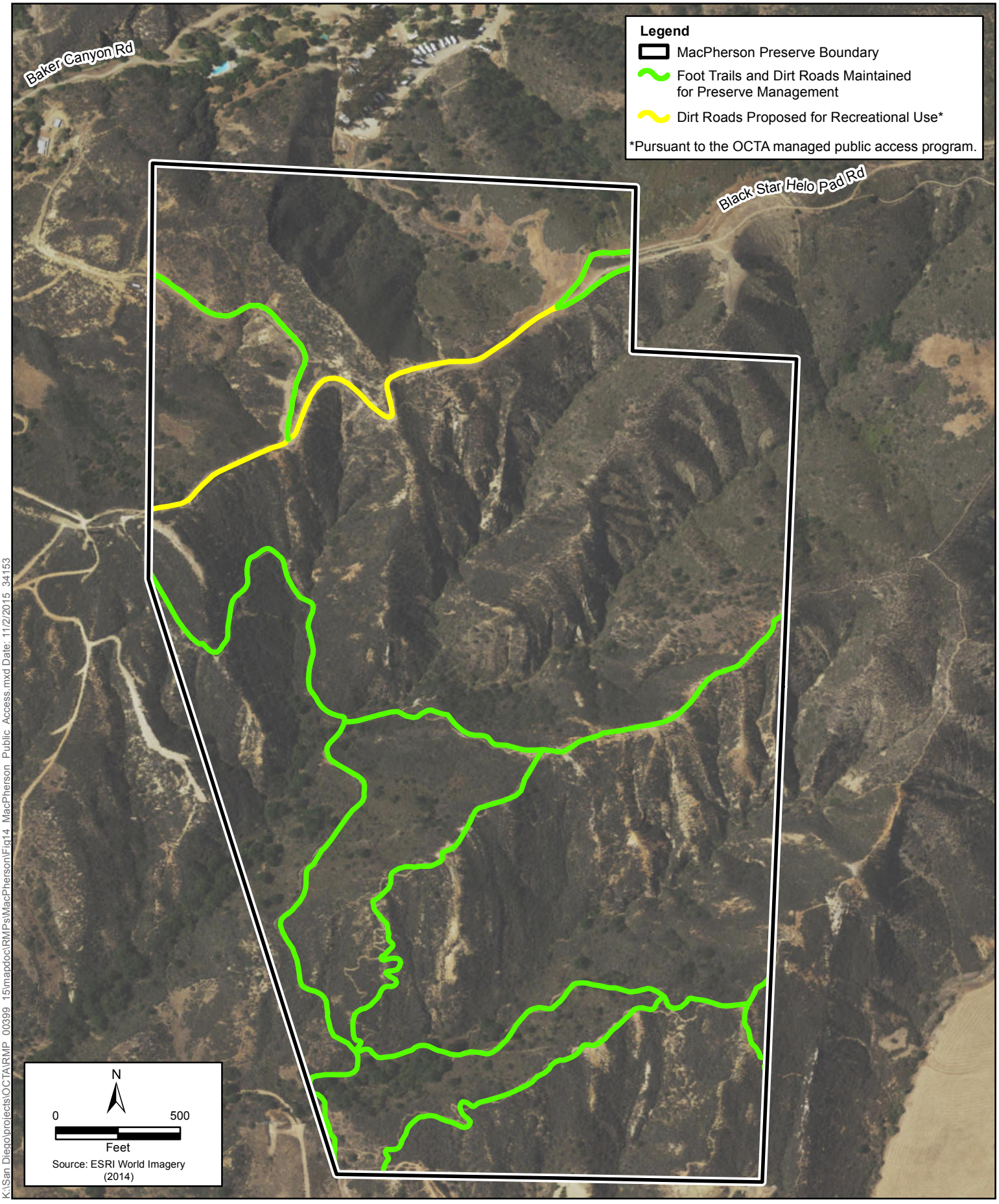
The final design of the MacPherson Preserve approved roads and trails network was determined based on avoidance and minimization of impacts to sensitive biological resources as well as coordination with the Wildlife Agencies. In addition, published scientific research was also reviewed including the paper, "*An Efficient Monitoring Framework and Methodologies for Adaptively Managing Human Access on NCCP Lands and Other Reserves in Southern California*" (Irvine Ranch Conservancy add date of publication) to help finalize the Preserve's trail network.

Based on a review and analysis of the existing trails and biological constraints on the MacPherson Preserve, the trails depicted on Figure 14 will be designated as potential trails for recreational use and will also include trails maintained for management use. A 0.62-mile of the existing dirt road/trails system will be maintained for potential recreational use on the Preserve. During approved events, trails will be open during daylight hours only and access will be restricted during nighttime hours to reduce impacts (noise and light) to wildlife species and to ensure the safety of the public.



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig13_MacPherson Land Ownership.mxd Date: 11/3/2015 34153

Figure 13
Surrounding Land Ownership
MacPherson Resource Management Plan



K:\San Diego\projects\OCTA\RMP_00399_15\mapdoc\RMPs\MacPherson\Fig14_MacPherson_Public_Access.mxd Date: 11/2/2015 34153

Figure 14
Public Access
MacPherson Resource Management Plan

OCTA recognizes that regional trails planning evolves and changes over time. OCTA will participate in regional trails planning efforts to evaluate possible trail connections and anticipate how (and if) future trail connections could be made. This requirement will be extended to the Preserve Managers if and when OCTA transfers ownership and responsibility for managing a Preserve to another entity.

Staging and Parking Areas

Silverado Canyon Road is a County road and is approximately .20 mile south of the Preserve. There are no restrictions on parking along Silverado Canyon Road. Baker Canyon Road and Black Star Canyon Road are private roads with no defined parking status. No open staging areas occur near the Preserve. Traveling from any of these roads to the MacPherson Preserve would require illegal access through non-OCTA owned property. Prior to OCTA acquiring MacPherson in December 2013, access was restricted.

3.1.4 Public Education and Enforcement of Public Access

Public education and involvement are critical components for ensuring successful management and public support of the Preserve System. If the public is properly informed of the biological values, goals, and activity restrictions within the Preserve, it is more likely that management goals and guidelines will be respected and followed. The OCTA NCCP/HCP Administrator and Preserve Managers will coordinate to determine the most effective methods and materials for educating the public. They may include the following:

- Hold annual public meetings to present information regarding Preserve goals, guidelines, restrictions, and compatible uses. These meetings may be held concurrently with the annual NCCP/HCP reporting meeting and a regularly scheduled Environmental Oversight Committee meeting and will be announced with the property public notice.
- Establish information on OCTA's website that provides information on the Preserve, Preserve Manager contact information, and links to additional information on Preserve goals and guidelines.
- Provide signs, displays, and pamphlets that explain Preserve rules and management goals.
- Develop a volunteer program that addresses a variety of education and management issues, including, but not limited to, preparation of educational materials, trail repair, erosion control, invasive species removal, native habitat and plant restoration, trash removal, biological monitoring, and management patrols.
- Prevent and remove illegal trails, trail modifications (e.g., bike jumps), and other intrusions into the Preserve, and enforce land use and recreational activity restrictions.
- Encourage two-way communication with adjacent residents to collect and disseminate Preserve information.

Ongoing management of the Preserve must monitor and control permitted activities and unauthorized activities (e.g., use of closed trails, illegal dumping of waste materials and debris, and encroachment) in sensitive areas to protect biological resources on the Preserve. Damage caused by unauthorized public access is potentially one of the greatest threats to Preserves near urban population centers. Without enforcement, it is often difficult to change human behavior, especially in areas that have been used historically for activities that are not compatible with biological resource protection (e.g., off-road vehicle use).

Preserve monitoring and enforcement will consist of regular patrols of the Preserve by the Preserve Manager and staff to communicate safety measures, resource protection measures, and recreational use and access guidelines to public users. Public outreach and education, including educational materials, docents, and volunteers will supplement Preserve patrol efforts.

All persons using the Preserve for general access or recreational purposes, as well as persons responsible for authorized management and maintenance activities, will be encouraged to participate in "self-monitoring and policing" programs to minimize impacts on protected biological resources. For example, trail user groups will be encouraged to self-monitor and police their community to minimize off-trail activities and other abuses to habitat resources within the Preserve.

The Preserve Manager will be responsible for enforcing public access guidelines and ensuring that only permitted recreational and general access activities occur within the Preserve. Enforcement of Preserve guidelines falls into two categories of offenses: minor and major infractions.

- **Minor infractions** (e.g., hiking on a closed trail, bringing a dog into the Preserve, unauthorized equestrian use, excess irrigation running onto the Preserve from an adjacent property) shall be handled by the Preserve Manager through discussion and education of the offending party and a warning process. The Preserve Manager can work with other Preserve Managers and local community groups on a public education program to explain goals and regulations as well as educate the public on the area's resources (see Section 3.11, *Public Outreach and Education*).
- **Major infractions** (e.g., illegal off-road vehicle use, cutting new trails, illegal dumping, vandalism, illegal encampments [itinerant workers and transients], illegal hunting, and excessive repeat offenders of minor infractions) may require coordination between the Preserve Manager and law enforcement officials. Perpetrators of major infractions are often not caught due to the delay in response time.

If allowed by State and local regulations, the Preserve Manager and staff should be given the authority to issue citations and impose fines for misuse of trails and other Preserve facilities, trespassing, and other unauthorized or illegal activities. Alternatively, the Preserve Manager may involve local law enforcement agencies to enforce biological protection measures and to restrict prohibited activities, including issuing citations and fines. Fines levied for abuse of Preserve facilities resulting in harm to species or sensitive habitat will be sufficient to discourage repeat occurrences (subject to existing laws and regulations).

The Preserve Manager will make adjustments, as needed, to site access and recreational activities (including adjusting hours/days of use and restricting road and preserve access) to ensure protection of biological resources. Repeated offenses (minor and/or major) by the same user or users will provide grounds for permanent loss of access to the entire Preserve as a means of avoiding unacceptable adverse impacts on habitats/species within the Preserve. This will be enforced with the use of local law enforcement as well as public education regarding the reasons for closure and the corrective actions needed to reopen it.

Repeated offenses by multiple users will provide grounds for the temporary closure of trail segments and, when necessary, the entire Preserve as a means of avoiding unacceptable adverse impacts to habitats/species within the Preserve. Such temporary closures, again paired with public education efforts, will also serve to inform users regarding the need and reasons to obey Preserve rules and regulations, thereby reducing future recreational impacts on biological resources of the Preserve.

The Preserve Manager will install fencing, barriers, or signage at key access points, as necessary, to restrict public access and limit unauthorized activities thereby protecting resources and facilitating public safety.

3.2 Invasive Plant Species Control

The MacPherson Preserve has a relatively low percentage of invasive plant species and is generally undisturbed from surrounding development or historical agricultural activities. Even so, there are pockets of invasive species identified during baseline surveys and the potential for invasive plants have been identified as a threat to natural communities and species on the Preserve. Invasive plant control is expected to be a long-term, ongoing management issue.

The Preserve Manager will contract with a Restoration Ecologist to prepare an invasive plant treatment plan within two years of RMP adoption. The treatment plan will prioritize invasive species for control; specify goals (eradication versus control); identify treatment locations, timelines (including potential re-treatments), and removal methods; provide realistic, measurable success criteria and monitoring methodology; and identify areas that may need post-treatment restoration. The treatment plan will set forth target-specific control strategies for invasive species control, using an integrated pest management (IPM) approach. The IPM approach uses the least biologically intrusive control methods and is applied at the most appropriate period in the growth cycle to achieve desired control goals. Invasive control strategies may include mechanical and chemical methods.

The invasive plant treatment plan will be reviewed and approved by the Wildlife Agencies. The treatment plan should include the following measures.

- Development of an accurate mapping of invasive plant species. The Preserve Manager in coordination with the Monitoring Biologist and Restoration Ecologist will map priority invasive species and create a spatial dataset of invasive species locations. The mapping of invasive plant species will be maintained over time through surveys completed by the Preserve Manager, Monitoring Biologist, or volunteers, focusing on areas that function as natural conduits for dispersal (trails, streams, disturbed areas). Surveys will be conducted during general stewardship monitoring, biological monitoring, or volunteer patrols. The invasive species map will be updated yearly based on mapping results.
- Chemical control will be conducted using herbicides compatible with biological goals and objectives. Pest control applicators qualified and licensed under the California Department of Pesticide Regulations will provide recommendations for chemical control.
- Best Management Practices (BMPs) will be identified for the disposal of invasive plant materials removed from the Preserve at a landfill or secure, onsite location to avoid spreading invasive seeds or propagules. Onsite storage may include chipping, mulching, and periodic spot-treatment of compost piles with herbicide to kill any germinating or re-sprouting invasive plants.
- A monitoring schedule will be established to evaluate the success of invasive plant control efforts for five years following implementation or until eradication is maintained for one year without follow-up control activities. Monitoring will be conducted by the Preserve Manager during stewardship monitoring and by the Restoration Ecologist during initial removal activities and then annually for up to five years following initial activities. Regular monitoring and annual assessments will evaluate re-growth of target species (giant reed, salt cedar, pampas grass, and cardoon), unauthorized encroachment, and related vandalism and damage.

- Situations where the implementation of habitat restoration should be implemented in conjunction with invasive plant removal to improve native habitat cover and quality will be identified.

The Preserve Manager will implement remedial actions where necessary, based on monitoring results. These may include re-treatments, adjustments to invasive plant control methods or timing, and modifications to site protection measures. The Preserve Manager will continue to collaborate with the Restoration Ecologist to receive input regarding site conditions, changes in control methods or timing of actions, and adjustments to monitoring frequencies. Results of the implementation and monitoring of the invasive plant species control plan will be included in the Annual Reports.

3.3 Habitat Restoration

Habitat restoration activities may be required and/or desirable in response to different threats, stressors, and habitat conditions. This RMP identifies habitat restoration as a potential activity within the MacPherson Preserve associated with trail closures (Section 3.1), invasive plant species control (Section 3.2), response to fire events (Section 3.5), and biological monitoring and management (Chapter 4). At this point in time, specific habitat restoration activities have been identified for trail closures. Additional restoration activities associated with other priorities may be warranted in the future based on monitoring and future conditions.

3.3.1 Habitat Restoration of Closed Trails

An existing foot trail on the north portion the Preserve will be closed for public access (see Section 3.1 and Figure 9) and initially allowed to passively restore back to natural habitat. During the first five years after adoption of the RMP, the Preserve Manager will monitor conditions at this trail location using photo monitoring methods to track progress of passive restoration. After five years the goal will be to have native plant cover of at least 70 percent of the closed trails. Results of the effectiveness of passive restoration of closed trails will be reported in the Annual Report. After five years, the Preserve Manager, in consultation with the Restoration Ecologist, may determine the need for active (versus passive) restoration, including invasive plant control and supplemental seeding, to improve the cover and quality of native habitat on closed trails.

If active restoration is determined necessary, the Preserve Manager will have the Restoration Ecologist develop a Trail Restoration Plan. This plan will include a fine-scale map of treatment area(s), along with guidelines for (1) site preparation, including any needed soils treatments, grading, supplemental water, and weed control; (2) plant establishment, including planting and seeding palettes and methods; and/or (3) follow-up maintenance, including weed control, supplemental water, pest control, and re-planting/re-seeding. The Trail Restoration Plan should consider current site conditions, including soils, hydrological conditions, accessibility, proximity to municipal water sources, existing invasive plant species, and existing onsite and adjacent biological resources. The Restoration Ecologist will monitor active trail restoration on a quarterly basis for a minimum of one year following implementation. Monitoring will include a qualitative assessment of native plant cover, including progress towards meeting the 70-percent coverage goal; identification of invasive plant species establishment; documentation of unauthorized encroachment and related vandalism and damage; and identification of necessary remedial actions, including additional native seeding, adjustments to invasive plant control methods and timing, and modifications to site protection measures.

3.4 Vegetation Management

Pruning, cutting, or clearing of native vegetation will generally be avoided except for maintenance along access roads and approved recreation trails and installation of erosion control measures, if necessary. The clearing of natural vegetation on the Preserve will be required to comply with the Nesting Bird Policy included in the OCTA M2 NCCP/HCP (a version of the policy has been slightly edited to be applicable for preserve management and is included as Appendix D). The Preserve Manager will be responsible for ensuring all staff working within the Preserve understands and follow procedures set forth for vegetation management.

The Preserve Manager will have General Maintenance staff to perform vegetation management along the designated access roads within the Preserve to allow for vehicle access for preserve management and fire protection activities. Vegetation management will be a combination of physical trimming of vegetation and application of herbicide treatment along the edges of access roads. Impacts on narrow endemic plant populations, including intermediate mariposa lily, will be avoided by flagging known occurrences and avoiding herbicide treatments 10 feet from known occurrences.

3.5 Fire Management

The OCFA is responsible for fire control within the Preserve, and their first priority will be to protect life and property. OCTA will continue to work closely with the OCFA to identify fire management guidelines, including specific fire and brush maintenance zone specifications and access route locations that minimize impacts on sensitive biological resources, and will identify areas that should be avoided to preserve sensitive biological resources.

3.5.1 Fire Management Plan

Within two years from adoption of the RMP, the Preserve Manager, in coordination with OCTA and OCFA, will develop a Fire Management Plan (FMP) that establishes policies and approaches to maximize protection of biological resources during fire suppression activities, to the degree feasible. The FMP will identify environmentally sensitive lands (ESLs) that should be avoided to minimize irreparable impacts on biological and cultural resources during fire suppression activities. The ESLs will include Covered Species locations and sensitive natural communities (e.g., native grassland). A map will be prepared that shows fire management and ESLs consistent with the OCFA regional fire management program and will include the following.

- Preferred access points and access routes on the Preserve, fire hydrants, and potential staging areas for fire suppression activities.
- Covered Species, sensitive species, and sensitive natural communities that are highly susceptible to fire or fire suppression activities (e.g., coast prickly pear scrub, and locations of previously recorded rare plant observations). The ESL map should distinguish between areas that should be protected from fire versus areas that should be protected from surface disturbance (e.g., grading) based on the ability of target resources to recover from these impacts.
- Location of bulldozer lines, if these are a potential component of the fire suppression strategy for the Preserve.

3.5.2 Strategy and Approach

The FMP will emphasize a fire suppression strategy of controlling any smaller fires on site, where feasible. Larger fires that originate outside the Preserve and move across the Preserve may require suppression tactics within the Preserve. In these cases, OCFA will establish defenses within and nearby any adjacent homes to protect life and property. The final suppression tactics will be derived from current or predicted fire weather, topography, fuels (fire behavior), and the surrounding resources (lives and property) that are at risk. Once these have been identified OCFA will develop a strategy for suppressing the fire and will coordinate with OCTA and keep OCTA informed as to the course of action necessary. OCFA will engage OCTA to gain concurrence or an understanding of what actions are necessary. The Preserve Manger, OCTA, and OCFA will collaborate to define the least damaging suppression strategies within the FMP and delineate this preferred area(s) graphically. Strategies should avoid ESLs during fire suppression activities, to the degree feasible.

Public and firefighter safety will be the primary consideration before and during a wildfire. Accordingly, the following measures will be implemented at the Preserve.

- Close trails during a red flag warning or when an active fire threatens the Preserve.
- Post fire danger signs at trail heads.
- Post signs with phone numbers for Preserve users to call and report suspicious activity or fires to the 911 dispatch center.
- Post signs instructing Preserve users to immediately report fire activity to the 911 dispatch center or fire agency. The contact information for OCFA headquarters is (714) 573-6000.
- In the event of a fire on the Preserve or a fire approaching the Preserve, the Preserve Manager will provide assistance to OCFA, as necessary.

3.5.3 Post-Fire Response

The Preserve Manager will inventory the condition of natural communities following a fire on the Preserve, and will coordinate with the Monitoring Biologist, and Wildlife Agencies as necessary, to determine if habitat restoration is warranted. The OCTA NCCP/HCP Administrator and Preserve Manager will work with the Wildlife Agencies and OCFA, as necessary, to determine if fire severity and frequency meet the requirements of a Changed Circumstance as defined in the NCCP/HCP and utilize funding as appropriate to implement post-fire restoration. Options for funding this restoration include (1) using funds allocated for adaptive management, (2) reallocating funds from existing management priorities, as appropriate, (3) pursuing outside funding sources, or (4) seeking authorization to use Changed Circumstance funding.

Post-fire management activities may include, but are not limited to the following.

- Conduct emergency post-fire erosion control, where necessary.
- Repair/restore damaged fences, roads, or other official Preserve structures to pre-fire conditions.
- Monitor post-fire recovery closely. Implement control measures to remediate any resulting erosion, sedimentation, and invasion by nonnative plant species.
- Coordinate with OCFA to recontour any dozer lines created within the Preserve. Restoration or dozer lines by OCFA will include, but not be limited to, recontouring lines, removing berms, scattering previously cut brush over lines, and potentially replanting available cactus pads. These activities will be agreed upon and coordinated between OCFA and Preserve Manager.

- Plan all post-fire actions (e.g., habitat restoration, invasive species removal, erosion control, or trail stabilization) in consultation with the Wildlife Agencies prior to project initiation and permitted if necessary by State and Federal regulation programs. The Preserve Manager will use current information on best approaches and strategies for post-fire restoration, including erosion control, seeding, and success criteria.

3.6 Nonnative Animal Species Management

Nonnative animal species are potential threats and stressors to wildlife protection and productivity on the Preserve. The Preserve Manager will be responsible for the following measures specific to nonnative animal species management, including nonnative species control and feral and domestic animal restrictions and control.

3.6.1 Invasive Nonnative Species Control

The Preserve Manager will work towards controlling the spread of invasive ant species as follows.

- Inspect irrigation/supplemental water runoff from adjacent landowners onto the Preserve and taking steps to educate landowners or rectify the problems by other means such as coordination with local governments regarding irrigation or other urban runoff ordinances or capturing runoff in a vegetated swale on site to contain and limit adverse effects on the Preserve.
- Control irrigation/supplemental water application used for onsite restoration activities to avoid any overflow, which may attract and sustain nonnative ants by increasing soil moisture.
- Ensure that native plant materials used for habitat restoration do not contain invasive ant or other species by inspecting all container stock before it enters the Preserve.
- Empty all trash receptacles located on the Preserve on a regular basis.

The Preserve Manager will also need to monitor and address other potential infestations of invasive insects and other pathogens that can threaten native habitat. The Preserve Manager will stay current on the latest information and science of invasive insects or other pathogens (e.g. goldspotted oak borer) and monitor for signs of infestations as part of general stewardship monitoring. If an infestation is identified, the Preserve Manager will coordinate with the OCTA NCCP/HCP Administrator and the Wildlife Agencies on any appropriate control actions.

3.6.2 Feral and Domestic Animal Restrictions and Control

With the exception of service animals, all dogs are prohibited within the Preserve. In general, control of feral and domestic animals will consist of the following.

- Documentation of feral or domestic animal activity.
- Establishment of a removal program or refer the infraction to the local animal control agency if a problem with feral animals or animal control is identified.
- Prohibit Preserve Management personnel from housing or allowing domestic pets on the Preserve.

3.7 Property Management

Property management includes routine and ongoing property management activities conducted by the Preserve Manager and staff or contractors to ensure that the Preserve is maintained in good condition.

3.7.1 Lighting and Noise

The Preserve Manager will be responsible for implementation of the public access plan and ensuring operational activities within the Preserve avoid or minimize impacts on Covered Species and natural communities from lighting or noise. To the degree feasible, lighting in or adjacent to the Preserve will be eliminated except where essential for roadway use, facility use, safety, or security purposes. The Preserve Manager will work with adjacent land owners and the County of Orange to shield light sources adjacent to conserved habitat so that lighting is focused downward. The Preserve will be closed during nighttime hours, which will reduce the need for additional lighting within the Preserve. As part of the public outreach efforts, the Preserve Manager will prepare and disseminate informational materials to adjacent neighbors and Preserve visitors to educate the public about the importance of minimizing edge effects such as nighttime lighting and noise.

3.7.2 Fencing

If necessary for the protection of biological resources, OCTA will install fencing (three strand smooth wire) and/or gates around the exterior of the property. Fence type and placement will be designed to limit human access but maintain wildlife movement. Gates have been installed by the County of Orange to control access to many of the access roads. The Preserve Manager will be responsible for monitoring and maintaining fencing and gates to control public access and trespassing. Fencing and locks should be inspected on a regular basis (a minimum of two times per year). Damaged or missing fencing or locks should be replaced as soon as possible, but not more than one month after detection.

The Preserve Manager will identify situations that warrant the installation of additional fencing or natural barriers within the Preserve around areas that require enhancement control of public access. Natural barriers may include dense plantings of prickly, thorny, or rash-inducing plant species such as California wild rose (*Rosa californica*), cactus (*Opuntia* sp.), or poison oak (*Toxicodendron diversilobum*), as well as large rocks or logs.

The Preserve Manager will identify interior fencing that should be removed and develop a plan for removal methods.

3.7.3 Signage

The Preserve Manager will be responsible for installing and maintaining signs at key access points to provide visitors with information on Preserve rules, recreational features (including trails), and biological and cultural resources (as appropriate). The Preserve Manager should install signs at Preserve boundaries, selected roads, and natural features to indicate permitted and prohibited uses in the Preserve, including appropriate visitor behavior, trail use, safety, and resource protection. Signage may include (but is not limited to) the following.

- Speed limit signs along roads within the Preserve that are accessible to vehicles.

- Road/trail map signs that indicate roads and trails that are open to the public, as well as trail closures.
- Interpretative signs or kiosks that provide information on protected resources.
- Temporary signage indicating active habitat restoration/enhancement areas.
- Rules and regulations signs that indicate prohibited activities including (but not necessarily limited to) hunting, dumping, and dog walking.

The Preserve Manager should inspect all signage on a regular basis to ensure that signs are still in place and not damaged. Damaged or missing signs should be replaced as soon as possible after detection.

3.7.4 Hydrology and Erosion Control

The Preserve Manager will complete all management and operations of the Preserve in a manner designed to maintain natural hydrologic processes to the extent possible. This includes avoiding water contamination or excessive erosion that could affect hydrological systems. Minimizing impacts on hydrological systems will preserve natural ecosystem structure and function.

The Preserve Manager will inspect and identify situations requiring erosion control. Using erosion control BMPs, the Preserve Manager will install appropriate erosion control measures during regular maintenance and operation activities. These may include rice straw wattles, hay bales, silt fencing, sediment traps, and/or sandbags. These devices will be used on slopes below newly graded roads or fuel management/fire control areas to prevent erosion and deposition of materials in sensitive habitat areas, as necessary. These BMPs will also be used as necessary to reduce bank erosion (excess scour and undercutting) or sedimentation in existing streams or aquatic resources caused by changes in hydrology due to upstream/off-Preserve development activities. These activities will utilize stream bioengineering practices utilizing native materials and biodegradable structures with the goal of achieving long-term self-sustainable conditions or dynamic equilibrium.

The Preserve Manager will inspect vulnerable areas (e.g., trails, streams or aquatic resources, and fuel maintenance areas) immediately after a heavy rain storm to identify problems with erosion and sedimentation. Where erosion or sedimentation is identified, the Preserve Manager will follow BMPs (e.g., install control devices) as soon as possible to avoid further damage. In addition, access will be restricted to limit further damage or where required for safety purposes.

3.8 Land Uses within the Preserve

Permitted activities include those shown to have a minimal impact on biological resources and ecosystem functions, while prohibited activities are those expected to have a detrimental effect on those resources.

3.8.1 Allowed Uses

The following land uses are conditionally allowed if it can be assured that the activity minimizes or avoids impacts on biological resources and ecosystem functions, while allowing certain recreational, operational, and safety uses within the Preserve.

- Allow limited passive recreational activities within the Preserve (e.g., hiking and mountain biking uses) during daylight hours; refer to Section 3.1, *Public Access*, for additional information on conditionally allowed recreational uses within the Preserve.
- Provide access onto the Preserve for Preserve management, public services (e.g., fire management to monitor vegetation moisture levels and prevent the loss of human life or property), or law enforcement in response to violations of Preserve rules and regulations.
- Allow restoration and enhancement of native plant communities, including the removal of nonnative species, planting or seeding native trees, shrubs and herbaceous vegetation.
- Allow for the restoration and stabilization of streambeds and banks using native bio-engineering practices using natural and biodegradable material if necessary following fire, flood, or other natural disaster or unauthorized anthropogenic activities causing unnatural degradation.
- Allow for the maintenance of road and trail stream crossings with the least environmentally damaging practices and designs including minor grading of streambanks for small at-grade crossings that are left natural and stabilized with native plantings or other approved material.
- Allow for the replacement of road or trail stream crossings with the least environmentally damaging design limited to bridges, bottomless arch culverts, or embedded round culverts as long as natural stream processes are maintained through avoidance or recreation of the channel cross-section through the structure.

3.8.2 Prohibited Uses

The following activities are prohibited in the Preserve because they are not compatible with Preserve management and have a high potential to adversely affect biological resources.

- Residential, commercial, industrial, institutional, or landfill development; agricultural uses such as row crops, orchards, improved pastures, nurseries, greenhouses, and feedlots; livestock grazing (unless part of a habitat management strategy); itinerant worker camps; and mineral extraction.
- The creation of new trails or roads for the purposes of off-road vehicle use, mountain biking, or other recreational or other uses without prior authorization by the Wildlife Agencies.
- Recreational activities within the Preserve such as the following.
    - Active recreation, including ball fields, golf courses, improved park facilities, off-road vehicle use, or any other recreational activity that requires conversion of native habitats (e.g., clearing, grubbing, or planting of nonnative vegetation or turf grasses), facility construction (e.g., equestrian facilities, buildings, or paved pathways), or that otherwise negatively affects natural vegetation or wildlife habitat values.
    - Shooting, target practice, hunting.
    - Paint-ball.
    - Off-road vehicle use.
    - Dog walking, whether leashed or unleashed.
    - Geocaching.

3.9 Land Uses Adjacent to the Preserve

The Preserve Manager will monitor land uses adjacent to the Preserve to identify situations in which edge effects can negatively affect biological resources within the Preserve. The types of adjacency issues that will be monitored will include, but are not limited to, trespassing, drainage, lighting, noise, invasive planting, pet and livestock control, and fuel modification zones. The Preserve Manager will enforce trespassing regulations and prevent and remove illegal intrusions into the Preserve. Barriers (fencing, rocks/boulders, appropriate vegetation) and/or signage will be installed where necessary to protect the Preserve's sensitive biological resources and direct public access to appropriate locations. Additionally, educational information will be disseminated to adjacent residents and landowners to heighten their awareness of the Preserve's role in achieving the M2 NCCP/HCP biological goals, and provide information regarding approved access, fire management, and other adjacency issues.

OCTA will coordinate with adjacent landowners and local jurisdictions to address edge effect issues primarily through public outreach, education, and dialogue. OCTA does not have land use authority, and if legal or enforcement actions are deemed necessary, OCTA and/or the Preserve Manager will coordinate with the local jurisdictions or enforcement entities as appropriate. For new development adjacent to the Preserve, OCTA and/or the Preserve Manager will, to the extent practicable, provide input and direction through the public review process (e.g., the California Environmental Quality Act [CEQA] and permitting process) on appropriate adjacency guidelines.

3.9.1 Existing Land Use

The Preserve Manager will develop and implement a public awareness program within two years of the RMP approval to educate existing property owners in the vicinity of the Preserve of the Preserve's goals and objectives and steps they can take to protect the biological resources. In coordination with the OCTA NCCP/HCP Administrator, the Preserve Manager will develop flyers and other education materials that describe the types of activities that can occur on an adjacent property that can have negative effects on biological resources. OCTA will provide information on how an adjacent property owner can minimize these impacts. The types of issues that will be addressed will include, but not be limited to the following.

- Drainage – adjacent property owners will be encouraged to monitor drainage and irrigation that flows from their property onto the Preserve. Excessive irrigation can promote invasive plant and animal species (e.g., argentine ants) to expand into the Preserve.
- Lighting – lighting of properties adjacent to the Preserve should be directed away from the Preserve wherever feasible and consistent with public safety. Adjacent property owners will be encouraged to use low-pressure sodium lighting whenever possible.
- Invasive plant species – certain types of landscaping can introduce invasive nonnative plant species into the Preserve. Adjacent property owners will be provided with information on ways that they can landscape with species less likely to negatively impact the Preserve or use native species that reflect the adjacent native habitat.
- Invasive pests – recently coast live oak trees in Orange County were identified as being affected by the pest polyphagous shot hole borer/fusarium. In addition, the invasive goldspotted oak borer beetle was also found within the county. These pests and diseases damage trees and shrubs and are a serious threat to the Preserve ecosystem. OCTA will continue to partner with other land managers in the region for the latest survey methodology to help ensure early

detection of these species. OCTA is currently a member of the Orange County Invasive Tree Pests group administered by the University of California system. This multi-agency group shares information and resources related to the ongoing research, education, and outreach activities for the goldspotted oak borer beetle, polyphagous shot hole borer/fusarium, and other invasive pest/pathogen tree mortality issues specific to Orange County. In addition, OCTA will include information about these pests as part of the public outreach program.

As part of general stewardship monitoring, the Preserve Manager will regularly monitor the interface of the Preserve with urban/residential areas. The Preserve Manager will identify situations in which adjacent land uses create negative effects on biological resources and will identify possible solutions. The Preserve Manager will maintain a dialogue with adjacent landowners to discuss and address edge effect issues. The Preserve Manager may make suggestions on ways to minimize effects, but OCTA does not have land use authority of the adjacent properties and cannot directly enforce actions on the adjacent properties. If circumstances arise where legal or enforcement actions are deemed necessary, OCTA and/or the Preserve Manager will coordinate with the local jurisdictions or enforcement entities as appropriate.

3.9.2 Future Land Use

To the extent practicable, the Preserve Manager and OCTA will coordinate with local land use authorities (e.g., for the CEQA public review process) to ensure that new developments adjacent to the Preserve adhere to the following adjacency guidelines.

- Drainage – all developed and paved areas must prevent the release of toxins, chemicals, petroleum products, excess water, exotic plant materials, and other elements that might degrade or harm the natural environment or ecosystem processes within the Preserve. This will be accomplished using a variety of methods, including natural detention basins, grass swales, or mechanical trapping devices.
- Lighting – lighting of all developed areas adjacent to the Preserve should be directed away from the Preserve wherever feasible and consistent with public safety. Low-pressure sodium lighting should be used whenever possible.
- Noise – uses adjacent to the Preserve should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas and any other use that may introduce noises that could affect or interfere with wildlife utilization of the Preserve.
- Invasive species –invasive nonnative plant or animal species should not be introduced into areas immediately adjacent to the Preserve. All open space slopes immediately adjacent to the Preserve should be planted with native species that reflect the adjacent native habitat.
- Fuel modification zones – fuel modification zones should be fully contained on adjacent properties for all new development. Prior to implementing new developments adjacent to the Preserve, the local fire authority should review and approve proposed fuel modification treatments to ensure that no new fuel modification will be required within the Preserve.

3.10 Management of Cultural Resources

An ASA was conducted by LSA Associates, Inc. on the Preserve in 2014. The assessment included a records search, Native American coordination, field survey, and report. This information will be kept confidential and not included in this RMP.

3.11 Public Outreach and Education

Public outreach and education are critical components to ensuring successful management and public support of the Preserve. A public that is informed of the Preserve's biological values, goals, and activity restrictions is more likely to respect and follow Preserve guidelines. The OCTA NCCP/HCP Administrator and Preserve Manager will coordinate the most effective methods and materials for educating the public, which may include management tasks described below.

- Hold Public Meetings – the Preserve Manager will hold annual public meetings to present goals, guidelines, restrictions, and compatible uses. These meetings may be held concurrently with the annual M2 NCCP/HCP reporting meeting and a regularly scheduled Environmental Oversight Committee meeting.
- Develop and Maintain Website – the Preserve Manager, in coordination with OCTA, will post information on the OCTA website regarding Preserve goals and guidelines, public outreach and volunteer activities, contact information, and links to other relevant Preserve information.
- Provide Educational and Interpretive Materials – the Preserve Manager will provide signs, displays, and pamphlets that explain Preserve rules and management goals and provide interpretive information on the natural resources found onsite.
- Develop Outreach and Volunteer Programs – the Preserve Manager will, to the extent feasible, develop a volunteer program that addresses education and management needs including (but not limited to) preparation of educational materials, trail repair, erosion control, invasive species removal, habitat restoration and enhancement, trash removal, biological monitoring, and management patrols.
- Develop an Educational/Outreach Program to Inform the Public and Adjacent Landowners – the Preserve Manager will implement a program that may include distributing brochures in surrounding neighborhoods, working with homeowner's associations in the vicinity, developing an informational website, installing educational kiosks, providing outdoor experiences, etc. The Preserve Manager will coordinate with special interest groups and the Wildlife Agencies to encourage volunteer opportunities, such as trash pick-up and invasive species removal, to support RMP goals and objectives. Other activities to encourage on the Preserve include the Audubon Christmas bird counts that could supplement Preserve monitoring data and inform management strategies.
- Encourage Trail User Groups to participate in "Self-Monitoring and Policing" Programs – the Preserve Manager will collaborate with local and regional trail user groups to minimize instances of off-trail activities and other abuses to habitat resources within the Preserve.

The Preserve Manager will also collaborate with local entities to encourage scientific research on the Preserve and accommodate scientific research within the Preserve by allowing access to researchers, students, and other external conservation entities. Scientific research projects are subject to approval by the Preserve Manager, who will informally discuss the costs and benefits of the proposed work with the Wildlife Agencies as necessary. Potential research includes (but is not limited to) Covered Species biological or ecological studies, wildlife movement studies, climate change studies, habitat restoration, or nonnative species control.

This page intentionally left blank.

Chapter 4
Biological Monitoring and Management

The primary purpose of the Preserve is to meet biological preservation requirements of the M2 NCCP/HCP Plan. However, the Preserve will also provide recreational benefits and must accommodate site-specific operational and safety activities. This section provides goals, objectives, and management tasks to ensure that biological resources are protected.

Types of Monitoring

There are several types of monitoring that may potentially occur on the Preserve. Refer to the M2 NCCP/HCP Plan (Sections 7.1 and 7.2.7.4) for a full discussion of monitoring types. These types are summarized below.

- **Baseline (Inventory) Monitoring.** Identifies and characterizes the status of conserved resources, including threats and stressors, for management planning and future comparisons (e.g., trend analysis). Baseline surveys of the MacPherson Preserve were completed in 2014, and the results are summarized in Appendix B (BonTerra Psomas 2015a).
- **General Stewardship Monitoring.** Identifies general management issues and documents whether management actions are completed. This monitoring is conducted in perpetuity by the Preserve Manager during regular monitoring visits (monthly or as appropriate). The Preserve Manager may be assisted by biologists and other technical experts, as needed; monitoring personnel may record incidental data on observations, status, and threats to biological resources.
- **Effectiveness Monitoring.** Assesses status, trends, and threats to biological resources. This monitoring is conducted by the Monitoring Biologist(s) in perpetuity, according to the frequency and protocols in Table 4-1, and requires expertise in wildlife biology, botany, and, possibly, restoration ecology (Table 4-2).
- **Targeted Monitoring.** Answers specific management questions (hypotheses) and determines the effect of management actions on Covered Species and natural communities. Targeted monitoring is conducted by the Preserve Manager and/or Monitoring Biologist with input from outside sources (e.g., sampling design, data collection, analyses), as needed. Results are used to develop or refine management actions and BMPs. Targeted monitoring needs will be identified and prioritized as a result of baseline, stewardship, or effectiveness monitoring.
- **Regional Monitoring.** Identifies threats and trends to biological resources at the regional or landscape-level. OCTA may contribute Preserve monitoring data to regional assessments, as appropriate/feasible, but will not collect data outside the Preserve. OCTA will coordinate data collection methods with the Wildlife Agencies and other regional land managers to facilitate regional comparisons. OCTA will provide access for other entities to collect biological monitoring data on the Preserve, as appropriate, and will submit Preserve data to an appropriate data repository, such as the Biogeographic Information and Observation System, CNDDB, or other regional databases. OCTA will encourage scientific studies and surveys on the Preserve by academic institutions and other external conservation entities where these activities contribute to the understanding and management of Covered Species and natural communities.

Monitoring Methods

Monitoring and adaptive management on the Preserve will ensure that OCTA is in compliance with M2 NCCP/HCP Plan requirements. Monitoring establishes baseline conditions, identifies threats and trends, measures the effectiveness of conservation and management actions, and provides information to adaptively manage biological resources and improve the health and stewardship of the Preserve. Refer to the M2 NCCP/HCP Plan (Section 7.2.7.4) for an expanded discussion of monitoring guidelines. Modifications to monitoring methods will require consultation with the Wildlife Agencies as necessary, and will be documented in Annual Reports.

Adaptive management provides a strategy to improve future management actions through monitoring to evaluate management effectiveness. Where success criteria are not met, adaptive management provides a structured approach to improve management outcomes. Monitoring and adaptive management on the Preserve will be a cooperative effort between OCTA, the Preserve Manager, Monitoring Biologist and other supporting biologists, external entities conducting research on the Preserve, and the Wildlife Agencies. Refer to the M2 NCCP/HCP Plan (Sections 7.2.7.2 and 7.2.7.3) for an expanded discussion of the adaptive management approach and guidelines. Adaptive management is built into Preserve management through the use of phased monitoring and evaluation to modify management actions based on monitoring results. Adaptive management measures will be coordinated with the Wildlife Agencies for approval prior to implementation.

Management Goals, Objectives, and Implementation Strategies

Goals and objectives guide decision-making and provide a standard for measuring management effectiveness and, ultimately, the biological success of the M2 NCCP/HCP Plan (Atkinson et al. 2004, Lewison and Deutschman 2014). Goals are "broad, concise visionary statements that set the overall direction for monitoring and management, while objectives are concrete, measurable statements that detail how a specific goal can be attained" (Lewison et al. 2011). A single goal may have multiple objectives. Further, each objective may require one or more implementation strategies (management tasks) (Lewison et al. 2011).

Plan goals and objectives applicable to the Preserve are presented in Section 1.1.1, while Preserve-specific goals, objectives, and management tasks are summarized in Table 1-1 and detailed in Sections 3.1 to 3.11. Preserve-level objectives are based on current information (Chapter 2, *Site Description*). Additional refinement of objectives to ensure they meet SMART criteria (see below) should be included in Annual Work Plans, based on site evaluations and monitoring results. SMART criteria (Adamcik et al. 2004, Lewison et al. 2011, SDMMP 2013, Lewison and Deutschman 2014) are defined as follows.

- **Specific** – objectives will be detailed, clear, concise, and unambiguous.
- **Measurable** – objectives will include criteria for measuring progress.
- **Achievable** – objectives will not be unrealistic to achieve nor below acceptable standards.
- **Results-oriented** – objectives will specify an end result.
- **Time-fixed** – objectives will specify an end-point for being met.

Management Prioritization

All management actions will be identified as either Priority 1 or Priority 2 objectives. Priority designations establish a logical stepwise process and do not necessarily infer differences in importance, as described below. Refer to the M2 NCCP/HCP Plan (Section 7.2.7.3, "Adaptive Management Guidelines") for additional information on prioritization of management actions.

- **Priority 1 Actions.** These actions identify threats and negative trends that may require management and are, thus, a predecessor to Priority 2 (management) actions. Priority 1 objectives are ongoing and generally accomplished through stewardship monitoring, effectiveness monitoring, and general Preserve management. These actions are funded through the established Preserve management budget.
- **Priority 2 Actions.** These actions identify specific management actions identified through Priority 1 actions. Priority 2 actions will be implemented in consultation with the Wildlife Agencies as necessary, and will be further prioritized based on (1) alignment with Plan goals and objectives, (2) regional context (e.g., value or importance of a Preserve for a given resource), (3) level of threat, (4) expected effectiveness of proposed action (e.g., availability of proven methods to effect change), (5) logical sequencing (e.g., invasive species control may precede restoration), (6) catastrophic events (e.g., wildfire may necessitate a shift in priorities), (7) funding and staffing, and (8) SMARTness of objectives (i.e., well-defined objectives are easier to achieve than poorly defined objectives). In general, Priority 2 actions will be funded by using adaptive management funds, reallocating stewardship monitoring and Preserve management funds, or obtaining outside funding (e.g., grants).

4.1 Biological Monitoring and Management

Biological monitoring and management are critical to protection and long-term viability of biological resources and ecosystem functions on the Preserve, and are guided by all management goals (Table 1-1). Monitoring indicates status, threats, and trends of biological resources, including Covered Species and natural communities, while management provides measures to minimize adverse impacts on these resources. Monitoring and management objectives and management tasks for Covered Species and natural communities are described below. Table 4-1 indicates frequency and methods for monitoring Covered Species on the Preserve, while Table 4-2 indicates required qualifications for monitoring personnel.

Monitoring and management objectives and tasks that influence biological resources occur under other Preserve management elements, as well. These elements are referenced in the following sections, as appropriate.

Table 4-1 provides protocols and a timeline for effectiveness monitoring of biological resources on the Preserve. Protocols may be refined or updated based on new information or to ensure consistency with regional monitoring efforts. OCTA will coordinate regularly with the Wildlife Agencies and Preserve Managers in other NCCP/HCP areas to ensure the most current, established protocols are used. The Preserve Manager and Monitoring Biologist, in consultation with the Wildlife Agencies and other species experts, will review and select the most appropriate monitoring method(s) to address resource-specific management questions. Targeted monitoring will likely require development of an experimental approach and quantitative or semi-quantitative sampling, and will be designed on an as-needed basis.

Table 4-1. Effectiveness Monitoring for MacPherson Preserve

Type	Frequency	Protocols/Methods
Vegetation		
Comprehensive	10 Years	Conduct comprehensive vegetation mapping using the classification system from *A Manual of California Vegetation,* second edition,[a] and *Vegetation Classification Manual for Orange County* (release pending).
Invasive Species	Annually	Conduct invasive plant surveys along natural conduits for dispersal (trails, creeks and streams, disturbed areas) during general stewardship or biological monitoring, or through volunteer patrols.
Statistical Sampling	4 years	Conduct quantitative vegetation sampling to detect changes in species composition, cover, and structure using a sampling design and data collection protocols developed in conjunction with the Natural Communities Coalition (formerly known as Nature Reserve of Orange County [NROC]).[b] Sampling design will include stratified random sampling that considers habitat of various types and sizes, and includes adequate replication for statistical analyses.
Covered Species		
Plants		
Rare Plant Surveys	3 to 5 years, depending on precipitation conditions	Conduct special-status plant surveys following CNPS and CDFW survey guidelines.[c] In addition to population counts or estimates, collect covariate data on vegetation composition and cover, invasive nonnative plants and other threats, and map the perimeter of the population or suitable habitat. Conduct surveys during the appropriate blooming periods for each target plant species, which will vary depending on rainfall and temperature. Monitor reference populations will to determine appropriate survey times (generally between March and July).
Reptiles		
Coast horned lizard	4 years	Conduct focused visual encounter surveys for terrestrial reptiles during the peak activity period for the species, following the time-constrained search methodology.[d] Devote enough time to each survey area to allow for complete coverage. Expend equal effort (staff hours) in each search area.
Orangethroat whiptail	4 years	Conduct focused visual encounter surveys for terrestrial reptiles during the peak activity period for the species, following the time-constrained search methodology.[d] Devote enough time to each survey area to allow for complete coverage. Expend equal effort (staff hours) in each search area.

Type	Frequency	Protocols/Methods
Birds		
Cactus wren	4 years	Because of similar habitat requirements, surveys for cactus wren will be conducted simultaneously with coastal California gnatcatcher surveys, using the same protocols.[e]
Coastal California gnatcatcher	4 years	Conduct two surveys in suitable habitats with at least one week between site visits; conduct surveys in late winter/early spring. Conduct all visits during the morning hours, and survey no more than 100 acres of suitable habitat per visit. With the exception of timing and number of visits, surveys will follow USFWS coastal California gnatcatcher protocol, which includes playing tape vocalizations.[e]
Mammals		
Bobcat	4 years	Set up and monitor wildlife movement cameras for at least six months prior to effectiveness monitoring to document wildlife movement on the Preserve. A qualified wildlife biologist will assess camera results to determine wildlife movement and connectivity.
Mountain lion	4 years	Set up and monitor wildlife movement cameras for at least six months prior to effectiveness monitoring to document wildlife movement on the Preserve. A qualified wildlife biologist will assess camera results to determine wildlife movement and connectivity.

[a] Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens 2009. *A Manual of California Vegetation*, second edition. California Native Plant Society. Sacramento CA.

[b] Deutschman, D., S. Strahm, D. Bailey, J. Franklin and R. Lewison 2008. *Improving Statistical Sampling and Vegetation Monitoring for Open Space in Central Orange County*. Prepared for The Nature Reserve of Orange County (NROC).

[c] California Native Plant Society (CNPS). 2001. *CNPS Botanical Survey Guidelines*. Sacramento CA. Available: <http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf>. Accessed: August 29 2012.

[d] Corn, P. S., and R. B. Bury. 1990. *Sampling Methods for Terrestrial Amphibians and Reptiles*. USDA Forest Service, General and Technical Report PNW-GTR-256, 34 pp.

[e] USFWS. 1997. *Coastal California Gnatcatcher* (Polioptila californica californica) *Presence/Absence Survey Guidelines.* Report from Carlsbad, California, Field Office, Dated July 28, 1997.

[f] USFWS. 2001. *Least Bell's Vireo Survey Guidelines.* Report from Carlsbad, California, Field Office, dated January 19, 2001. 3 pp.

Table 4-2 defines the skills and experience for qualified biologists to complete effectiveness monitoring. Baseline monitoring will require a biologist with at least three years of experience with the general biological resources of Orange County to identify and evaluate threat to Covered Species and habitats.

Table 4-2. Qualified Biologist Skills and Expertise Requirements

Type	Task	Skills and Expertise
Vegetation		
	Comprehensive Mapping, Invasive Species Mapping, Statistical Sampling	Botanist with at least three years of experience mapping southern California vegetation communities; working knowledge of the classification system used in *A Manual of California Vegetation,* second edition.[a] and *Vegetation Classification Manual for Orange County* (release pending).
Covered Species		
Plants		
Rare Plant Surveys	Effectiveness Monitoring	Botanist with experience conducting floristic field surveys; knowledge of plant taxonomy and plant community ecology and classification; familiarity with plants of the area, including special-status and locally significant plants; familiarity with appropriate State and Federal statutes related to plants and plant collecting; and experience analyzing impacts of a project on native plants.[b]
Reptiles		
Coast horned lizard	Effectiveness Monitoring	Biologist with at least two years of independent experience conducting herpetological surveys; should have demonstrated experience in handling coast horned lizard.
Orangethroat whiptail	Effectiveness Monitoring	Biologist with at least two years of independent experience conducting herpetological surveys; should have demonstrated experience in handling orangethroat whiptail.
Birds		
Cactus wren	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species.
Coastal California gnatcatcher	Effectiveness Monitoring	Trained ornithologist with at least 40 hours of observation in the field of the target species and documented experience locating and monitoring nests of the target species; must have a current a USFWS Section 10(a)(1)(A) permit for coastal California Gnatcatcher.
Mammals		
Bobcat	Effectiveness Monitoring	Trained wildlife biologist with at least five years of independent experience evaluating wildlife movement and habitat connectivity.
Mountain lion	Effectiveness Monitoring	Trained wildlife biologist with at least five years of independent experience evaluating wildlife movement and habitat connectivity.

[a] Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens 2009. *A Manual of California Vegetation*, second edition. California Native Plant Society. Sacramento CA.

[b] California Native Plant Society (CNPS). 2001. *CNPS Botanical Survey Guidelines*. Sacramento CA. Available: <http://www.cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf.> Accessed: August 29 2012.

4.1.1 Covered Plant Species

Covered Plant Species considered in this section include intermediate mariposa lily, which has been detected on the Preserve, and many-stemmed dudleya, which is considered potentially occurring based on the presence of suitable habitat. These species have similar threats and management needs and thus, are addressed together. Identified threats include off-road activity and hiking and mountain biking activity (Appendix B); additional threats may include invasive plant species, other recreational activities, and road maintenance. Refer to Section 2.3.4 (Table 2-5), Appendix B, and the M2 NCCP/HCP Plan (Section 7.2.8.1) for additional information on the onsite status, habitat requirements, and threats to these species.

The following preserve-specific management objectives and tasks have been developed to address Species Goal 1 and Species Objective 1.1 from the M2 NCCP/HCP (see Section 1.1.1).

Management Objective: Ensure the long-term viability of Covered Plants by protecting, managing, and enhancing populations and suitable habitat on the Preserve.

Management Task 4.1.1.a: Identify Status, Threats, and Population Trends (Priority 1)

- Utilize baseline surveys to identify and map Covered Plants on the Preserve.
- Conduct effectiveness monitoring every three to five years to determine status and threats to Covered Plants, using survey methodology outlined in Table 4-1. Refine the Covered Species map based on survey results.
- In addition to population counts or estimates, collect covariate data on vegetation composition and cover and invasive plants and other threats. Map the perimeter of the population or suitable habitat.
- Summarize monitoring results (including findings and recommendations) in Annual Reports. Share data with other regional Preserve Managers to help decipher regional trends. Revise Conceptual Model (M2 NCCP/HCP, Section 7.2.8.1), as appropriate.

Management Task 4.1.1.b: Identify Anthropogenic Conflicts (Priority 1)

- Conduct general stewardship monitoring at specified intervals (e.g., monthly, quarterly) to record and/or track impacts on Covered Plants from vegetation management along access roads, trail use, and other potential disturbance activities. Record incidental observations of Covered Plants.
- Refine Covered Species map, based on monitoring results.

Management Task 4.1.1.c: Maintain Database of Population Size of Covered Plants on Preserve (Priority 1)

- Per requirements outlined in Section 5.6.2.2 of the M2 NCCP/HCP, "Covered Plant Species Policy," the OCTA NCCP/HCP Administrator is responsible for maintaining a ledger-type accounting system to track credits and debits for Covered Plants conservation and impacts. Using the results from the baseline surveys and subsequent surveys as part of general stewardship and/or effectiveness monitoring, the Preserve Manager will maintain a database of Covered Plant occurrences (locations) and population (number of individuals). Surveys must be completed by a qualified biologist (see Table 4-2) and include appropriate documentation (e.g., completing form for CNDDB). The Preserve Manager will keep track of the data of each observation and make sure surveys are not double-counting previous observations. Whenever

there are updates to this dataset, the Preserve Manager will provide the information to the OCTA NCCP/HCP Administrator, who will provide documentation to the Wildlife Agencies (during submission of the Annual Report) for review and approval to receive additional credits under the Covered Plant Species Policy.

Management Task 4.1.1.d: Protect Covered Plants during Property Maintenance and/or from Public Access and Recreational Activities (Priority 1)

- Implement specific management actions where baseline surveys indicate Covered Plant populations are directly or indirectly impacted by anthropogenic (operational or recreational) threats. Specific management actions may include (but are not limited to) modifications to vegetation management activities along access roads, invasive plant control, public access, and trail use management.
- Within five years of RMP adoption, implement targeted monitoring to assess potential conflicts with vegetation management along access roads. Monitoring targets may include (but are not limited to) vegetation cover and composition and invasive species cover. Monitoring may include quantitative methods (e.g., point-intercept, quadrats) and an experimental design (Chapter 3, *Preserve Management*).
- Where impacts are detected, protect Covered Plant populations by fencing, signage, or possibly, trail closures or realignment, as appropriate

Management Task 4.1.1.e: Protect Covered Plants during Fire Suppression Activities (Priority 1)

- Include Covered Plant populations on the ESL map to ensure that impacts are avoided or minimized during fire suppression activities. Update the ESL map based on stewardship or effectiveness monitoring.
- Include strategies to minimize direct impacts on Covered Plants in the FMP.

Management Task 4.1.1.f: Augment Populations (Priority 2)

- Restore/expand Covered Plant populations where monitoring indicates declines due to fire, disturbance, or other factors. Methods may include population augmentation through introduction of propagules (e.g., seed, bulb) collected on site or from a site in proximity, and invasive plant control. Site selection for population expansion should consider suitable habitat parameters (vegetation, soils, topography), as determined through monitoring or focused studies (e.g., soil sampling).
- The Preserve Manager will coordinate with the Monitoring Biologist and Restoration Ecologist to determine feasibility of augmentation and BMPs for implementation.
- Develop a species-specific restoration plan that specifies propagule source, augmentation methods, monitoring methods, and success criteria.
- Implement targeted monitoring to determine success of restoration/expansion efforts. Monitoring may include quantitative methods, an experimental design, and success criteria.
- Implement adaptive management (e.g., remedial measures, alternative introduction strategies) where success criteria are not met.
- Fund restoration efforts through (1) funds allocated for adaptive management, (2) reallocation of existing management priorities as appropriate, and/or (3) funds set aside for Changed Circumstances, if appropriate.

4.1.2 Covered Animal Species

Reptiles

Covered Reptile Species considered in this section include coast horned lizard and orangethroat whiptail. These species have been documented on the Preserve and have similar habitat requirements, threats, and management needs and, thus, are addressed together. Identified threats include mortality and habitat destruction from illegal off-road vehicle use, recreational trail use activity, and nonnative ant species (coast horned lizard) (Appendix B); additional threats may include invasive plant species and road maintenance. Refer to Section 2.3.4 (Table 2-5), Appendix B, and the M2 NCCP/HCP Plan (Section 7.2.8.4) for additional information on status, habitat requirements, and threats.

The following preserve-specific management objectives and tasks have been developed to address Species Goal 5 and Species Objective 5.1 and Species Goal 6 and Species Objective 6.1 from the M2 NCCP/HCP (see Section 1.1.1).

Management Objective: Ensure the long-term viability of Covered Reptiles by protecting, managing, and enhancing suitable habitat on the Preserve.

Management Task 4.1.2.1.a: Identify Status, Threats, and Population Trends (Priority 1)

- Utilize baseline surveys to identify and map Covered Reptiles on the Preserve.
- Conduct effectiveness monitoring surveys once every 4 years, using survey methodology outlined in Table 4-1. Develop or refine the Covered Species map based on survey results.
- In addition to population counts or estimates, collect covariate data on vegetation composition and cover and invasive plants and other threats.
- Refer to vegetation mapping and invasive species mapping to inform the assessment of habitat condition for Covered Reptiles.
- Summarize monitoring results (including findings and recommendations) in Annual Reports. Share data with other regional Preserve Managers to help decipher regional trends. Revise Conceptual Model (M2 NCCP/HCP Plan, Sections 7.2.8.4), as appropriate.

Management Task 4.1.2.1.b: Identify Anthropogenic Conflicts (Priority 1)

- Conduct general stewardship monitoring at specified intervals (e.g., monthly, quarterly) to record and/or track impacts on Covered Reptile habitat from trail use, illegal off-road vehicle activity, vegetation management along access roads, and other potential disturbance activity. Record incidental observations of Covered Reptile Species.
- Evaluate the need to implement targeted monitoring to assess potential conflicts with vegetation management along roads and/or with public access and recreational trail use. Monitoring targets may include (but are not limited to) observations of trampling species and/or presence of juveniles. Monitoring may include quantitative methods and an experimental design.
- Refine Covered Species map, based on monitoring results.

Management Task 4.1.2.1.c: Protect Covered Reptiles and Habitat during Property Maintenance and/or from Public Access and Recreational Activities (Priority 1)

- Evaluate vegetation management methods along access roads within five years of RMP adoption to determine if modifications are needed to protect Covered Reptiles.
- Evaluate public access and recreational trail use along roads and trails within five years of RMP adoption to determine if modifications are needed to protect Covered Reptiles.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat. Specific management actions may include (but are not limited to) vegetation management along access roads, invasive plant and animal control, and public access and trail use management, and habitat restoration.
- Where impacts are detected, protect Covered Reptiles and habitat by fencing, signage, or possibly, trail closures or realignment, as appropriate.

Birds

Covered Bird Species considered in this section include cactus wren and coastal California gnatcatcher; potential habitat for both species occurs on the Preserve but were not detected during baseline surveys in 2014. Because these species have similar habitat requirements, threats, and management needs, they are addressed together in this section. Identified threats include habitat loss, degradation, and fragmentation (Appendix B); additional threats may include altered fire regime, invasive plant and animal species, edge effects, small population size, drought, and pesticides. Refer to Section 2.3.4 (Table 2-5), Appendix B, and the M2 NCCP/HCP Plan (Sections 7.2.8.5 and 7.2.8.6) for additional information on status, habitat requirements, and threats for these species.

Other Covered Bird Species (least Bell's vireo and southwestern willow flycatcher) are not addressed in this RMP because these species were not detected during baseline surveys and it was determined that there is no potential habitat on the Preserve. If these species are observed on the Preserve, it will necessitate development of species-specific management objectives and management tasks; guidance for these additional species, if necessary, is provided in the M2 NCCP/HCP Plan (Section 7.2.8.7).

The following preserve-specific management objectives and tasks have been developed to address Species Goal 8 and Species Objective 8.1 and 8.3, and Species Goal 9 and Species Objective 9.1 and 9.3 from the M2 NCCP/HCP (see Section 1.1.1).

Management Objective: Ensure the long-term viability of Covered Birds by protecting, managing, and enhancing suitable habitat on the Preserve.

Management Task 4.1.2.2.a: Determine Status, Threats and Population Trends (Priority 2)

- Utilize baseline surveys to identify and map potential habitat for Covered Birds on the Preserve.
- Conduct effectiveness monitoring every four years to determine if Covered Birds are using the Preserve using survey methodology outlined in Table 4-1. In addition to population counts, collect covariate data on threats. Refine Covered Species map based on survey results.
- Map and inventory cactus patches on the Preserve within two years of RMP adoption following protocols used by the Natural Communities Coalition on other Orange County preserves.

- Refer to vegetation mapping and invasive species mapping to inform the assessment of coastal sage scrub habitat.
- Summarize monitoring results (including findings and recommendations) in Annual Reports. Share data with other regional Preserve Managers to help decipher regional trends. Revise Conceptual Models (M2 NCCP/HCP, Sections 7.2.8.5 and 7.2.8.6), as appropriate.

Management Task 4.1.2.2.b: Identify Anthropogenic Conflicts (Priority 1)

- Conduct general stewardship monitoring at specified intervals (e.g., monthly, quarterly) to record and/or track impacts on coastal sage scrub habitat from trail use, vegetation management along access roads, and other potential disturbance activity. In addition, record incidental observations of Covered Birds.
- Refine Covered Species map, based on monitoring results.

Management Task 4.1.2.2.c: Protect Covered Birds and Habitat during Property Maintenance and/or from Public Access and Recreational Activities (Priority 1)

- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to suitable habitat or where surveys show a decline in Covered Bird populations or habitat; assess attribute and climatic data for potential causal effects (e.g., type conversion of coastal sage scrub to another vegetation type, surface disturbance). Specific management actions may include (but are not limited to) vegetation management along access roads, invasive plant and animal control, public access and trail use management, and habitat restoration.
- Evaluate vegetation management methods along access roads as well as public access and recreational trail use within five years of RMP adoption to determine if modifications are needed to protect Covered Birds and habitat.
- Evaluate the need of targeted monitoring to identify significant impacts on bird populations or habitat from invasive animal species (e.g. cowbirds), vegetation management along roads, or from public access and recreational trail use. Monitoring targets may include (but are not limited to) vegetation cover and composition, invasive species cover, bird presence or absence, or nesting success. Monitoring may include quantitative methods and an experimental design.
- Where impacts are detected, protect Covered Birds and habitat by fencing, signage, or, possibly, trail closures or realignment, as appropriate.

Management Task 4.1.2.2.d: Protect Covered Birds and Habitat during Fire Suppression Activities (Priority 1)

- Include Covered Bird locations, if detected, and cactus patches (once they are mapped) on the ESL map to ensure that impacts are avoided or minimized during fire suppression activities. Update the ESL map based on stewardship or effectiveness monitoring.
- Include strategies to minimize direct impacts on Covered Birds in the Fire Management Plan.

Mammals

Covered Mammal Species considered in this section include bobcat and mountain lion; both species have potential habitat on the Preserve. Because these species have similar habitat requirements, threats, and management needs, they are addressed together in this section. Identified threats include habitat loss and illegal hunting (Appendix B); additional threats may include vehicular

mortality, altered fire regime, human disturbances from onsite recreational trail use, and edge effects. Refer to Section 2.3.4 (Table 2-5), Appendix B, and the M2 NCCP/HCP Plan (Section 7.2.8.8) for additional information on status, habitat requirements, and threats.

The following Preserve-specific management objectives and tasks have been developed to address Species Goal 12 and Species Objective 12.1 and Species Goal 13 and Species Objective 13.1 from the M2 NCCP/HCP (see Section 1.1.1).

Management Objective: Ensure the long-term viability of Covered Mammals by protecting, managing, and enhancing populations and suitable habitat on the Preserve.

Management Task 4.1.2.3.a: Conduct Baseline Photo Monitoring of Wildlife Movement (Priority 1)

- Within one year from adoption of the RMP, the Preserve Manager will set up and monitor wildlife movement cameras to document wildlife movement on the Preserve. A qualified wildlife biologist will assess camera results to determine wildlife movement and connectivity.

Management Task 4.1.2.3.b: Determine Status, Threats, and Population Trends (Priority 2)

- Utilize results from stewardship monitoring (tracks, scat, and/or incidental observations) to potentially coordinate with local researchers conducting regional wildlife movement assessments (e.g., Dr. Winston Vickers, mountain lion radio-collar tracking) as well as other regional land managers or wildlife entities (i.e., Natural Communities Coalition and Irvine Ranch Conservancy) to evaluate the role of the Preserve in facilitating large mammal presence and movement.
- Evaluate the need for photo monitoring surveys to identify signs of bobcat and mountain lion use on the Preserve.
- Summarize monitoring results (including findings and recommendations) in Annual Reports. Share data with other regional Preserve Managers to help decipher regional trends. Revise Conceptual Models (M2 NCCP/HCP, Section 7.2.8.8), as appropriate.

Management Task 4.1.2.3.c: Identify Anthropogenic Threats (Priority 2)

- Conduct general stewardship monitoring at specified intervals (e.g., monthly, quarterly) to record and/or track impacts on natural habitat used by Covered Mammals from trail use, vegetation management, and other potential disturbance activity. In addition, record incidental observations of Covered Mammals.
- Refine Covered Species map, based on monitoring results.

Management Task 4.1.2.3.d: Develop a Fencing Plan that Protects the Preserve While Facilitating Wildlife Movement (Priority 2)

- Inventory and map existing fencing as part of baseline surveys or general stewardship monitoring and identify future fencing needs. Use fencing mapping and signs of wildlife trail use (general stewardship monitoring) to determine if fencing modifications are needed for the Preserve within two years of the adoption of the RMP.
- Ensure that all installed fencing is wildlife friendly (i.e., allows for wildlife movement; e.g., remove bottom strand of exterior fence along key areas of the Preserve that are actively used by wildlife, thereby improving wildlife movement while retaining access control functions). Monitor to ensure that the fencing remains in good condition and is tight.

Management Task 4.1.2.3.e: Protect Covered Mammals from Hunting (Priority 1)

- Implement patrols and enforcement measures within the first year of Preserve management to ensure hunting is not occurring within the Preserve. Hunting is an illegal activity within the Preserve. The Preserve Manager will install appropriate signage that clearly indicates that hunting is not permitted on the Preserve.
- The Preserve Manager will establish a patrol and enforcement schedule to ensure that hunting restrictions are actively enforced within the Preserve. Patrol frequency will depend on the level of public access on the Preserve.

Management Task 4.1.2.3.f: Protect Covered Mammals from Public Access and Recreational Use (Priority 2)

- The Preserve Manager, Monitoring Biologist, and OCTA will evaluate wildlife movement monitoring data in conjunction with public access and recreation uses within two years of RMP adoption to determine whether these uses should be limited or prohibited within the Preserve to minimize human-wildlife interactions.
- Evaluate the need to implement targeted monitoring to determine effectiveness of trail closures in enhancing Covered Mammals use of the site or, specifically, wildlife movement. Monitoring targets may include a number of animal occurrences over time or amount of movement. Monitoring may include quantitative methods and an experimental design.
- Implement specific management actions where surveys indicate anthropogenic threats in or adjacent to movement corridors or when coordination shows a decline in Covered Mammal presence or movement within the region. Specific management actions may include (but are not limited to) property management, public access and trail use management, and habitat restoration.

4.1.3 Natural Communities

Natural communities considered in this section include scrub, chaparral, grassland, woodland, and riparian habitats. Threats to these communities are varied and include invasive species, pests and disease, habitat degradation (altered fire regime, drought), public uses (including recreation), erosion, and edge effects. This section provides guidelines for monitoring and managing these communities. Refer to Section 2.3.4, Appendix B, and the M2 NCCP/HCP Plan (Section 7.2.8.9) for additional information on sensitive natural communities.

The following Preserve-specific management objectives and tasks have been developed to address Natural Communities Goal 1 and Natural Communities Objective (1.1-1.5) and Natural Communities Goal 2 and Natural Communities Objective 2.1 from the M2 NCCP/HCP (see Section 1.1.1).

Management Objective: Ensure the long-term viability of natural communities by protecting, managing, and enhancing these resources on the Preserve.

Management Task 4.1.3.a: Update Vegetation Map (Priority 1)

- Utilize vegetation map developed during baseline surveys (2014) as initial vegetation map for management and monitoring.
- Conduct comprehensive vegetation mapping according to the schedule and methods in Table 4-1 as part of effectiveness monitoring. Refine a vegetation map for the Preserve.

- Compare updated vegetation mapping results with the vegetation baseline or most recent vegetation map to identify vegetation changes, including natural communities in decline. Assess the Preserves for threats to natural communities during vegetation mapping and updates.
- Include vegetation mapping results and management recommendations in the Annual Report; incorporate management recommendations into Annual Work Plans, as appropriate.

Management Task 4.1.3.b: Identify Operational or Public Use Conflicts (Priority 1)

- Conduct general stewardship monitoring at specified intervals (e.g. monthly, quarterly) to record and/or track impacts on natural communities from trail use, erosion, invasive species, or unauthorized activities.
- Implement management actions to offset impacts, as appropriate. Where impacts are extensive, develop detailed plans (e.g., restoration, invasive plant eradication, erosion control) prior to implementation, in consultation with the Wildlife Agencies.

Management Task 4.1.3.c: Establish Long-term Monitoring Plots to Identify Vegetation Condition and Trends (Priority 1)

- Supplement vegetation mapping with quantitative data collection to assess vegetation condition and habitat quality for Covered Species. Within two years from the adoption of the RMP, identify vegetation survey locations and implement baseline surveys. Conduct quantitative vegetation monitoring in established plots every four years to detect changes in species composition, cover, and structure (Table 4-1). Conduct monitoring using a sampling design and data collection protocols developed in conjunction with Natural Communities Coalition. Sampling design will include stratified random sampling that considers habitat of various types and sizes, and includes adequate replication for statistical analyses.
- Use sampling results to detect vegetation trends on the Preserve by habitat type, and assess habitat conditions for Covered Species. Assess attribute and climatic data for potential causal effects. Where sampling indicates a decline in habitat quality that can be attributed to anthropogenic threats, identify and implement specific management actions including (but not limited to) vegetation management, invasive species control, habitat restoration, erosion control, public access and trail use management, fire management, and enforcement of policies related to the wildland/urban interface.
- Share data with other regional Preserve Managers to help decipher regional trends. Regional results will inform status and management priorities for natural communities at the Plan level.

Management Task 4.1.3.d: Monitor Nonnative Invasive Species Eradication Efforts and/or Enhancement/Restoration Actions (Priority 1)

- Monitor nonnative invasive species efforts to ensure that success criteria (as specified in the eradication plans) are met (Section 3.2). Additional eradication effort and/or enhancement/restoration actions will be recommended in Annual Reports, as warranted. Eradication and restoration plans will be developed and implemented by a qualified Restoration Ecologist.
- The Restoration Ecologist will be responsible for coordinating with the Preserve Manager or staff members and Restoration Contractor regarding site conditions and required remedial measures. It is anticipated that habitat enhancement/restoration monitoring activities may include monitoring one or more of the following activities.

  - Site preparation
  - Weed control
  - Plant establishment
  - General site conditions

- Specific monitoring activities and frequencies will be identified in site-specific restoration/enhancement plans and Annual Reports (management recommendations) in coordination with the Wildlife Agencies. It is anticipated that monitoring for some activities will occur only in the early phases of implementation, and others will occur throughout the restoration program.
- Implement targeted monitoring to evaluate habitat restoration success. Success criteria may include habitat structure, cover, and composition. Where success criteria are not met, modified or alternative management strategies may be required.

Management Task 4.1.3.e: Control Invasive Pests or Disease (Priority 1)

- The Preserve Manager or Monitoring Biologist will inventory natural communities at risk from invasive pests or disease (e.g., oak woodlands), and will coordinate with the Wildlife Agencies, Monitoring Biologist, and other entities to identify appropriate actions and BMPs to eliminate or reduce the threat from these species (e.g., treatment, removal, and restoration).
- OCTA and the Preserve Manager will work with the Wildlife Agencies to develop and implement an invasive species pest/disease control plan that includes both treatment and post-treatment restoration, if needed. Treatment and restoration will be funded by (1) using funds allocated for adaptive management, (2) reallocating funds from existing management priorities as appropriate, (3) pursuing outside funding sources, or (4) seeking authorization to use Changed Circumstance funding. Habitat restoration will be implemented using current information on best approaches and strategies for restoration.
- Implement targeted monitoring to evaluate the success of pest or disease control actions. Success criteria may include number of trees without disease. Where success criteria are not met, modified or alternative management strategies may be required.

Management Task 4.1.3.f: Restore Natural Communities Impacted by Altered Fire Regime or Climate Change (Priority 2)

- The Preserve Manager will coordinate with the Monitoring Biologist and Wildlife Agencies to determine if habitat restoration is warranted for natural communities that have been altered due to habitat type conversion or prolonged drought to the degree that they can no longer support Covered Species at levels that existed at Preserve acquisition. Where restoration is warranted, implement per guidelines in Section 3.3, *Habitat Restoration*, as appropriate.
- The Preserve Manager and OCTA will work with the Wildlife Agencies to conduct restoration efforts where determined necessary and appropriate by (1) using funds allocated for adaptive management, (2) reallocating funds from existing management priorities as appropriate, (3) pursuing outside funding sources, or (4) seeking authorization to use Changed Circumstance funding. Habitat restoration will be implemented using current information on best approaches and strategies for restoration, and restoration will be appropriate for current climatic conditions.

Management Task 4.1.3.g: Protect Natural Communities from Public Access and Recreational Trail Use (Priority 1)

- Evaluate the effects of public access and recreational trail use on natural communities within five years of RMP adoption to determine if modifications are needed to protect sensitive natural communities.
- Implement targeted monitoring, as warranted, to assess potential conflicts with public access and recreational trail use. Monitoring targets may include (but are not limited to) vegetation cover and composition and invasive species cover. Monitoring may use quantitative or semi-quantitative methods and an experimental design, and will be conducted in conjunction with other non-quantitative efforts to monitor trail use and activity (stewardship monitoring).
- Where recreational impacts are identified, protect sensitive natural communities by limiting and adjusting access during the certain seasons, trail closures, or trail realignments, as appropriate.

Management Task 4.1.3.h: Protect Natural Communities from Erosion (Priority 1)

- The Preserve Manager will inspect and identify areas vulnerable to erosion within two years of RMP adoption.
- The Preserve Manager and Restoration Contractor will identify and implement management actions to reduce erosion, including erosion control BMPs (e.g., sand bags, swales), closure of trails within and adjacent to creeks and streams, and improvements to flood control features.

Management Task 4.1.3.i: Protect Natural Communities from Edge Effects (Priority 1)

- The Preserve Manager will implement policies to minimize edge effects and encroachment from urban development to the Preserve. These include feral and domestic animal restrictions and control, trespassing, illegal intrusions, illegal off-road vehicle use, runoff, and vegetation management.
- The Preserve Manager will install signage and implement monitoring, patrols, and enforcement within the first year of Preserve management and in perpetuity thereafter to reduce impacts on natural communities at the wildland-urban interface. The frequency of patrols will depend upon the level and type of disturbances in and adjacent to the Preserve.

4.2 Adaptive Management

Adaptive management provides a strategy to improve future management actions through monitoring to evaluate management effectiveness. Where success criteria are not met, adaptive management provides a structured approach to improve management outcomes. Monitoring and adaptive management on the Preserve will be a cooperative effort between OCTA, the Preserve Manager, Monitoring Biologist and other supporting biologists, external entities conducting research on the Preserve, and the Wildlife Agencies. Refer to the M2 NCCP/HCP Plan (Sections 7.2.7.2 and 7.2.7.3) for an expanded discussion of the adaptive management approach and guidelines. Adaptive management is built into Preserve management through the use of phased monitoring and evaluation to modify management actions based on monitoring results.

Adaptive management deals with reducing uncertainty and improving management effectiveness through iterative monitoring and evaluation. Some of the key issues for a focused adaptive management approach to address uncertainties of preserve management on the MacPherson Preserve include the following.

- **Public Access and Wildlife Activity.** Use wildlife movement cameras to monitor and gauge wildlife activity to evaluate changes in the MacPherson Preserve public access policies. This monitoring would be collected while the levels of public access are being reviewed and potentially changed.
- **Covered Plants and Vegetation Management.** Closely monitor the response of Covered Plant Species (e.g., intermediate mariposa lily) to vegetation management actions along the side of access roads.
- **Trails Revegetation**. Collect photo monitoring of the revegetation of closed trails to determine if passive restoration was successful. If not, determine if active restoration is needed.
- **Vegetation Control around Cactus Patches**. Research current approaches for vegetation management around cactus patches to determine if this is needed at the MacPherson Preserve to protect and/or improve cactus wren populations.

The accumulation of understanding and subsequent adaptation of a management strategy depends on feeding information obtained from monitoring results back into the decision-making process. The link between the technical and decision-making steps requires regular interaction and an exchange of information between the technical staff and decision-makers. This will be accomplished by bi-annual meetings involving the Preserve Managers from each of the OCTA M2 Preserves, Monitoring Biologists, NCCP/HCP Administrator, and the Wildlife Agencies where both policy and technical expertise can be integrated into revising goals and objectives, refining conceptual models, adjusting management and/or monitoring activities, or allocating funding. Meetings should be timed such that any new information discussed assists with the planning of upcoming seasonal work (i.e., invasive species control, vegetation management, or biological surveys). Timing some meetings to coordinate with other regional conservation planning meetings is encouraged to maximize communication and cooperation in the region.

4.3 Annual Progress Reports

The M2 NCCP/HCP requires that Annual Progress Reports documenting the status of the EMP open space properties be submitted to the NCCP/HCP Administrator for incorporation into the M2 NCCP/HCP annual report each year. The Preserve Manager will prepare an Annual Progress Report that summarizes the results of research and monitoring activities, provides recommendations for future preserve management activities for the Preserve, and discusses anticipated activities for the upcoming year. Status updates and anticipated activities for the upcoming year will be provided for one or more of the following, depending on specific activities performed each year.

- Monitoring of preserved biological resources, including natural communities and Covered Species.
- Fire management and control, recreational uses, access, general site maintenance, and encroachment issues.
- Habitat restoration and enhancement.

- Education and outreach.

Depending on the results of monitoring activities, recommendations for adjustments to the management of resources and activities will be summarized in the Annual Progress Reports. Any adjustments to the management of resources and activities will be identified in coordination with supporting biologists, and Wildlife Agencies. Depending on the results of ongoing management and evaluations, adjustments to annual management activities may include, but are not limited to, the following.

- Modifications of existing, or the addition of new, monitoring and survey activities.
- Modifications to resource-protection measures, including the designation of restricted areas of the Preserve, road closures, and seasonal limitations on recreational use, among other measures.
- Site-specific habitat restoration and enhancement activities, including restoration of disturbed areas and control of specific invasive plant species.
- Control of nonnative animal species.
- Specific fire-management activities, including site-specific fuel-modification efforts, staging areas, and access.
- As-needed site-maintenance activities, including road repair, site-specific erosion control, and debris clean-up, among other activities.
- Modification of educational and outreach activities, including additional site tours, new signage, interpretive handout materials, and additional community coordination and outreach efforts.
- Changes to the frequency of managed access events consistent with the Public Access Plan.

Chapter 5
Financial Section

5.1 Financial Requirements

As described and outlined in this RMP, OCTA will be required to fund the following types of management and monitoring activities on MacPherson.

- **Start-up Expenditures**. These will include preparation of Invasive Plant Species Treatment Plan, preparation of a Fire Management Plan, and installation and/or removal of fencing for public access control and wildlife movement.
- **Preserve Management.** This includes all general Preserve management activities such as access control, enforcement, fencing, maintenance, signage, public outreach, vegetation management, invasive species control, erosion control, and fire management. In addition, this includes periodic and ongoing biological assessments, a comprehensive annual assessment to identify major threats, Preserve-specific biological monitoring above and beyond effectiveness biological monitoring, Preserve-level data management, and Preserve-level annual reporting.
- **Adaptive Management.** The Preserve Manager will be expected to manage, and be responsible for managing, the MacPherson Preserve following the principles and procedures of adaptive management. A separate budget line-item will be set aside to fund additional and specific adaptive management actions that are above and beyond the general adaptive management steps undertaken by the Preserve Manager. The adaptive management funding is estimated to be 5 percent of the Preserve Management budget.
- **Effectiveness Biological Monitoring.** Comprehensive biological monitoring (following established protocols) will occur every four years for Covered Species and every 10 years for comprehensive vegetation mapping.
- **Changed Circumstances.** Events that meet the triggers of a Changed Circumstance as set forth in the M2 NCCP/HCP will be managed as they arise.

OCTA has developed initial estimates of the financial requirements for the long-term Preserve management and monitoring based on an accumulated experience with the costs and responsibilities associated with OCTA's interim management role for the MacPherson Preserve. Using these initial estimates, OCTA has developed an initial estimate of the endowment funding requirements. The final endowment funding requirements will be based on a Property Analysis Report (PAR) or PAR-like analysis that will be completed by OCTA. This analysis will itemize and define the long-term obligations using the Preserve-specific information detailed in this RMP. It is expected that additional years of interim habitat management would provide a database and sounder basis for estimating the cost of long-term management costs. The final endowment funding level will be based upon actual negotiated long-term management contracts for the Preserve. OCTA will coordinate with the Wildlife Agencies for the review and approval for the PAR analysis and determination of the permanent endowment funding requirements.

5.2 Funding Sources

OCTA will establish and manage a permanent, non-wasting endowment to provide funding for the long-term commitments of Preserve management and monitoring. There will be an endowment that will cover the annual expenses for all Preserve management and monitoring, and program management. OCTA will, most likely, contract with local management entities and biological firms for Preserve management and biological monitoring services.

OCTA will accumulate funding for the endowment using the ongoing revenue generated for the M2 EMP. OCTA estimates it will take approximately 10 years, but no longer than 15 years, from the signing of the Implementing Agreement (IA) to accumulate sufficient funding for the endowment using unappropriated funds from the annual revenue stream.

An initial estimate of the endowment funding requirements has been developed by OCTA as part of the M2 NCCP/HCP preparation. The final endowment funding requirements will be based on a Property Analysis Report (PAR) or PAR-like analysis that will be completed by OCTA within five years of signing the IA. This analysis will itemize and define the long-term obligations at each Preserve using the Preserve-specific information detailed in this RMP. It is expected that additional years of interim habitat management would provide a database and sounder basis for estimating the cost of long-term management costs. The final endowment funding level will be based upon actual negotiated long-term management contracts for the Preserve. OCTA will coordinate with the Wildlife Agencies for the review and approval for the PAR analysis and determination of the permanent endowment funding requirements.

Once OCTA has established a permanent, non-wasting endowment and the endowment has been reviewed and approved by the Wildlife Agencies the endowment will be deemed as adequate funding to carry out the obligations under the Plan, and the Wildlife Agencies will not require additional funding from OCTA.

Chapter 6
References

Adamcik, R. S., E. S. Bellantoni, D. H. DeLong, Jr., J. H. Schomaker, D. B. Hamilton, M. K.Laubhan, and R. L. Schroeder. 2004. *Writing Refuge Management Goals and Objectives: A Handbook*. Washington, D.C.: U.S. Fish and Wildlife Service, National Wildlife Refuge System.

Atkinson, A. J., P.C. Trenham, R. N. Fisher, S. A. Hathaway, B. S. Johnson, S. G. Torres, and Y. C. Moore. 2004. *Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Plans.* U.S. Geological Survey Technical Report. USGS Western Ecological Research Center, Sacramento, CA. 69 pp.

BonTerra Psomas. 2015a (September). *Baseline Biological Surveys Technical Report for the MacPherson Property, Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation.* Irvine, CA: BonTerra Psomas.

———. 2015b (October). *Jurisdictional Delination Report for the MacPherson Property, Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation.* Irvine, CA: BonTerra Psomas.

California Department of Fish and Game (CDFG). 2009 (November 24). *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Sacramento, CA: CDFG.

California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory Database (Cal-IPC Publication 2006-02). Berkeley, CA: Cal-IPC. http://www.cal-ipc.org/ip/inventory/weedlist.php.

California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Vascular Plants of California* (6th ed.) (D.P. Tibor, Ed.). Sacramento, CA: CNPS, Rare Plant Scientific Advisory Committee.

California Wetlands Monitoring Workgroup (CWMW). 2012 (March). *California Rapid Assessment Method (CRAM) for Wetlands and Riparian Areas* (Version 6.0).

Conservation Biology Institute (CBI). 2009. *Conservation Assessment of Orange County*. December. Prepared for the Orange County Transportation Authority. 54 pp.

Elvin, M. A., and A.C. Sanders. 2009. Nomenclatural changes for *Monardella* (Lamiaceae) in California. *Novon* 19:315–343.

ICF Jones & Stokes. 2010. (October). *OCTA M2 NCCP/HCP General Monitoring and Management Guidelines,* Irvine, CA: ICF Jones & Stokes.

Irvine Ranch Conservancy. 2011. *An Efficient Monitoring Framework and Methodologies for Adaptively Managing Human Access on NCCP Lands and Other Reserves in Southern California*.

Lewison, R. L. and D. H. Deutschman 2014. *Framework Management Plan: Guidelines for Best Practices with Examples of Effective Monitoring and Management*. Prepared for San Diego Association of Governments (SANDAG). Contract 5001562. Prepared by Department of Biology and Institute for Ecological Monitoring and Management, San Diego State University.

Lewison, R. L., D. H. Deutschman, E. Marnocha, C. Tredick, and P. McIntyre. 2011. *Developing and Refining Goals and Objectives for Monitoring and Management: Building and Implementing an Integrated Framework for Monitoring and Management in San Diego County*. Prepared for San Diego Association of Governments, MOU # 5001562. Prepared by Institute for Ecological Monitoring and Management, San Diego State University.

LSA Associates, Inc. 2015. *Archaeological Sensitivity Assessment, MacPherson Preserve Property,* Irvine, CA: LSA Associates, Inc.

LSA Associates, Inc. and Irvine Ranch Conservancy. 2010. (June). *Draft Irvine Ranch Northern Open Space Recreation & Resource Management Plan. Irvine, CA:* LSA Associates, Inc. and Irvine Ranch Conservancy.

Orange, County of. 1997 (as amended). *Silverado-Modjeska Specific Plan*. Santa Ana, CA: County of Orange Environmental Management Agency.

Orange County Transportation Authority (OCTA). 2012a (February). *Draft Environmental Mitigation Program Chronicles*. Orange, CA: Orange County Transportation Authority.

San Diego, City of. 2010 (November). *Draft Black Mountain Open Space Park Natural Resource Management Plan.* San Diego, CA: the City.

San Diego Management and Monitoring Program (SDMMP). 2013. *Management Strategic Plan for Conserved Lands in Western San Diego County*. Prepared for San Diego Association of Governments (SANDAG). Prepared bySan Diego Management and Monitoring Program (SDMMP). Version 08.27.2013. Available: http://sdmmp.com/reports_and_products/Management_Strategic_Plan.aspx.

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens. 2009. *A Manual of California Vegetation (Second Edition)*. Sacramento, CA: CNPS.

U.S. Environmental Protection Agency (EPA). 2006. *Application of Elements of a State Water Monitoring and Assessment Program for Wetlands*. Washington, D.C.: Wetlands Division, Office of Wetlands, Oceans and Watersheds, EPA. Available: http://www.epa.gov/owow/wetlands/pdf/Wetland_Elements_Final.pdf.

U.S. Fish and Wildlife Service (USFWS). 2011 (February 9). Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Arroyo Toad; Final Rule. *Federal Register* 76(27): 7245–7467. Washington, D.C.: USFWS.

———. 2009 (October 13). Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Arroyo Toad (*Anaxyrus californicus*); Proposed Rule. *Federal Register* 74(196): 52611–52664. Washington, D.C.: USFWS.

———. 2007 (December 19). Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule. *Federal Register* 72(243): 72009–72213. Washington, D.C.: USFWS.

———. 2005 (April 13). Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Arroyo Toad (*Bufo californicus*); Final Rule. *Federal Register* 70(70): 19561–19633. Washington, D.C.: USFWS.

———. 1997 (July 28). *Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Protocol.* Washington, D.C.: USFS

This page intentionally left blank.

Appendix A

Checklist and Annual Schedule of Ongoing Preserve Management and Biological Monitoring Actions

This page intentionally left blank

Appendix A – Checklist for Ongoing Preserve Management and Biological Monitoring Actions

Category	Management Action	Frequency	Preserve Management	Stewardship Monitoring	Effectiveness Monitoring	Targeted Monitoring
Preserve Management (Chapter 3)						
Public Access (Section 3.1)	Implement a managed access program that allows for public access during limited, designated docent led hiking and riding days.	Ad hoc	○			
	Install, monitor, and maintain gates, signage, and obstructions, as appropriate, to control public access.	Part of monthly visits		○		
	Monitor and control permitted activities and unauthorized activities (e.g., use or creation of unauthorized trails).	Part of monthly visits		○		
	Implement a public education and outreach program focused on public access.	Ad hoc	○			
Invasive Species Control Plan (Section 3.2)	Prior to implementation of the invasive plant treatment plan, the Preserve Manager will map priority invasive species during general stewardship monitoring efforts.	Part of monthly visits		○		
	Evaluate the success of invasive plant control efforts for five years following implementation of invasive species control treatment plan or until eradication is maintained for one year without follow-up control activities.	Per invasive species control treatment plan				○
Habitat Restoration (Section 3.3)	During the first five years after adoption of the RMP, the Preserve Manager will monitor conditions at 10 to 15 representative trail locations using photo monitoring methods to track progress of passive restoration.	Quarterly				○
Vegetation Management (Section 3.4)	Pruning, cutting, or clearing of native vegetation will generally be avoided except for maintenance along access roads and approved recreation trails, and installation of erosion control measures, if necessary.	As needed, but following nesting bird policy and seasonal restrictions	○			
Fire Management (Section 3.5)	The Preserve Manager will conduct regular maintenance of weeds along existing fire roads and maintain existing roads in a condition that will provide safe access for firefighters.	Annual	○			

Category	Management Action	Frequency	Preserve Management	Stewardship Monitoring	Effectiveness Monitoring	Targeted Monitoring
Nonnative Animal Species Management (Section 3.6)	The Preserve Manager will work towards controlling the spread of invasive ant species.	Part of monthly visits		○		
	The Preserve Manager will monitor and address other potential infestations of invasive insects and other pathogens that can threaten native habitat.	Part of monthly visits		○		
	Implement and enforce feral and domestic animal restrictions and control.	Part of monthly visits		○		
Property Management (Section 3.7)	Implement routine and ongoing property management activities to ensure that the Preserve is maintained in good condition.	Ad hoc and part of monthly visits	○	○		
Land Uses within the Preserve (Section 3.8)	Conduct monitoring of the Preserve to ensure prohibited uses are not occurring with the Preserve.	Part of monthly visits and enforcement patrols	○	○		
Lands Uses Adjacent to the Preserve (Section 3.9)	The Preserve Manager will monitor land uses adjacent to the Preserve to identify situations in which edge effects can negatively affect biological resources within the Preserve.	Part of monthly visits		○		
	Prior to implementation of the public awareness program, the Preserve Manager will regularly monitor the interface of the Preserve with urban/residential areas. The Preserve Manager will identify situations in which adjacent land uses create negative effects on biological resources and maintain a dialogue with adjacent landowners to discuss and address edge effect issues.	Ad hoc and part of monthly visits	○	○		
	To the extent practicable, the Preserve Manager and OCTA will coordinate with local land use authorities (e.g., for the CEQA public review process) to ensure that new developments adjacent to the Preserve adhere to the following adjacency guidelines.	Ad hoc	○			
Management of Cultural Resources (Section 3.10)	Manage the Preserve in a manner that does not impact sensitive archeological resources.	Ad hoc	○			
Public Outreach and Education (Section 3.11)	Hold public meetings.	Annual	○			

Category	Management Action	Frequency	Preserve Management	Stewardship Monitoring	Effectiveness Monitoring	Targeted Monitoring
	Provide educational and interpretative materials and maintain website.	Ongoing	○			
	Implement outreach and volunteer program.	Ongoing	○			
	Encourage trail user groups to participate in "self-monitoring and policing" programs.	Ad hoc and part of monthly visits	○	○		
Biological Monitoring and Management (Chapter 4)						
Covered **Plant** Species (Section 4.1.1)	Conduct periodic monitoring and assessment of Covered Plant Species known populations and search for new occurrences.	Part of monthly visits		○		
	Conduct protocols surveys of Covered Plant Species.	Every 3-5 years, depending on rainfall			○	
	Update and maintain database of population size of Covered Plants on Preserve.	Annual	○			
Covered **Reptile** Species (Section 4.1.2)	Conduct periodic monitoring and assessment of Covered Reptile Species and their habitat.	Part of monthly visits		○		
	Conduct protocols surveys of Covered Reptile Species.	Every 4 years			○	
Covered **Bird** Species (Section 4.1.2)	Conduct periodic monitoring and assessment of Covered Bird Species and their habitat.	Part of monthly visits		○		
	Conduct protocols surveys of Covered Bird Species.	Every 4 years			○	
	Update and maintain database of cactus patches and cactus wren nest, if detected.	Annual	○	○		

Category	Management Action	Frequency	Preserve Management	Stewardship Monitoring	Effectiveness Monitoring	Targeted Monitoring
Covered **Mammal** Species (Section 4.1.2)	Within one year from adoption of the RMP, the Preserve Manager will set up and monitor wildlife movement cameras to document wildlife movement on the Preserve. A qualified wildlife biologist will assess camera results to determine wildlife movement and connectivity.	Ad hoc during first year from adoption of the RMP		○		
	Conduct periodic monitoring and assessment of Covered Mammal Species and their habitat.	Part of monthly visits		○		
	Conduct protocols surveys of Covered Mammal Species.	Every 4 years			○	
	Monitor fencing to evaluate ways to facilitate wildlife movement while maintaining control of unauthorized access.	Part of monthly visits		○		
Natural Communities (Section 4.1.3)	Conduct comprehensive update of vegetation map.	Every 10 years			○	
	Monitor vegetation plots/transects to identify vegetation condition and trends.	Every 4 years			○	
	Monitor threats to natural communities from non-native species, invasive pests or disease, unauthorized public access, erosion, and/or edge effects.	Part of monthly visits		○		
Adaptive Management (Section 4.2)	Monitor public access and wildlife activity during the initial establishment of managed public access program.	Quarterly				○
	Monitor effectiveness of methods to protect Covered Plants from vegetation management activities along access roads.	Annual				○
	Monitor success of revegetation of closed trails through photo monitoring to determine if additional habitat restoration is warranted.	Quarterly				○
	Evaluate vegetation growth surrounding cactus patches to determine if vegetation control is warranted.	Annual				○
Annual Progress Reports (Section 4.3)	The Preserve Manager will prepare an Annual Progress Report that summarizes the results of research and monitoring activities, provides recommendations for future preserve management activities for the Preserve, and discusses anticipated activities for the upcoming year.	Annual	○			

Table A-2 – Annual Schedule for Preserve Management and Biological Monitoring Actions

Action	Frequency / Schedule	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Adopt RMP						X																								
Preserve Management																														
Prepare Invasive Species Control Plan	Within two years of RMP adoption							X																						
Implement and monitor success of invasive species control actions	Five years after invasive species control plan								X	X	X	X	X																	
Prepare Fire Management Plan	Within two years of RMP adoption							X																						
Effectiveness Monitoring																														
- Rare Plants	Three to five years				B					X				X				X				X				X				X
- Reptiles	Four years				B					X				X				X				X				X				X
- Birds	Four years				B					X				X				X				X				X				X
- Mammals	Four years						B			X				X				X				X				X				X
- Natural Communities Quantitative	Four years						B			X				X				X				X				X				X
- Natural Communities Comprehensive	10 years				B										X										X					
Targeted Monitoring																														
Monitor public access and wildlife activity	Five years after beginning of access plan					X	X	X	X	X																				

Table A-2 – Annual Schedule for Preserve Management and Biological Monitoring Actions

Action	Frequency / Schedule	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Monitor effectiveness of covered plant protection along access roads	Seven years after adoption					X	X	X	X	X	X	X																		
Monitor success of passive revegetation of closed trails through photo monitoring to determine if additional habitat restoration is warranted	Five years after RMP adoption					X	X	X	X	X																				
Evaluate vegetation growth surrounding cactus patches to determine if vegetation management is warranted	Every few years after RMP adoption						X		X																					

B = Baseline Survey

Appendix B

Baseline Biological Surveys Technical Report Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation for the MacPherson Property in Orange County, California

This page intentionally left blank

BonTerra PSOMAS

Baseline Biological Surveys Technical Report for the MacPherson Property

Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California

Prepared for

Lesley L. Hill
Project Manager, Environmental Programs
Orange County Transportation Authority
600 South Main Street, 9th Floor
Orange, California 92868

Prepared by

Ann M. Johnston
Vice President, Resource Management
BonTerra Psomas
2 Executive Circle, Suite 175
Irvine, California 92614
T: (714) 444-9199 F: (714) 444-9599

September 2015

TABLE OF CONTENTS

TABLES

EXHIBITS

ATTACHMENTS

1.0 INTRODUCTION

This Biological Technical Report has been prepared to support California Environmental Quality Act (CEQA) documentation and resource management planning for the Measure M2 Freeway Environmental Mitigation Program (EMP) Acquisition Properties Evaluation Project. The EMP project originally included five separate Orange County Transportation Authority (OCTA) acquisition properties (Hayashi, Ferber Ranch, O'Neill Oaks, Hafen, and Saddle Creek South). An additional acquisition was made of the MacPherson property, also located in unincorporated Orange County, California (Exhibit 1). This report is limited to the MacPherson property; separate reports were previously prepared for the other properties.

This information has been reported in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW).

1.1 BACKGROUND

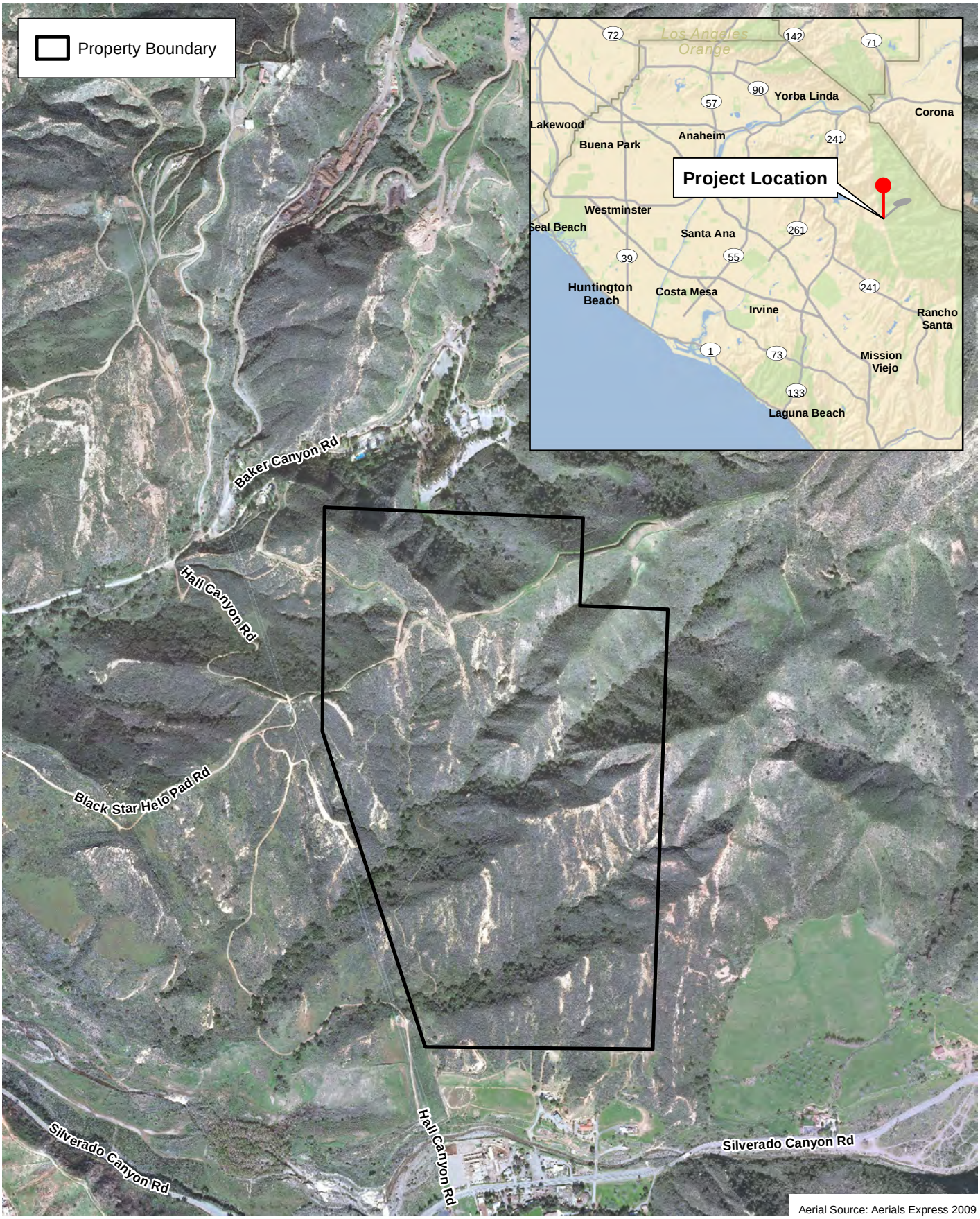
1.1.1 Project Description

In 2006, Orange County voters approved the renewal of Measure M, effectively extending the half-cent sales tax in the County from April 2011 to March 2041. Renewed Measure M (or Measure M2) will continue to provide funding for transportation projects and programs in the County, including select freeway and roadway improvements, transit programs, and two environmental programs.

OCTA's M2 Freeway EMP provides comprehensive mitigation to offset the environmental impacts of the 13 Measure M2-funded freeway projects. The EMP is spearheaded by the Environmental Oversight Committee (EOC), which is made up of OCTA Board members and representatives from the California Department of Transportation (Caltrans), resource agencies, environmental groups, and the public.

Instead of mitigating the natural resource impacts of Measure M2 freeway projects on a project-by-project basis, the EMP presents a comprehensive mitigation approach that not only replaces habitat, but also provides the opportunity to improve the overall functions and values of sensitive biological resources throughout Orange County. Working collaboratively with the resource and regulatory agencies, OCTA ultimately decided that creation of a Natural Community Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) and programmatic wetland permitting program would best serve as the EMP's main implementation tools.

As one of the key components of the conservation strategy for the NCCP/HCP and wetlands permitting, OCTA has undertaken a systematic approach to identifying and acquiring habitat preserves to meet the goals and objectives of the NCCP/HCP and wetland mitigation programs. A formal conservation assessment was completed by Conservation Biology Institute (CBI) for Orange County, which resulted in the identification of Priority Conservation Areas (PCA); these included candidate parcels and properties that could be considered for habitat and wildlife conservation purposes. OCTA solicited willing sellers and evaluated each property using standardized criteria and a prioritization process to rank properties for purchase. Properties for acquisition were selected based on conservation values, policy considerations, mitigation credits, mitigation plan review, and adoption and real estate value/economics.



Aerial Source: Aerials Express 2009

D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_RL_Aerial.mxd

Project Location

Exhibit 1

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

1,000 500 0 1,000

Feet

BonTerra PSOMAS

(Rev: 10-08-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex1_ProjectLocation.pdf

The MacPherson property was selected and acquired on December 24, 2013. Baseline biological surveys were completed in 2014 with the following purposes:

- A general biological assessment was completed to establish the baseline biological value of the property and to identify any biological threats that have the potential to reduce the long-term biological value. In addition, information on the overall condition of the property will guide the development of a site-specific Resource Management Plan (RMP).
- Comprehensive surveys of vegetation types were completed to provide detailed knowledge of the natural habitat and a quantification of habitat type credits on the property.
- Focused surveys for OCTA M2 NCCP/HCP Covered Species and their habitats were completed to establish a baseline of the property status and conditions. Results of future biological monitoring will be compared to the baseline results to evaluate habitat and Covered Species trends.

1.2 PROJECT LOCATION AND PHYSICAL ENVIRONMENTAL SETTING

1.2.1 Property Location and Physical Condition

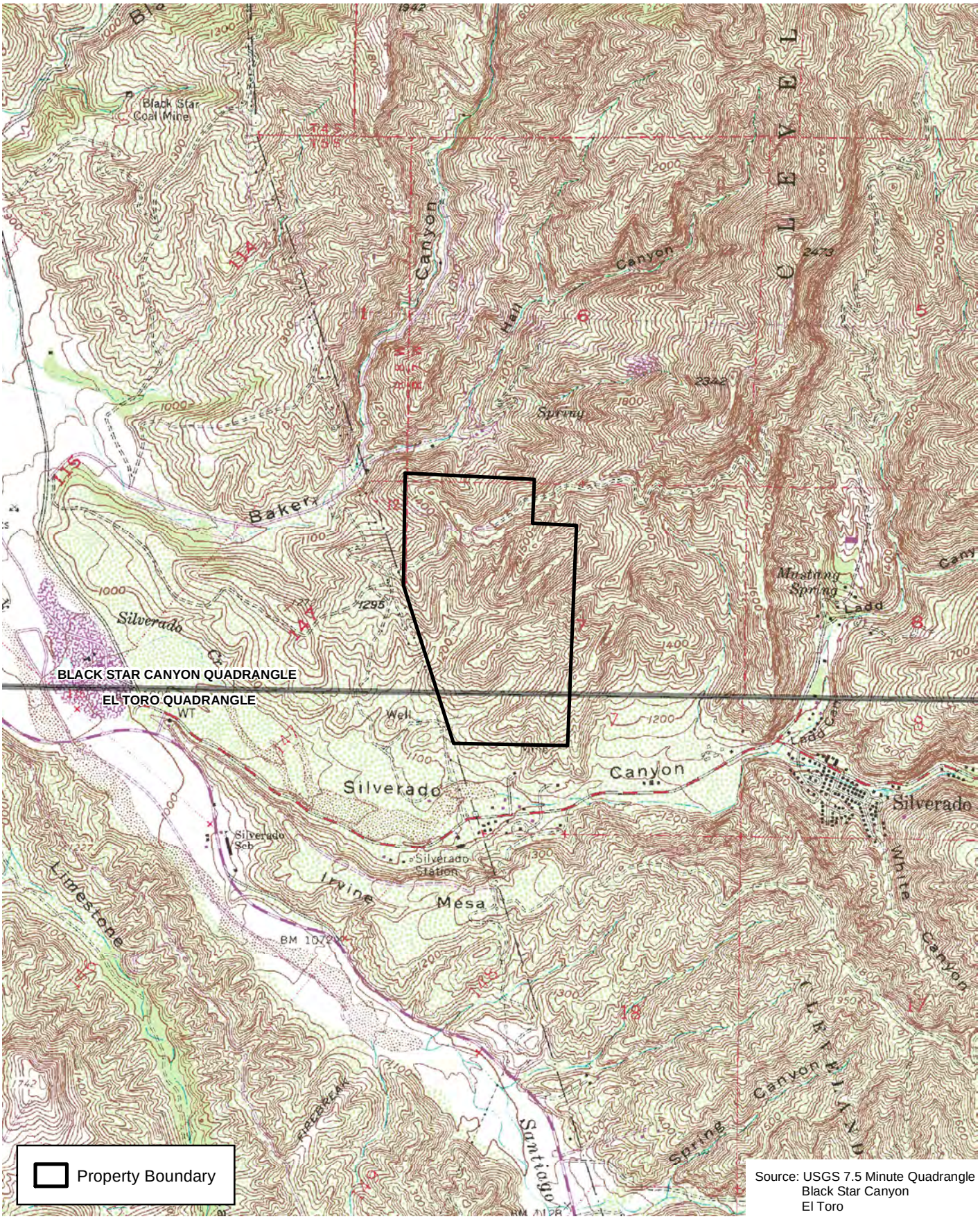
The approximate 204-acre MacPherson property is located in unincorporated Orange County, east of the cities of Orange and Irvine (Exhibit 1). Baker Canyon Road is to the north, Ladd Canyon Road is to the east, Silverado Canyon Road is to the south, and Black Star Canyon Road is to the west. The property is located on the U.S. Geological Survey's (USGS') Black Star Canyon and El Toro 7.5-minute topographic quadrangle maps in Sections 6 and 7 of Township 5 South, Range 7 West (Exhibit 2).

The majority of the property is within the Cleveland National Forest; the western edge of the property is within Irvine Ranch Open Space. The property is within a "Non-Reserve Open Space" area of the Orange County NCCP/HCP for the Central-Coastal Subregion. The property is also located within the Silverado-Modjeska Specific Plan area. The purpose of this plan is to "ensure the preservation of the rural environment and lifestyle of the area while providing for reasonable development" (Orange County 1977).

Topography on the property is hilly, with the main ridgelines oriented in a northeast to southwest direction. Elevations range from approximately 1,135 to 1,678 feet above mean sea level (msl). No blueline streams occur on the property, but multiple drainage features are present in the canyon bottoms. Soil types mapped on the property consist of Anaheim clay loam (30 to 50 percent slopes), Cieneba sandy loam (30 to 75 percent slopes, eroded), Myford sandy loam (2 to 9 percent slopes), and Soper loam (30 to 50 percent slopes) (Exhibit 3).

1.2.2 Regional Environmental Setting

The MacPherson property is located in the cismontane foothills of the Santa Ana Mountains (Exhibit 4). This area is part of a 31-mile swath of continuous wildlife habitat that spans from the Cleveland National Forest in the south to the west end of the Puente Hills (i.e., above Whittier Narrows) in the north. This represents the "last major natural open space resource connecting Los Angeles, Orange, San Bernardino, and Riverside Counties" (Los Angeles County et al. 2003). Specifically, the property occurs between Baker and Hall Canyons to the north, Ladd Canyon to the east, Silverado Canyon to the south, and Santiago Canyon to the west. These canyons are part of the Santiago Hydrologic Subarea of the 1,680-square-mile Santa Ana Watershed. The two main drainages on the property are mapped by the National Wetlands Inventory as freshwater forested/shrub wetland, with the various tributaries mapped as riverine



Source: USGS 7.5 Minute Quadrangle
Black Star Canyon
El Toro

D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_USGS.mxd

USGS 7.5-Minute Quadrangle

Exhibit 2

Measure M2 Acquisition Properties Evaluation – MacPherson Property

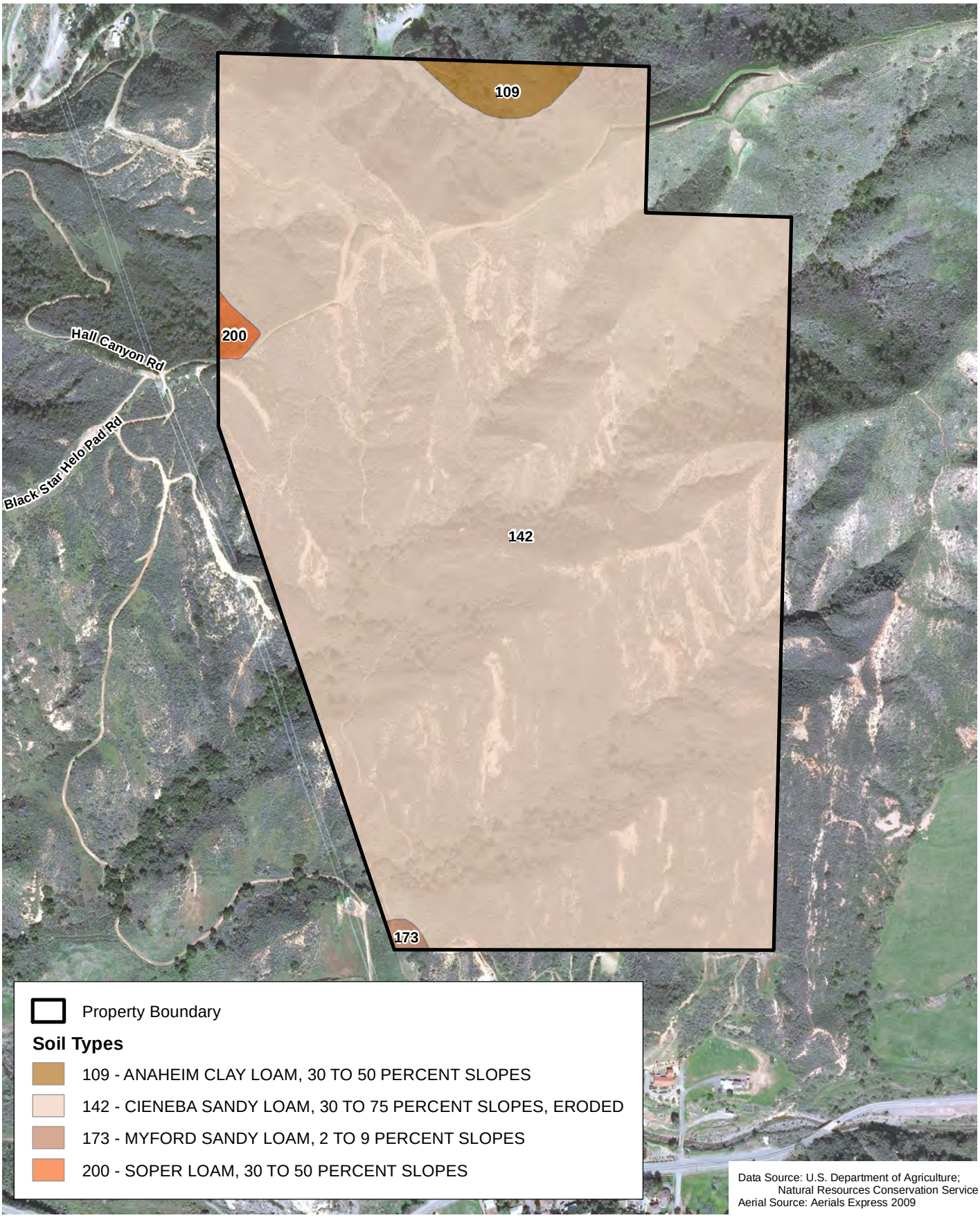
N W E S

2,000 1,000 0 2,000

Feet

BonTerra PSOMAS

(Rev: 10-08-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex2_USGS.pdf



D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_Soils.mxd

Soil Types

Exhibit 3

Measure M2 Acquisition Properties Evaluation – MacPherson Property

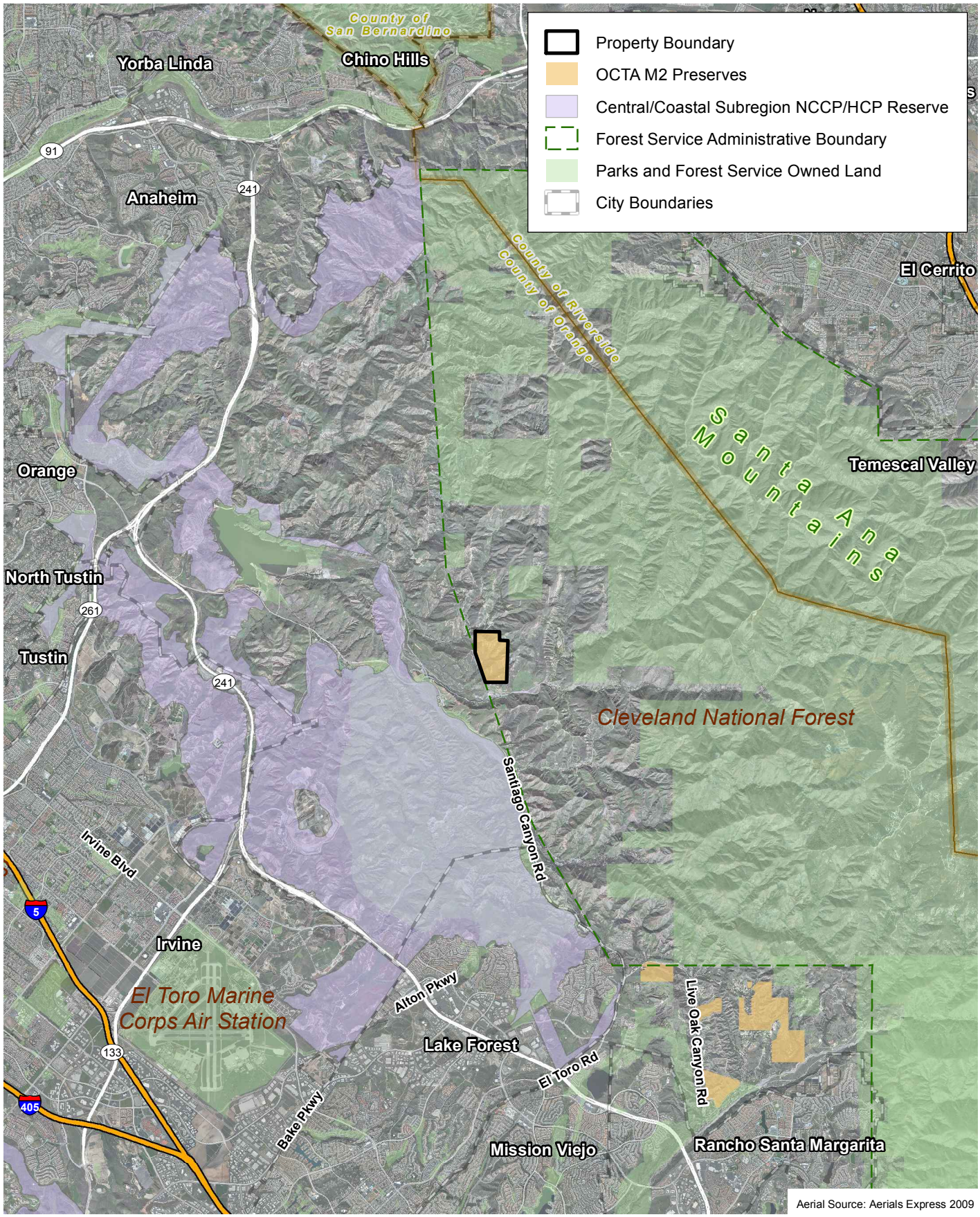
N W E S

600 300 0 600

Feet

BonTerra PSOMAS

(Rev: 10-08-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex3_soils.pdf



D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_RegionalEnvironmentalSetting_20141211.mxd

Regional Environmental Setting

Exhibit 4

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

2 1 0 2 Miles

BonTerra PSOMAS

(Rev: 12-11-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex4_RegionalEnvironmentalSetting.pdf

(USFWS 2006). These drainages flow into Santiago Creek, which is a tributary to the Santa Ana River.

1.2.3 Fire History

There are various hypotheses regarding the fire history of Southern California; what constitutes a "natural" fire regime; and the role of fire for chaparral plant species. Traditionally, the fire season in Southern California is from May through September (OCFA 2007). In the past, fires were started by lightning and typically moved down slopes due to falling brands and coals. According to one school of thought, fires only occasionally formed the hot runs on steep slopes that are typical of today's fires and large, intense fires were uncommon (Howard 1992). This fire regime resulted in a mosaic of numerous small burns. New fires were limited by recently burned regions with very little fuel; dead wood and other fuels could not accumulate for long. However, an opposing hypothesis is that large, high-intensity chaparral fires were regular occurrences in the 19th century, often driven by severe weather that involved high temperatures, low humidity, and high winds (Keeley and Zedler 2009).

Mediterranean shrub communities, including those types found on the property, are resilient to infrequent wildfires and historically burned at a frequency of every 30 to 150 years (Halsey 2005). Many plant species associated with chaparral and scrub communities' exhibit characteristics that constitute adaptations to fire. A new fire will then typically burn hot and high into the canopy, killing much of the aboveground biomass. These canopy fires facilitate seed establishment by removing shrub cover and eliminating competitors. In the first few years after a fire, herbs and herbaceous shrubs—such as deerweed (*Acmispon glaber* [*Lotus scoparius*]), lupines (*Lupinus* spp.), paintbrushes (*Castilleja* spp.), and phacelias (*Phacelia* spp.)—are abundant. Because chaparral fires burn nitrogenous compounds in plant tissues and detritus, there is a large loss of nitrogen from the ecosystem. This allows species equipped with nitrogen-fixing bacteria to grow quickly after a fire.

While herbaceous species are establishing, the previously dominant chaparral species are also returning. Many chaparral species rely on fire to release and germinate seeds. Others resprout from roots or buds at the base of the stem. As the shrub canopy closes, whether due to resprouting of individuals burned by the fire or due to seedling growth, these herbaceous species decrease in abundance.

Fire is also a natural element of oak ecosystems and a decreasing fire frequency tends to favor development of oak woodland over scrub or chaparral. Coast live oak is especially fire resistant; trees can survive and resprout even after severe burning due to food reserves stored in the extensive root system. Adaptations to fire include evergreen leaves, thick bark, and the ability to resprout. Trees resprout from the main trunk and upper crown, but also from the root crown; resprouting may result in a multi-trunk tree. While acorns on the soil are killed, animal-buried acorns usually survive moderately severe fire which allows for high rates of post-fire establishment. Post-fire establishment may also be facilitated by western scrub-jays (*Aphelocoma californica*), which prefer burned areas for caching sites (Steinberg 2002). The frequent, low-intensity burning by Native Americans likely resulted in cohorts of large oak trees growing in open, savannah-like stands (McCreary 2004).

Although fires are a natural part of chaparral, scrub, and oak communities, both unnatural increases and decreases in fire frequency can have a negative impact. Now, nearly all wildfires are started by humans, either through arson or accidents (Schoenherr 1992). While the fire season traditionally occurred from May through September, in the past 15 years, Orange County has experienced its most devastating wildfires from October through April (OCFA 2008). Drought conditions contribute to an increase in dead fuels; drier and more explosive fuels; and more intense fire behavior. In addition, sustained Santa Ana Winds increase the speed of fire

and magnify the effects on the available fuel bed. Santa Ana Winds are strong, warm, and dry winds that flow down into the valleys when stable; during these conditions, high pressure air is forced across and then down the lee-side slopes of a mountain range. The descending air is warmed and dried, which produces critical fire weather conditions.

Anthropogenic increases in fire frequency can change the natural resilience of native communities. With a high frequency of fires, plants may not store enough energy between fires to resprout from roots or buds. In general, when an area burns too often for the community to mature, native plants may not be able to maintain dominance, often resulting in a habitat type conversion. Ruderal species, including annual grasses and invasive forbs, often thrive in post-fire conditions. As a result, fires often promote the spread of non-native species into native habitats. In turn, this high degree of non-native grass and forb cover can lead to more frequent fire return intervals (e.g., intervals of less than eight years have been reported) (Minnich and Dezzani 1998).

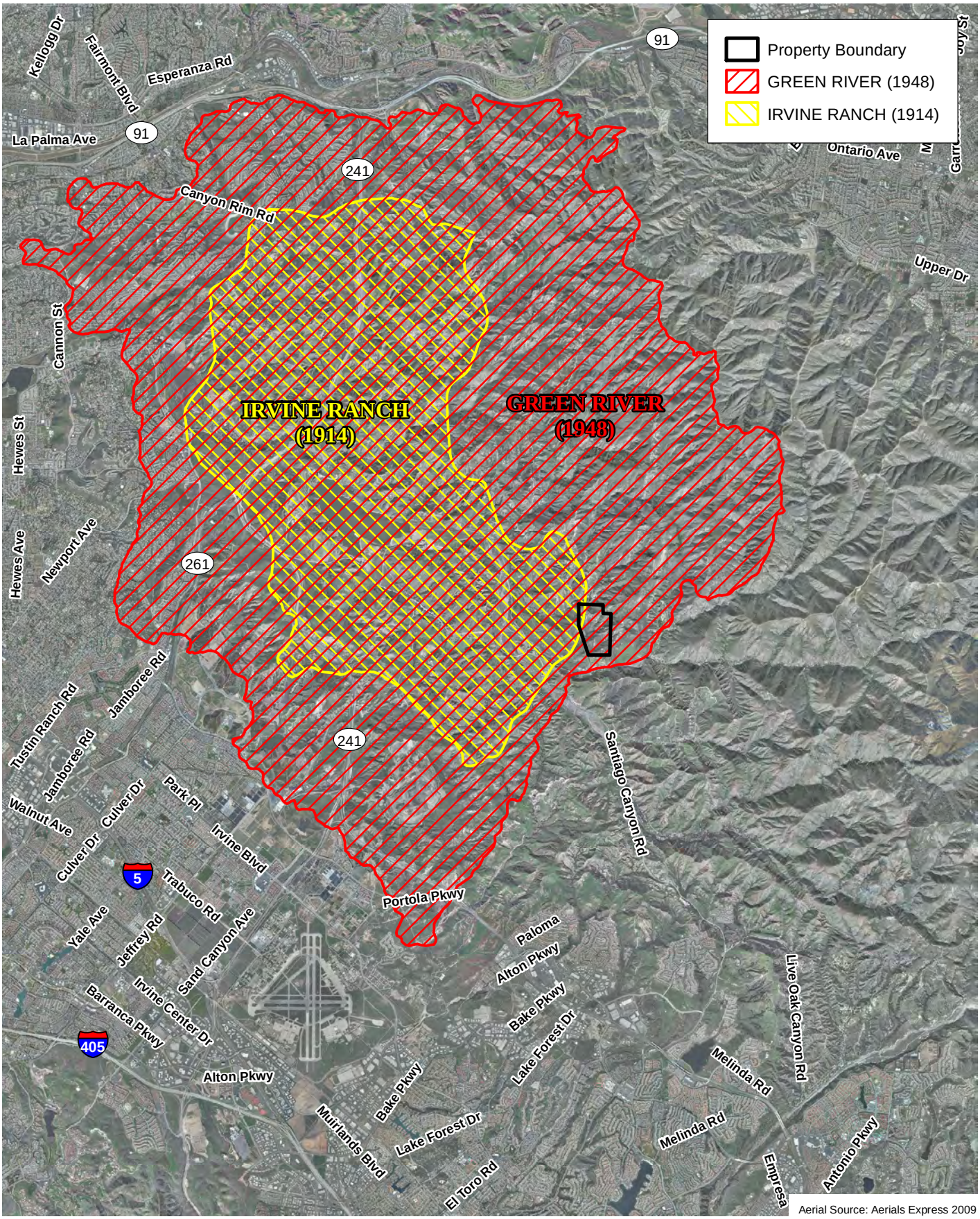
A decrease in fire frequency may also hinder reproduction of fire-adapted species. In the past, government agencies tried to prevent and stop the spread of wildfires through a policy of fire suppression. These efforts were found to be unsuccessful, and they occasionally resulted in larger and more catastrophic fires. While they are less frequent, unnaturally large fires may burn so hot and intense that the canopy, roots, and even the seeds of fire-adapted plants are destroyed. Habitat type conversion may occur in scrub and chaparral communities where fire suppression allows oaks to increase in density (McCreary 2004). When fire is not allowed to regenerate the understory of oak savannahs, the shrub component increases and more severe, crown-consuming fires may result.

Over the past 60 years, Orange County has experienced a number of major (i.e., burned greater than 2,000 acres, burned for an extended period or time, and/or resulted in extraordinary property loss) wildland fires, including 20 that burned over 2,000 acres (OCFA 2008). Most recently, the Silverado Fire burned a total of 968 acres approximately 2.75 miles east of the property in September 2014. The California Department of Forestry and Fire Protection (CAL FIRE) has tracked significant fire events on the MacPherson property. Exhibit 5 shows the fire history of the property. The Irvine Ranch Fire (1914) burned approximately 17.43 acres on the property and the Green River Fire (1948) burned the entire property (CAL FIRE 2014).

1.2.4 Climate

Southern California experiences a Mediterranean climate characterized by mild, rainy winters and hot, dry summers. There can also be dramatic differences in rainfall from year to year. Consequently, the vegetation types in the Southern California area consist of drought-tolerant, woody shrubs and trees and annual, fall/winter-sprouting grasses.

The temperature in Southern California is moderated by the coastal influence of the Pacific Ocean, which creates mild conditions throughout most of the year. The stable atmosphere creates cloudless conditions, producing dry summers and a subtropical climate with many days of sunshine (Ritter 2006). The most distinguishing characteristic of a Mediterranean climate is its seasonal precipitation. In Southern California, precipitation is characterized by brief, intense storms generally between November and March. It is not unusual for a majority of the annual precipitation to fall during a few storms over a close span of time. Rainfall patterns are subject to extreme variations from year to year and longer-term wet and dry cycles.



Aerial Source: Aerials Express 2009

D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_Fire.mxd

Fire History

Exhibit 5

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

2 1 0 2

Miles

BonTerra PSOMAS

(Rev: 10-09-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex5_Fire.pdf

In the region, the average daily temperature in the summer[1] is approximately 71 degrees Fahrenheit (°F). The average daily temperature in the winter is approximately 56°F. The region receives an average of 12.4 inches of rain a year; the majority of this rain falls in the winter months, which receive an average of 6.7 inches; summer rain is approximately 0.10 inch (NWS 2014).

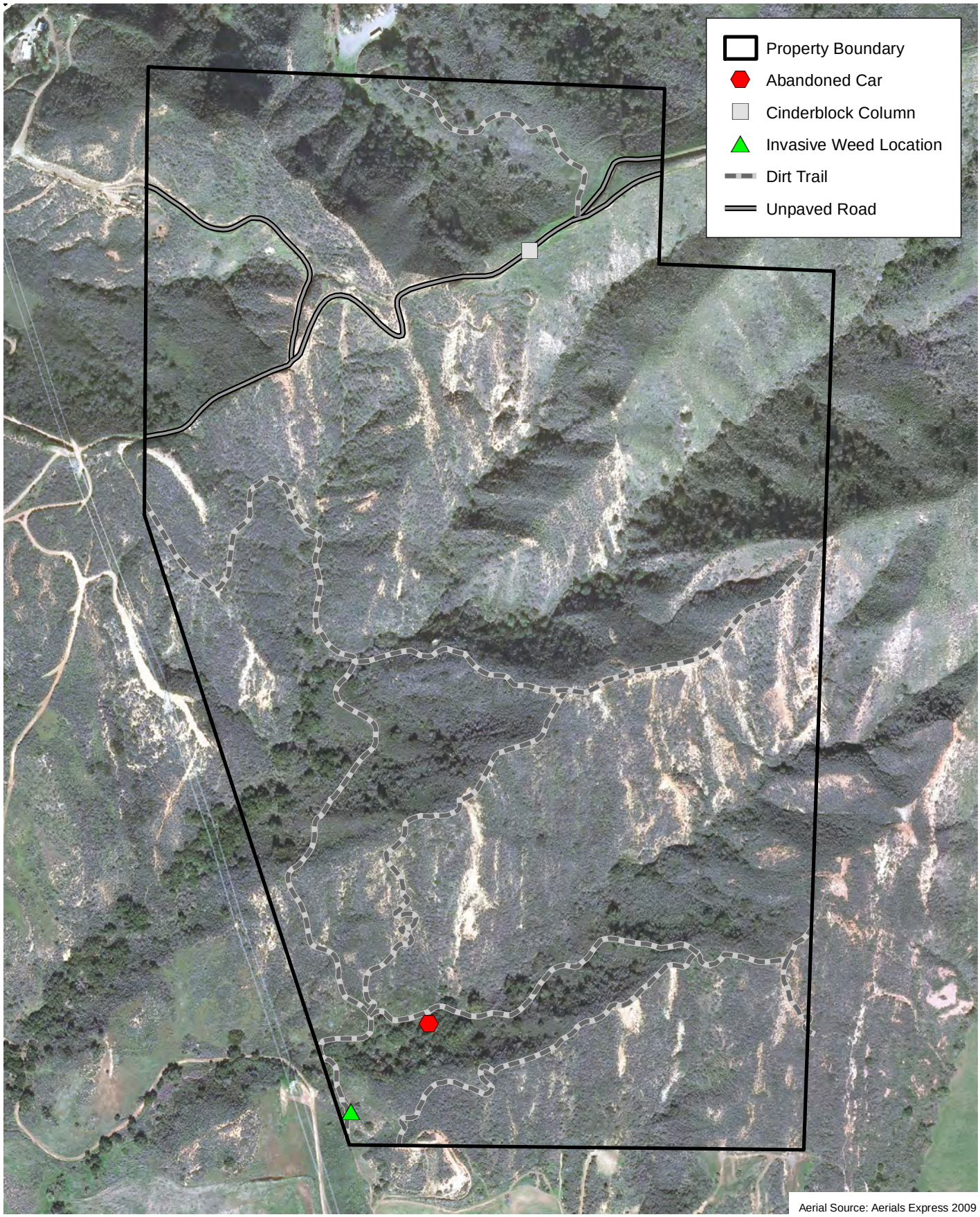
1.2.5 Anthropogenic Uses of the Property

According to the U.S. Forest Service (USFS), the area was inhabited by the Kumeyaay, Luiseño, Cahuilla, and Cupeño Native Americans, who would burn the brushlands along the coast and in the mountains (USFS 2013). Juan Rodriguez Cabrillo arrived in 1542, but the land did not undergo significant change until the establishment of the California missions by Junipero Serra and a ranching culture. The Silverado-Modjeska Canyon area was named "Canyon de la Madera" (or "Canyon of Timber") in 1769 during a Spanish expedition led by Gaspar de Portolá (CLCF 2011). The Spanish had received land grants in the canyons for logging timber as well as for cattle and horse grazing. In 1877, silver was found in Silverado Canyon and coal was found near the canyon's entrance the following year. By 1883, both the coal mine and silver mines were closed. In the early 1900s, the sulphur springs in the canyon attracted residents, and mining resumed at the Blue Light Mine. Suburban development continues to encroach into the area.

A review of historic aerial photographs of the property shows that, in general, vegetation communities have not significantly altered since 1946. Low density development along Silverado Canyon Road is present in aerial photographs as early as 1946, though development along Baker Canyon Road has occurred since 1952. Buildings or otherwise significant structures are not identified in the historic aerials on the property.

Anthropogenic features on the property are shown in Exhibit 6. The property is currently used by hikers and mountain bikers; multiple informal trails cross the property. There is some evidence that target practice occurs on the property (see photograph on left). An old car (see photograph on right) was abandoned in the canyon bottom in the southern portion of the property. A short rebar and cinderblock column was observed along the access road at the northeast corner of the property. Relatively little trash was observed during the surveys and included old barbed wire, portions of cans, and a brush. Evidence of grazing is not present on this property.

[1] Seasons are climatological; winter is considered to be December, January, and February and summer is considered to be June, July, and August.



Aerial Source: Aerials Express 2009

D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_AnthropogenicAndInvasive.mxd

Anthropogenic Features and Invasive Species

Exhibit 6

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

500 250 0 500

Feet

BonTerra PSOMAS

(Rev: 10-14-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex6_AnthropogenicAndInvasive.pdf

2.0 SURVEY METHODS

This section describes the methods used to conduct the literature review; perform general biological surveys, vegetation mapping, and focused biological surveys; and assess the property's potential to support special status species. A cumulative list of all plant and wildlife species observed on the property is included as Attachments A-1 and A-2, respectively. Photographs of the property are included as Attachment B.

2.1 LITERATURE REVIEW

BonTerra Psomas conducted a literature search to identify special status plants, wildlife, and habitats reported to occur in the vicinity of the MacPherson property. This search included a review of the USGS' Black Star Canyon and El Toro 7.5-minute quadrangles in the California Native Plant Society's (CNPS') Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2014b) and the CDFW's California Natural Diversity Database (CNDDB) (CDFW 2014a). In addition, a species list was obtained from the USFWS' Information, Planning, and Conservation System (IPaC) for the property.

2.2 VEGETATION MAPPING AND GENERAL SURVEYS

BonTerra Psomas Senior Biologists Ann Johnston and Allison Rudalevige conducted a general survey to describe and map the vegetation types on the property on April 7, 2014. Vegetation mapping was refined concurrently with the special status plant survey conducted on July 1, 2014. Nomenclature for vegetation types follows *A Manual of California Vegetation* (Sawyer et al. 2009) for recognized Alliances or Associations.[2] Vegetation was mapped in the field on an aerial photograph at a scale of 1 inch equals 150 feet (1″=150′).

The general surveys included an evaluation of the property's potential to support special status plant and wildlife species, with special focus on M2 NCCP/HCP Covered Species. Covered Species include intermediate mariposa lily (*Calochortus weedii* var*. intermedius*), southern tarplant (*Centromadia parryi* ssp. *australis* [*Hemizonia p.* ssp. *a.*]), many-stemmed dudleya (*Dudleya multicaulis*), arroyo chub (*Gila orcutti*), Blainville's [coast] horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra* [*Cnemidophorus h.*]), Pacific [western] pond turtle (*Actinemys marmorata* [*Emys m.*]), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), coastal California gnatcatcher (*Polioptila californica californica*), bobcat (*Lynx rufus*), and mountain lion (*Puma concolor* [*Felis c.*]). Suitable habitat and/or observed individuals were documented in field notes and with global positioning system (GPS) units, and a CNDDB form was filled out for each occurrence.

During field surveys, natural or physical resources and opportunities were identified (mapped and included in field notes) that "preserve, restore and enhance aquatic, riparian and terrestrial natural communities and ecosystems that support Covered Species" (OCTA 2010). The following resources were mapped and documented in field notes: resources that provide valuable enhancement, restoration, or preservation opportunities (e.g., significant stands of non-native species requiring eradication/control; presence of rock outcroppings that provide niche areas for unusual plants, bats, ringtails [*Bassariscus astutus*], or other species; nesting cavities; large mammal burrows; avian rookeries/roosts; and dens). This may include significant stands of invasive plant species based on the California Invasive Plant Council (Cal-IPC) Inventory.

[2] Alliance is "a classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover". Association is "a vegetation classification unit defined by a diagnostic species, a characteristic range of species composition, physiognomy, and distinctive habitat conditions" (Sawyer et al. 2009).

Anthropogenic influences/structures on the property (e.g., paved and unpaved roads, trails, cell towers, water towers, abandoned vehicles and/or "dumped" trash or debris) were also documented. GPS devices were utilized for recording all point locations.

Plant species were identified in the field or collected for subsequent identification using keys in Baldwin et al. (2012), Hickman (1993), and Munz (1974). Taxonomy follows Baldwin et al. (2012), Hickman (1993), and current scientific data (e.g., scientific journals) for scientific and common names. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows Crother (2008) for amphibians and reptiles, American Ornithologists' Union (AOU 2013) for birds, and Smithsonian National Museum of Natural History (SNMNH 2011) for mammals. All species observed were recorded in field notes and are included in Attachments A-1 and A-2.

2.3 FOCUSED BIOLOGICAL SURVEYS

Focused biological surveys were conducted in 2014 for special status plant species and coastal California gnatcatcher. Surveys were conducted in suitable habitat, based on the Senior Biologists' best professional judgment.

2.3.1 Special Status Plant Species

Special status plant surveys were floristic in nature and were conducted following the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). Target species included the following Covered Species: intermediate mariposa lily and many-stemmed dudleya.

Rainfall received in the winter and spring determines the germination of many annual and perennial herb species. The region received approximately 5.92 inches of precipitation between June 30, 2013 and July 31, 2014 (data taken from Irvine – South Coast Valleys Station No. 75) (CIMIS 2014). The average annual precipitation for this area is between 10 and 13 inches. In years of low or unusual rainfall patterns, monitoring of reference populations is important in order to ensure that the surveys were comprehensive. Prior to conducting the field surveys, accessible reference populations of target species known from the Orange County area were monitored to ensure that the scheduled surveys were comprehensive and conducted during the appropriate blooming period for these species. A population of many-stemmed dudleya was confirmed blooming at the University of California, Irvine Ecological Reserve on May 7, 2014, and the initial survey visit was scheduled after that date. Reference populations were not monitored for intermediate mariposa lily because it was observed on site during the initial plant survey. Reference populations were not monitored for large perennials (e.g., Tecate cypress [*Hesperocyparis forbesii*] and chaparral nolina [*Nolina cismontana*]), which would be identifiable throughout the year. Rainfall throughout the region was below average for the year. Although reference populations and regional rainfall amounts were monitored to ensure the scientific adequacy of these focused surveys, there is always a minimal potential for false negative survey results as species could possibly be present on a site but may not be detectable at the time of the surveys.

The survey area for special status plant species consisted of the entire property. Surveys were conducted on May 20, 2014, by Ms. Rudalevige, BonTerra Psomas Senior Biologists Jennifer Pareti and Lindsay Messett, and Biologist Jason Mintzer and on July 1, 2014, by Ms. Rudalevige, Ms. Pareti, Mr. Mintzer, and Consulting Botanist David Bramlet. Systematic walking surveys were conducted in all areas of suitable special status plant habitat (i.e., coastal

sage scrub, chaparral) and transects were walked at regularly spaced intervals to achieve 100 percent visual coverage of the ground surface (i.e., ridgelines, trails, canyon bottoms) and all potential habitat within the survey area. The habitat preferences of target species (see Table 3, below) were compared to the resources on site (e.g., community associations, soil, slope, shade) to determine which portions of the property represented suitable habitat. All plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified to the taxonomic level necessary to determine whether or not they are a special status species using taxonomic keys, descriptions, and illustrations in Baldwin et al. (2012), Hickman (1993), and Munz (1974). Any voucher specimens collected would be deposited with the herbarium at Rancho Santa Ana Botanic Gardens in Claremont, California.

2.3.2 Coastal California Gnatcatcher

Surveys for the coastal California gnatcatcher were conducted in accordance with the guidelines issued by the USFWS for areas participating in an NCCP/HCP (USFWS 1997). These guidelines stipulate that three surveys must be conducted in suitable habitats with at least one week between site visits; the surveys can be conducted year-round. All visits must take place during the morning hours, and no more than 100 acres of suitable habitat may be surveyed per visit.

Ms. Messett (USFWS Permit No. PRT-067064-2) conducted all coastal California gnatcatcher surveys on the MacPherson property. The surveys covered all potentially suitable habitats for the coastal California gnatcatcher. A summary of the focused survey dates and conditions is shown in Table 1 below.

TABLE 1
SUMMARY OF SURVEY DATA AND CONDITIONS FOR GNATCATCHER SURVEYS

Date	Time	Weather Conditions		
		Temperature (°F) (Start/End)	Wind (mph) (Start/End)	Cloud Cover (%) (Start/End)
August 22, 2014	0700/1200	70/84	0–1/0–3	30/10
August 29, 2014	0640/1150	68/87	0–1/0–4	40/Clear
September 5, 2014	0630/1200	66/85	0–1/0–4	20/Clear

°F: degrees Fahrenheit; mph: miles per hour.

Source: BonTerra Psomas 2014.

Weather conditions met the USFWS survey protocol requirements for optimal gnatcatcher detection. Weather conditions that were too cold (below 55 degrees Fahrenheit [°F]), too hot (above 95°F), or too windy (wind speed greater than 15 miles per hour) were avoided. Surveys were conducted by slowly walking through all appropriate habitats while listening and watching for gnatcatcher activity. A combination of recordings of gnatcatcher vocalizations and “pishing” sounds were used in an attempt to elicit responses from any gnatcatchers that might be present. The frequency of vocalization playback and “pishing” varied depending on conditions (e.g., habitat patch size and topography). All bird species detected during the survey were recorded, including notable observations of special status wildlife species.

3.0 EXISTING BIOLOGICAL RESOURCES

This section describes the biological resources that occur or potentially occur on the MacPherson property. Vegetation types, wildlife populations and movement patterns, and special status biological resources are discussed below.

3.1 VEGETATION TYPES AND OTHER AREAS

Eleven vegetation types and other areas occur on the MacPherson property, as shown in Table 2 and Exhibit 7. Descriptions of these vegetation types are provided below. Note that classification follows *A Manual of California Vegetation* (Sawyer et al. 2009), but Gray and Bramlet's (1992) classification is provided that is more condensed than the formal classification. These vegetation types were also cross-walked to the general vegetation types used in the NCCP/HCP Plan.

TABLE 2
VEGETATION TYPES AND OTHER AREAS ON THE MACPHERSON PROPERTY

General Vegetation Types	Vegetation Types and Other Areas	Status	Amount on Property (Acres)
Chaparral	southern mixed chaparral	G5 S5	123.91
	open southern mixed chaparral	G5 S5	20.78
	Chaparral Subtotal		*144.69*
Scrub	California sagebrush scrub	G5 S5	8.23
	mixed sage scrub	G4 S4	32.12
	Scrub Subtotal		*40.35*
Grassland	annual grassland	G3? S3?	2.27
	ruderal	—	0.23
	Grassland Subtotal		*2.50*
Riparian	southern coast live oak riparian forest	G4 S4	9.48
	poison oak scrub	G4 S4	0.29
	Riparian Subtotal		*9.77*
Woodland	coast live oak woodland	G4 S4	2.80
Barren	cliff/rock	—	0.96
Developed/Non-Native	disturbed	—	2.56
	Total Acreage		***203.63***

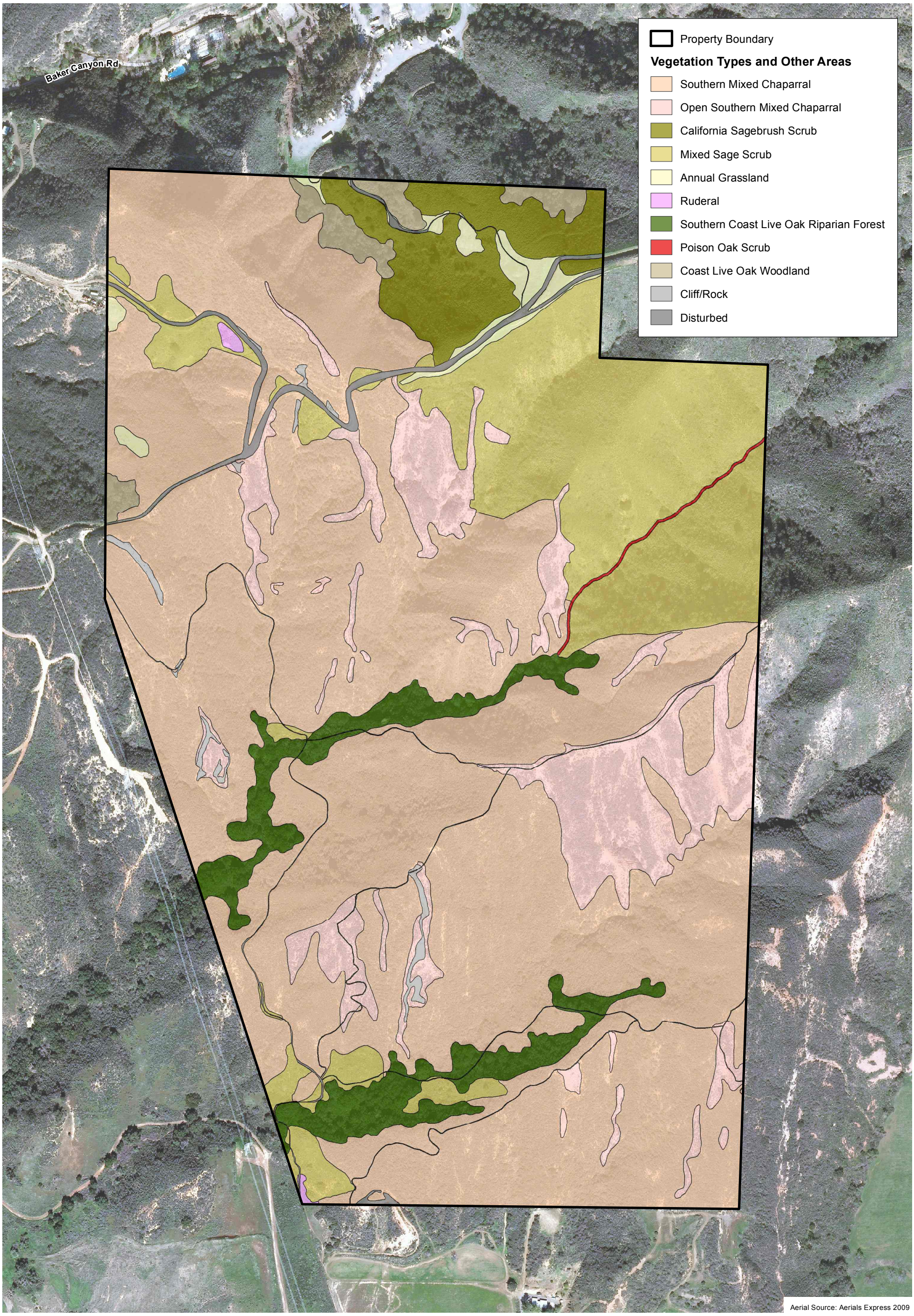
G: Global; S: State.

Status
3 Vulnerable and at moderate risk of extinction or elimination
4 Apparently secure and uncommon but not rare
5 Secure
? Inexact numeric rank, but existing information points to this rank

Chaparral

Southern Mixed Chaparral

A total of 123.91 acres of southern mixed chaparral (the *Adenostoma fasciculatum – Ceanothus crassifolius* Shrubland Association [Sawyer et al. 2009]) occurs on slopes throughout the property. This vegetation type is dominated by a mix of chamise (*Adenostoma fasciculatum*)



Aerial Source: Aerials Express 2009

D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_Veg.mxd

Vegetation Types and Other Areas

Exhibit 7

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

300 150 0 300 Feet

BonTerra PSOMAS

(Rev: 12-11-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex7_Veg.pdf

and hoaryleaf ceanothus (*Ceanothus crassifolius*), with the proportion of each varying across the site. The plant cover is dense, with no understory vegetation except along the margins, where sage scrub species and non-native grasses and herbs extend into the chaparral.

Open Southern Mixed Chaparral

A total of 20.78 acres of open southern mixed chaparral (the *Adenostoma fasciculatum – Ceanothus* crassifolius Shrubland Association [Sawyer et al. 2009]) occurs on steep, eroding slopes and ridgelines throughout the property. The vegetation composition is similar to that of southern mixed chaparral, but the density of shrubs is much lower. Bare ground occurs between the shrubs.

Scrub

California Sagebrush Scrub

A total of 8.23 acres of the California sagebrush scrub (the *Artemisia californica* Shrubland Alliance [Sawyer et al. 2009]) occurs on north-facing slopes at the northern edge of the property. This vegetation type is dominated by California sagebrush (*Artemisia californica*). Some slopes contain scattered blue elderberry (*Sambucus nigra* ssp. *caerulea*) or toyon (*Heteromeles arbutifolia*).

Mixed Sage Scrub

A total of 32.12 acres of mixed sage scrub (the *Artemisia californica – Eriogonum fasciculatum – Salvia mellifera* Association [Sawyer et al. 2009]) occurs on slopes in the northeast corner of the property and in scattered patches in the southern portion of the property. This vegetation type is dominated by a mix of coastal sage scrub species, primarily black sage (*Salvia mellifera*), California sagebrush, and California buckwheat (*Eriogonum fasciculatum*). Some areas of mixed sage scrub contain needlegrass (*Stipa* sp.) or stands of laurel sumac (*Malosma laurina*) and toyon.

Grassland

Annual Grassland

A total of 2.27 acres of annual grassland (the *Deinandra fasciculata* – Annual Grass-Herb Association [Sawyer et al. 2009]) occurs along roadsides and in openings of coastal sage scrub and chaparral throughout the property. These areas are dominated by non-native grasses and herbs such as wild oat (*Avena* sp.), ripgut grass (*Bromus diandrus*), black mustard (*Brassica nigra*), and tocalote (*Centaurea melitensis*) with a seasonal component of fascicled tarweed (*Deinandra fasciculata* [*Hemizonia f*.]). Some scattered shrubs, such as California buckwheat, are also present.

Ruderal

A total of 0.23 acre of ruderal (various semi-natural herbaceous stands [Sawyer et al. 2009]) occurs in small patches near the northwestern and southwestern corners of the property. This vegetation type is dominated by non-native, weedy herbs such as black mustard, tocalote, red-stemmed filaree (*Erodium cicutarium*), and Russian thistle (*Salsola tragus*).

Riparian

Southern Coast Live Oak Riparian Forest

A total of 9.48 acres of southern coast live oak riparian forest (the *Quercus agrifolia* Woodland Alliance [Sawyer et al. 2009]) occurs in the major drainages bisecting the property. This vegetation type is dominated by a canopy of coast live oak (*Quercus agrifolia*). Understory species are scattered in varying densities and include caterpillar phacelia (*Phacelia cicutaria*), giant wild rye (*Elymus condensatus* [*Leymus c*.]), bush monkeyflower (*Mimulus aurantiacus*), western poison oak (*Toxicodendron diversilobum*), and smilo grass (*Stipa miliacea* [*Piptatherum m*.]).

Poison Oak Scrub

A total of 0.29 acre of poison oak scrub (the *Toxicodendron diversilobum* Shrubland Alliance [Sawyer et al. 2009]) occurs along a canyon bottom in the northeast corner of the property. This vegetation type consists of an approximate ten-foot-wide strip of western poison oak.

Woodland

Coast Live Oak Woodland

A total of 2.80 acres of coast live oak woodland (the *Quercus agrifolia* Woodland Alliance [Sawyer et al. 2009]) occurs on upland slopes in the northern portion of the property. This vegetation type is dominated by a canopy of coast live oak. Note that Sawyer et al. (2009) do not distinguish between riparian and upland oak woodlands, but these areas are discussed separately because the community composition differs.

Barren

Cliff/Rock

A total of 0.96 acre of cliff/rock occurs along ridgelines and on steep, eroding slopes. This represents areas of exposed rock face or eroding hillsides that lack vegetation.

Developed/Non-Native

Disturbed

A total of 2.56 acres of disturbed areas occur on the property. This represents unpaved roads and dirt trails located throughout the property. No vegetation is present in these areas.

3.2 WILDLIFE POPULATIONS AND MOVEMENT PATTERNS

Vegetation on and adjacent to the property provides potential habitat for a number of wildlife species. Common wildlife species observed or expected to occur on the property and/or in adjacent off-site areas are discussed below.

3.2.1 Fish

Most creeks and waterways in Southern California are subject to periods of high water flow in winter and spring and little to no flow during the late summer and fall. Most drainages occurring on the property are expected to convey water only following storm events. No fish species were observed on the property, nor are they expected to occur, due to lack of suitable habitat.

3.2.2 Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Terrestrial species may or may not require standing water for reproduction; they survive in dry areas by aestivating (i.e., remaining beneath the soil in burrows or under logs and leaf litter, and emerging only when temperatures are low and humidity is high). Many of these species' habitats are associated with water and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year in some habitat types depending on factors such as amount of vegetation cover, elevation, and slope/aspect.

Marginally suitable habitat for amphibian species occurs in the drainages on the property. No amphibian species were observed on the property. Common amphibian species that may occur on the property include garden slender salamander (*Batrachoseps major*), western toad (*Anaxyrus boreas*), and Pacific treefrog (*Pseudacris* [*Hyla*] *regilla*).

3.2.3 Reptiles

Reptiles are well-adapted to life in arid habitats. They have several physiological adaptations that allow them to conserve water. Reptiles can also become dormant during weather extremes, allowing them to survive prolonged droughts and paucity of food (Ruben and Hillenius 2005). Reptilian diversity and abundance typically varies with vegetation type and character. Many species prefer only one or two vegetation types; however, most species will forage in a variety of habitats. Most reptile species that occur in open areas will excavate a burrow or use rodent burrows for cover, protection from predators, and refuge during extreme weather conditions.

Common reptile species observed on the property include western fence lizard (*Sceloperus occidentalis*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis catenifer*).

3.2.4 Birds

A variety of bird species are expected to be residents on the property, using habitats throughout the year. Other species are present only during certain seasons. For example, the white-crowned sparrow (*Zonotrichia leucophrys*) is expected to occur on the property during the winter season, but would not occur in the summer season because it migrates north to its breeding range.

Resident bird species observed on the property include California quail (*Callipepla californica*), western scrub-jay, common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), wrentit (*Chamaea fasciata*), California thrasher (*Toxostoma redivivum*), spotted towhee (*Pipilo maculatus*), and California towhee (*Pipilo crissalis*). Urban-tolerant species that occur in disturbed areas and in natural vegetation types that were also observed on the property include mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Spinus* [*Carduelis*] *psaltria*).

Wintering birds are those species that generally breed outside the region but migrate to the area for the winter season. Wintering species that may occur on the property include Townsend's warbler (*Setophaga* [*Dendroica] townsendi*), chipping sparrow (*Spizella passerina*), and fox sparrow (*Passerella iliaca*). Summer residents are species that migrate into the region to breed, but generally winter south of the region. Summer breeders that may occur on the property include black-chinned hummingbird (*Archilochus alexandri*) and western kingbird (*Tyrannus*

verticalis). During spring and fall migration, the property also provides foraging habitat for a variety of migratory species.

Birds of prey (raptors) observed on the property include turkey vulture (*Cathartes aura*) (a scavenger), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*).

3.2.5 Mammals

Burrows provide cover for a number of small mammal species. Small ground-dwelling mammals observed or expected to occur on the property include California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), dusky-footed woodrat (*Neotoma fuscipes*), and desert woodrat (*Neotoma lepida*).

Open grassland communities and the leafy understory of scrub and woodland communities provide excellent foraging habitat for herbivorous mammals. Common herbivores observed or expected to occur on the property include mule deer (*Odocoileus hemionus*) and desert cottontail (*Sylvilagus audubonii*).

Medium to larger mammalian predators (both carnivorous and omnivorous species) observed or expected to occur on the property in a variety of habitats include common striped skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), and mountain lion.

Bat activity on the property may occur in the lower elevation canyons and ravines where the bats are most likely to find more abundant insect food. No suitable cliffs, buildings, or other man-made structures that would be suitable for roosting are present on the property. The property has some potential to support roosting bats in tree snags or under bark; however, the closed nature of the chaparral habitat provides limited open areas suitable for foraging. Species such as the Brazilian free-tailed bat (*Tadarida brasiliensis*), big brown bat (*Eptesicus fuscus*), and Yuma myotis (*Myotis yumanensis*), may occur on the property.

3.2.6 Wildlife Movement

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information (MacArthur and Wilson 1967; Soule 1987; Harris and Gallagher 1989; Bennett 1990). Corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats, thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (such as fire or disease) will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move in their home ranges in search of food, water, mates, and other necessary resources (Noss 1983; Fahrig and Merriam 1985; Simberloff and Cox 1987; Harris and Gallagher 1989).

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas or individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories or searching for mates, breeding areas, or cover). A number of terms such as "wildlife corridor", "travel route", "habitat linkage", and "wildlife crossing" have been used in various wildlife movement studies to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are defined as follows:

- **Travel Route –** a landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and to provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another. It contains adequate food, water, and/or cover while moving between habitat areas and it provides a relatively direct link between target habitat areas.

- **Wildlife Corridor –** a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bound by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and to facilitate movement while in the corridor. Larger, landscape-level corridors (often referred to as "habitat linkages" or "landscape linkages") can provide both transitory and resident habitat for a variety of species.

- **Wildlife Crossing –** a small, narrow area, relatively short in length and generally constricted in nature that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings typically are man-made and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent "choke points" along a movement corridor, which may impede wildlife movement and increase the risk of predation.

It is important to note that, in a large open space area where there are few or no man-made or naturally occurring physical constraints to wildlife movement, wildlife corridors (as defined above) may not yet exist. Given an open space area that is both large enough to maintain viable populations of species and to provide a variety of travel routes (e.g., canyons, ridgelines, trails, riverbeds, and others), wildlife will use these "local" routes while searching for food, water, shelter, and mates and will not need to cross into other large open space areas. Based on their size, location, vegetative composition, and availability of food, some of these movement areas (e.g., large drainages and canyons) are used for longer lengths of time and serve as source areas for food, water and cover, particularly for small- and medium-sized animals. This is especially true if the travel route is within a larger open space area. However, once open space areas become constrained and/or fragmented as a result of urban development or construction of physical obstacles (such as roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food and water, and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

In general, animals discussed within the context of movement corridors typically include larger, more mobile species (such as mule deer, black bear [*Ursus americanus*], mountain lion, fox [*Urocyon* sp.], and coyote) and even some of the mid-sized mammals (such as raccoon [*Procyon lotor*], striped skunk, American badger [*Taxidea taxus*], and Virginia opossum

[*Didelphis virginiana*]). Most of these species have relatively large home ranges through which they move to find adequate food, water, and breeding and wintering habitat. It is assumed that corridors that serve larger, more fragile species also serve as corridors for many smaller, less mobile species, such as reptiles, amphibians, and rodents (generally discussed within the context of local movement). Regional movement for these species facilitates gene flow and requires at least some local "stepping stone" movement of individuals between populations.

The availability of open space corridors is generally considered less important for bird species. Most bird species are believed to fly in more or less direct paths to desired locations; however, some habitat-specific species may not move great distances from their preferred habitat types, and are believed to be less inclined to travel across unsuitable areas.

Ideally, an open space corridor should encompass a heterogeneous mix of vegetation types to accommodate the ecological requirements of a wide variety of resident species in any particular region. Most species typically prefer adequate vegetation cover during movement, which can serve as both a food source and as protection from weather and predators. Drainages, riparian areas, and forested canyon bottoms typically serve as natural movement corridors because these features provide cover, food, and often water for a variety of species. Very few species will move across large expanses of open, uncovered habitat unless it is the only option available to them. For some species, landscape linkages must be able to support animals for sustained periods, not just for travel. Smaller or less mobile animals (such as rodents and reptiles) require long periods to traverse a corridor, so the corridor must contain adequate food and cover for survival.

Regional Movement

The MacPherson property occurs within the boundaries of the Cleveland National Forest and the Irvine Ranch Open Space. This represents approximately 460,000 and 50,000 acres of open space, respectively. Open space on the property is contiguous with larger areas of open space in the Santa Ana Mountains. Wildlife movement is relatively unhindered to the east of the property, with no major roads or development in that direction. Low density rural residential development occurs along Silverado Canyon Road south of the property, and a recreational vehicle (RV) park occurs to the north along Baker Canyon Road. The relatively undeveloped nature of the landscape is highly conducive to regional wildlife movement.

Local Movement

The MacPherson property contains multiple ridgelines and canyons that provide a variety of travel routes for local wildlife movement. The trails and access roads on the property may also be used for movement. Movement is expected to occur on the property, as well as between the property and contiguous off-site habitat. Coyote, a wildlife species that requires a relatively large home range, was observed on the MacPherson property.

3.3 SPECIAL STATUS BIOLOGICAL RESOURCES

This section addresses special status biological resources that were observed, reported, or have the potential to occur on the property or in adjacent off-site areas. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and State resource agencies and private conservation organizations. In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. Tables 3 and 6 respectively provide a summary of special status plant and wildlife species known to occur in the vicinity of the MacPherson property (i.e., the USGS' Black Star Canyon and El Toro 7.5-minute quadrangles) and include information on the status; habitat; potential for occurrence; results of focused survey efforts; and definitions for the various status designations. Generally, this list includes species reported by the CNDDB and CNPS, supplemented with species from the author's experience that either occur nearby or could occur based on the presence of suitable habitat. In addition to species, special status biological resources include vegetation types and habitats that are either unique; of relatively limited distribution in the region; or of particularly high wildlife value. These resources have been defined by federal, State, and local government conservation programs. Sources used to determine the status of biological resources are listed below.

- **Plants –** Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2014b); the CNDDB (CDFW 2014a); various USFWS *Federal Register* notices regarding listing status of plant species; and the *List of Special Vascular Plants, Bryophytes, and Lichens* (CDFW 2014c).

- **Wildlife –** California Wildlife Habitat Relationships Database System (CDFW BDB 2014); the CNDDB (CDFW 2014a); various USFWS *Federal Register* notices regarding listing status of wildlife species; and the *List of Special Animals* (CDFW 2014b).

- **Habitats –** CNDDB (CDFW 2014a) and the *List of California Natural Communities* (CDFG 2010).

3.3.1 Definitions of Special Status Biological Resources

A **federally Endangered species** is one facing extinction throughout all or a significant portion of its geographic range. A **federally Threatened species** is one likely to become Endangered in the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species in a project impact area generally imposes severe constraints on development, particularly if a project would result in "take" of the species or its habitat. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm, in this sense, can include any disturbance of habitats used by the species during any portion of its life history.

Proposed species or **Candidate species** are those officially proposed by the USFWS for addition to the federal Threatened and Endangered species list. Because proposed species may soon be listed as Threatened or Endangered, these species could become listed prior to or during implementation of a proposed project. The presence of a Proposed or Candidate species within a project impact area may impose constraints on development if they are listed prior to issuance of project permits, particularly if a project would result in "take" of the species or its habitat.

The State of California considers an **Endangered species** as one whose prospects of survival and reproduction are in immediate jeopardy; a **Threatened species** as one present in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management; and a **Rare species** as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. Rare species applies only to California native plants. State-listed Threatened and Endangered species are protected against take unless an Incidental Take Permit is obtained from the resource agencies. The presence of any State-listed Threatened or Endangered species in a project impact area generally imposes severe constraints on development, particularly if a project would result in "take" of the species or its habitat.

California Species of Special Concern is an informal designation used by the CDFW for some declining wildlife species that are not State Candidates. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFW. Recently, the CDFW downgraded some of these species from Species of Special Concern to the **Watch List.**

Species that are **California Fully Protected** and **Protected** include those protected by special legislation for various reasons, such as the mountain lion and white-tailed kite (*Elanus leucurus*). Fully Protected species may not be taken or possessed at any time. California Protected species include those species that may not be taken or possessed at any time except under special permit from the CDFW issued pursuant to the *California Code of Regulations* (Title 14, §650, §670.7) or Section 2081 of the *California Fish and Game Code.*

Species of **Local Concern** are those that have no official status with the resource agencies, but are being watched because there is either a unique population in the region or the species is declining in the region.

Special Animal is a general term that refers to species that the CNDDB is interested in tracking, regardless of legal or protective status. This term includes species designated as any of the above terms, but also includes species that may be considered biologically rare; restricted in distribution; declining throughout their range; have a critical, vulnerable stage in their life cycle that warrants monitoring; are on the periphery of their range and are threatened with extirpation in California; are associated with special status habitats; or are considered by other State or federal agencies or private organizations to be sensitive or declining.

The California Rare Plant Rank (CRPR), formerly known as CNPS List, is a ranking system by the Rare Plant Status Review group[3] and managed by the CNPS and the CDFW. A ranking is given based on information regarding the distribution, rarity, and endangerment of California's vascular plants. Plants with a CRPR of **1A** are presumed extinct in California because they have not been seen in the wild for many years. Plants with a CRPR of **1B** are Rare, Threatened, or Endangered throughout their range. Plants with a CRPR of **2A** are presumed extirpated from California, but are more common elsewhere. Plants with a CRPR of **2B** are considered Rare, Threatened, or Endangered in California, but are more common elsewhere. Plants with a CRPR of **3** require more information before they can be assigned to another rank or rejected; this is a "review" list. Plants with a CRPR of **4** are of limited distribution or infrequent throughout a broader area in California; this is a "watch" list. The CRPR Threat Rank is an extension added onto the CRPR to designate the level of endangerment by a 1 to 3 ranking (CNPS 2014a). An extension of **.1** is assigned to plants that are considered to be "seriously threatened" in California (i.e., over 80 percent of the occurrences are threatened or have a high degree and immediacy of threat). Extension **.2** indicates the plant is "fairly threatened" in California (i.e.,

[3] This group consists of over 300 botanical experts from the government, academia, non-governmental organizations, and the private sector.

between 20 and 80 percent of the occurrences are threatened or have a moderate degree and immediacy of threat). Extension **.3** is assigned to plants that are considered "not very threatened" in California (i.e., less than 20 percent of occurrences are threatened or have a low degree and immediacy of threat or no current threats known). The absence of a threat code extension indicates plants lacking any threat information.

In addition to providing an inventory of special status plant and wildlife species, the CNDDB also provides an inventory of vegetation types that are considered special status by the State and federal resource agencies, academic institutions, and various conservation groups (such as the CNPS). Determination of the level of imperilment (i.e., exposure to injury, loss, or destruction) is based on the NatureServe Heritage Program Status Ranks that rank both species and vegetation types on a global (G) and statewide (S) basis according to their rarity; trend in population size or area; and recognized threats (e.g., proposed developments, habitat degradation, and non-native species invasion) (Faber-Langendoen et al. 2009). The ranks are scaled from 1 to 5. NatureServe considers **G1** or **S1** communities to be critically imperiled and at a very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors; **G2** or **S2** communities to be imperiled and at high risk of extinction or elimination due to very restricted range, very few populations or occurrences, steep declines, or other factors; **G3** or **S3** communities to be vulnerable and at moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors; **G4** or **S4** communities to be apparently secure and uncommon but not rare with some cause for long-term concern due to declines or other factors; and **G5** or **S5** communities to be secure. A question mark (?) denotes an inexact numeric rank, but existing information points to this rank (Faber-Langendoen et al. 2009). For vegetation alliances[4] that have State ranks of S1–S3, all associations within the alliance are considered to be highly imperiled.

3.3.2 Vegetation Types

Special status vegetation types observed on the property are described further below.

Chaparral Communities

The predominant vegetation type on the MacPherson property is southern mixed chaparral (123.91 acres). Open southern mixed chaparral occurs in steep, eroding slopes and has lower shrub cover. These vegetation types are considered to be the *Adenostoma fasciculatum – Ceanothus crassifolius* Shrubland Association, which is ranked by the CDFW as G5 S5.

Chaparral is a "drought tolerant plant community dominated by sclerophyllous, woody shrubs shaped by a Mediterranean-type climate and naturally recurring wildfires" (Halsey 2007). It is the most extensive vegetation community in California and is not presently considered to have special status, though its status in the future may be uncertain given continuing drought conditions; increased fire frequencies; and limited understanding of the system.

Scrub Communities

California sagebrush shrub (8.23 acres) and mixed sage scrub (32.12 acres) occur on the MacPherson property. California sagebrush scrub is considered to be the *Artemisia californica* Shrubland Alliance, which is ranked as G5 S5. Mixed sage scrub most closely matches the *Artemisia californica – Eriogonum fasciculatum – Salvia mellifera* Association, which is ranked as G4 S4.

[4] A vegetation alliance is "a classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover" (Sawyer et al. 2009).

While the Global/State rankings of California sagebrush shrub and mixed sage scrub indicate that they are secure or apparently secure, they are of local concern as part of the larger coastal sage scrub community and because they have potential to support Threatened or Endangered species. Coastal sage scrub had, as a whole, declined approximately 70 to 90 percent in its historic range in California by the mid-1990s (Noss and Peters 1995). Sage scrub has largely been lost to land use changes in Southern California basins and foothills. The ecological function of Southern California's remaining sage scrub is threatened by habitat fragmentation and degradation, which is largely the result of invasive non-native species, livestock grazing, off-highway vehicles, altered fire regime, and air pollution (O'Leary 1995; Allen et al. 2000).

Grassland Communities

Annual grassland (2.27 acres) and ruderal vegetation (0.23 acre) occur on the MacPherson property. Ruderal areas, dominated by non-native vegetation, are considered to be semi-natural herbaceous stands and so are not given a ranking. The annual grassland on the property corresponds to the *Deinandra fasciculata* – Annual Grass-Herb Association. This association is ranked as G3? S3?.

While native grasslands, which once may have covered nearly $^1/_5$ of the state, have declined by approximately 99 percent in their historic range in California (Barry 1972; Noss and Peters 1995), the annual grasslands on the property primarily contain non-native grasses and herbs. They would be considered semi-natural herbaceous stands by Sawyer et al. (2009) except for the seasonal component of the native fascicled tarweed. Therefore, this vegetation would not be considered as biologically valuable as vegetation undisturbed by non-native species.

Riparian Communities

Southern coast live oak riparian forest (9.48 acres) and poison oak scrub (0.29 acre) occur on the MacPherson property. The *Quercus agrifolia* Woodland Alliance is ranked as G5 S4. However, the CDFW considers southern coast live oak riparian forest to be ranked G4 S4. Poison oak scrub is considered to be the *Toxicodendron diversilobum* Shrubland Alliance, which is ranked as G4 S4.

Typically, riparian vegetation provides important biological functions for an ecosystem such as (1) for cover and water sources for wildlife; (2) for filtration of runoff water and groundwater to be recharged; and (3) for flood-control and sediment stabilization purposes. Riparian habitats are biologically productive as well as diverse, and are the exclusive habitat of several special status species. As a result, the resource agencies often consider riparian vegetation types to be important resources. It is estimated that as much as 95 to 97 percent of historic riparian habitats in Southern California had been lost by the late 1980s due to agriculture, urban development, flood control, and other human-caused impacts (Faber et al. 1989; Bell 1997). Additionally, since the 1970s, giant reed (*Arundo donax*) has become the greatest threat to the remaining riparian resources in coastal Southern California (Bell 1997). This invasive species competes with native species such as willows (*Salix* spp.), mule fat, and cottonwoods (*Populus* spp.); is difficult to control; and apparently does not provide food or nesting habitat for native species (Bell 1997).

Woodland Communities

Coast live oak woodland (2.80 acres) occurs on the MacPherson property. The *Quercus agrifolia* Woodland Alliance is ranked as G5 S4. However, the CDFW considers coast live oak woodland to be ranked G4 S4.

Oak woodlands are declining throughout California due to residential, commercial, and industrial development. Woodlands are an important resource in California that provide aesthetic, cultural, economic, and environmental value, in addition to wildlife habitat.

Jurisdictional Areas

Drainages, which may include wetlands and other "waters of the U.S.", are protected under Section 404 of the Clean Water Act (CWA) and are under the jurisdiction of the U.S. Army Corps of Engineers (USACE). "Waters of the U.S." include navigable coastal and inland waters, lakes, rivers, streams and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. Wetland "waters of the U.S." are delineated based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology pursuant to the USACE guidance documents (i.e., Environmental Laboratory 1987; USACE 2008).

A CWA Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB) is required before the USACE will issue a Section 404 permit. The RWQCB shares the USACE jurisdiction unless isolated waters are present. If isolated waters are present, the RWQCB takes jurisdiction using the USACE's definition of the Ordinary High Water Mark and/or the three-parameter wetlands method.

In addition, if drainages on the property meet the criteria established by Section 1600 of the *California Fish and Game Code,* the CDFW may require a Streambed Alteration Agreement prior to any modification of the bed, bank, or channel. The CDFW's jurisdiction is defined as the top of the bank of the stream, channel, or basin or the outer limit (drip-line) of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, or lake.

The drainages on the MacPherson property are potentially under the jurisdiction of the USACE, the RWQCB, and the CDFW. A jurisdictional delineation should be performed to describe the type and extent of resources on the property. Should jurisdictional resources be impacted by management activities on the property, permits/agreements from the regulatory agencies would be required. This would consist of a USACE Section 404 Permit; an RWQCB Section 401 Water Quality Certification; and a CDFW Section 1602 Streambed Alteration Agreement.

A California Rapid Assessment Method (CRAM) analysis may be required as part of the permitting procedure. CRAM is a tool for assessing the overall condition[5] of a wetland; it was developed by a consortium of federal, State, and local scientists and managers. The results of a condition assessment can be used to infer the ability to provide various functions or services to which a wetland is most suited. This analysis can be used for a variety of applications, such as in evaluating a site to inform regulatory decisions (e.g., Section 401 and 404 permitting) or restoration or mitigation site evaluation.

CRAM scores range from 25 to 100. The maximum score possible represents how a wetland is doing relative to the best achievable conditions for that wetland type in the state. It is assumed that the same scores for different wetlands of the same type represent the same overall condition and functional capacity. Therefore, these scores may be used to track the progress of restoration efforts over time; to compare impacted sites to their in-kind mitigation sites; or to compare an individual wetland to the status and trends in ambient condition of its wetland type. Enhancement of the property, such as through targeted removal of weed species, may result in higher CRAM scores.

[5] "Condition" is defined as the state of a wetland Assessment Area's (AA's) physical and biological structure, the hydrology, and its buffer and landscape context relative to the best achievable states for the same type of wetland (CWMW 2012).

3.3.3 Special Status Plants

Based on the results of the literature review, 33 special status plant species have been reported in the vicinity of the MacPherson property. These species and their potential for occurrence (which is based on the presence of suitable habitat) are summarized in Table 3. Note that these species are listed alphabetically according to their scientific name. Three special status plant species were observed on the property. These species are discussed after the table.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Abronia villosa var. *aurita* chaparral sand-verbena	–	–	1B.1	Between January and September.	Sandy places, primarily in coastal sage scrub and chaparral habitats and in alluvial washes and river benches.	Central and southern South Coast and western Sonoran (Colorado) Desert; between sea level and 5,250 feet above msl.	No suitable habitat; not expected to occur and not observed during surveys.
Astragalus brauntonii Braunton's milkvetch	FE	–	1B.1	Between March and July.	Recent burns or disturbed areas in chaparral and tecate cypress forest.	Western Transverse Ranges, San Gabriel Mountains possibly to the South Coast, and northern Peninsular Ranges; between sea level and 2,133 feet above msl.	Suitable habitat, but at edge of known range in Orange County; not observed during surveys.
Baccharis malibuensis Malibu baccharis	–	–	1B.1	Between August and September.	Grassy openings in chaparral.	Western Transverse Ranges and Peninsular Ranges; between 164 and 984 feet above msl.	Only known from Fremont Canyon in Orange County (Roberts 2008); not expected to occur and not observed during surveys.
Brodiaea filifolia thread-leaved brodiaea	FT	SE	1B.1	Between March and June.	Grasslands and vernal pools.	South Coast, San Bernardino Mountains, and western Peninsular Ranges; between 80 and 2,820 feet above msl.	No suitable habitat; not expected to occur and not observed during surveys.
Calandrinia breweri Brewer's calandrinia	–	–	4.2	Between March and June, uncommonly as early as February.	Heavy soils in open grasslands, coastal sage scrub, and chaparral.	Southern Central Coast, western South Coast, and Channel Islands; between sea level and 2,300 feet above msl.	Suitable habitat; not observed during surveys.
Calochortus catalinae Catalina mariposa lily	–	–	4.2	Between May and July.	Coastal sage scrub; dry, rocky chaparral; and yellow-pine forest.	South Coast and Peninsular Ranges; between sea level and 5,580 feet above msl.	Suitable habitat; not observed during surveys.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Calochortus plummerae Plummer's mariposa lily	–	–	4.2	Between August and September.	Grassy openings in chaparral.	Western Transverse Ranges and Peninsular Ranges; between 164 and 984 feet above msl.	Suitable habitat but at edge of known range in Orange County; not observed during surveys.
***Calochortus weedii* var. *intermedius* intermediate mariposa lily[a]**	**–**	**–**	**1B.2**	**Between May and July.**	**Coastal sage scrub and chaparral on dry, rocky, open slopes.**	**South Coast and northern Peninsular Ranges; between sea level and 2,230 feet above msl.**	**Suitable habitat; observed during surveys.**
Camissoniopsis lewisii Lewis' evening-primrose	–	–	3	Between March and June.	Sandy or clay soils of coastal grassland.	South Coast, western Peninsular Ranges, and northern Baja California, Mexico; between sea level and 984 feet above msl.	Outside elevation range; not expected to occur and not observed during surveys.
Centromadia parryi ssp. *australis* southern tarplant[a]	–	–	1B.1	Between May and November.	Seasonally moist, silty, alkaline soils in salt marshes, alkali meadows, mesic grasslands, vernal pools, ditches, and coastal scrub.	South Coast to northwestern Baja California, Mexico; between sea level and 655 feet above msl.	Outside elevation range; not expected to occur and not observed during surveys.
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	FC	SE	1B.1	Between April and June.	Sandy areas.	Laskey Mesa in Ventura County and the northern Santa Susana Mountains of Los Angeles County; between 295 and 1,640 feet above msl.	Outside current known range; not expected to occur and not observed during surveys.
Chorizanthe polygonoides var. *longispina* long-spined spineflower	–	–	1B.2	Between April and June.	Sandy areas.	Peninsular Ranges; between 98 and 4,921 feet above msl.	Only known from Gypsum Canyon in Orange County (Roberts 2008); not expected to occur and not observed during surveys.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Deinandra paniculata **paniculate tarplant**	**–**	**–**	**4.2**	**Between April and September.**	**Open or disturbed sites, grassland, scrub, woodland, and vernal pools.**	**Southern Central Coast, western Outer South Coast Ranges, Southwestern California to central Baja California, Mexico; between sea level and 3,937 feet above msl.**	**Suitable habitat; observed during surveys.**
Dodecahema leptoceras slender-horned spineflower	FE	SE	1B.1	Between April and June.	Sandy or gravelly areas.	East-central South Coast, adjacent foothills of the Transverse Ranges, and Peninsular Ranges; between 655 and 2,295 feet above msl.	Outside current known range; not expected to occur and not observed during surveys.
Dudleya multicaulis many-stemmed dudleya[a]	–	–	1B.2	Between April and July.	Heavy (often clayey) soils in coastal sage scrub and native grassland on coastal plains and sandstone outcrops.	South Coast; between sea level and 1,970 feet above msl.	Suitable habitat; not observed during surveys.
Dudleya stolonifera Laguna Beach dudleya	FT	ST	1B.1	Between May and July.	North-facing cliffs and outcrops.	San Joaquin Hills; between sea level and 820 feet above msl.	No suitable habitat; not expected to occur and not observed during surveys.
Eriastrum densifolium ssp. *sanctorum* Santa Ana River woollystar	FE	SE	1B.1	Between May and September.	Washes, floodplains, and dry river beds.	Eastern South Coast (i.e., the Santa Ana River drainage and southwestern San Bernardino County); between sea level and 1,640 feet above msl.	No suitable habitat; not expected to occur and not observed during surveys.
Harpagonella palmeri Palmer's grapplinghook	–	–	4.2	Between March and April.	Dry, semi-barren sites in chaparral, coastal scrub, and grassland.	South Coast, Peninsular Ranges, southwest Sonoran Desert, southwestern Arizona, to northwestern Mexico; between sea level and 3,281 feet above msl.	Suitable habitat; not observed during surveys.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Hesperocyparis [*Callitropsis*] *forbesii* Tecate cypress	–	–	1B.1	—	Chaparral.	Western Peninsular Ranges to northwestern Baja California, Mexico; planted outside native range; between 1,476 and 4,921 feet above msl.	Suitable habitat; not observed during surveys.
Hesperocyparis [*Callitropsis*] *goveniana* Gowen cypress	FT	–	1B.2	—	Closed-cone pine/cypress forests, mixed-evergreen forest, maritime chaparral, and coastal terraces.	Monterey Peninsula of the Central Coast; between 164 and 525 feet above msl.	Outside current known range; not expected to occur and not observed during surveys.
Lepechinia cardiophylla heart-leaved pitcher sage	–	–	1B.2	Between April and July.	Chaparral.	Peninsular Ranges; between 1,969 and 3,937 feet above msl.	Suitable habitat, but at edge of elevation range; not observed during surveys.
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass[b]	–	–	4.3	Between January and July.	Dry, sandy, or thin soils in coastal sage scrub and chaparral.	Southwestern California and Baja California, Mexico; between sea level and 1,640 feet above msl.	Suitable habitat; not observed during surveys.
Lilium humboldtii ssp. *ocellatum* ocellated Humboldt lily	–	–	4.2	Between May and August.	Oak canyons, chaparral, and yellow-pine forest.	Southern, central-western, and southwestern California; between sea level and 5,906 feet above msl.	Suitable habitat; not observed during surveys.
Monardella hypoleuca ssp. *intermedia* intermediate monardella[a]	–	–	1B.3	Between June and September.	Dry slopes of chaparral, oak woodland, and occasionally conifer forest.	Northwestern Peninsular Ranges (Orange, western Riverside, and northern San Diego counties); between 656 and 4,101 feet above msl.	Suitable habitat; not observed during surveys.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Nama stenocarpum mud nama	–	–	2B.2	Between March and October.	Intermittently wet areas and margins of vernal pools and ponds.	San Joaquin Valley, South Coast, southern Channel Islands, western Peninsular Ranges, southeastern Sonoran Desert to Texas and northern Mexico; between sea level and 2,657 feet above msl.	No suitable habitat; not expected to occur and not observed during surveys.
***Nolina cismontana* chaparral nolina**	**–**	**–**	**1B.2**	**Between May and July.**	**Dry chaparral or coastal mountains.**	**South Coast, Western Transverse Ranges, and Peninsular Ranges; between 655 and 4,265 feet above msl.**	**Suitable habitat; observed during surveys.**
Penstemon californicus California beardtongue	–	–	1B.2	Between May and June.	Sandy soils of yellow-pine forest or pinyon/juniper woodland.	Peninsular Ranges and Mexico; between 3,937 and 7,546 feet above msl.	No suitable habitat and outside current known range; not expected to occur and not observed during surveys.
Pentachaeta aurea ssp. *allenii* Allen's pentachaeta	–	–	1B.1	Between March and May.	Grassy areas.	Southern South Coast and Peninsular Ranges of Orange County; between sea level and 1,640 feet above msl.	Suitable habitat; not observed during surveys.
Pickeringia montana var. *tomentosa* woolly chaparral-pea	–	–	4.3	Between May and August.	Chaparral and washes.	San Bernardino Mountains, Peninsular Ranges to Baja California, Mexico; between sea level and 5,577 feet above msl.	Suitable habitat; not observed during surveys.
Polygala cornuta var. *fishiae* Fish's milkwort	–	–	4.3	Between May and August.	Chaparral and oak woodland.	Southern Outer South Coast Ranges, Western Transverse Ranges, San Gabriel Mountains, and Peninsular Ranges to northern Baja California, Mexico; between 295 and 4,167 feet above msl.	Suitable habitat; not observed during surveys.

TABLE 3
SPECIAL STATUS PLANT SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status			Blooming Period	Habitat	Range	Potential to Occur on the Property; Results of Survey
	USFWS	CDFW	CRPR				
Pseudognaphalium leucocephalum white rabbit-tobacco	–	–	2B.2	Between August and November, uncommonly as early as July or as late as December.	Sandy or gravelly benches, dry stream bottoms, and canyon bottoms.	South Coast, San Bernardino Mountains, and Peninsular Ranges to Arizona, New Mexico, and Mexico; between sea level and 1,640 feet above msl.	Marginally suitable habitat; not observed during surveys.
Romneya coulteri Coulter's matilija poppy	–	–	4.2	Between March and July.	Dry washes and canyons.	South Coast, Western Transverse Ranges, and Peninsular Ranges; between sea level and 3,937 feet above msl.	Suitable habitat; observed just east of the property.
Senecio aphanactis chaparral ragwort	–	–	2B.2	Between January and April.	Alkaline flats and dry, open rocky areas of coastal bluff scrub and coastal sage scrub.	Central Western California and South Coast to Baja California, Mexico; between 30 and 1,805 feet above msl.	Suitable habitat; not observed during surveys.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank; msl: mean sea level.

Federal (USFWS)
FE Endangered
FT Threatened
FC Candidate

State (CDFW)
SE Endangered
ST Threatened

CRPR
1B Plants Rare, Threatened, or Endangered Throughout Their Range
2B Plants Rare, Threatened, or Endangered in California But More Common Elsewhere
3 Plants that require more information before they can be assigned to another rank or rejected
4 Plants of Limited Distribution – A Watch List

CRPR Threat Rank Extensions
None Plants lacking any threat information
.1 Seriously Endangered in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2 Fairly Endangered in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)
.3 Not very Threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

[a] A Covered Species
[b] Robinson's pepper-grass is not recognized in Baldwin et al. (2012); however, it is still tracked by the CNDDB.

Intermediate Mariposa Lily

Intermediate mariposa lily has a CRPR of 1B.2. It typically blooms between June and July (Baldwin et al. 2012). This perennial bulbiferous herb occurs on dry, rocky, open slopes in chaparral and coastal sage scrub at elevations between sea level and approximately 2,231 feet above msl (Roberts 2008; Baldwin et al. 2012). This species is known from the South Coast and northern Peninsular Ranges (Baldwin et al. 2012).

A total of 18 intermediate mariposa lily individuals were observed in 9 locations on the property (Table 4; Exhibit 8). These plants were observed primarily on south-facing slopes and ridgelines in loamy soils. The species generally associated with these populations included chamise, black sage, chaparral yucca (*Hesperoyucca whipplei*), California buckwheat, California sagebrush, hoaryleaf ceanothus, blue dicks (*Dichelostemma capitatum*), wild oat, and red brome (*Bromus madritensis* ssp. *rubens*). A voucher specimen was not collected due to the small population size.

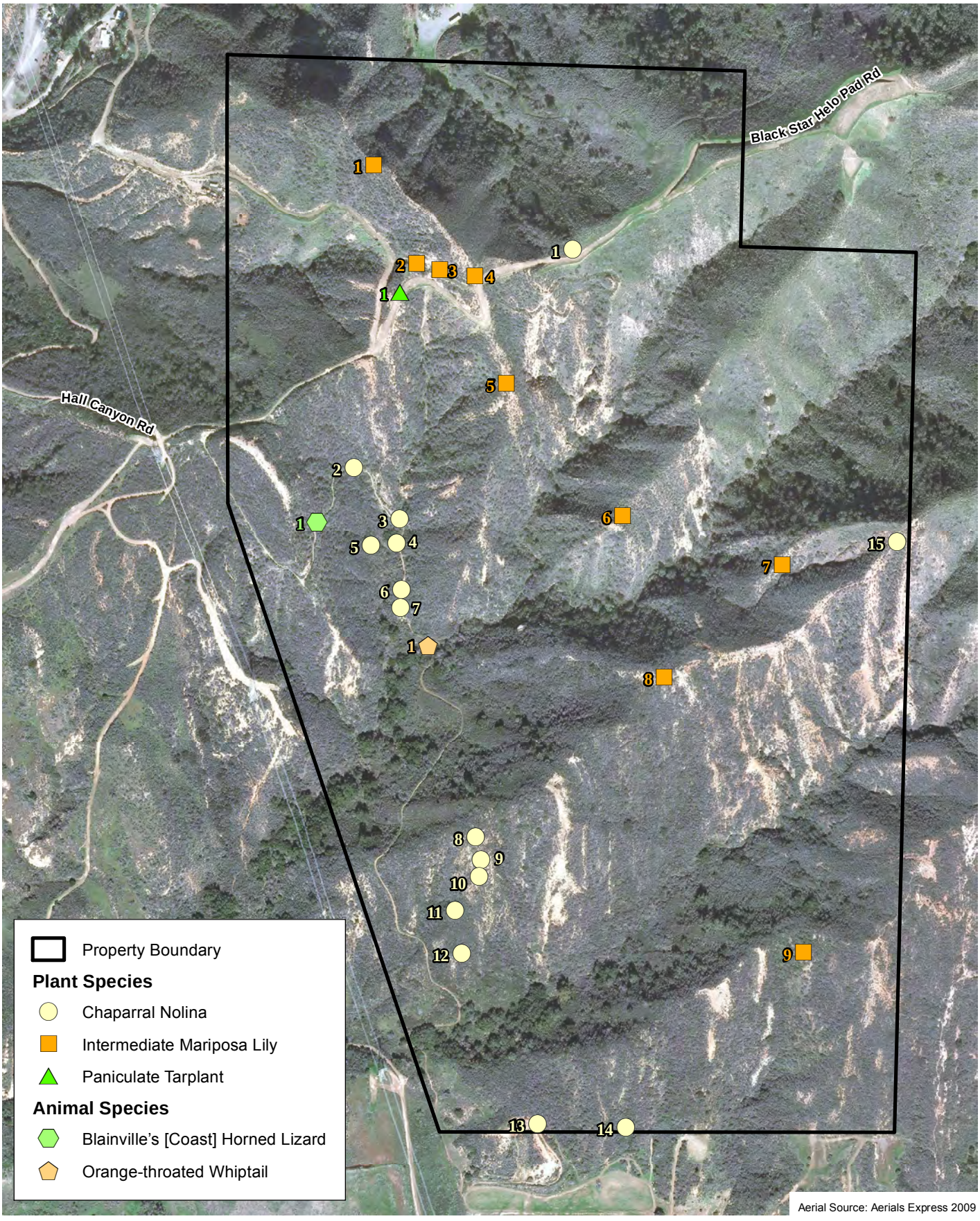
TABLE 4
INTERMEDIATE MARIPOSA LILY
POPULATIONS OBSERVED
ON THE PROPERTY

Population	Number of Individuals	Phenology Percentage		
		Vegetative	Flowering	Fruiting
1	3	100	–	–
2	2	–	50	50
3	1	–	–	100
4	5	80	20	–
5	1	–	100	–
6	3	–	100	–
7	1	–	100	–
8	1	–	100	–
9	1	–	100	–
Total	**18**	**N/A**	**N/A**	**N/A**

Paniculate Tarplant

Paniculate tarplant (*Deinandra paniculata* [formerly in *Hemizonia*]) has a CRPR of 4.2. It typically blooms between May and November (Baldwin et al. 2012). This annual herb occurs in grassland, open chaparral and woodland, and disturbed areas at elevations between sea level and approximately 4,331 feet above msl (Baldwin et al. 2012). This species is known from the southern Central Coast/Outer South Coast Ranges, southern Outer South Coast Ranges, South Coast, eastern Santa Ynez Mountains of the Western Transverse Ranges, Peninsular Ranges, and northern Baja California, Mexico (Baldwin et al. 2012).

One paniculate tarplant individual was observed blooming along an access road in the northern portion of the property (Exhibit 8). The species generally associated with this individual included California buckwheat, chamise, fascicled tarweed, deerweed, and wild oat. A voucher specimen was not collected due to the small population size.



D:\Projects\OCTA\J008\MXD\MacPherson\BioTech\ex_SSPlants.mxd

Special Status Species

Exhibit 8

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

600 300 0 600 Feet

BonTerra PSOMAS

(Rev: 10-09-2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\ex8_SSSpecies.pdf

Chaparral Nolina

Chaparral nolina has a CRPR of 1B.2. It typically blooms between May and July (Baldwin et al. 2012). This perennial subshrub occurs in dry chaparral and coastal sage scrub at elevations between approximately 656 and 4,265 feet above msl (Roberts 2008; Baldwin et al. 2012). This species is known from the South Coast, Western Transverse Ranges, and Peninsular Ranges (Baldwin et al. 2012).

A total of 326 chaparral nolina individuals were observed in 15 locations on the property (Table 5; Exhibit 8). These plants were observed primarily on south-facing slopes and canyon bottoms in loamy soils. The species generally associated with these populations included chamise, black sage, hoaryleaf ceanothus, and California buckwheat. A voucher specimen was not collected due to the growth form of the species.

TABLE 5
CHAPARRAL NOLINA POPULATIONS
OBSERVED
ON THE PROPERTY

Population	Number of Individuals	Phenology Percentage		
		Vegetative	Flowering	Fruiting
1	20	100	0	0
2	10	100	0	0
3	1	100	0	0
4	2	100	0	0
5	2	100	0	0
6	2	100	0	0
7	1	100	0	0
8	6	84	0	16
9	15	100	0	0
10	30	100	0	0
11	20	100	0	0
12	5	100	0	0
13	10	100	0	0
14	200	~80	0	~20
15	2	100	0	0
Total	**326**	**N/A**	**N/A**	**N/A**

3.3.4 Special Status Wildlife

Based on the results of the literature review and the list of proposed covered wildlife species for the NCCP/HCP, 57 special status wildlife species are known to occur in vicinity of the MacPherson property. These species and their potential for occurrence (which is based on the presence of suitable habitat) are summarized in Table 6. Note that these species are listed taxonomically. Two special status wildlife species were observed on the property. These species are discussed after the table.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Invertebrates					
Branchinecta sandiegonensis San Diego fairy shrimp	FE	–	Vernal pools and ephemeral ponds.	Coastal Orange County and San Diego County.	No suitable habitat; not expected to occur.
Streptocephalus woottoni Riverside fairy shrimp	FE	–	Vernal pools and ephemeral ponds.	Coastal Ventura County south to Baja California, Mexico.	No suitable habitat; not expected to occur.
Fish					
Catostomus santaanae Santa Ana sucker	FT	SSC	Small to medium-sized perennial streams, preferably with coarse gravel, rubble, or boulder substrate.	Los Angeles, San Gabriel, and Santa Ana River drainages.	No suitable habitat; not expected to occur.
Gila orcuttii arroyo chub[a]	–	SSC	Coastal freshwater streams and rivers with steady current and emergent vegetation.	Currently found at three native locations: Santa Margarita and De Luz Creeks in San Diego County, Trabuco and San Juan Creeks in Orange County, and Malibu Creek in Los Angeles County; introduced elsewhere.	No suitable habitat; not expected to occur.
Rhinichthys osailolus Santa Ana speckled dace	–	SSC	Small streams, springs, large rivers, deep lakes; prefer clear oxygenated water with movement from current or waves and typically with overhanging vegetation cover.	Restricted to the headwaters of the Los Angeles, Santa Ana, and San Gabriel rivers.	No suitable habitat; not expected to occur.
Amphibians					
Spea hammondii western spadefoot	–	SSC	Quiet streams, vernal pools, and temporary ponds.	Great Valley and bordering foothills and Coast Ranges from Monterey Bay south to Baja California, Mexico.	Limited suitable habitat; limited potential to occur.
Anaxyrus californicus [*Bufo microscaphus californicus*] arroyo toad	FE	SSC	Semi-arid regions near washes or intermittent streams; requires suitable breeding pools.	Southern California and northwestern Baja California, Mexico.	No suitable habitat; not expected to occur.
Lithobates [*Rana*] *pipiens* northern leopard frog (native populations)	–	SSC	Variety of habitats such as grasslands, brushlands, woodlands, and forests; requires aquatic habitat for overwintering and breeding.	Broadly distributed; native in California only from Modoc and Lassen Counties.	Outside native range of species; not expected to occur as a native population.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Taricha torosa Coast Range newt	–	SSC	Wet forests, oak forests, chaparral, and grasslands. Breeds in streams, rivers, ponds, lakes, and reservoirs.	Coast and coast range mountains from Mendocino County south to San Diego County.	Limited suitable habitat; limited potential to occur.
Reptiles					
Actinemys marmorata [*Emys m.*] Pacific [western] pond turtle[a]	–	SSC	In ponds, lakes, marshes, rivers, streams, and irrigation ditches with a rocky or muddy bottom and aquatic vegetation.	Pacific slope drainages from Washington south to northern Baja California, Mexico.	No suitable habitat; not expected to occur.
Phrynosoma blainvillii **Blainville's [coast] horned lizard[a]**	**–**	**SSC**	**Scrubland, grassland, coniferous forests, and broadleaf woodland with friable soil for burrowing.**	**Northern California south to northern Baja California, Mexico.**	**Suitable habitat; observed on the property.**
***Aspidoscelis hyperytha* [*Cnemidophorus hyperythus beldingi*]** **orange-throated whiptail[a]**	**–**	**SSC**	**Washes and open areas of sage scrub and chaparral in friable, gravelly soil.**	**Western Peninsular Ranges from Orange and San Bernardino Counties south to Baja California, Mexico.**	**Suitable habitat; observed on the property.**
Aspidoscelis [*Cnemidophorus*] *tigris stejnegeri* coastal whiptail [coastal western whiptail]	–	SA	Hot and dry open areas with sparse foliage (e.g., chaparral, woodland).	Coastal Southern California, mostly west of the Peninsular Ranges, south of the Transverse Ranges, and north into Ventura County.	Suitable habitat; may occur.
Salvadora hexalepis virgultea coast patch-nosed snake	–	SSC	Sandy or rocky grasslands, chaparral, sagebrush plains, piñon-juniper woodlands, and desert scrub.	Coast of California from San Luis Obispo County south to Baja California, Mexico.	Suitable habitat; may occur.
Thamnophis hammondii two-striped garter snake	–	SSC	Perennial or intermittent freshwater streams with rocky beds bordered by willows or other dense vegetation.	From Monterey County south to El Rosario in Baja California, Mexico.	Limited suitable habitat; limited potential to occur.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Crotalus ruber red-diamond rattlesnake	–	SSC	Open scrub, chaparral, woodland, and grassland.	Orange County and San Bernardino County south to Baja California, Mexico.	Suitable habitat; may occur.
Birds					
Accipiter cooperii Cooper's hawk (nesting)	–	WL	Prefers to nest in oak woodlands and riparian woodlands; forages primarily in forest habitats.	Breeds from southern Canada into northwestern and north-central Mexico; wintering range extends south.	Suitable foraging and nesting habitat; expected to occur for foraging and nesting.
Accipiter striatus sharp-shinned hawk (nesting)	–	WL	Nests and forages in forest habitats.	Breeds in Alaska and Canada; portions of the U.S.; in the West Indies; and south through Mexico, Central America, and South America. Migrant and winter visitor in Orange County.	Suitable foraging habitat; may occur for foraging. Outside the breeding range of the species; not expected to occur for nesting.
Aquila chrysaetos golden eagle (nesting and non-breeding/wintering)	–	FP, WL	Nests in open and semi-open habitats (e.g., tundra, shrublands, grasslands, woodland-brushlands, coniferous forests, farmland, and riparian habitats). Forages in broad expanses of open country.	Resident throughout Southern California, except in the Colorado Desert and Colorado River, where it is a casual winter visitor.	Suitable foraging habitat; may occur for foraging. Limited suitable nesting habitat; limited potential to occur for nesting.
Buteo regalis ferruginous hawk (non-breeding/ wintering)	–	WL	Open, dry habitats such as grasslands, shrublands, rangelands, and plowed agricultural fields.	Winter resident in California; visitor along the coast of Southern California.	Suitable foraging habitat; may occur for foraging. Outside the breeding range of the species; not expected to occur for nesting.
Circus cyaneus northern harrier (nesting)	–	SSC	Breeds on the ground within dense vegetation. Forages in open habitats such as marshes and fields.	Winter migrant throughout Southern California, but a scarce local breeder.	Limited suitable foraging and nesting habitat; limited potential to occur for foraging and nesting.
Elanus leucurus white-tailed kite (nesting)	–	FP	Low elevation grassland, agricultural areas, wetlands, oak woodlands, savannahs, and riparian habitat adjacent to open areas.	Resident in coastal Southern California and a visitor and local breeder on the western edge of the deserts.	Suitable foraging and nesting habitat; may occur for foraging and nesting.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Haliaeetus leucocephalus bald eagle (nesting and wintering)	Delisted	SE, FP	Forested areas adjacent to large bodies of water.	Occurs from Alaska and Canada; throughout the U.S.; and Baja California, Mexico.	Limited suitable foraging and nesting habitat; limited potential to occur for foraging and nesting.
Falco columbarius merlin (non-breeding/ wintering)	–	WL	Breeds in forests and prairies. Occures along the coast in open grasslands and savannahs; in inland and montane valleys; and in the desert.	Breeds in northern North America, Europe, and Asia. Fall transient and rare winter visitor in California.	Suitable foraging habitat; may occur for foraging. Outside the breeding range of the species; not expected to occur for nesting.
Falco mexicanus prairie falcon (nesting)	–	WL	Nests on cliffs; forages in grassland and scrub vegetation.	Year-round resident of interior Southern California. Winter resident and rare summer resident along the Southern California coast.	Suitable foraging habitat; may occur for foraging. No suitable nesting habitat; not expected to occur for nesting.
Asio otus long-eared owl (nesting)	–	SSC	Nests in dense trees such as oaks and willows. Forages over grasslands and other open habitats.	Breeds in Canada south to northern Baja California, Mexico. Winters throughout breeding range to the interior of Mexico.	Limited suitable foraging habitat; limited potential to occur for foraging. Suitable nesting habitat; may occur for nesting.
Athene cunicularia burrowing owl (burrow sites; wintering in northern counties)	–	SSC	Sparse vegetation in arid and semi-arid habitats such as grasslands, steppes, deserts, prairies, and agricultural areas. Nests in mammal burrows or man-made cavities.	In California from the Central Valley and Southern California.	No suitable habitat; not expected to occur.
Empidonax traillii extimus southwestern willow flycatcher[a] (nesting)	FE	SE	Riparian habitats with dense growths of willows, often with a scattered overstory of cottonwood.	Breeds in coastal Southern California.	No suitable habitat; not expected to occur.
Lanius ludovicianus loggerhead shrike (nesting)	–	SSC	Grasslands and other dry, open habitats.	Throughout North America; a year-round resident in Southern California.	Suitable foraging and nesting habitat; may occur for foraging and nesting.
Vireo bellii pusillus least Bell's vireo[a] (nesting)	FE	SE	Riparian habitat dominated by willows with dense understory vegetation.	Breeds throughout the Central Valley and other low-elevation river systems in California and Baja California, Mexico.	No suitable habitat; not expected to occur.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Eremophila alpestris actia California horned lark	–	WL	Open habitats with bare ground or short vegetation, such as shortgrass prairie, deserts, brushy flats, alpine, shrubsteppe, and agricultural areas.	From Alaska and the Canadian arctic south to Mexico. Common migrant and winter resident that remains to breed along the Southern California coast.	Limited suitable habitat; limited potential to occur.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren[a] (San Diego and Orange Counties)	–	SSC	Coastal sage scrub and alluvial sage scrub with prickly pear cactus and/or cholla.	Southern Orange County and San Diego County to northwestern Baja California, Mexico.	No suitable habitat; not expected to occur.
Polioptila californica californica coastal California gnatcatcher[a]	FT	SSC	Coastal sage scrub vegetation.	Los Angeles, Orange, Riverside, and San Diego Counties south to Baja California, Mexico.	Suitable habitat; not observed during focused surveys.
Dendroica petechia brewsteri yellow warbler (nesting)	–	SSC	Riparian vegetation, often with willows and cottonwoods.	Breeds in Southern California.	No suitable habitat; not expected to occur.
Icteria virens yellow-breasted chat (nesting)	–	SSC	The border of streams, creeks, sloughs, and rivers in dense thickets and tangles of blackberry, wild grape, and willow.	Summer resident in Southern California along the coast and in the deserts.	No suitable habitat; not expected to occur.
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	–	WL	Steep, dry, rocky, south- or west-facing slopes in scrub vegetation interspersed with grasses and forbs or rock outcrops.	Year-round in Southern California.	Suitable habitat; may occur.
Ammodramus savannarum grasshopper sparrow (nesting)	–	SSC	Dense, dry or well-drained grassland.	Across North America from southern Canada south to Ecuador. Summer resident along the coastal slope of Southern California.	Limited suitable foraging and nesting habitat habitat; limited potential to occur for foraging and nesting.
Amphispiza belli belli Bell's sage sparrow	–	WL	Low, dense chamise chaparral and dry scrub vegetation, often with stands of cactus.	Resident in interior foothills or coastal Southern California.	Suitable habitat; may occur.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Mammals					
Antrozous pallidus pallid bat	–	SSC	Low elevation grasslands, shrublands, woodlands, and forests. Roosts in caves, crevices, mines, bridges, and occasionally in hollow trees.	Throughout California except the high Sierra Nevada from Shasta County to Kern County and in the northwestern portion of the State.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Corynorhinus townsendii Townsend's big-eared bat	–	CT, SSC	Wide variety of habitats except subalpine and alpine. Roosts in caves, mines, tunnels, buildings, or other human-made structures.	Throughout most of California.	Suitable foraging habitat; may occur for foraging. No suitable roosting habitat; not expected to occur for roosting.
Euderma maculatum spotted bat	–	SSC	Foothills, mountains, arid deserts, grasslands, and mixed conifer forests. Roosts in rock crevices, occasionally in caves and buildings.	Western North America from southern British Columbia to Mexico.	Suitable foraging habitat; may occur for foraging. No suitable roosting habitat; not expected to occur for roosting.
Lasionycteris noctivagans silver-haired bat	–	SA	Coastal and montane forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. Primarily a forest dweller.	North America, from southern British Columbia to northern Mexico.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Lasiurus blossevillii western red bat	–	SSC	Prefers riparian areas dominated by walnuts, oaks, willows, cottonwoods, and sycamores where they roost in these broad-leafed trees.	Found in western Canada, the western U.S., western Mexico and Central America.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Lasiurus cinereus hoary bat	–	SA	Prefers open habitats or habitat mosaics, with access to trees and open areas or habitat edges.	Widest range of any New World bat, living from Argentina and Chile northward through Canada.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Lasiurus xanthinus western yellow bat	–	SSC	Valley foothill riparian, desert riparian, desert wash, and palm oasis. Roosts in trees.	Mexican Plateau, coastal western Mexico, and deserts of the southwestern U.S.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Myotis ciliolabrum western small-footed myotis	–	SA	Arid uplands, primarily in arid wooded and brushy uplands near water. Roosts in caves, buildings, mines, crevices, and occasionally under bridges and under bark.	Southern British Columbia, Alberta, and Saskatchewan, Canada to the southwestern U.S.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Myotis evotis long-eared myotis	–	SA	Nearly all brush, woodland, and forest habitats, but appears to prefer coniferous woodlands and forests. Roosts in buildings, crevices, spaces under bark, and snags.	Western Canada; western U.S.; and Baja California, Mexico.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.
Myotis yumanensis Yuma myotis	–	SA	Open forests and woodlands, closely associated with water bodies. Roosts in buildings, mines, caves, crevices, swallow nests, and under bridges.	Southwestern British Columbia through the western U.S., and into central Mexico.	Suitable foraging habitat; may occur for foraging. No suitable roosting habitat; not expected to occur for roosting.
Eumops perotis californicus western mastiff bat	–	SSC	Open, semi-arid to arid habitats including conifer and deciduous woodland, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban. Roosts in crevices in cliffs, high buildings, trees, and tunnels.	Southeastern San Joaquin Valley and Coastal Ranges from Monterey County south through Southern California, and from the coast eastward to the Colorado Desert.	Suitable foraging habitat; may occur for foraging. Limited suitable roosting habitat; limited potential to occur for roosting.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Nyctinomops femorosaccus pocketed free-tailed bat	–	SSC	Pinyon-juniper woodland, desert scrub, desert succulent scrub, desert riparian, and desert. Roosts in crevices in cliffs, caverns, or buildings.	Southwestern U.S. to south-central Mexico.	Suitable foraging habitat; may occur for foraging. No suitable roosting habitat; not expected to occur for roosting.
Lepus californicus bennettii San Diego black-tailed jackrabbit	–	SSC	Herbaceous and desert-shrub areas and open, early stages of forest and chaparral.	Pacific slope from Santa Barbara County south to northwestern Baja California, Mexico.	Limited suitable habitat; limited potential to occur.
Chaetodipus fallax fallax northwestern San Diego pocket mouse	–	SSC	Chaparral, coastal sage scrub, and grassland.	Southwest San Bernardino County south to northern Baja California, Mexico.	Suitable habitat; may occur.
Perognathus longimembris brevinasus Los Angeles pocket mouse	–	SSC	Lower elevation grasslands and coastal sage scrub with fine sandy soils.	Los Angeles Basin to San Bernardino, Cabazon, Hemet, and Aguanga.	Suitable habitat; may occur.
Neotoma lepida intermedia San Diego desert woodrat	–	SSC	Joshua tree woodland, pinyon-juniper, mixed and chamise-redshank chaparral, sagebrush, and desert habitats.	Pacific slope from San Luis Obispo south to northwestern Baja California, Mexico.	Suitable habitat; may occur.
Taxidea taxus American badger	–	SSC	Drier, open stages of shrub, forest, and herbaceous habitats with friable soil.	Throughout California except the extreme northwest.	Suitable habitat; may occur.
Puma [*Felis*] *concolor* mountain lion[a]	–	–	Broad variety of habitats in range except shrubless deserts and agricultural areas.	Latitudinal range of 110 degrees in North and South America.	Suitable habitat; may occur.

TABLE 6
SPECIAL STATUS WILDLIFE SPECIES REPORTED FROM THE PROPERTY VICINITY

Species	Status		Habitat	Range	Potential to Occur on the Property/ Results of Focused Surveys
	USFWS	CDFW			
Lynx rufus bobcat[a]	–	–	Broad variety of habitats.	Throughout contiguous U.S. and Mexico south to Rio Mescale, and Canada.	Suitable habitat; may occur.

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife.

LEGEND

Federal (USFWS)		**State (CDFW)**	
FE	Endangered	SE	Endangered
FT	Threatened	CT	Candidate Threatened
		SSC	Species of Special Concern
		WL	Watch List
		FP	Fully Protected
		SA	Special Animal

[a] Proposed Covered Species in the NCCP/HCP.

Blainville's [Coast] Horned Lizard

Blainville's [coast] horned lizard is a California Species of Special Concern. It is a small, spiny, somewhat rounded lizard that occurs in scrubland, grassland, coniferous forests, and broadleaf woodland vegetation types. It prefers open areas for basking and loose, friable soil for burrowing. The Blainville's [coast] horned lizard occurs throughout much of California, west of the desert and Cascade-Sierra highlands south to Baja California, Mexico. However, many of the populations in lowland areas have been reduced or eliminated due to urbanization and agricultural expansion (Stebbins 2003). Three factors have contributed to its decline: loss of habitat, overcollecting, and the introduction of exotic ants (Jennings and Hayes 1994). Blainville's [coast] horned lizard was observed in an opening of southern mixed chaparral vegetation in the western portion of the property.

Orange-Throated Whiptail

Orange-throated whiptail is a California Species of Special Concern. The orange-throated whiptail occurs in washes and in open areas of sage scrub and chaparral with gravelly soils, often with rocks. It prefers well drained, friable soil on slopes with a southern exposure that are barren or only sparsely covered with vegetation. This species occurs between sea level and 2,000 feet above msl in the western Peninsular Ranges from Orange and San Bernardino Counties south to Baja California, Mexico. Approximately 75 percent of the former range has been lost to development, and the remaining populations are highly fragmented (Stebbins 2003). Orange-throated whiptail was observed in an opening of mixed sage scrub vegetation in the center of the property.

3.3.5 Critical Habitat

The federal Endangered Species Act defines critical habitat as follows:

> (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of this [Endangered Species] Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of this [Endangered Species] Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

On February 9, 2011, the USFWS published a Final Rule designating critical habitat for arroyo toad. This Final Rule designates 98,366 acres in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties as critical habitat. The property is within Unit 8 of the current final critical habitat for arroyo toad.

3.4 COVERED SPECIES SUMMARY

The baseline surveys described in this document were focused towards establishing baseline knowledge of the set of species covered by the OCTA M2 NCCP/HCP. The OCTA M2 NCCP/HCP includes requirements to understand and document the status of Covered Species and their habitats within the Preserves. Table 7 provides a summary of the OCTA M2 NCCP/HCP Covered Species; whether they were observed during the baseline surveys; other information documenting the potential for the Covered Species to occur on site; and a description of the threats and opportunities for management of the Preserve to benefit Covered Species.

Potential threats to Covered Species and their habitats on the property include habitat destruction by hikers and mountain bikers; illegal hunting; the spread of non-native plants and wildlife (e.g., Spanish broom and non-native ants); and wildland fires. A RMP may incorporate restricting unauthorized access on the property; restoring native habitat by removing invasive plants; and maintaining movement opportunities through the property. A grant from the Wildlife Conservation Board (WCB), which provides funding for watershed-wide habitat enhancement, may be available to assist with restoration activities.

The grasslands on the property represent the primary candidate areas for habitat restoration to native grassland, scrub, or woodland communities, depending on the slope, aspect, and soils present. Control of species such as ripgut grass, wild oat, black mustard, and tocalote presents a challenge given their prevalence throughout the wildlands of Orange County. However, the Spanish broom (*Spartium junceum*), which was observed in the southwestern corner of the property (see Exhibit 6), should be targeted for removal.

TABLE 7
SUMMARY OF COVERED SPECIES

Species	Observations During Baseline Surveys	Potential to Occur on the Property	Opportunities, Threats, and Management
Plants			
Calochortus weedii* var. *intermedius **intermediate mariposa lily**	**Observed on site.**	**Suitable habitat; additional individuals/populations may be present.**	**Potential threats include hikers and mountain bikers.** **Opportunities occur to establish the species in areas with suitable conditions (e.g., soils) that are currently degraded.** **An RMP may restrict unauthorized access on site and allow for transplantation and/or seeding of this variety in suitable areas on site.**
Centromadia parryi ssp. *australis* southern tarplant	Not observed on site.	No suitable habitat; not expected to occur.	No opportunities available because suitable habitat does not occur on the property.
Dudleya multicaulis many-stemmed dudleya	Not observed on site.	Suitable habitat; may establish on site.	Potential threats include hikers and mountain bikers. Opportunities occur to establish the species in areas with suitable conditions (e.g., soils) that are currently degraded. An RMP may restrict unauthorized access on site and allow for transplantation and/or seeding of this variety in suitable areas on site.
Fish			
Gila orcuttii arroyo chub	Not observed on site.	No suitable habitat; not expected to occur.	No opportunities available because suitable habitat does not occur on the property.
Reptiles			
Actinemys marmorata [*Emys m.*] Pacific [western] pond turtle	Not observed on site.	No suitable habitat; not expected to occur.	No opportunities available because suitable habitat does not occur on the property.

TABLE 7
SUMMARY OF COVERED SPECIES

Species	Observations During Baseline Surveys	Potential to Occur on the Property	Opportunities, Threats, and Management
Phrynosoma blainvillii **Blainville's [coast] horned lizard**	**Observed on site.**	**Suitable habitat; additional individuals/populations are likely present.**	**Potential threats include mortality and habitat destruction due to hikers and mountain bikers, intense fire events, and the spread of non-native ant species.** **Habitat restoration opportunities for coastal sage scrub and other suitable habitat occurs on site.** **An RMP may restrict unauthorized access on site and ensure any plant/soil material brought on site is free of non-native ant species.**
***Aspidoscelis hyperytha* [*Cnemidophorus hyperythus beldingi*] orange-throated whiptail**	**Observed on site.**	**Suitable habitat; additional individuals/populations are likely present.**	**Potential threats include mortality and habitat destruction due to hikers and mountain bikers and intense fire events.** **Habitat restoration opportunities for coastal sage scrub and other suitable habitat occurs on site.** **An RMP may incorporate restoration opportunities for coastal sage scrub and other native habitats utilized by this species.**
Birds			
Empidonax traillii extimus southwestern willow flycatcher (nesting)	Not observed on site.	No suitable habitat; not expected to occur.	No opportunities available because suitable habitat does not occur on the property.
Vireo bellii pusillus least Bell's vireo (nesting)	Not observed on site.	No suitable habitat; not expected to occur.	No opportunities available because suitable habitat does not occur on the property.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren (San Diego and Orange Counties)	Not observed on site.	Suitable habitat present.	Potential threats include mortality and habitat destruction due to hikers and mountain bikers and intense fire events. Protection of coastal sage scrub habitat that contains cactus is crucial for the preservation of this subspecies. Habitat restoration opportunities for coastal sage scrub with cactus species occur on site.

TABLE 7
SUMMARY OF COVERED SPECIES

Species	Observations During Baseline Surveys	Potential to Occur on the Property	Opportunities, Threats, and Management
Polioptila californica coastal California gnatcatcher	Not observed on site.	Suitable habitat present.	Potential threats include mortality and habitat destruction due to hikers and mountain bikers and intense fire events. Protection of coastal sage scrub habitat is crucial for the preservation of this subspecies. There are limited opportunities to provide habitat for this subspecies on site because coastal sage scrub is a component of the chaparral vegetation. Coastal sage scrub may be established in suitable semi-natural herbaceous stands on site.
Mammals			
Puma [*Felis*] *concolor* mountain lion	Not observed on site.	Suitable habitat present.	Potential threats include illegal hunting and intense fire events. Opportunities are available for on-site native habitat restoration and enhancement, which would benefit this species. Management should include maintenance of movement opportunities through the site.
Lynx rufus bobcat	Not observed on site.	Suitable habitat present.	Potential threats include illegal hunting and intense fire events. Opportunities are available for on-site native habitat restoration and enhancement, which would benefit this species. Management should include maintenance of movement opportunities through the site.

4.0 REFERENCES

Allen, E.B, S.A. Eliason, V.J. Marquez, G.P. Schultz, N.K. Storms, C.D. Stylinski, T.A. Zink, and M.F. Allen. 2000. What are the Limits to Restoration of Coastal Sage Scrub in Southern California (pp. 253–262). *2nd Interface Between Ecology and Land Development in California* (J.E. Keeley, M. Baer-Keeley, and C.J. Fotheringham, Eds.). Sacramento, CA: U.S. Geological Survey.

American Ornithologists' Union (AOU). 2013 (September). *Check-list of North American Birds* (7th ed., as revised through 54th Supplement). Washington, D.C.: AOU. http://www.aou.org/checklist/north/index.php.

Baldwin, B.G., D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (Eds.). 2012. *The Jepson Manual: Vascular Plants of California* (Second ed.). Berkeley, CA: University of California Press.

Barry, W.J. 1972. *California Prairie Ecosystems*. *Vol. 1: The Central Valley Prairie.* Sacramento, CA: State of California Resources Agency, Department of Parks and Recreation.

Bell, G. 1997. Ecology and Management of *Arundo donax* and Approaches to Riparian Habitat Restoration in Southern California (pp. 103–113). *Plant Invasions: Studies from North America and Europe* (J.H. Brock, M. Wade, P. Pysek, and D. Green, Eds.). Leiden, The Netherlands: Blackhuys Publishers.

Bennett, A.F. 1990. Habitat Corridors and the Conservation of Small Mammals in the Fragmented Forest Environment. *Landscape Ecology* 4(2–3):109–122. New York, NY: International Association for Landscape Ecology.

BonTerra Psomas. 2014 (October 16). *Results of Focused Presence/Absence Coastal California Gnatcatcher Surveys for the MacPherson Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California.* Irvine, CA: BonTerra Psomas.

California Department of Fish and Game (CDFG). 2010 (September). *List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program.* Sacramento, CA: CDFG.

———. 2009 (November 24). *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Sacramento, CA: CDFG.

California Department of Fish and Wildlife (CDFW). 2014a. California Natural Diversity Database. Records of Occurrence for the USGS Black Star Canyon and El Toro 7.5-minute quadrangles. Sacramento, CA: CDFW, Natural Heritage Division.

———. 2014b (September). *Special Animals.* Sacramento, CA: CDFW, Natural Heritage Division.

———. 2014c (October). *Special Vascular Plants, Bryophytes, and Lichens List.* Sacramento, CA: CDFW, Natural Heritage Division.

California Department of Fish and Wildlife, Biogeographic Data Branch (CDFW BDB). 2014. Wildlife Habitats — California Wildlife Habitat Relationships System. Sacramento, CA: CDFW BDB. http://www.dfg.ca.gov/bdb/html/wildlife_habitats.html.

California Department of Forestry and Fire Protection (CAL FIRE). 2014. Fire Perimeter Data. Sacramento, CA: CAL FIRE, U.S. Department of Agriculture Forest Service Region 5 Remote Sensing Lab, Bureau of Land Management, National Park Service. http://frap.cdf.ca.gov/projects/fire_data/fire_perimeters/.

California Irrigation Management Information System (CIMIS). 2014. CIMIS Monthly Report for Irvine – South Coast Valleys Station #75. Sacramento, CA: California Department of Water Resources, CIMIS. http://www.cimis.water.ca.gov.

Canyon Land Conservation Fund (CLCF). 2011. Canyon History. Silverado, CA: CLCF. http://www.canyonland.org/canyonhistory.html.

California Native Plant Society (CNPS). 2014a. *The CNPS Ranking System*. Sacramento, CA: CNPS. http://www.cnps.org/cnps/rareplants/ranking.php.

———. 2014b. Electronic Inventory of Rare and Endangered Vascular Plants of California. Records of Occurrence for the USGS Black Star Canyon and El Toro 7.5-minute quadrangles. Sacramento, CA: CNPS. http://www.cnps.org/inventory.

California Wetlands Monitoring Workgroup (CWMW). 2012 (March). *California Rapid Assessment Method (CRAM) for Wetlands and Riparian Areas* (Version 6.0).

Crother, B.I. (Ed.). 2008 (May 2011, last update). Scientific and Standard English Names of Amphibians and Reptiles of North American North of Mexico, with Comments Regarding Confidence in our Understanding (Edition 6.1). Shoreview, MN: Society for the Study of Amphibians and Reptiles. http://www.ssarherps.org/pages/comm_names/Index.php.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Faber, P., E. Keller, A. Sands, B. Massey. 1989. *The Ecology of Riparian Habitats of the Southern California Coastal Region: A Community Profile* (Biological Report 85 [7.27]). Washington, D.C: U.S. Fish and Wildlife Service, Research and Development, National Wetlands Research Center.

Faber-Langendoen, D., L. Master, J. Nichols, K. Snow, A. Tomaino, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, and B. Young. 2009. *NatureServe Conservation Status Assessments: Methodology for Assigning Ranks.* Arlington, VA: NatureServe. http://www.natureserve.org/publications/ConsStatusAssess_RankMethodology.pdf.

Fahrig, L. and G. Merriam. 1985. Habitat Patch Connectivity and Population Survival. *Ecology* 66(6): 1762–1768. Tempe, AZ: Ecological Society of America.

Gray, J. and D. Bramlet. 1992. *Habitat Classification System Natural Resources Geographic Information System (GIS) Project* (Prepared for the County of Orange Environmental Management Agency). Santa Ana, CA: Gray and Bramlet.

Halsey, R.W. 2007. Chaparral: Pure California. *Fremontia* 35(4): 2–7. Sacramento, CA: CNPS.

———. 2005. *Fire, Chaparral, and Survival in Southern California*. San Diego, CA: Sunbelt Publications, Inc.

Harris, L.D. and P.B. Gallagher. 1989. New Initiatives for Wildlife Conservation: The Need for Movement Corridors (pp. 11–34). *Preserving Communities and Corridors* (G. Mackintosh, Ed.). Washington, D.C.: Defenders of Wildlife.

Hickman, J.C., Ed. 1993. *The Jepson Manual of Higher Plants of California*. Berkeley, CA: University of California Press.

Howard, J.L. 1992. Malomsa laurina. In: Fire Effects Information System, [Online]. Golden, CO: U.S., Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/.

Jennings, M.R. and M.P. Hayes. 1994. Decline of Native Ranid Frogs in the Desert Southwest. In *Herpetology of the North American Deserts: Proceedings of a Symposium* (P.R. Brown and J.W. Wright, Eds.). *Southwestern Herpetologists Society Special Publication No. 5.* Van Nuys, CA: Southwestern Herpetologists Society.

Keeley, J.E. and P.H. Zedler. 2009. Large, High-intensity Fire Events in Southern California Shrublands: Debunking the Fine-grain Age Patch Model. *Ecological Applications* 19(1): 69-94. Tempe, AZ: Ecological Society of America.

Los Angeles, County of, Santa Monica Mountains Conservancy, City of Brea, City of La Habra Heights, City of Whittier, and City of Diamond Bar (Los Angeles County et al.). 2003 (October 14, adopted). Wildlife Corridor Conservation Authority Joint Exercise of Powers Agreement (an agreement "to provide for the proper planning, conservation, environmental protection, and maintenance of the habitat and wildlife corridor between the Whittier-Puente Hills and the Cleveland National Forest in the Santa Monica Mountains.").

MacArthur, R.H. and E.O. Wilson. 1967. *The Theory of Island Biogeography*. Princeton, NJ: Princeton University Press.

McCreary, D.D. 2004. *Fire in California's Oak Woodlands*. University of California Integrated Hardwood Range Management Program. Davis, CA: University of California, Agricultural Issues Center, Integrated Hardwood Range Management Program. http://ucanr.org/faqs/filegroups/faqs14-sep-09-1109/16808.pdf.

Minnich, R.A. and R.J. Dezzani. 1998. Historic Decline of Coastal Sage Scrub in the Riverside – Perris Plain, California. *Western Birds.* 29(4): 366–391. San Diego, CA: Western Field Ornithologists.

Munz, P.A. 1974. *A Flora of Southern California*. Berkeley, CA: University of California Press.

National Weather Service (NWS). 2014. International Station Meteorological Climate Summary for El Toro Station 722974. Salt Lake City, UT: National Oceanic and Atmospheric Administration, NWS Western Region Headquarters.

Noss, R.F. 1983. A Regional Landscape Approach to Maintain Diversity. *BioScience.* 33(11): 700–706. Washington, D.C.: American Institute of Biological Sciences.

Noss, R.F. and R.L. Peters. 1995. *Endangered Ecosystems: a Status Report on America's Vanishing Habitat and Wildlife.* Washington, D.C.: Defenders of Wildlife.

O'Leary, J. 1995. Coastal Sage Scrub: Threats and Current Status. *Fremontia.* 23(4): 27–31. Sacramento, CA: California Native Plant Society.

Orange, County of. 1977 (as amended). *Silverado-Modjeska Specific Plan*. Santa Ana, CA: Orange County Board of Supervisors.

Orange County Fire Authority (OCFA). 2008 (November 15). *After Action Report: Freeway Complex Fire*. Irvine, CA: OCFA.

———. 2007 (October). *After Action Report: Santiago Fire*. Irvine, CA: OCFA.

Orange County Transportation Authority (OCTA). 2010 (December 3). Notice of Preparation to Prepare an Environmental Impact Report. Orange, CA: OCTA.

Ritter, M.E. 2006. The Physical Environment: Mediterranean or Dry Summer Subtropical Climate. Stevens Point, WI: University of Wisconsin. http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/climate_systems/mediterranean.html.

Roberts, F.M. 2008. *The Vascular Plants of Orange County, California: An Annotated Checklist*. San Luis Rey, CA: F.M. Roberts Publications.

Ruben, J.A. and W.J. Hillenius. 2005 (May). Cold Blooded. *Natural History*. New York, NY: American Museum of Natural History.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation* (2nd ed.). Sacramento, CA: CNPS.

Schoenherr, A.A. 1992. *A Natural History of California.* Berkeley, CA: University of California Press.

Simberloff, D. and J. Cox. 1987. Consequences and Costs of Conservation Corridors. *Conservation Biology* 1(1): 63–71. Boston, MA: Blackwell Scientific Publications.

Smithsonian National Museum of Natural History (SNMNH). 2011. Mammal Species of the World (3rd ed.) (a database based on Wilson, D.E. and D.M. Reeder's 2005 publication entitled *Mammal Species of the World, A Taxonomic and Geographic Reference, 3rd ed*). Washington, D.C.: SNMNH. http://www.vertebrates.si.edu/msw/mswcfapp/msw/index.cfm.

Soule, M.E. 1987. *Viable Populations for Conservation*. New York, NY: Cambridge University Press.

Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians* (3rd ed.). Boston, MA: Houghton-Mifflin Company.

Steinberg, P.D. 2002. Quercus agrifolia. In: Fire Effects Information System, [Online]. Golden, CO: USDA, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Fish and Wildlife Service (USFWS). 2011 (February 9). Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Arroyo Toad; Final Rule. *Federal Register* 76(27): 7245–7467. Washington, D.C.: USFWS.

———. 2006 (March 24). Wetland Mapper [Information for the MacPherson Property]. Washington D.C.: USFWS, National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html.

———. 1997 (February 28). *Coastal California Gnatcatcher (Polioptila californica californica). Presence/Absence Survey Guidelines.* Washington, D.C.: USFWS.

U.S. Forest Service (USFS). 2013 (March). Cleveland National Forest: History Heritage. San Diego, CA: Cleveland National Forest.

ATTACHMENT A

PLANT AND WILDLIFE COMPENDIA

A-1
PLANT SPECIES OBSERVED DURING SURVEYS

Species	
***PTERIDOPHYTES* – FERNS AND ALLIES**	
PTERIDACEAE – BRAKE FAMILY	
Pellaea mucronata	bird's-foot fern
Pentagramma triangularis ssp. *triangularis*	goldenback fern
SELAGINELLACEAE – SPIKE-MOSS FAMILY	
Selaginella bigelovii	Bigelow's or bushy spike-moss
***ANGIOSPERMAE* – FLOWERING PLANTS**	
EUDICOTS	
ADOXACEAE – MUSKROOT FAMILY	
Sambucus nigra ssp. c*aerulea* [*S. mexicana*]	blue elderberry
ANACARDIACEAE – SUMAC FAMILY	
Malosma laurina	laurel sumac
Rhus integrifolia	lemonade berry
Rhus ovata	sugar bush
Toxicodendron diversilobum	western poison oak
APIACEAE – CARROT FAMILY	
Lomatium lucidum	shiny lomatium
Sanicula sp.	sanicle
ASTERACEAE – SUNFLOWER FAMILY	
Acourtia microcephala	sacapellote
Artemisia californica	California sagebrush
Artemisia douglasiana	mugwort
Baccharis pilularis ssp. *consanguinea* [*B. pilularis*]	coyote brush
Baccharis salicifolia ssp. *salicifolia* [*B. salicifolia*]	mule fat
Carduus pycnocephalus ssp. *pycnocephalus**	Italian thistle
*Centaurea melitensis**	tocalote, Malta star-thistle
Chaenactis artemisiifolia	white pincushion
Corethrogyne filaginifolia [*Lessingia f.*]	California-aster
*Cynara cardunculus**	cardoon, globe artichoke
Deinandra fasciculata [*Hemizonia f.*]	fascicled tarweed
Deinandra paniculata [*Hemizonia p.*]	San Diego, paniculate tarplant
Encelia californica	California brittlebush
Erigeron foliosus	leafy fleabane
Eriophyllum confertiflorum	golden-yarrow
*Gazania linearis**	gazania
Hazardia squarrosa	saw-toothed goldenbush
Helianthus gracilentus	slender sunflower
Heterotheca grandiflora	telegraph weed
*Hypochaeris glabra**	smooth cat's-ear
Isocoma menziesii	coastal goldenbush
*Lactuca serriola**	prickly lettuce
Logfia filaginoides [*Filago californica*]	California cottonrose
Logfia gallica [*Filago g.*]*	daggerleaf cottonrose
Malacothrix saxatilis	malacothrix
Osmadenia tenella	osmadenia

A-1
PLANT SPECIES OBSERVED DURING SURVEYS

Species	
Pseudognaphalium californicum [*Gnaphalium c.*]	California everlasting
Pseudognaphalium canescens [*Gnaphalium c.*]	everlasting
Pseudognaphalium microcephalum [*Gnaphalium canescens* ssp. *m.*]	white everlasting
*Silybum marianum**	milk thistle
*Sonchus oleraceus**	common sow thistle
Stephanomeria exigua	wreath plant
Stylocline gnaphaloides	everlasting neststraw
Uropappus lindleyi [*Microseris l.*]	silver puffs
BORAGINACEAE – BORAGE FAMILY	
Cryptantha sp.	cryptantha
Eriodictyon crassifolium	thick-leaf yerba santa
Eucrypta chrysanthemifolia	common eucrypta
Phacelia cicutaria	caterpillar phacelia
Phacelia minor	wild canterbury-bell
Phacelia parryi	Parry's phacelia
BRASSICACEAE – MUSTARD FAMILY	
*Brassica nigra**	black mustard
*Hirschfeldia incana**	shortpod mustard
*Raphanus sativus**	radish
CACTACEAE – CACTUS FAMILY	
Opuntia littoralis	coastal prickly-pear
Opuntia x occidentalis	western prickly-pear
CARYOPHYLLACEAE – PINK FAMILY	
*Silene gallica**	small-flower catchfly
CHENOPODIACEAE – GOOSEFOOT FAMILY	
*Salsola tragus**	Russian thistle
CISTACEAE – ROCK-ROSE FAMILY	
Helianthemum scoparium	peak rush-rose
CONVOLVULACEAE – MORNING-GLORY FAMILY	
Calystegia macrostegia	large-bracted morning-glory????/
*Convolvulus arvensis**	bindweed
Cuscuta californica	chaparral dodder
Cuscuta subinclusa	canyon dodder
CRASSULACEAE – STONECROP FAMILY	
Dudleya lanceolata	lance-leaved dudleya, lanceleaf, coastal dudleya, coastal live-forever
CUCURBITACEAE – GOURD FAMILY	
Marah macrocarpus	wild cucumber, chilicothe
EUPHORBIACEAE – SPURGE FAMILY	
Chamaesyce albomarginata [*Euphorbia a.*]	rattlesnake weed
FABACEAE – LEGUME FAMILY	
Acmispon glaber [*Lotus scoparius*]	deerweed
Acmispon strigosus [*Lotus s.*]	strigose lotus
Lupinus hirsutissimus	stinging lupine

A-1
PLANT SPECIES OBSERVED DURING SURVEYS

Species	
*Medicago polymorpha**	California burclover
*Melilotus indica**	sourclover
Pickeringia montana	chaparral pea
*Spartium junceum**	Spanish broom
FAGACEAE – OAK/BEECH FAMILY	
Quercus agrifolia	coast live oak
GERANIACEAE – GERANIUM FAMILY	
*Erodium botrys**	long-beaked filaree
*Erodium cicutarium**	red-stemmed filaree
GROSSULARIACEAE – GOOSEBERRY FAMILY	
Ribes indecorum	white-flowered currant
Ribes malvaceum	chaparral currant
Ribes speciosum	fuchsia-flowered gooseberry
LAMIACEAE – MINT FAMILY	
Salvia apiana	white sage
Salvia columbariae	chia
Salvia mellifera	black sage
Trichostema lanatum	woolly blue curls
LOASACEAE – LOASA FAMILY	
Mentzelia micrantha	small-flowered stick-leaf
MALVACEAE – MALLOW FAMILY	
Malacothamnus fasciculatus	chaparral bushmallow
*Malva parviflora**	cheeseweed
MYRSINACEAE – MYRSINE FAMILY	
*Anagallis arvensis**	scarlet pimpernel
MYRTACEAE – MYRTLE FAMILY	
*Eucalyptus globulus**	blue gum
NYCTAGINACEAE – FOUR-O'CLOCK FAMILY	
Mirabilis laevis var. *crassifolia* [*M. californica*]	wishbone bush, California wishbone bush
ONAGRACEAE – EVENING-PRIMROSE FAMILY	
Eulobus californicus [*Camissonia californica*]	mustard-like evening primrose
OXALIDACEAE – WOOD-SORREL FAMILY	
Oxalis californica [*O. albicans* ssp. *c.*]	California wood-sorrel
PAPAVERACEAE – POPPY FAMILY	
Eschscholzia californica	California poppy
PHRYMACEAE – LOPSEED FAMILY	
Mimulus aurantiacus	bush monkeyflower
Mimulus brevipes	slope semaphore
PLANTAGINACEAE – PLANTAIN FAMILY	
Antirrhinum kelloggii	Kellogg's/climbing snapdragon
Keckiella cordifolia	heart-leaved bush-penstemon
Penstemon centranthifolius	scarlet bugler
Plantago erecta	dwarf plantain, California plantain

A-1
PLANT SPECIES OBSERVED DURING SURVEYS

Species	
POLEMONIACEAE – PHLOX FAMILY	
Eriastrum sapphirinum	sapphire woollystar
POLYGONACEAE – BUCKWHEAT FAMILY	
Eriogonum elongatum var. *elongatum*	long-stemmed wild buckwheat
Eriogonum fasciculatum	California buckwheat
Pterostegia drymarioides	woodland threadstem
RHAMNACEAE – BUCKTHORN FAMILY	
Ceanothus crassifolius	hoaryleaf ceanothus
Rhamnus crocea	spiny redberry
Rhamnus ilicifolia	hollyleaf redberry
ROSACEAE – ROSE FAMILY	
Adenostoma fasciculatum	chamise
Heteromeles arbutifolia	toyon, Christmas berry
RUBIACEAE – MADDER FAMILY	
Galium angustifolium	narrowly leaved bedstraw
Galium nuttallii ssp. *nuttallii*	San Diego bedstraw
SOLANACEAE – NIGHTSHADE FAMILY	
Solanum xanti	chaparral nightshade
***MONOCOTYLEDONES* – MONOCOTS**	
AGAVACEAE – CENTURY PLANT FAMILY	
Chlorogalum parviflorum	miniature soap plant
Hesperoyucca whipplei [*Yucca w.*]	chaparral yucca
IRIDACEAE – IRIS FAMILY	
Sisyrinchium bellum	western blue-eyed grass
LILIACEAE – LILY FAMILY	
Calochortus splendens	splendid mariposa lily
Calochortus weedii var. *intermedius*	intermediate mariposa lily
POACEAE – GRASS FAMILY	
*Avena barbata**	slender wild oat
*Avena fatua**	wild oat
Bothriochloa barbinodis	cane bluestem
*Brachypodium distachyon**	purple false brome
*Bromus diandrus**	ripgut grass
*Bromus hordeaceus**	soft chess
Bromus madritensis ssp. *rubens**	red brome
*Cynodon dactylon**	bermuda grass
Elymus condensatus [*Leymus c.*]	giant wild rye
*Eragrostis cilianensis**	stink grass
Festuca myuros [*Vulpia m.* var. *myuros*]*	rattail fescue
*Lamarckia aurea**	goldentop
Melica imperfecta	little California melic grass
Muhlenbergia microsperma	littleseed muhly
*Pennisetum setaceum**	crimson fountain grass
Poa secunda	one-sided bluegrass, malpais bluegrass
*Schismus barbatus**	Mediterranean schismus

A-1
PLANT SPECIES OBSERVED DURING SURVEYS

Species	
Stipa lepida [*Nassella l.*]	foothill needlegrass
Stipa miliacea [*Piptatherum miliacea*]*	smilo grass
Stipa pulchra [*Nassella p.*]	purple needlegrass
RUSCACEAE – BUTCHER'S-BROOM FAMILY	
Nolina cismontana	chaparral nolina
THEMIDACEAE – BRODIAEA FAMILY	
Bloomeria crocea	common goldenstar
Dichelostemma capitatum	blue dicks
* non-native to the region it was found	

A-2
WILDLIFE SPECIES OBSERVED DURING SURVEYS

Species	
REPTILES	
***LEPIDOSAURIA* – LIZARDS AND SNAKES**	
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS	
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
Phrynosoma blainvillii	Blainville's [coast] horned lizard
TEIIDAE – WHIPTAIL LIZARDS	
Aspidoscelis [*Cnemidophorus*] *hyperythra*	orange-throated whiptail
COLUBRIDAE – COLUBRID SNAKES	
Pituophis catenifer	gopher snake
BIRDS	
***AVES* – BIRDS**	
ODONTOPHORIDAE – QUAILS	
Callipepla californica	California quail
CATHARTIDAE – NEW WORLD VULTURES	
Cathartes aura	turkey vulture
ACCIPITRIDAE – HAWKS, KITES, EAGLES, AND ALLIES	
Buteo jamaicensis	red-tailed hawk
COLUMBIDAE – PIGEONS AND DOVES	
Zenaida macroura	mourning dove
CUCULIDAE – CUCKOOS AND ROADRUNNERS	
Geococcyx californianus	greater roadrunner
APODIDAE – SWIFTS	
Aeronautes saxatalis	white-throated swift
TROCHILIDAE – HUMMINGBIRDS	
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
FALCONIDAE – FALCONS	
Falco sparverius	American kestrel
TYRANNIDAE – TYRANT FLYCATCHERS	
Sayornis nigricans	black phoebe
Tyrannus vociferans	Cassin's kingbird
CORVIDAE – CROWS AND JAYS	
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
HIRUNDINIDAE – SWALLOWS	
Tachycineta thalassina	violet-green swallow
Petrochelidon pyrrhonota	cliff swallow
AEGITHALIDAE – BUSHTITS	
Psaltriparus minimus	bushtit
TROGLODYTIDAE – WRENS	
Salpinctes obsoletus	rock wren
Thryomanes bewickii	Bewick's wren

A-2
WILDLIFE SPECIES OBSERVED DURING SURVEYS

Species	
POLIOPTILIDAE – GNATCATCHERS AND GNATWRENS	
Polioptila caerulea	blue-gray gnatcatcher
SYLVIIDAE – SYLVIID WARBLERS	
Chamaea fasciata	wrentit
TURDIDAE – THRUSHES AND ROBINS	
Sialia mexicana	western bluebird
MIMIDAE – THRASHERS	
Toxostoma redivivum	California thrasher
Mimus polyglottos	northern mockingbird
PTILOGONATIDAE – SILKY-FLYCATCHERS	
Phainopepla nitens	phainopepla
PARULIDAE – WARBLERS	
Setophaga [*Dendroica*] *nigrescens*	black-throated gray warbler
EMBERIZIDAE – SPARROWS AND JUNCOS	
Pipilo maculatus	spotted towhee
Melozone [*Pipilo*] *crissalis*	California towhee
Chondestes grammacus	lark sparrow
FRINGILLIDAE – FINCHES	
Haemorhous [*Carpodacus*] *mexicanus*	house finch
Spinus [*Carduelis*] *psaltria*	lesser goldfinch
Spinus [*Carduelis*] *tristis*	American goldfinch
MAMMALS	
***MAMMALIA* – MAMMALS**	
LEPORIDAE – HARES AND RABBITS	
Sylvilagus audubonii	desert cottontail
CANIDAE - DOGS, FOXES, AND WOLVES	
Canis latrans	coyote
* introduced species Note that this compendium only includes vertebrate species.	

ATTACHMENT B

SITE PHOTOGRAPHS

Overview of the project site from the north end facing south.

Mixed sage scrub (foreground) and southern mixed chaparral (background) in the southwestern corner of the property.

Patches of annual grassland and southern mixed chaparral in the northwestern corner of the property.

Southern coast live oak riparian forest in the southern portion of the property.

Disturbed access road and cliff/rock surrounded by mixed chaparral and mixed sage scrub in the northern portion of the property.

Spanish broom observed in the southwestern corner of the property.

D:\Projects\OCTAU008\Graphics\MacPherson\BioTech\ex_SP1.ai

Site Photographs

Attachment B

Measure M2 Acquisition Properties Evaluation – MacPherson Property

BonTerra PSOMAS

(10/08/2014 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\BioTech\AttB_SP.pdf

Appendix C

Jurisdictional Delineation Report Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation MacPherson Property in Orange County, California

This page intentionally left blank

BonTerra PSOMAS

Jurisdictional Delineation Report

Measure M2 Freeway Environmental Mitigation Program Acquisition Properties Evaluation for the MacPherson Property in Orange County, California

Prepared for

Orange County Transportation Authority
600 South Main Street, 9th Floor
Orange, California 92862
Contact: Lesley L. Hill
Project Manager, Environmental Programs

Prepared by

BonTerra Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, California 92707
Contact: Brad Blood, PhD
T: (714) 751-7373 F: (714) 545-8883

October 2015

TABLE OF CONTENTS

Section **Page**

TABLES

EXHIBITS

ATTACHMENTS

EXECUTIVE SUMMARY

The purpose of this report is to provide baseline data concerning the type and extent of jurisdictional resources for the Measure M2 Freeway Environmental Mitigation Program (EMP) Acquisition Properties Evaluation Project. Jurisdictional resources considered for this report include wetlands and non-wetland "waters of the U.S." regulated by the U.S. Army Corps of Engineers (USACE); "waters of the State" regulated by the Regional Water Quality Control Board (RWQCB); and the bed, bank, and channel of all lakes, rivers, and/or streams (and associated riparian vegetation), as regulated by the California Department of Fish and Wildlife (CDFW).

The limits of non-wetland "waters of the U.S." and "waters of the State" were identified by the presence of an ordinary high water mark (OHWM). Wetland features were identified based on the USACE's three-parameter approach in which wetlands are defined by the presence of hydrophytic vegetation, hydric soils, and presence of wetland hydrology indicators. The limits of CDFW jurisdictional waters were identified as either the top of bank or the outer drip line of riparian vegetation.

The jurisdictional delineation work was performed by BonTerra Psomas on July 8, 2015. Based on the results of the jurisdictional delineation fieldwork, it was determined that the total jurisdictional resources on the MacPherson property are as follows:

- **USACE Jurisdiction:** 0.814 acre.
- **RWQCB Jurisdiction:** 0.819 acre (0.814 acre of non-wetland "waters of the State" and 0.005 acre of isolated waters).
- **CDFW Jurisdiction:** 4.334 acres.

This page intentionally left blank

1.0 INTRODUCTION

This Jurisdictional Delineation Report (report) was prepared for the Orange County Transportation Authority (OCTA) to provide baseline data concerning the type and extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the Regional Water Quality Control Board (RWQCB) for the Measure M2 Freeway Environmental Mitigation Program (EMP) Acquisition Properties Evaluation Project. This report is limited to the MacPherson property (hereinafter referred to as the "property").

1.1 PROJECT LOCATION AND DESCRIPTION

The approximate 204-acre property is located in unincorporated Orange County east of the cities of Orange and Irvine (Exhibit 1). Baker Canyon Road is to the north, Ladd Canyon Road is to the east, Silverado Canyon Road is to the south, and Black Star Canyon Road is to the west. The property is located on the U.S. Geological Survey's (USGS') Black Star Canyon and El Toro 7.5-minute topographic quadrangles of the San Bernardino Meridian in Sections 6 and 7 of Township 5 South, Range 7 West (Exhibit 2). It is within the 1,680-square-mile Santa Ana Watershed (Hydrologic Unit Code 18070203).

The property is part of a Natural Community Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) habitat preserve purchased to mitigate for natural resource impacts of the Renewed Measure M (or Measure M2)-funded freeway improvement project.

1.2 REGULATORY AUTHORITY

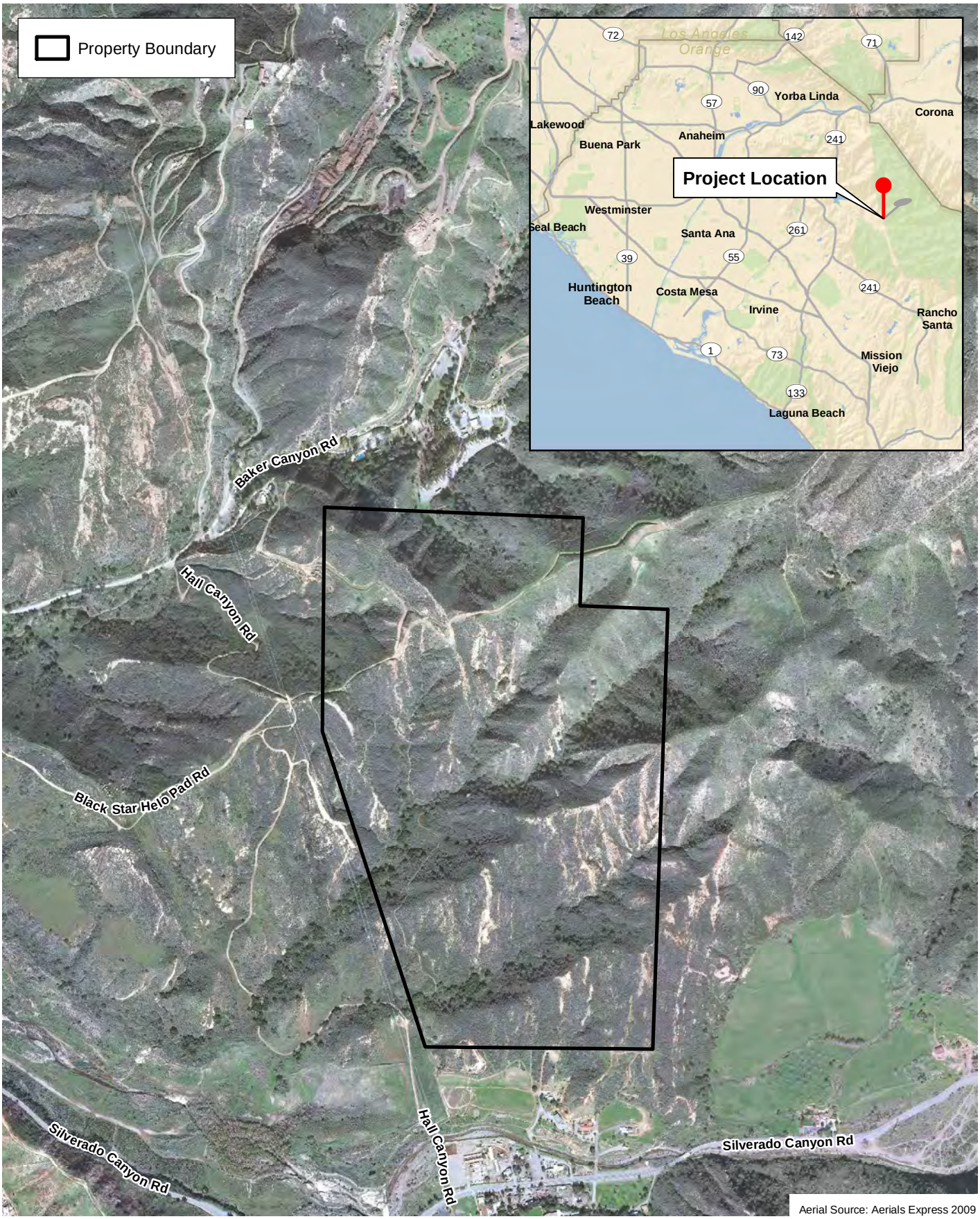
This section summarizes the federal and State agencies' regulatory jurisdiction over activities that have a potential to impact jurisdictional resources. A detailed explanation of each agency's regulatory authority is provided in Attachment A.

1.2.1 U.S. Army Corps of Engineers

The USACE's Regulatory Branch regulates activities that discharge dredged or fill materials into "waters of the U.S." under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Its authority applies to all "waters of the U.S." where the material (1) replaces any portion of a "waters of the U.S." with dry land or (2) changes the bottom elevation of any portion of any "waters of the U.S.". Activities that result in fill or dredge of "waters of the U.S." require a permit from the USACE.

1.2.2 Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB), in conjunction with the nine RWQCBs, is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The SWRCB's and RWQCBs' jurisdictions extend to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated).



Aerial Source: Aerials Express 2009

D:\Projects\OCTA\J008\MXD\MacPherson\JD\Ex_RL_Aerial_20151009.mxd

Project Location

Exhibit 1

Measure M2 Acquisition Properties Evaluation – MacPherson Property

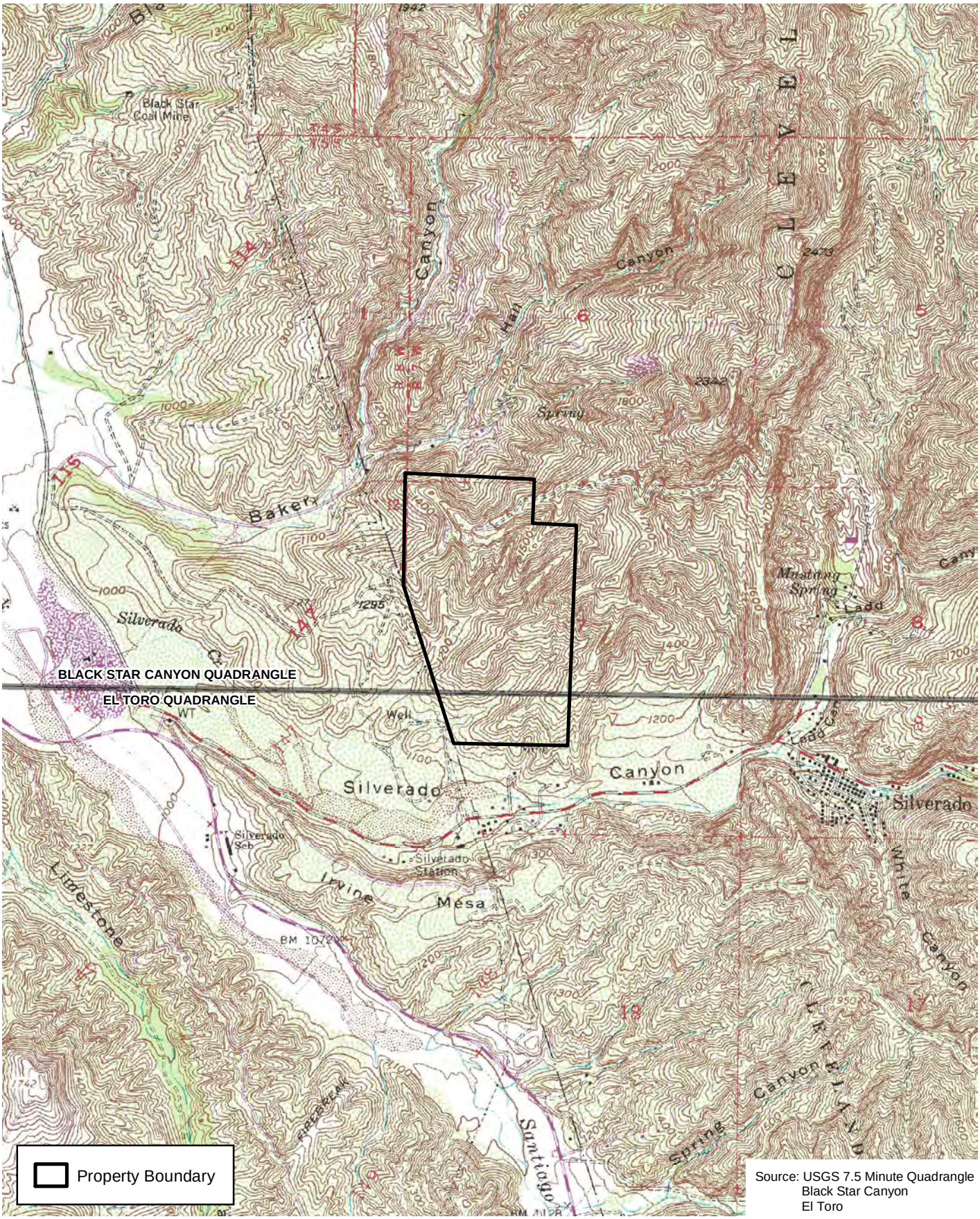
N W E S

1,000 500 0 1,000

Feet

BonTerra PSOMAS

(Rev: 10-09-2015 LEW) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\JD\Ex1_RL_Aerial_20151009.pdf



D:\Projects\OCTAJ008\MXD\MacPherson\JD\Ex_USGS_20151009.mxd

USGS 7.5-Minute Quadrangle

Exhibit 2

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

2,000 1,000 0 2,000

Feet

BonTerra PSOMAS

(Rev: 10-09-2015 LEW) R:\Projects\OCT_OCTAJ008\Graphics\MacPherson\JD\Ex2_USGS_20151009.pdf

1.2.3 California Department of Fish and Wildlife

The CDFW regulates activities that may affect rivers, streams, and lakes pursuant to the *California Fish and Game Code* (§§1600–1616). According to Section 1602 of the *California Fish and Game Code*, the CDFW has jurisdictional authority over any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

2.0 METHODS

This section discusses the literature reviewed for the preparation of the delineation and the methods employed during performance of the field delineation. The entire property was surveyed.

2.1 LITERATURE

Prior to conducting the delineation and during the course of preparing this report, BonTerra Psomas reviewed the following documents to identify areas that may fall under agency jurisdiction: the USGS' Black Star Canyon and El Toro 7.5-minute quadrangle maps; color aerial photography provided by Aerials Express (spring 2009); the Web Soil Survey (USDA NRCS 2015); the National Hydric Soils List (USDA NRCS 2014); the National Wetlands Inventory's Wetland Mapper (USFWS 2015); and the Regional Water Quality Control Plan for the Santa Ana Region (RWQCB 1995). A description of this literature and a summary of the results for the property found from each source are provided below.

USGS Topographic Quadrangle. USGS quadrangle maps show geological formations and their characteristics; they describe the physical settings of an area through topographic contour lines and other major surface features. These features include lakes, streams, rivers, buildings, roadways, landmarks, and other features that may fall under the jurisdiction of one or more regulatory agencies. In addition, the USGS maps provide topographic information that is useful in determining elevations, latitude and longitude, and Universal Transverse Mercator Grid coordinates for a project site.

Topography on the property consists of low hills, with the main ridgelines oriented in a northeast to southwest direction. Elevations range from approximately 1,135 to 1,678 feet above mean sea level (msl). No blueline streams occur on the property, but multiple drainage features are present in the canyon bottoms.

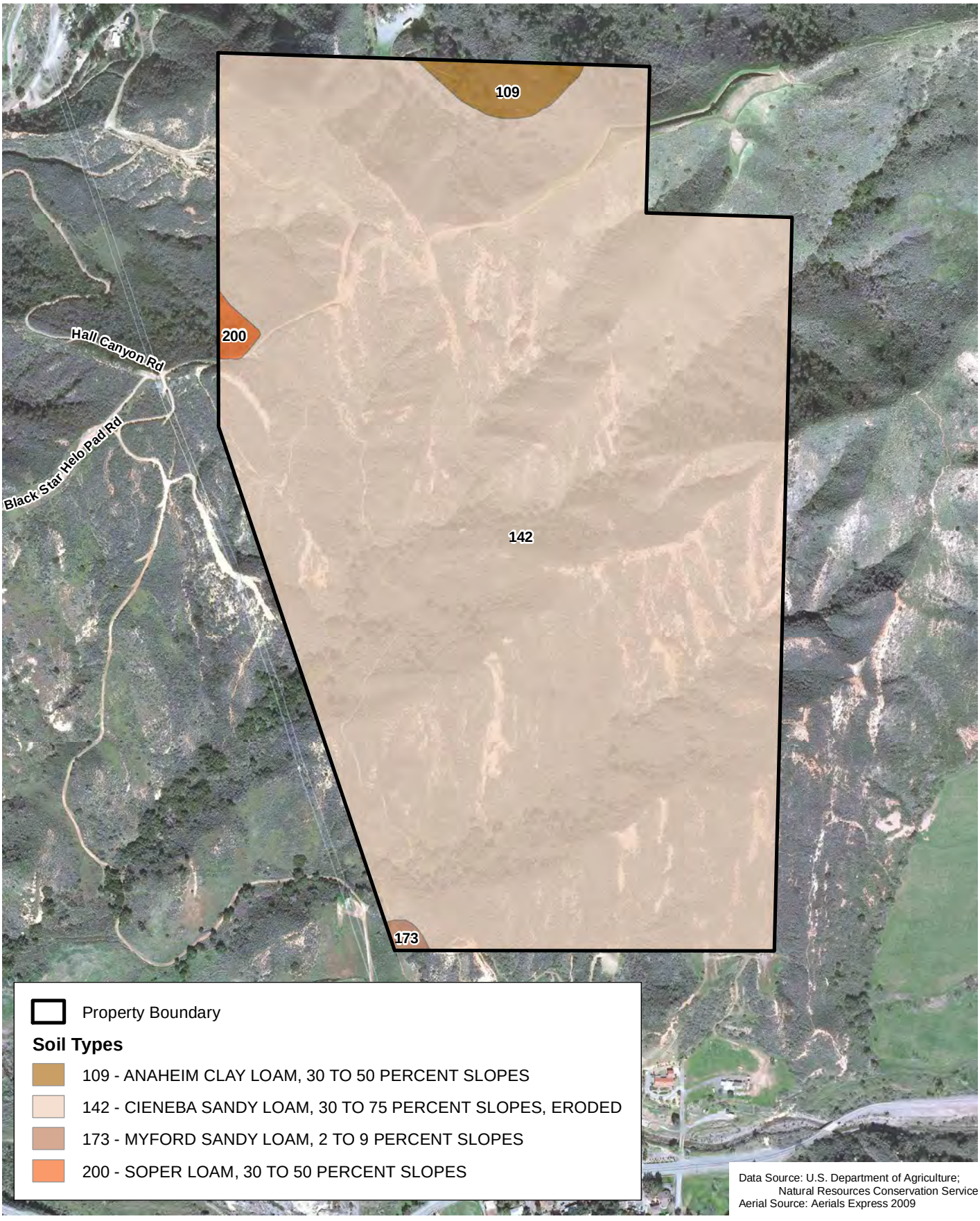
Color Aerial Photography. BonTerra Psomas reviewed an existing color aerial photograph prior to conducting the field delineation to identify the extent of any drainages and riparian vegetation occurring on the property.

Multiple ridgelines and canyons are visible on the aerial imagery and vegetation appears to be primarily shrubland. The two main drainages contain trees along the canyon bottom and scattered up the slopes.

U.S. Department of Agriculture, Natural Resources Conservation Service. The presence of hydric soils is one of the chief indicators of jurisdictional wetlands. BonTerra Psomas reviewed U.S. Department of Agriculture (USDA) soil data for the property (USDA NRCS 2015).

The property occurs in the soil survey area for Orange County and Part of Riverside County, California. The following soil types have been mapped on the property: Anaheim clay loam (30 to 50 percent slopes), Cieneba sandy loam (30 to 75 percent slopes, eroded), Myford sandy loam (2 to 9 percent slopes), and Soper loam (30 to 50 percent slopes) (Exhibit 3).

The Natural Resources Conservation Service (NRCS) has delineated the boundaries of "soil map units", which often contain components of multiple soil types that may be classified as hydric or non-hydric. The National Hydric Soils List (USDA NRCS 2014) identifies a soil map unit as "hydric" if it contains either a major or minor component that is at least in part hydric. On the property, the following map unit is listed as "hydric" on the National List for the soil survey area in which it occurs: Myford sandy loam (2 to 9 percent slopes). A brief description of the soils mapped on the property is provided in Attachment B of this report.



D:\Projects\OCTA\J008\MXD\MacPherson\JD\Ex_Soils_20151009.mxd

Soil Types

Exhibit 3

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

600 300 0 600

Feet

BonTerra PSOMAS

(Rev: 10-09-2015 LEW) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\JD\Ex3_Soils_20151009.pdf

U.S. Fish and Wildlife Service, National Wetlands Inventory. The Wetlands Mapper shows wetland resources available from the Wetlands Spatial Data Layer of the National Spatial Data Infrastructure (USFWS 2015). This resource provides the classification of known wetlands following the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). This classification system is arranged in a hierarchy of (1) Systems, which share the influence of similar hydrologic, geomorphologic, chemical, or biological factors (i.e., Marine, Estuarine, Riverine, Lacustrine, and Palustrine); (2) Subsystems (i.e., Subtidal and Intertidal; Tidal, Lower Perennial, Upper Perennial, and Intermittent; or Littoral and Limnetic); (3) Classes, which are based on substrate material and flooding regime or on vegetative life forms; (4) Subclasses; and (5) Dominance Types, which are named for the dominant plant or wildlife forms. In addition, there are modifying terms applied to Classes or Subclasses.

The following resources are mapped on the property: (1) riverine, intermittent streambed, temporary flooded (R4SBA) and (2) Palustrine, forested/scrub-shrub, seasonally flooded (PFO/SSC) (Exhibit 4). The descriptions for mapped resources are provided in Attachment B of this report.

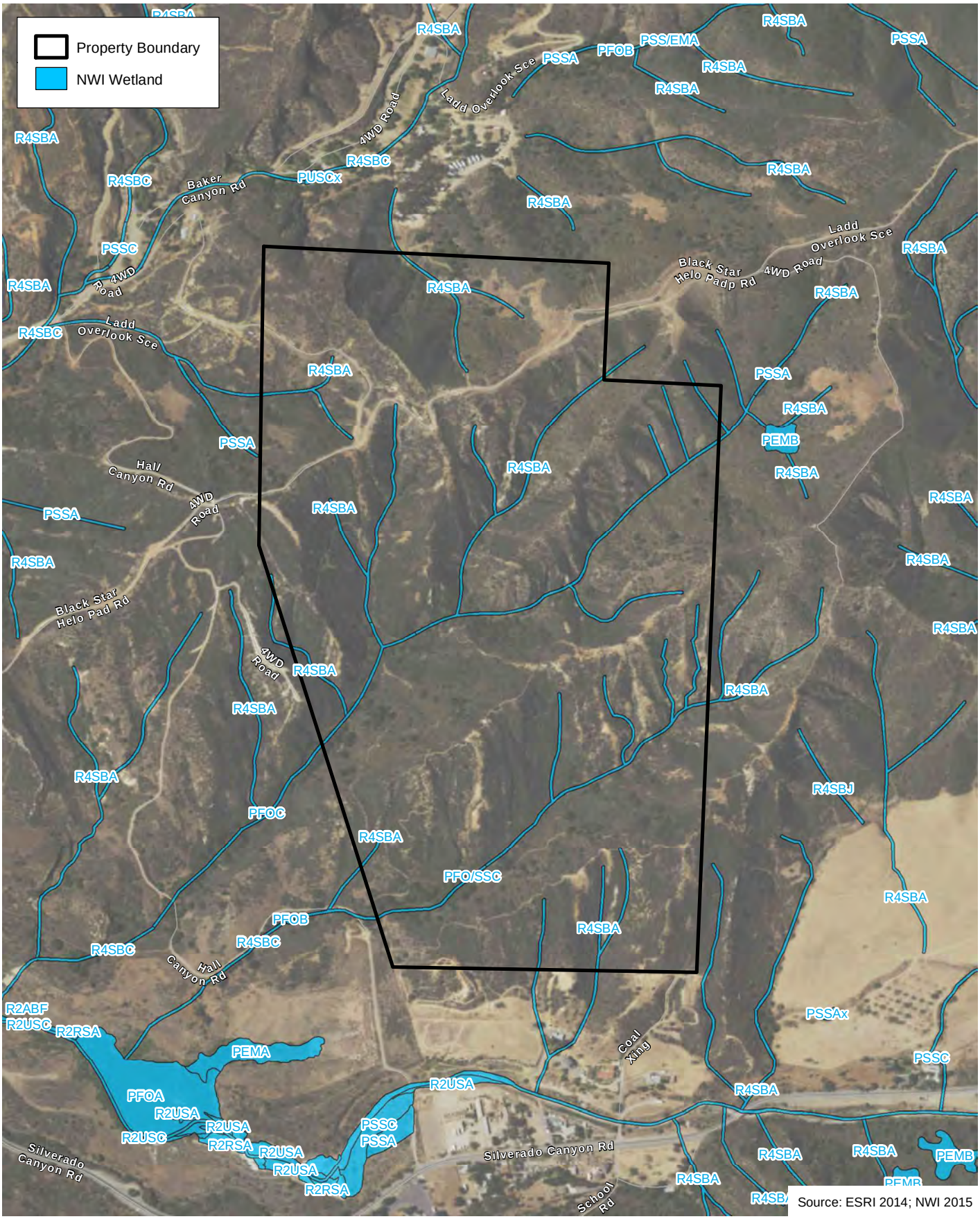
Regional Water Quality Control Plans. The property is located in RWQCB Region 8, the Santa Ana Region. The RWQCB has adopted a Water Quality Control Plan (or "Basin Plan") for this region. The Basin Plan contains goals and policies, descriptions of conditions, and proposed solutions to surface and groundwater issues. The Basin Plan also establishes water quality standards for surface and groundwater resources and includes beneficial uses and levels of water quality that must be met and maintained to protect these uses. These water quality standards are implemented through various regulatory permits pursuant to the CWA, specifically Section 401 for Water Quality Certifications and Section 402 for Report of Waste Discharge (ROWD) permits.

The Santa Ana Basin Plan indicates that the property is located in the Santa Ana River Hydrologic Unit, Lower Santa Ana River Hydrologic Area, and the Santiago Hydrologic Subarea (HSA). While the Basin Plan does not provide Water Quality Objectives for the unnamed drainages on the property, objectives are provided for Silverado Creek, of which the on-site drainages are tributaries (Table 1).

TABLE 1
WATER QUALITY OBJECTIVES FOR SILVERADO CREEK

Water Quality Objectives (mg/L)						
Total Dissolved Solids	**Hardness**	**Sodium**	**Chloride**	**Total Inorganic Nitrogen**	**Sulfate**	**Chemical Oxygen Demand**
650	450	30	20	1	275	–
mg/L: milligrams per liter; –: none provided Source: RWQCB 1995						

Beneficial uses are defined in the Porter-Cologne Act as those uses of water that are necessary for tangible and intangible economic, social, and environmental benefits. The Basin Plan identifies a number of beneficial uses for Silverado Creek: Municipal and Domestic Water Supply (MUN) waters; Groundwater Recharge (GWR) waters; Water Contact Recreation (REC1) waters; Non-Contact Water Recreation (REC2) waters; Warm Fresh Water Habitat (WARM) waters; and Wildlife Habitat (WILD) waters. Descriptions of the beneficial uses applicable to waters on the property are provided in Attachment B of this report.



Source: ESRI 2014; NWI 2015

D:\Projects\OCTA\J008\MXD\MacPherson\JD\Ex_NWI_MacPherson_20151009.mxd

National Wetland Inventory

Exhibit 4

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

750 375 0 750

Feet

BonTerra PSOMAS

(Rev: 10-14-2015 LEW) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\JD\Ex4_NWI_MacPherson_20151009.pdf

2.2 JURISDICTIONAL DELINEATION

Non-wetland "waters of the U.S." are delineated based on the limits of the ordinary high water mark (OHWM), which can be determined by a number of factors including erosion, deposition of vegetation or debris, and changes in vegetation. The OHWM limits (i.e., active floodplain) occurring on the property were further verified using methods contained in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*, *A Delineation Manual* (Lichvar and McColley 2008), and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010).

In September 2008, the USACE issued the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.* This regional supplement is designed for use with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Both the 1987 Wetlands Manual and the Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of "waters of the U.S." and wetland resources. A three-parameter approach is used to identify wetlands and requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils. Wetlands generally include swamps, marshes, bogs, and similar areas. In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within the three parameters. However, problem areas may periodically or permanently lack certain indicators due to seasonal or annual variability of the nature of the soils or plant species on site. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement.

It should be noted that the RWQCB shares USACE jurisdiction unless isolated conditions are present. If isolated waters conditions are present, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the three-parameter wetlands method pursuant to the 1987 Wetlands Manual. The CDFW's jurisdiction is defined as the top of the bank to the top of the bank of the stream, channel, or basin or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, or lake or other impoundment.

The analysis contained in this report uses the results of a field survey conducted by BonTerra Psomas Senior Biologist Allison Rudalevige and Biologist Tanessa Hartwig on July 8, 2015. Jurisdictional features were delineated using a 1 inch equals 300 feet (1″ = 300′) scale aerial photograph. Jurisdictional water resources were delineated as a drainage centerline with corresponding width measurements. Inaccessible areas (i.e., where the topography was very steep or vegetation was too dense) were mapped remotely on the aerial photograph. Datasheets that provide a summary of the drainages on the property are provided in Attachment C.

2.2.1 Vegetation

Hydrophytic vegetation (or hydrophytes) is defined as any macrophytic plant that "grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats" (Environmental Laboratory 1987). Specifically, these plant species have specialized morphological, physiological, or other adaptations for surviving in permanently saturated to periodically saturated soils where oxygen levels are very low or the soils are anaerobic. The USACE—as part of an interagency effort with the U.S. Environmental Protection Agency (USEPA), the U.S. Fish and Wildlife Service (USFWS), and the NRCS—approved a new National Wetland Plant List (NWPL) (Lichvar and Kartesz 2009) to replace the *National List of Plant Species that Occur in Wetlands* (Reed 1988). The current NWPL went into effect in 2014, and is to be used to determine whether the hydrophytic vegetation parameter is met when conducting wetland determinations under the CWA and the Wetland Conservation Provisions of the Food Security Act. The NWPL is also intended to be used for

wetland restoration, establishment, and enhancement projects. This report utilizes the indicator statuses for the Arid West Supplement portion of the NWPL.

The following revisions were made to Reed's *National List of Plant Species that Occur in Wetlands* (1988) pursuant to the NWPL:

1. The USACE eliminated the "probability-of-occurrence" categories (e.g., <1 percent, 1-33 percent, 34–66 percent, 67–99 percent, and >99 percent) due to the lack of numerical data to support these ratings.
2. The USACE determined that, because the wetland plant indicator statuses have shifted from a series of numerical categories to qualitative definitions, the use of +/– suffixes is difficult to apply accurately. Adding finer-scale +/– ratings implies there are data to support their assignments, which is generally not the case. Therefore, to improve the accuracy of the overall list, the USACE decided to drop the +/– suffixes.

Lichvar and Gillrich (2011) provide updated technical definitions of wetland plant indicator status categories as part of the procedures used in updating the NWPL:

- **Obligate Wetland (OBL):** These wetland-dependent plants (herbaceous or woody) require standing water or seasonally saturated soils (14 or more consecutive days) near the surface to assure adequate growth, development, and reproduction and to maintain healthy populations. These plants are of four types:
    - *submerged:* plants that conduct virtually all of their growth and reproductive activity under water.
    - *floating:* plants that grow with the leaves and most often their vegetative and reproductive organs floating on the water surface.
    - *floating-leaved:* plants that are rooted in sediment but also have leaves that float on the water surface.
    - *emergent:* herbaceous and woody plants that grow with their bases submerged and rooted in inundated sediment or seasonally saturated soil and their upper portions, including most of the vegetative and reproductive organs, growing above the water level.
- **Facultative Wetlands (FACW):** These plants depend on and predominantly occur with hydric soils, standing water, or seasonally high water tables in wet habitats for assuring optimal growth, development, and reproduction and for maintaining healthy populations. These plants often grow in geomorphic locations where water saturates soils or floods the soil surface at least seasonally.
- **Facultative (FAC):** These plants can occur in wetlands or non-wetlands. They can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil [hydrogen potential] pH, and elevation, and they have a wide tolerance of soil moisture conditions.
- **Facultative Upland (FACU):** These plants are not wetland dependent. They can grow on hydric and seasonally saturated soils, but they develop optimal growth and healthy populations on predominantly drier or more mesic sites. Unlike FACW plants, these plants are non-wetland plants by habitat preference.

- **Obligate Upland (UPL):** These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.

The following are three procedures for determining hydrophytic vegetation: Indicator 1, "Dominance Test", using the "50/20 Rule"; Indicator 2, "Prevalence Index"; or Indicator 3, "Morphological Adaptation", as identified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). Hydrophytic vegetation is present if any indicator is satisfied. If none of the indicators are satisfied, then hydrophytic vegetation is absent unless (1) indicators of hydric soil and wetland hydrology are present and (2) the site meets the requirements for a problematic wetland situation.

- **Dominance Test:** Vegetative cover is estimated and ranked according to its dominance. Dominant species are the most abundant species for each stratum of the community (i.e., tree, sapling/shrub, herb, or woody vine) that individually or collectively amounts to 50 percent of the total coverage of vegetation plus any other species that, by itself, accounts for 20 percent of the total vegetation cover (also known as the "50/20 Rule"). These species are recorded on the "Wetland Determination Data Form – Arid West Region". The wetlands indicator status of each species is also recorded on the data forms based on the NWPL (Lichvar and Kartesz 2009). If more than 50 percent of the dominant species across all strata are OBL, FACW or FAC species, the criterion for wetland vegetation is considered to be met.
- **Prevalence Index:** The prevalence index considers all plant species in a community, not just the dominant ones. The prevalence index is the average of the wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric code (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and is weighted by the species' abundance (percent cover). Hydrophytic vegetation is present if the prevalence index is 3.0 or less.
- **Morphological Adaptation:** Morphological adaptations, such as adventitious roots (i.e., roots that take advantage of the wet conditions) and shallow root systems, must be observed on more than 50 percent of the individuals of a FACU species for the hydrophytic vegetation wetland criterion to be met.

2.2.2 Soils

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that is formed under conditions of saturation, flooding, or ponding that occurs long enough during the growing season to develop anaerobic conditions (or conditions of limited oxygen) at or near the soil surface and that favor the establishment of hydrophytic vegetation (USDA NRCS 2008). It should be noted that hydric soils created under artificial conditions of flooding and inundation sufficient for the establishment of hydrophytic vegetation would also meet this hydric soils indicator.

The soil conditions are verified by digging test pits along each transect to a depth of at least 20 inches (except where a restrictive layer occurs in areas containing hard pan, cobble, or solid rock). It should be noted that, at some sites, it may be necessary to make exploratory soil test pits up to 40 inches deep to more accurately document and understand the variability in soil properties and hydrologic relationships on the site. Soil test pit locations are usually dug within the drainage invert or at the edge of a drainage course in vegetated areas. Soil extracted from each soil test pit is then examined for texture and color using the standard plates on the Munsell Soil Color Chart (1994) and recorded on the Data Form. The Munsell Soil Color Chart aids in designating soils by color labels based on gradations of three simple variables: hue, value, and chroma. Any indicators of hydric soils, such as the following, are also recorded on the Data Form:

redoximorphic features (i.e., areas where iron is reduced under anaerobic conditions and oxidized following a return to aerobic conditions); buried organic matter; organic streaking; reduced soil conditions; gleyed (i.e., soils having a characteristic bluish-gray or greenish-gray color) or low-chroma soils; or sulfuric odor. If hydric soils are found, progressive pits are dug along the transect moving laterally away from the active channel area until hydric soil features are no longer present in the top 20 inches of the soil.

2.2.3 Hydrology

Wetland hydrology indicators provide evidence that a site has a continuing wetland hydrologic regime. Wetlands hydrology is represented by either (1) all of the hydrological elements or characteristics of areas permanently or periodically inundated or (2) areas containing soils that are saturated for a sufficient duration of time to create hydric soils suitable for the establishment of plant species that are typically adapted to anaerobic soil conditions. The presence of wetland hydrology is evaluated at each intersect by recording the extent of observed surface flows; the depth of inundation; the depth to saturated soils; and the depth to free water in soil test pits. In instances where stream flow is divided into multiple channels with intervening sandbars, the entire area between the channels is considered to be within the “Active Floodplain” and within the OHWM. Therefore, an area containing these features would meet the indicator requirements for wetland hydrology.

3.0 RESULTS

3.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

3.1.1 "Waters of the U.S." Determination (Non-Wetland)

Connectivity to a Traditional Navigable Water

Five separate drainage areas occur on the property.

The largest drainage areas on the property (Drainages 4 and 5) are tributaries[1] of Silverado Creek. Drainages 1 and 3 convey flow to the Baker Canyon drainage, which is a tributary of Silverado Creek. Silverado Creek conveys flow to Santiago Creek, which flows through the Santiago Creek Reservoir, Santiago Creek Recharge Basin, and into the Santa Ana River, which discharges into the Pacific Ocean between Huntington Beach and Newport Beach. Therefore, these Drainages (i.e., 1, 3, 4, and 5) and their tributaries would be considered under the jurisdiction of the USACE.

One drainage feature (Drainage 2) conveys water from a slope in the northwestern corner of the property. Evidence of bed, bank, and OHWM dissipate as the drainage feature runs along a dirt access road. There is no connectivity to a downstream water. This isolated drainage feature would not be considered under the jurisdiction of the USACE.

Limits of "Waters of the U.S."

The limits of non-wetland "waters of the U.S." were defined by the presence of the OHWM. Evidence of an OHWM for the drainages consists of a break in bank slope, change in vegetation cover and average sediment texture, and the presence of drift deposits. Arid West Ephemeral and Intermittent Streams OHWM Datasheets were completed for representative areas within the drainages and are contained in Attachment D.

Results

Based on the field observations and data collected, a total of approximately 0.814 acre of non-wetland "waters of the U.S." occurs on the property (Table 2; Exhibit 5).

[1] "Tributaries" are defined as waters that are characterized by the presence of physical indicators of flow—bed, banks, and OHWM—and that contribute flow directly or indirectly to a traditional navigable water, interstate water, or territorial sea.

TABLE 2
SUMMARY OF JURISDICTIONAL
RESOURCES ON THE PROPERTY

Drainage Area	Amount of Jurisdictional Resources (Acres)			
	USACE	Isolated	RWQCB*	CDFW
Drainage 1	0.082	–	0.082	0.082
Drainage 2	–	0.005	0.005	0.005
Drainage 3	0.036	–	0.036	0.036
Drainage 4	0.514	–	0.514	2.139
Drainage 5	0.182	–	0.182	2.072
Total	**0.814**	**0.005**	**0.819**	**4.334**

USACE: U.S. Army Corps of Engineers; RWQCB: Regional Water Quality Control Board; CDFW: California Department of Fish and Wildlife; –: not present in this drainage.

* RWQCB jurisdictional boundaries are defined as those determined for the USACE under "waters of the U.S."; however, the RWQCB also takes jurisdiction over isolated waters.

3.1.2 Wetlands Determination

No portion of the property exhibited both evidence of hydrophytic vegetation and wetland hydrology. Therefore, soil test pits were not dug.

Vegetation

Vegetation types mapped on the property include southern mixed chaparral, open southern mixed chaparral, California sagebrush scrub, mixed sage scrub, annual grassland, ruderal, southern coast live oak riparian forest, poison oak scrub, and coast live oak woodland. Cliff/rock and disturbed areas are also present. Hydrophytic vegetation was not observed in any drainage feature.

Soils

The southwestern corner of the property has mapped areas of hydric soil. However, this portion of the property does not exhibit evidence of hydrophytic vegetation together with wetland hydrology.

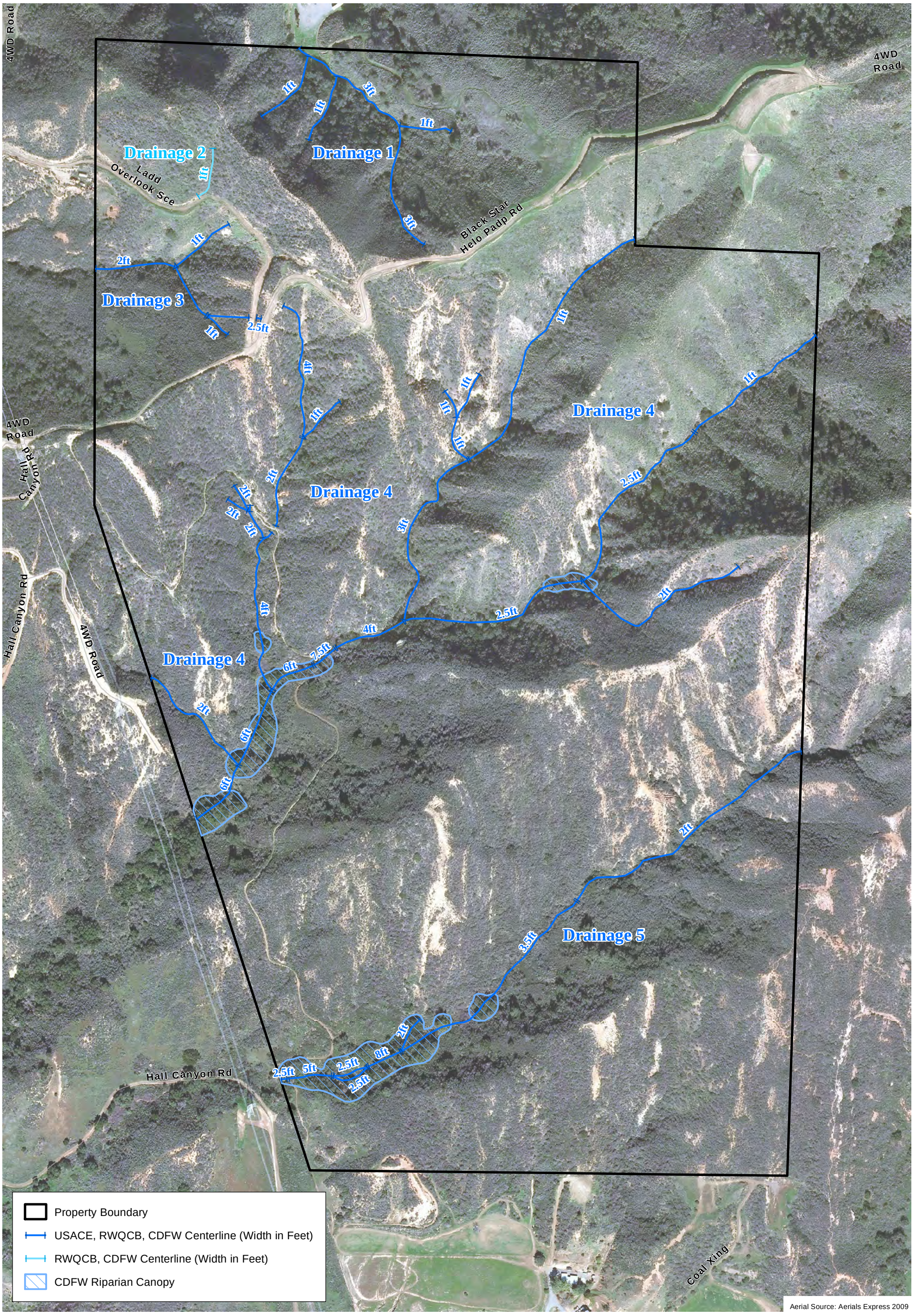
Hydrology

Evidence of wetland hydrology is indistinct throughout all but the largest drainages and consists of areas of drift deposits and drainage patterns.

No wetland "waters of the U.S." are present on the property.

3.2 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD DETERMINATION

The RWQCB has authority to take jurisdiction over the drainages that are also under the jurisdiction of the USACE. In addition, the isolated drainage is also subject to the jurisdiction of the RWQCB. Therefore, a total of approximately 0.819 acre of "waters of the State" under the jurisdiction of the RWQCB (of which 0.005 acre is isolated waters) occurs on the property (Table 2; Exhibit 5).



D:\Projects\OCTAJ008\MXD\MacPherson\JD\Ex_JD_MacPherson_20151009.mxd

Jurisdictional Resources

Exhibit 5

Measure M2 Acquisition Properties Evaluation – MacPherson Property

N W E S

310 155 0 310 Feet

BonTerra PSOMAS

(Rev: 10-20-2015 JAZ) R:\Projects\OCT_OCTA\J008\Graphics\MacPherson\JD\ex5_JD_20151009.pdf

3.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DETERMINATION

The limits of CDFW jurisdiction on the property were mapped according to the top of the stream bank for most drainages; the largest drainage features on the property contained riparian vegetation, and CDFW jurisdiction extends to the outer dripline in these areas. A total of approximately 4.334 acres of waters under the jurisdiction of the CDFW occurs on the property (Table 2; Exhibit 5).

This page intentionally left blank

4.0 CONCLUSION OF REGULATORY APPROVAL PROCESS

4.1 REGULATORY PERMIT REQUIREMENTS

While no modifications to drainages on the property are anticipated at this time, the following is a general summary of the various permits, agreements, and certifications that are expected to be required prior to initiation of future habitat enhancement or restoration activities that would involve impacts to areas under the jurisdiction of the USACE, the RWQCB, and/or the CDFW:

- USACE Section 404 Permit;
- RWQCB Section 401 Water Quality Certification; and
- CDFW Section 1602 Notification of Lake or Streambed Alteration.

It should be noted that all regulatory permit applications can be processed concurrently. The USACE Section 404 Permit would be issued subject to the receipt of the RWQCB's Section 401 Water Quality Certification.

4.1.1 U.S. Army Corps of Engineers

Regulatory authorization from the USACE may be in the form of a Nationwide Permit (NWP) or an Individual Permit (IP), depending on the nature and amount of impacts to jurisdictional waters. The current set of NWPs became effective on March 19, 2012, and will expire in on March 18, 2017. NWPs authorize only those activities with minimal adverse effects on the aquatic environment and are valid only if the conditions applicable to the permits are met or waivers to these conditions are provided in writing from the USACE. One or more NWPs may be appropriate for future project activities. Note that NWPs do not authorize stream channelization or conversion of natural wetlands or streams except for relocation activities. There is no filing fee for the Section 404 Permit.

4.1.2 Regional Water Quality Control Board

As noted above, issuance of the USACE Section 404 Permit would be contingent upon the approval of a Section 401 Water Quality Certification from the Santa Ana RWQCB. Also, the RWQCB requires certification of a project's California Environmental Quality Act (CEQA) documentation before it will approve the Section 401 Water Quality Certification or ROWD. The RWQCB, as a responsible agency, will use the project's CEQA document to satisfy its own CEQA-compliance requirements.

The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications. The notification/application for a CWA Section 401 Water Quality Certification must also address compliance with the Basin Plan. Please note that the application would also require the payment of an application fee, which would be based on project impacts.

4.1.3 California Department of Fish and Wildlife

Prior to construction, a Notification of Lake or Streambed Alteration (LSA) must be submitted to the CDFW that describes any proposed streambed alteration that a project might cause. If an LSA is required, the CDFW may want to conduct an on-site inspection.

In addition to the formal application materials and the fee, a copy of the appropriate environmental document (e.g., a Mitigated Negative Declaration) should be included in the submittal consistent with CEQA requirements. The CDFW will not deem the application complete until the application fees have been paid and the agency is provided with a certified CEQA document and a signed copy of the receipt of County Clerk filing fees for the Notice of Determination (NOD).

4.2 RECOMMENDATIONS

Based on the conclusions of this Jurisdictional Delineation Report, the following recommendations are identified:

1. If jurisdictional resources would be impacted in the future, a pre-application meeting with USACE, USFWS, CDFW, and RWQCB staff is recommended to discuss site conditions; biological and jurisdictional resources; the project; impacts to these resources resulting from the project; proposed minimization measures and the mitigation program to offset these impacts; and the regulatory permitting process, including the decision to prepare and submit an Approved Jurisdictional Determination or a Preliminary Jurisdictional Determination. The USACE is expected to approve a Preliminary Jurisdictional Determination given the extent of project impacts and the length of project construction.
2. The preparation and processing of a USACE Section 404 Permit; an RWQCB Section 401 Water Quality Certification; and a CDFW Section 1602 Notification of Lake or Streambed Alteration; and the appropriate jurisdictional determination form approved by the USACE is recommended.
3. It is recommended that the OCTA consider long-term permits for recurring maintenance activities such as a Routine Maintenance Streambed Alteration Agreement from the CDFW that covers long-term operation and maintenance activities. If habitat enhancement or restoration activities are planned for any of the mitigation properties, the California Rapid Assessment Method (CRAM) may be utilized as an evaluation tool to measure the success of these efforts. Metrics that may see a scoring increase as a result of enhancement activities include the number of co-dominant species, percent of invasive species, and vertical biotic structure.

5.0 REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States* (Version 04DEC1998). Washington, D.C.: U.S. Fish and Wildlife Service. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm.

Curtis, K.E. and R.W. Lichvar. 2010 (July). *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual* (Technical Report Y-87-1). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Lichvar, R.W. and J.J. Gillrich. 2011 (September). *Final Protocol for Assigning Wetland Indicator Status Ratings during National Wetland Plant List Update*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Lichvar, R.W. and J.T. Kartesz. 2009. *North American Digital Flora: National Wetland Plant List, Version 2.4.0*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory and Chapel Hill, NC: Biota of North America. https://wetland_plants.usace.army.mil.

Lichvar, R.W. and S.M. McColley. 2008 (August). *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual*. Hanover, NH: USACE, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Munsell Color. 1994. Munsell Soil Color Charts. New Windsor, NY: Kollmorgen Instruments Corp.

Reed, P.B., Jr. 1988. *National List of Plant Species That Occur In Wetlands: National Summary* (Biological Report 88 [24]). Washington, D.C.: USFWS.

Regional Water Quality Control Board (RWQCB). 1995 (January 24, updated February 2008). *Water Quality Control Plan: Santa Ana River Basin (8)*. Riverside, CA: Santa Ana RWQCB.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). (Accessed 2015). Web Soil Survey [Information for the MacPherson Property, Survey Area Data v. 8, September 19, 2014] Lincoln, NE: USDA NRCS. http://websoilsurvey.nrcs.usda.gov/.

———. 2014. Hydric Soils: National List – 2014 (Excel document). Washington, D.C.: USDA, NRCS. http://soils.usda.gov/use/hydric/index.html.

———. 2008 (August 28, last modified). Hydric Soils – Introduction. Washington, D.C.: USDA NRCS. http://soils.usda.gov/use/hydric/intro.html.

U.S. Fish and Wildlife Service 2015. Wetland Mapper [Information for the Aliso Canyon Property]. Washington D.C.: USFWS, National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html.

ATTACHMENT A

SUMMARY OF REGULATORY AUTHORITY

REGULATORY AUTHORITY

This attachment summarizes the regulatory authority of the U.S. Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW) over activities that have potential to impact jurisdictional resources.

U.S. Army Corps of Engineers

The USACE Regulatory Branch regulates activities that discharge dredged or fill materials into "waters of the U.S." under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. This permitting authority applies to all "waters of the U.S." where the material (1) replaces any portion of "waters of the U.S." with dry land or (2) changes the bottom elevation of any portion of any "waters of the U.S.". These fill materials would include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in these waters.

Waters of the United States

"Waters of the U.S." can be divided into three categories: territorial seas, tidal waters, or non-tidal waters. The term "waters of the U.S." is defined by the *Code of Federal Regulations*[1] (CFR) and includes:

1. All waters that have, are, or may be used in interstate or foreign commerce (including sightseeing or hunting), including all waters subject to the ebb and flow of the tide (i.e., Traditional Navigable Waters [TNWs]).
2. All interstate waters including interstate wetlands.
3. All other waters such as intrastate lakes, rivers, or streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds where the use, degradation, or destruction of which could affect interstate or foreign commerce.
4. All impoundments of waters otherwise defined as "waters of the U.S." under the definition.
5. All tributaries of waters identified above.
6. The territorial seas.
7. All wetlands adjacent to waters (other than waters that are themselves wetlands) identified above.

On June 19, 2006, a majority of the U.S. Supreme Court overturned two Sixth Circuit Court of Appeals decisions, finding that certain wetlands constituted "waters of the U.S." under the CWA. In his plurality opinion, Justice Scalia argued that "waters of the U.S." should not include channels through which water flows intermittently or ephemerally or channels that periodically provide drainage for rainfall. He also stated that a wetland may not be considered "adjacent to" remote "waters of the U.S." based on a mere hydrologic connection. Justice Kennedy authored a separate concurring opinion concluding that wetlands are "waters of the U.S." if they, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as "navigable". Lacking a majority opinion, regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's "significant nexus" standard is satisfied. On June 5, 2007, the

[1] Specifically, Title 33, Navigation and Navigable Waters; Part 328, Definition of waters of the United States; §328.3, Definitions.

USACE published a memorandum that provides guidance to both the U.S. Environmental Protection Agency (USEPA) regions and the USACE districts that implement the Supreme Court's decision in the Rapanos cases (which address the jurisdiction over "waters of the U.S." under the CWA).[2]

In summary, the USACE and the USEPA will assert jurisdiction over the following waters: (1) TNWs; (2) wetlands adjacent to a TNW; (3) relatively permanent, non-navigable tributaries of a TNW that typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and (4) wetlands that directly abut such tributaries.

The USACE and the USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW: (1) non-navigable tributaries that are not relatively permanent; (2) wetlands adjacent to non-navigable tributaries that are not relatively permanent; and (3) wetlands adjacent to, but that do not directly abut, a relatively permanent, non-navigable tributary.

The USACE and the USEPA will apply the significant nexus standard based on the following:[3]

1. A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs.
2. A significant nexus includes consideration of hydrologic and ecological factors.

The USACE and the USEPA generally will not assert jurisdiction over the following features: (1) swales or erosional features (e.g., gullies or small washes characterized by low volume, infrequent, or short duration flow) and (2) ditches (including roadside ditches) excavated wholly within and draining only into uplands and that do not carry a relatively permanent flow of water.

Ordinary High Water Mark

The landward limit of tidal "waters of the U.S." is the high-tide line. In non-tidal waters where adjacent wetlands are absent, the lateral limits of USACE jurisdiction extend to the ordinary high water mark (OHWM).[4] The OHWM is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas".[5] When wetlands are present, the lateral limits of USACE jurisdiction extend beyond the OHWM to the limits of the adjacent wetlands.[6]

Wetlands

A wetland is a subset of jurisdictional waters and is defined by the USACE and the USEPA as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of

---

2 Consolidated cases: *Rapanos v. United States* and *Carabell v. United States* refer to the U.S. Supreme Court's decision concerning USACE jurisdiction over "waters of the U.S." under the CWA.

3 U.S. Army Corps of Engineers and Environmental Protection Agency (USACE and USEPA). 2015 (June 29). Clean Water Rule: Definition of "Waters of the United States". *Federal Register* 80(124): 37054–37127. Washington, D.C.: USACE and USEPA.

4 U.S. Army Corps of Engineers (USACE). 2005 (December 7). Regulatory Guidance Letter. Ordinary High Water Mark Identification. Washington, D.C.: USACE.

5 33 CFR §328.3(e)

6 USACE 2005

vegetation typically adapted for life in saturated soil conditions".[7] Wetlands generally include swamps, marshes, bogs, and areas containing similar features.

The definition and methods for identifying wetland resources can be found in the USACE's *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*,[8] a supplement to the USACE's *Corps of Engineers Wetlands Delineation Manual*.[9] Both the 1987 Wetlands Manual and the Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of wetland "waters of the U.S.". Pursuant to these manuals, a three-parameter approach is used to identify wetlands and requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils. In order to be considered a wetland, an area must exhibit one or more indicators of all three of these parameters. However, problem areas may periodically or permanently lack certain indicators for reasons such as seasonal or annual variability of rainfall, vegetation, and other factors. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement.

Section 404 Permit

Except as specified in Section 323.4 of the CFR, impacts to "waters of the U.S." require a Section 404 Permit. Permit authorization may be in the form of (1) a "general permit" authorizing a category of activities in a specific geographical region or nationwide or (2) an "individual permit" (IP) following a review of an individual application form (to be obtained from the district office having jurisdiction over the waters in which the activity is proposed to be located).

Regulatory authorization in the form of a Nationwide Permit (NWP) is provided for certain categories of activities such as repair, rehabilitation, or replacement of a structure or fill which was previously authorized; utility line placement; or bank stabilization. The current set of NWPs became effective on March 19, 2012, and will expire in on March 18, 2017. NWPs authorize only those activities with minimal adverse effects on the aquatic environment and are valid only if the conditions applicable to the permits are met or waivers to these conditions are provided in writing from the USACE. Please note that waivers may require consultation with affected federal and State agencies, which can be a lengthy process with no mandated processing time frames. Certain activities do not require submission of an application form, but may require a separate notification. If the NWP conditions cannot be met, an IP will be required. "Waters of the U.S." temporarily filled, flooded, excavated, or drained but restored to pre-construction contours and elevations after construction are not included in the measurement of loss of "waters of the U.S.". The appropriate permit authorization will be based on the amount of impacts to "waters of the U.S.", as determined by the USACE. There is no filing fee for the Section 404 Permit.

Approximately three or four months are typically required to process a routine permit application; large or complex activities may take longer to process. When a permit application is received, it will be assigned an identification number and reviewed for completeness by the District Engineer. If an application is incomplete, additional information will be requested within 15 days of receipt of the application. If an application is complete, the District Engineer will issue a public notice within 15 days unless specifically exempted by provisions of the CFR. Public comments will be accepted no more than 30 days but not less than 15 days from the date of public notice; these will become part of the administrative record of the application. Generally, the District Engineer will decide on the application no later than 60 days after receipt of the completed application.

---

7 33 CFR §328.3(b)

8 USACE. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

9 Environmental Laboratory. 1987. Cor*ps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1)*. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Additional permit situations may increase the permit processing time (e.g., projects involving Section 401 Water Quality Certification, coastal zone management consistency, historic properties, federal projects, and Endangered species). The Project Applicant will be given time, not to exceed 30 days, to respond to requests of the District Engineer.

On January 31, 2007, the USACE published a memorandum clarifying the Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) implementing regulations.[10] The Interim Guidance applies to all Department of the Army requests for authorization/verification, including IPs (standard permits and letters of permission) and all Regional General Permits (RGPs) and NWPs. The State or Tribal Historic Preservation Officer (SHPO/THPO) has 30 days to respond to a determination that a proposed activity, which otherwise qualifies for an NWP or an RGP, has no effect or no adverse effect on a historic property. If the SHPO/THPO does not respond within 30 days of notification, the Los Angeles District may proceed with verification. If the SHPO/THPO disagrees with the District's determination, the District may work with the SHPO/THPO to resolve the disagreement or request an opinion from the ACHP. The USACE will submit the Draft Jurisdictional Delineation Report to the SHPO/THPO for review prior to initiating the actual regulatory process.

Please note that if the USACE determines that the drainages are jurisdictional and would be impacted by project implementation, the Applicant will be required to obtain a CWA Section 401 Water Quality Certification from the RWQCB before the USACE will issue the Section 404 Permit. If the USACE determines that the impacted drainage is not jurisdictional, the Applicant will be required to obtain RWQCB authorization under the provisions of a Report of Waste Discharge (ROWD).

Jurisdictional Determinations

Pursuant to USACE Regulatory Guidance Letter (RGL) 08-02 (dated June 26, 2008), the USACE can issue two types of jurisdictional determinations to implement Section 404 of the CWA: Approved Jurisdictional Determinations and Preliminary Jurisdictional Determinations.[11] An Approved Jurisdictional Determination is an official USACE determination that jurisdictional "waters of the U.S.", "Navigable Waters of the U.S.", or both are either present or absent on a site. An Approved Jurisdictional Determination also identifies the precise limits of jurisdictional waters on a project site.

The USACE will provide an Approved Jurisdictional Determination when (1) an Applicant requests an official jurisdictional determination; (2) an Applicant contests jurisdiction over a particular water body or wetland; or (3) when the USACE determines that jurisdiction does not exist over a particular water body or wetland. The Approved Jurisdictional Determination then becomes the USACE's official determination that can then be relied upon over a five-year period to request regulatory authorization as part of the permit application.

In addition, an Applicant may decline to request an Approved Jurisdictional Determination and instead obtain a USACE IP or General Permit Authorization based on a Preliminary Jurisdictional Determination or, in certain circumstances (e.g., authorizations by non-reporting nationwide general permits), with no Jurisdictional Determination.

Preliminary Jurisdictional Determinations are non-binding, advisory in nature, and may not be appealed. They indicate that there may be "waters of the U.S." on a project site. An Applicant may elect to use a Preliminary Jurisdictional Determination to voluntarily waive or set aside questions

[10] USACE. 2007 (January 31). Memorandum: Interim Guidance for Amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) Implementing Regulations. Washington, D.C.: USACE.

[11] USACE. 2008b (June 26). Regulatory Guidance Letter. Jurisdictional Determinations. Washington, D.C.: USACE.

regarding CWA jurisdiction over a site, usually in the interest of expediting the permitting process. The USACE will determine what form of Jurisdictional Determination is appropriate for a particular project site.

The USACE Regulatory Branch Offices will coordinate with the USEPA Regional Office and USACE Headquarters (HQ), as outlined in its January 28, 2008, memorandum entitled "Process for Coordinating Jurisdictional Determinations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the *Rapanos* and *SWANCC* Supreme Court Decisions".[12] The guidance provided in this memorandum is quoted as follows:

1. Effective immediately, unless and until paragraph 5(b) of the June 5, 2007, Rapanos guidance coordination memorandum is modified by a joint memorandum from Army and EPA, we will follow these procedures:
    a. For jurisdictional determinations involving significant nexus determinations, USACE districts will send copies of draft jurisdictional delineations via e-mail to appropriate EPA regional offices. The EPA regional office will have 15 calendar days to decide whether to take the draft jurisdictional delineation as a special case under the January 19, 1989, "Memorandum of Agreement Between the Department of the Army and the USEPA Concerning the Determination of the Section 404 Program and the Application of the Exceptions under Section 404(f) of the Clean Water Act." If the EPA regional office does not respond to the district within 15 days, the district will finalize the jurisdictional determination.
    b. For jurisdictional determinations involving isolated waters determinations, the agencies will continue to follow the procedure in paragraph 5(b) of June 5, 2007, coordination memorandum, until a new coordination memorandum is signed by USACE and EPA. (In accordance with paragraph 6 of the June 5, 2007, coordination memorandum, this is a 21-day timeline that can only be changed through a joint memorandum between agencies).
2. Approved JDs are not required for non-reporting NWPs, unless the project proponent specifically requests an approved JD. For proposed activities that may qualify for authorization under a State Programmatic General Permit (SPGP) or RGP, an approved JD is not required unless requested by the project proponent.
3. The USACE will continue to work with EPA to resolve the JDs involving significant nexus and isolated waters determinations that are currently in the elevation process.
4. USACE districts will continue posting completed Approved JD Forms on their web pages.

Regional Water Quality Control Board

The RWQCB is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The RWQCB's jurisdiction extends to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated).

[12] USACE. 2008c (January 28). *Memorandum for Commander, Major Subordinate Commands and District Commands. Process for Coordinating Jurisdictional Determinations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the Rapanos and SWANCC Supreme Court Decisions.* Washington, D.C.: USACE.

Section 401 of the CWA provides the RWQCB with the authority to regulate, through a Water Quality Certification, any proposed, federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the USACE pursuant to Section 404 of the CWA. Section 401 requires the RWQCB to provide certification that there is reasonable assurance that an activity which may result in discharge to navigable waters will not violate water quality standards. Water Quality Certification must be based on a finding that the proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the nine RWQCBs' Basin Plans.

The Porter-Cologne Act provides the State with very broad authority to regulate "waters of the State" (which are defined as any surface water or groundwater, including saline waters). The Porter-Cologne Act has become an important tool in the post-SWANCC (Solid Waste Agency of Northern Cook Counties vs. Unites States Army Corps of Engineers) and Rapanos era with respect to the State's authority over isolated waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file an ROWD when there is no federal nexus, such as under Section 404(b)(1) of the CWA. Although "waste" is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

Section 401 Water Quality Certification

Issuance of the USACE Section 404 Permit would be contingent upon the approval of a Section 401 Water Quality Certification from the RWQCB. Also, the RWQCB requires certification of the project's California Environmental Quality Act (CEQA) documentation before it will approve the Section 401 Water Quality Certification or ROWD. The RWQCB, as a responsible agency, will use the project's CEQA document to satisfy its own CEQA-compliance requirements.

Upon acceptance of a complete permit application, the RWQCB has between 60 days and one year to make a decision regarding the permit request. This is compliant with USACE regulations, which indicate that the RWQCB has 60 days from the date of receipt of a completed application that requests water quality certification to make a decision.[13] The RWQCB has the option of issuing a "Denial Without Prejudice", which does not mean that the request is denied, but that it requires more information in order to make a decision. This effectively stops the processing clock until this information is provided.

The RWQCB is required under the *California Code of Regulations* (CCR) to have a "minimum 21 day public comment period" before any action can be taken on the Section 401 application.[14] This period closes when the RWQCB acts on the application. Since projects often change or are revised during the Section 401 permit process, the comment period can remain open. The public comment period starts as soon as an application has been received. Generally, the RWQCB Section 401, USACE Section 404, and CDFW Section 1602 permit applications are submitted at the same time. However, the RWQCB Section 401 Water Quality Certification may take longer to process.

The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications. The notification/application for a CWA Section 401 Water Quality Certification must also address compliance with the Basin Plan. Please note that filing an

[13] 33 CFR §325.2(b)(1)(ii)
[14] 23 CCR §3858(a)

application would also require the payment of an application fee, which would be based on project impacts.

California Department of Fish and Wildlife

The CDFW has jurisdictional authority over wetland resources associated with rivers, streams, and lakes pursuant to the *California Fish and Game Code*.[15] Activities of State and local agencies as well as public utilities that are project proponents are regulated by the CDFW under Section 1602 of the *California Fish and Game Code.* This section regulates any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The CDFW jurisdictional limits are not as clearly defined by regulation as those of the USACE. While they closely resemble the limits described by USACE regulations, they include riparian habitat supported by a river, stream, or lake regardless of the presence or absence of hydric and saturated soils conditions. In general, the CDFW takes jurisdiction from the top of a stream bank or to the outer limits of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place within or in the vicinity of a river, stream, lake or within or in the vicinity of tributaries to a river, stream, or lake. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish and other aquatic plant and/or wildlife species. It also includes watercourses that have a surface or subsurface flow that support or have supported riparian vegetation.

Section 1602 Notification of Lake or Streambed Alteration

The CDFW enters into a Lake or Streambed Alteration Agreement (LSAA) with a project proponent in order to ensure protection of wildlife and habitat values and acreages. The notification process involves the completion of an application, which will serve as the basis for the CDFW's issuance of a Section 1602 LSAA. Section 1602 of the *California Fish and Game Code* applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State.

The LSAA must address the initial construction and long-term operation and maintenance of any structures (such as a culvert or a desilting basin) included in the project design that are located within any river, stream, or lake.

Prior to construction, a Notification (an LSAA application) must be submitted to the CDFW that describes any proposed streambed alteration that would occur with implementation of the project. In addition to the formal application materials and the fee, a copy of the appropriate environmental document (e.g., a Mitigated Negative Declaration) should be included in the submittal, consistent with CEQA requirements. The CDFW will prepare a draft LSAA, which will include standard measures to protect sensitive plant and wildlife resources during project construction and during ongoing operation and maintenance of any project element that occurs within a CDFW jurisdictional area.

If an LSAA is required, the CDFW may want to conduct an on-site inspection. The CDFW then prepares a draft Agreement, which will include measures to protect fish and wildlife resources that will be directly or indirectly impacted by project construction. The draft Agreement must be transmitted to the Applicant within 60 calendar days of the CDFW's determination that the

[15] See §§1600–1616.

notification is complete. It should be noted that the 60-day timeframe might not apply to long-range agreements.

Following receipt of a draft LSAA from the CDFW, the Applicant has 30 calendar days to notify the CDFW concerning the acceptability of the proposed terms, conditions, and measures. If the Applicant agrees with these terms, conditions and measures, the Agreement must be signed and returned to the CDFW. The Agreement becomes final once the CDFW executes it and an LSAA is issued. Please note that all application fees must be paid, and the final certified CEQA documentation must be provided prior to the CDFW's execution of the Agreement.

If the CDFW does not respond in writing concerning the completeness of the Notification within 30 days of its submittal, the Notification automatically becomes complete. If the CDFW does not submit a draft LSAA to the Applicant within 60 days of the determination of a completed Notification package, the CDFW will issue a letter that either (1) identifies the final date to transmit a draft LSAA or (2) indicates that an LSAA was not required. The CDFW will also indicate that it was unable to meet this mandated compliance date and that, by law, the Applicant is authorized to complete the project without an LSAA as long as the Applicant constructs the project as proposed and complies with all avoidance, minimization, and mitigation measures described in the submitted Notification package. Please note that if the project requires revisions to the design or project construction, the CDFW may require submittal of a new Notification/application with an additional 90-day permit process.

ATTACHMENT B

LITERATURE REVIEW DETAILS

This attachment provides detailed results of the literature review.

SOIL SERIES

The description identified below was obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS).[1]

Anaheim Series

The Anaheim series is a fine-loamy, mixed, superactive, thermic Pachic Haploxeroll. It consists of well-drained, moderately deep soils over weathered, fine-grained sandstone and shale. Anaheim soils are on foothills and formed in material weathered from fine-grained sandstone or shell.[2] The mean annual precipitation is about 16 inches and the mean annual air temperature is about 61 degrees Fahrenheit (°F).

Range in Characteristics

Depth to a paralithic contact ranges from 20 to 40 inches. Usually the soil between depths of 5 to 15 inches is continuously dry in all parts from late April or May until late October or November and is moist in some parts all the rest of the year. The mean annual soil temperature at a depth of 20 inches is 60°F to 65°F, and the soil temperature is usually not below 47°F at any time. In some pedons, a few vertical cracks up to ¼ inch wide occur to a depth of 20 inches or more, but slickensides are absent.

The A horizon is brown, grayish brown, or dark grayish brown in 10YR hue. It has 1 to 3 percent organic matter to a depth of more than 20 inches. This horizon ranges from slightly acidic to slightly alkaline.

The Cr horizon is weathered sandstone or shale or both. It lacks lime coatings on the upper fracture faces in some pedons.

Drainage and Permeability

Anaheim soils are well drained, have rapid to very rapid runoff, and have moderate to moderately slow permeability.

Cieneba Series

The Cieneba series is a loamy, mixed, superactive, nonacid, thermic, shallow Typic Xerorthent. It consists of very shallow and shallow, somewhat excessively drained soils that formed in material weathered from granitic rock. Cieneba soils are on uplands and have slopes of 9 to 85 percent. The mean annual precipitation is about 25 inches, and the mean annual temperature is 60°F.

Range in Characteristics

Depth to a paralithic contact is 4 to 20 inches. Soil below a depth of about 4 to 6 inches usually is moist all of the time after November until sometime in May. It is dry the rest of the time. The mean annual soil temperature just above the weathered rock is 59°F to 65°F. Fragments larger than 2 millimeters (mm) make up 0 to 35 percent of the soil. The soil is neutral to strongly acidic, though

[1] U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2015 (June 8, access date). Official Soil Series Descriptions by List of Series Names (with FTP Option) [Information for Soils Mapped on the Property]. Lincoln, NE: USDA NRCS. https://soilseries.sc.egov.usda.gov/osdlist.asp.

[2] This most likely refers to “shale”.

moist pedons have slight or medium acidity. It is coarse sandy loam, gravelly sandy loam, light loam, or gravelly light loam and has less than 18 percent clay throughout the profile. The amount of coarse and very coarse sand is 15 to 25 percent. Organic matter content is less than 1 percent below a depth of about one inch to about four inches.

The A horizon is dark grayish brown to light brown (10YR 4/2, 4/3, 5/2, 5/3, 6/2, 6/3; 7.5YR 5/2, 6/4). Dry values of four or five extend to a depth of one to five inches in protected pedons that have not been burned or eroded.

Drainage and Permeability

Cieneba soils are somewhat excessively drained with low to medium runoff and moderately rapid permeability in the soil, but with much slower permeability in the weathered granite.

Myford Series

The Myford series is a fine-loamy, mixed, superactive, thermic Typic Palexeralf. It consists of deep, moderately well-drained soils formed on terraces. The mean annual precipitation is about 16 inches, and the mean annual air temperature is about 62°F.

Range in Characteristics

The solum ranges from 45 to 75 inches thick. Mean annual soil temperature at a depth of 20 inches is 60°F to 63°F. The soil between depths of about 5 and 15 inches is usually moist in some part from about November 15 until late May, and is continuously dry the rest of the year.

The A horizon is pinkish gray or light brown, light brownish gray, pale brown, grayish brown, or brown in 7.5YR or 10YR hue. It is sandy loam or fine sandy loam. This horizon has weak structure or is massive and ranges from strongly acidic to slightly acidic. The A3 horizon is one unit higher in value than the A1 horizon.

The Bt horizon is brown, dark brown, or yellowish brown in 7.5YR or 10YR hue. It is sandy clay or heavy clay loam in the upper part and sandy clay loam or clay loam in the lower part and averages 28 to 30 percent clay in the entire horizon. The upper boundary of the Bt horizon is abrupt, and the clay increase from the A horizon to the Bt horizon is 18 to 28 percent. This horizon has a prismatic or angular, blocky structure. It ranges from having medium acidity to being moderately alkaline in the upper part and is moderately alkaline in the lower part. Exchangeable sodium is 15 to 35 percent below a depth of one meter.

Drainage and Permeability

Myford soils are moderately well drained, have medium to rapid runoff, and have very slow permeability.

Soper Series

The Soper series is a fine-loamy, mixed, superactive, thermic Typic Argixeroll. It consists of moderately deep, well-drained soils that formed in material weathered from conglomerate and sandstone. Soper soils are on hills and uplands and have slopes of 15 to 50 percent. The mean annual precipitation is about 18 inches, and the mean annual air temperature is about 60°F.

Range in Characteristics

Depth to a paralithic contact is 24 to 40 inches. The mean annual soil temperature is 60°F to 65°F at 20 inches deep, and the soil temperature usually is not below 47°F at any time. The soil between depths of about 6 and 16 inches is continuously dry in all parts from late April or May until late October or November and is usually moist in some part for the rest of the year.

The A horizon is grayish brown, dark grayish brown, or brown in 10YR hue. It is loam or less commonly sandy loam, and is commonly gravelly or cobbly with 0 to 20 percent rock fragments by volume. The horizon usually has weak or moderate granular or subangular blocky structure and is slightly hard or hard. In some pedons, it is massive in some part and slightly hard. The A horizon contains neutral to medium acidity. It contains 1 to 4 percent organic matter to depth of about 10 inches, and the amount decreases regularly to less than 1 percent at a depth of about 15 inches.

The B2t horizon is brown, dark brown, or light yellowish brown in 10YR or 7.5YR hue or reddish brown in 5YR hue. It is gravelly or cobbly clay loam or gravelly or cobbly sandy clay loam, and has 25 to 35 percent clay. This horizon is slightly acidic to mildly alkaline. Some pedons have horizons transitional to the B2t horizon and have either or both Bl or B3 horizons. Some pedons have a C horizon above the paralithic contact that is gravelly or cobbly loam or gravelly or cobbly sandy loam.

Drainage and Permeability

Soper soils are well drained, have rapid runoff, and have moderately slow permeability.

NATIONAL WETLANDS INVENTORY

The following resources are mapped on the property:

- **R: System RIVERINE.** The Riverine System includes all wetlands and deep-water habitats contained in natural or artificial channels which periodically or continuously contain flowing water or which form a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.
    - **4: Subsystem INTERMITTENT.** This Subsystem includes channels that contain flowing water only part of the year, but may contain isolated pools when the flow stops.
        - **SB: Class STREAMBED.** Includes all wetlands within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide.
            - **L: Water Regime TEMPORARY FLOODED.** Surface water is present for brief periods during growing season, but the water table usually lies well below the soil surface for most of the growing season. Plants that grow both in uplands and wetlands may be characteristic of this water regime.

- **P: System PALUSTRINE.** The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, emergents, mosses, or lichens and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 part per trillion (ppt). Wetlands lacking such vegetation are also included if they (1) are less than 8 hectares (20 acres); (2) do not have an active wave-formed or bedrock shoreline feature; (3) have, at low water, a depth of less than 6.6 feet in the deepest part of the basin; and (4) have salinity due to ocean-derived salts of less than 0.5 ppt.

    - **FO: Class FORESTED.** This Class is characterized by woody vegetation that is 6 meters (20 feet) tall or taller.
    - **SS: Class SCRUB-SHRUB.** This Class includes areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.
        - **C: Water Regime Modifier SEASONALLY FLOODED.** Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

BASIN PLAN BENEFICIAL USES

The *Water Quality Control Plan: Santa Ana River Basin (8)* (Basin Plan) identifies a number of beneficial uses, some or all of which may apply to a specific hydrologic subarea (HSA), including Municipal and Domestic Water Supply (MUN) waters; Agricultural Supply (AGR) waters; Industrial Service Supply waters (IND); Industrial Process Supply (PROC) waters; Groundwater Recharge (GWR) waters; Navigation (NAV) waters; Hydropower Generation (POW) waters; Water Contact Recreation (REC1) waters; Non-Contact Water Recreation (REC2) waters; Commercial and Sport Fishing (COMM) waters; Warm Fresh Water Habitat (WARM) waters; Limited Warm Water Habitat (LWARM) waters; Cold Fresh Water Habitat (COLD) waters; Preservation of Biological Habitats of Special Significance (BIOL) waters; Wildlife Habitat (WILD) waters; Rare, Threatened or Endangered Species (RARE) waters; Spawning, Reproduction and Development (SPWN) waters; and Estuarine Habitat (EST) waters. Beneficial uses associated with Silverado Creek are described in detail below; beneficial uses not described below do not apply to the property.

- MUN waters support community, military, or individual water supply systems including, but not limited to, drinking water supply.
- GWR waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting saltwater intrusion into freshwater aquifers.
- REC1 waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, whitewater activities, fishing, and use of natural hot springs. Please note that while this beneficial use designation is assigned to surface water bodies in this region, it should not be construed as encouraging recreational activities.
- REC2 waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities. Please note that while this

beneficial use designation is assigned to surface water bodies in this region, it should not be construed as encouraging recreational activities.

- WARM waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife (including invertebrates).
- WILD waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

This page intentionally left blank

ATTACHMENT C

DATASHEETS DESCRIBING OVERALL CONDITIONS OF JURISDICTIONAL WATERS

Jurisdictional Delineation Summary Datasheet

Project/Task No.	Project Name
30CT000801/2	MacPherson Property
Field Staff	**Date**
A Rudalevige, T Hartwig	7/8/15

Feature ID	Drainage 4
Preliminary Jurisdictional Status[1]	USACE, CDFW, RWQCB
Potential Wetland (y/n)[2]	no
Hydrologic Indicators	drift deposits
Wetland Plant Indicators	none
Preliminary Hydrologic Regime[3]	ephemeral or intermittent
Surface Water Present (y/n), Depth	no
OHWM Width(s)	varies 1' to 7.5'
CDFW Width(s)	varies based on riparian canopy
Side Slope Estimate[4]	mostly vertical
Characteristic Vegetation[5]	upland (chaparral and CSS species)
Chemical Indicators[6]	Unknown
Anthropogenic Modifications[7]	trail crosses
Surrounding Land Use	undeveloped open space
Other Notes	major onsite drainage w/ multiple smaller tributaries.

[1] USACE/Isolated Water/CDFW.
[2] Note if wetland plants/hydrology present; if both present, proceed to dig soil test pit and fill out Wetland Determination Data Form.
[3] Hydrology is **ephemeral** when it occurs only during and immediately following precipitation; **intermittent** if occurs for extended period of time, e.g., due to groundwater influence; and **perennial** if flow is year-round. **Nuisance** flow varies and is a function of anthropogenic influences; can be in addition to natural flow.
[4] Percent slope, degrees, rise over run, or qualitative description.
[5] Describe vegetation within and surrounding drainage/waterbody – herbaceous wetland/shrubland, riparian woodland/forest, upland, etc.
[6] Describe any chemical influences on waters – e.g., potential toxics from road, oil film observed.
[7] Describe any anthropogenic modifications to channel – e.g., artificial channel, riprap, concrete banks, culverts, storm drains.

Jurisdictional Delineation Summary Datasheet

Project/Task No.	Project Name
30CT000801 /2	MacPherson Property
Field Staff	**Date**
APrudalevige, THartwig	7/8/15

Feature ID	Drainage 5
Preliminary Jurisdictional Status[1]	USACE, CDFW, RWQCB
Potential Wetland (y/n)[2]	no
Hydrologic Indicators	drift deposits
Wetland Plant Indicators	none
Preliminary Hydrologic Regime[3]	ephemeral or intermittent
Surface Water Present (y/n), Depth	no
OHWM Width(s)	varies 2' to 8'
CDFW Width(s)	varies based on riparian canopy
Side Slope Estimate[4]	gently sloping
Characteristic Vegetation[5]	upland; oak riparian canopy
Chemical Indicators[6]	unknown
Anthropogenic Modifications[7]	trail crosses
Surrounding Land Use	open space
Other Notes	major onsite drainage with multiple smaller tributaries

[1] USACE/Isolated Water/CDFW.
[2] Note if wetland plants/hydrology present; if both present, proceed to dig soil test pit and fill out Wetland Determination Data Form.
[3] Hydrology is **ephemeral** when it occurs only during and immediately following precipitation; **intermittent** if occurs for extended period of time, e.g., due to groundwater influence; and **perennial** if flow is year-round. **Nuisance** flow varies and is a function of anthropogenic influences; can be in addition to natural flow.
[4] Percent slope, degrees, rise over run, or qualitative description.
[5] Describe vegetation within and surrounding drainage/waterbody – herbaceous wetland/shrubland, riparian woodland/forest, upland, etc.
[6] Describe any chemical influences on waters – e.g., potential toxics from road, oil film observed.
[7] Describe any anthropogenic modifications to channel – e.g., artificial channel, riprap, concrete banks, culverts, storm drains.

ATTACHMENT D

ORDINARY HIGH WATER MARK DATASHEETS

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: MacPherson Property
Project Number: 30CT000801
Stream: Drainage 4
Investigator(s): ARuddevige, THartwig

Date: 7/8/15
Time:
Town:
State: CA
Photo begin file#:
Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

foot traffic, trails

Brief site description:

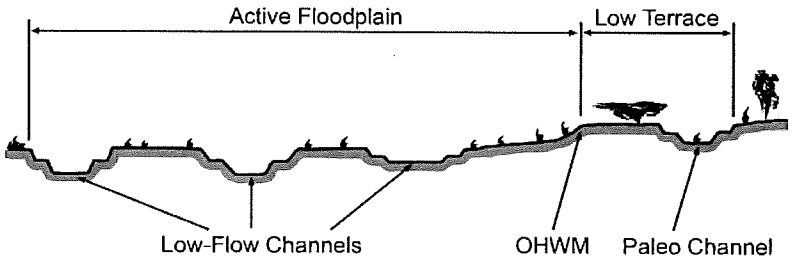
major on-site drainage

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 2009
- ☒ Topographic maps
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

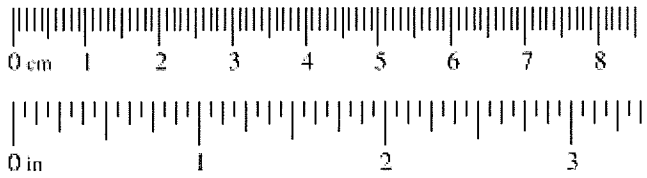


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☒ GPS
   - ☐ Other:

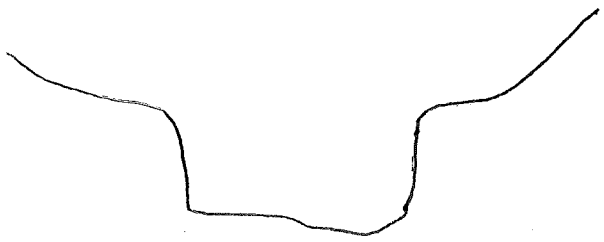
Wentworth Size Classes

Inches (in)	Millimeters (mm)	Wentworth size class	
10.08	256	Boulder	
		Cobble	Gravel
2.56	64	Pebble	
0.157	4	Granule	
0.079	2.00	Very coarse sand	
0.039	1.00	Coarse sand	
0.020	0.50	Medium sand	Sand
1/2 0.0098	0.25	Fine sand	
1/4 0.005	0.125	Very fine sand	
1/8 0.0025	0.0625	Coarse silt	
1/16 0.0012	0.031	Medium silt	
1/32 0.00061	0.0156	Fine silt	Silt
1/64 0.00031	0.0078	Very fine silt	
1/128 0.00015	0.0039	Clay	Mud



Project ID: MacPherson **Cross section ID:** 4 **Date:** 7/8/15 **Time:**

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: drift deposits
- [ ] Other: _____

Comments:

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: silt

Total veg cover: 5 % Tree: ____% Shrub: ____% Herb: 5 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [x] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

Project ID: MacPherson **Cross section ID:** 4 **Date:** 7/8/15 **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: coarse sand

Total veg cover: 5 % Tree: ____% Shrub: ____% Herb: 5 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

intermittent active floodplain

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: ____% Tree: ____% Shrub: ____% Herb: ____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

N/A

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: MacPherson Property
Project Number: 30CT000801
Stream: Drainage 5
Investigator(s): ARudalevige, THartwig

Date: 7/8/15
Time:
Town:
State: CA
Photo begin file#:
Photo end file#:

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details:

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

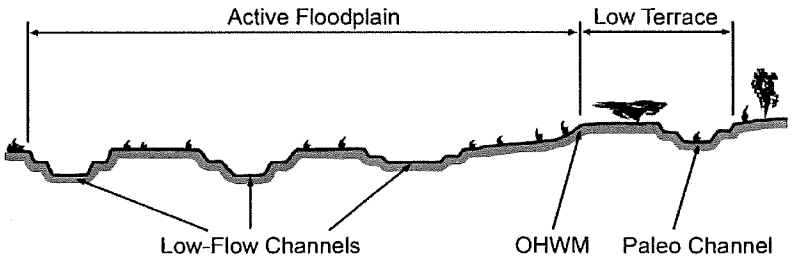
trails, trash

Brief site description:

Checklist of resources (if available):

- [X] Aerial photography
  Dates: 2009
- [X] Topographic maps
- [ ] Geologic maps
- [X] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

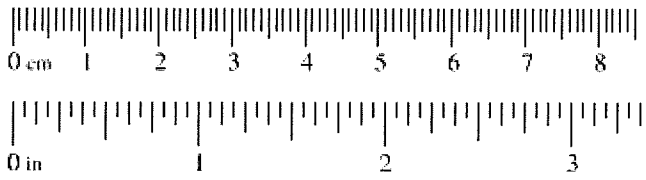


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [X] GPS
   - [ ] Other:

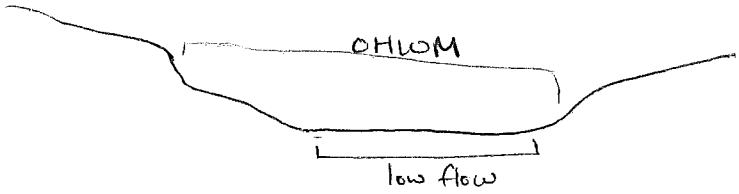
Wentworth Size Classes

Inches (in)	Millimeters (mm)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	Gravel
0.157	4	Pebble	Gravel
0.079	2.00	Granule	Gravel
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	Sand
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	Sand
1/8 0.0025	0.0625	Very fine sand	Sand
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	Silt
1/128 0.00015	0.0039	Very fine silt	Silt
		Clay	Mud



Project ID: MacPherson **Cross section ID:** 5 **Date:** 7/8/15 **Time:**

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [x] Other: drift deposits
- [ ] Other: _____

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: silt over sand

Total veg cover: 1 % Tree: _____% Shrub: _____% Herb: 1 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

Project ID: MacPherson **Cross section ID:** 5 **Date:** 7/8/15 **Time:**

Floodplain unit: ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: coarse sand

Total veg cover: 3 % Tree: 0 % Shrub: 1 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

leaf litter present

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: silt/loam

Total veg cover: 75 % Tree: 75 % Shrub: 50 % Herb: 20 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

oak woodland between OHWM and CSS vegetation

This page intentionally left blank

Appendix D
Nesting Bird Policy for Preserve Management

Preserve Managers will implement a Nesting Birds Policy to conform to existing regulations and procedures for protection of nesting birds. Migratory native bird species are protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (50 CFR 10.13). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code make it unlawful to: take, possess, or needlessly destroy the nest or eggs of any bird (3503); take, possess or destroy any birds in the orders of Falconiformes or Strigiformes (birds-of-prey) and the nest and eggs of any such bird (3503.5); and take or possess any migratory nongame bird, or any part thereof, as designated in the MBTA. Under State law, take means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill (Fish and Game Code Section 86), and includes take of eggs and/or young resulting from disturbances that cause abandonment of active nests.

Proposed activities with the potential to impact nesting birds (including, but not limited to, vegetation removal and use of heavy construction equipment) should occur outside of the avian breeding season, which generally runs from March 1 to September 15 (as early as January 1 for some birds) to avoid disturbance to breeding birds or destruction of the nest or eggs. Depending on the avian species present, a qualified biologist may determine that a change in the breeding season dates is warranted.

If the Preserve Manager determines that avoidance of the avian breeding season is not feasible, at least two weeks prior to the initiation of project activities, a qualified biologist with experience in conducting breeding bird surveys will conduct weekly bird surveys to detect presence/absence of native bird species occurring in suitable nesting habitat that is to be directly or indirectly disturbed and (as access to adjacent areas allows) any other such habitat within an appropriate buffer distance of the disturbance area. Generally the buffer distance should be 300 feet (500 feet for raptors). If a narrow buffer distance is warranted, the Preserve Manager will have a qualified biologist identify the appropriate buffer distances for raptors and non-raptors and notify Wildlife Agencies. The surveys should continue on a weekly basis with the last survey being conducted no more than three days prior to the initiation of project activities. If a native or nesting bird species is found, the Preserve Manager will do one of the following to avoid and minimize impacts on native birds and the nest or eggs of any birds.

a. Implement default 300-foot minimum avoidance buffers for all birds and 500-foot minimum avoidance buffers for all raptor species. The breeding habitat/nest site will be fenced and/or flagged in all directions, and this area will not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the project.

b. If a narrower buffer distance is determined appropriate by the qualified biologist, the Preserve Manager will develop a project-specific Nesting Bird Management Plan. The site-specific nest protection plan will be developed collaboratively with Wildlife Agencies and submitted to the Wildlife Agencies, although the Wildlife Agencies will not be responsible for approving the narrower buffer distance and the Nesting Bird Management Plan. The Plan should include detailed methodologies and definitions to enable a qualified avian biologist to monitor and implement nest-specific buffers based on topography, vegetation, species, and individual bird

behavior. This Nesting Bird Management Plan will be supported by a Nest Log that tracks each nest and its outcome. The Nest Log will be submitted to the Wildlife Agencies at the end of each week.

c. The Preserve Manager may propose an alternative plan for avoidance and nesting birds for Wildlife Agencies' review and approval.

Flagging, stakes, and/or construction fencing should be used to demarcate the inside boundary of the buffer between the project activities and the nest. The personnel working for the Preserve Manager, including any contractors working on site, should be instructed on the sensitivity of the area. The Preserve Manager will document the results of the recommended protective measures described above to demonstrate compliance with applicable State and Federal laws pertaining to the protection of native birds.

The Biological Monitor will be present on site during all grubbing and clearing of vegetation to ensure that these activities remain within the project footprint (i.e., outside the demarcated buffer) and that the flagging/stakes/fencing is being maintained, and to minimize the likelihood that active nests are abandoned or fail due to project activities. The Biological Monitor will send weekly monitoring reports to the Preserve Manager during the grubbing and clearing of vegetation and will notify the Preserve Manager immediately if project activities take, possess, or needlessly destroy the nest or eggs of any bird as well as birds-of-prey and their nest or eggs. Within 48 hours of damage to an active nest or eggs or observed death or injury of birds protected under State law or the MBTA (which includes, but not is limited to, the birds on the Covered Species list), the Preserve Manager will notify the OCTA NCCP/HCP Administrator and Wildlife Agencies.