Final Framework Resource Management Plan
for the
Montecito Ranch Preserve, San Diego County, California

Prepared by

Conservation Biology Institute, Dr. Michael White, Endangered Habitats Conservancy, ECORP Consulting, Inc. & San Diego Management and Monitoring Program in collaboration with United States Fish and Wildlife Service and United States Department of Defense

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Acronyms

ASMD	Area-Specific Management Directive
BAER	Burned Area Emergency Response
BMP	Best Management Practices
CAGN	Coastal California gnatcatcher
Cal-IPC	California Invasive Plant Council
Cal Fire	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CBI	Conservation Biology Institute
CDFW	California Department of Fish and Wildlife
CFWO	Carlsbad Fish and Wildlife Office
CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
CRUE	Conservation/Restrictive Use Easement
DOD	United States Department of Defense
EDRR	Early Detection Rapid Response
EHC	Endangered Habitats Conservancy
ESA	Endangered Species Act
F-RMP	Framework Resource Management Plan
ft	feet
Gnatcatcher RCS	Coastal California Gnatcatcher Recovery Crediting System
GPS	Geographic Positioning System
GSOB	Goldspotted oak borer (*Agrilus auroguttatus)*
HA	Hydrologic Area
HGM	Hydrogeomorphic Model
HSA	Hydrologic Subarea
IAMP	Invasive Animal Management Plan
IMG	Rare Plant Inspect and Manage

IPSP	Management Priorities for Invasive Non-native Plants: A Strategy for Regional Implementation
KSHB	Kuroshio shot hole borer (*Euwallacea* sp.)
m	meter
MCBCP	Marine Corps Base Camp Pendleton
MCV	Manual of California Vegetation
MHCP	Multiple Habitat Conservation Program
MMU	Minimum mapping unit
MSCP	San Diego Multiple Species Conservation Program
MSP/MSP Roadmap	Management and Monitoring Strategic Plan
MSPA	Management Strategic Plan Area
MU	Management Unit
NCCP	Natural Communities Conservation Plan
NCMSCP	North County Multiple Species Conservation Plan (North County Plan)
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicles
O&M	Operations and Maintenance
Preserve	Montecito Ranch Preserve
QAL	Qualified Applicator License
RA	Resource Advisor
RAA	Resource Avoidance Area
RDM	Residual Dry Matter
REPI	Readiness and Environmental Protection Integration
RHDV2	Rabbit Hemorrhagic Disease Virus Type 2
RPO	Resource Protection Ordinance
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SD PAF	San Diego Plant Assessment Form

SDG&E	San Diego Gas and Electric
SDMMP	San Diego Management and Monitoring Program
SDVC	San Diego Vegetation Classification
SDVC	Vegetation Classification Manual for Western San Diego County
SHPO	State Historic Preservation Officer
SKR	Stephens' kangaroo rat
SKR MMP	Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan
SKR Technical Team	Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan Technical Team
SL	Species at risk of Loss from MSPA
SO	Species with Significant Occurrences at risk of loss from MSPA
SR-78	State Route 78
SS	Species stable but still requires Species-Specific management to persist in MSPA
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
Navy	United States Department of the Navy
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
USGS	United States Geologic Survey
VF	Species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management (Vegetation Focus species)
VG	Species not specifically managed for, but may benefit from vegetation management for VF species
VPMMP	Vernal Pool Management and Monitoring Plan
WCB	California Wildlife Conservation Board
WFRAP	Wildfire Resource Advisor Program

Introduction and Background

Framework Resource Management Plan Background

The Conservation Biology Institute (CBI), Dr. Michael White, Endangered Habitats Conservancy (EHC), ECORP Consulting, Inc., and the San Diego Management and Monitoring Program (SDMMP) in coordination with the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) (collectively referred to as the Wildlife Agencies), and the United States Department of Defense (DOD) developed a Framework Resource Management Plan (F-RMP) for the Montecito Ranch Preserve (Preserve). The F-RMP aligns preserve-level management and monitoring with the regional Management and Monitoring Strategic Plan (MSP or MSP Roadmap) for conserved lands in western San Diego County (SDMMP and TNC 2017). The MSP Roadmap provides regional and preserve-level goals and objectives for prioritized species, vegetation communities, and threats, and includes recommendations from regional planning documents (e.g., Connectivity Monitoring Strategic Plan [SDMMP 2011], Invasive Plant Strategic Plan [CBI et al. 2012]).

The MSP Roadmap provides a framework for prioritizing, funding, and managing species and vegetation communities on conserved lands in the Management Strategic Plan Area (MSPA) and does not replace any forthcoming Natural Communities Conservation Plan (NCCP) obligations or requirements. Priorities, goals, and objectives in the MSP Roadmap are advisory and meant to be consistent with the intent of regional NCCP plans, but there may be preserve-level management concerns and future NCCP obligations not addressed in the MSP Roadmap that are important to fulfill (SDMMP and TNC 2017). In preparing the F-RMP, we used existing Preserve-specific biological documents, results of 2020-2021 rapid assessment field surveys, and the MSP Roadmap to determine whether any significant occurrences of species lie within the Preserve, and we reviewed goals and objectives for species, vegetation communities, and threats/stressors to develop or refine Preserve-specific goals, objectives, and implementation tasks.

The F-RMP will guide management and monitoring of the Preserve. Development of the F-RMP included:

- Reviewing existing biological surveys, studies, and documents.
- Communicating with local and regional experts and entities.
- Incorporating existing biological and stewardship spatial information provided by local and regional experts and entities.
- Refining existing vegetation mapping.
- Mapping and prioritizing threats and stewardship issues.

- Surveying for selected MSP priority species[1,2] and United States Marine Corps (USMC) focal species[3].
- Identifying priorities and timelines for detected MSP and USMC focal species.
- Developing or refining Area-Specific Management Directives (ASMDs).
- Providing a structure for adding to the F-RMP over time in an adaptive manner.

Preserve Acquisition and Regulatory Background

The Preserve lies within the North County Multiple Species Conservation Plan (NCMSCP), a draft NCCP area and was originally included in the North County plan as a Hardline Development Project. EHC acquired the 955-acre ranch on June 10, 2020, with funding from Section 6 of the Federal Endangered Species Act (ESA) of 1973, as amended. Specifically, two habitat conservation plan land acquisition grants associated with the County of San Diego Multiple Species Conservation Program (MSCP) were awarded funding for the acquisition of land that complements the MSCP and benefits covered listed and unlisted species. The California Wildlife Conservation Board (WCB) provided funding including the requisite non-federal matching funds for Section 6 grants and the DOD, through its Readiness and Environmental Protection Integration (REPI) program, leveraged additional acquisition funding.

Due to state and federal funding sources, the Preserve is encumbered by subgrant agreements, grant agreements, and notice of unrecorded subgrant agreements. A Grant Deed of Conservation/Restrictive Use Easement (CRUE) is also recorded on the Preserve to address Department of the Navy (Navy) interests. The Preserve is perpetually conserved for the benefit of species and natural habitats.

The REPI program is designed to acquire and/or conserve land to mitigate encroachment on military readiness. The Preserve is owned and managed by EHC, and the Navy, on behalf of the USMC, holds the CRUE on the Preserve. The Preserve requires perpetual management and monitoring to assure the persistence of suitable native habitat and the species that occupy these habitats. The Preserve benefits the USMC because it supports habitat occupied by USMC focal species including the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) (CAGN); federally endangered San Diego fairy shrimp (*Branchinecta sandiegoensis*); and federally endangered Stephens' kangaroo rat (*Dipodomys stephensi*) (SKR) that the ESA and Sikes Act of 1960, as amended require USMC to conserve. Under agreement with the USFWS Carlsbad Fish and Wildlife Office (CFWO), the USMC can reduce training constraints on their installations through habitat protection, maintenance, and improvement projects.

[1] Within the Preserve, MSP species include MSCP covered species plus additional species not covered under the MSCP but covered or proposed for coverage under other NCCPs in San Diego County.

[2] MSP species are prioritized for management based on risk of loss and are categorized based on whether they need species-focused management or vegetation-focused management (SDMMP 2013, SDMMP and TNC 2017). In this document, the term 'MSP priority species' refers to species requiring species-focused management or management of vegetation characteristics.

[3] USMC focal species include coastal California gnatcatcher, San Diego fairy shrimp, and Stephens' kangaroo rat.

The USMC provided funding for Preserve acquisition to contribute to the conservation of listed and sensitive species to offset future reductions in military training restrictions specifically on Marine Corps Base Camp Pendleton (MCBCP). CFWO supports conservation of the Preserve to offset USMC training relief through the development of a Coastal California Gnatcatcher Recovery Crediting System (Gnatcatcher RCS) and other agreements between USMC and USFWS. Furthermore, USMC's funding of management and restoration/enhancement actions on the Preserve improves resource values and increases conservation credits in a manner that further benefits threatened and endangered species. A critical component of the Gnatcatcher RCS is the long-term assurance that habitat is conserved and managed to support sensitive species, native habitats, and regional conservation goals. Assured funding for long-term management of conserved properties is essential to the Gnatcatcher RCS. EHC's support of USMC and the associated ESA requirements does not preclude EHC from implementing additional measures to manage, monitor, and enforce protection of natural and cultural resources of the Preserve.

1. Geographic Setting and Regional Ecological Significance

1.1 Location and Regional Context

The Preserve is located in west-central San Diego County near the town of Ramona (Figure 1) at the southern end of Management Unit (MU) 5 of the MSPA for western San Diego County. It is contiguous with the County of San Diego's Ramona Grasslands Preserve (Ramona Grasslands) to the south and west and Boden Canyon and Cleveland National Forest to the north (Figure 2). The Preserve is owned and managed by EHC.

The Preserve is part of Core L in the MSPA (SDMMP and TNC 2017) and supports connectivity functions to conserved habitats to the north within MU 5 and west into MU 6 (Figure 3). CBI recognized a Core Grassland area and Northern Buffer Linkage area within The Nature Conservancy's (TNC) Ramona Grasslands Conceptual Area Protection Plan (CBI 2004). The Preserve straddles the two areas, and thus supports functions and conservation values of both. Nearly all of the Preserve lies within designated Critical Habitat for CAGN.

1.2 Preserve Description

1.2.1 Topography and Soils

The 955-acre Preserve is located at the northwest edge of the Santa Maria Valley at an elevation of approximately 1,300 to nearly 1,800 feet (ft). Topography varies from flat or gently sloping to steeper peaks and ridges. Steeper terrain occupies the north and west sides and gentler terrain on the south side of the Preserve. A rocky ridge cuts across the center of the Preserve, and a small alluvial valley lies to the north of this ridge. The geology comprises intrusive granites and granodiorites, and soils are derived from these granitic rocks. Soils in the southern portion support clayey subsoils (e.g., Bonsall series) with vernal pools (Figure 4) (Appendix A).

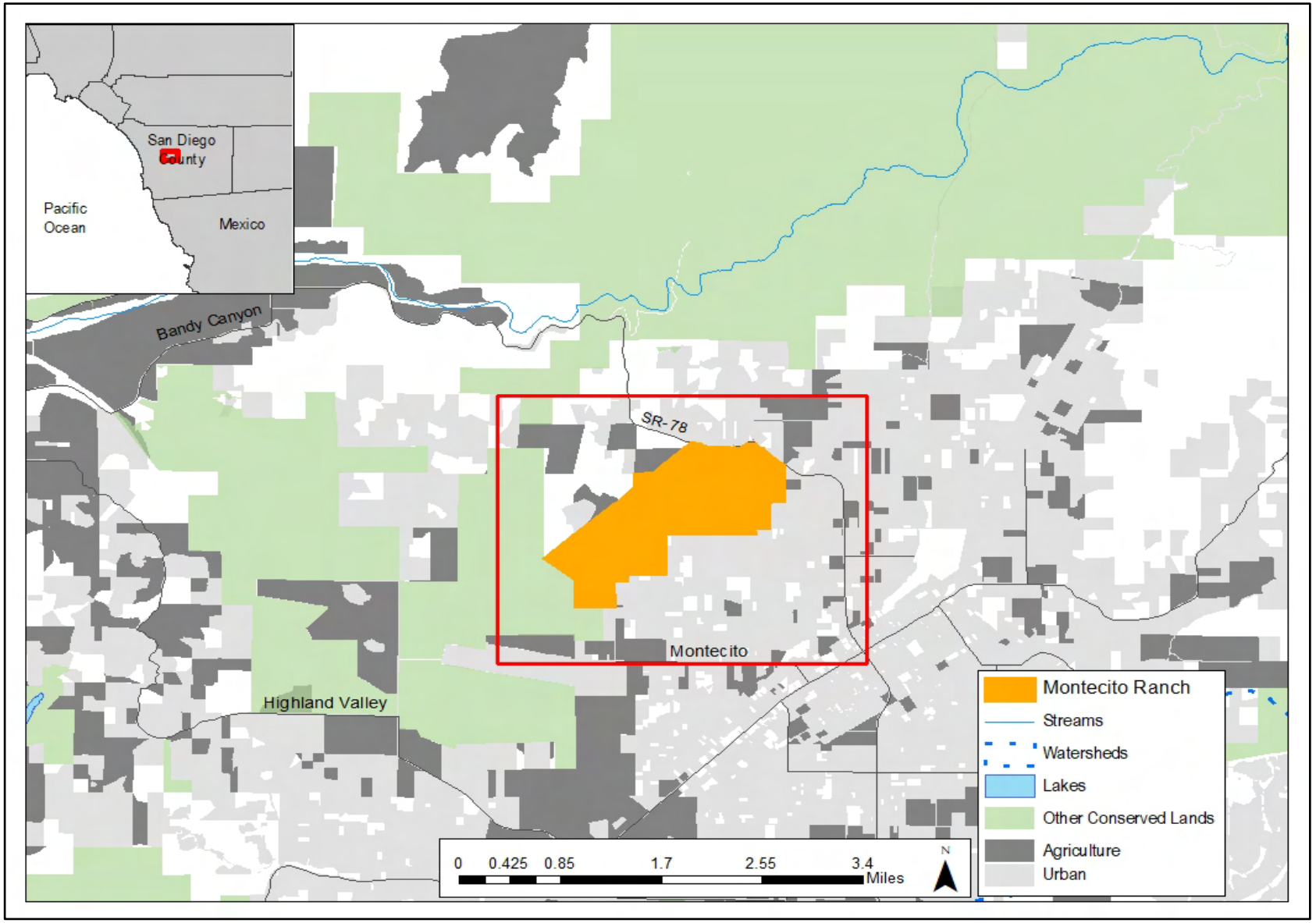

Figure 1. Location of the Montecito Ranch Preserve

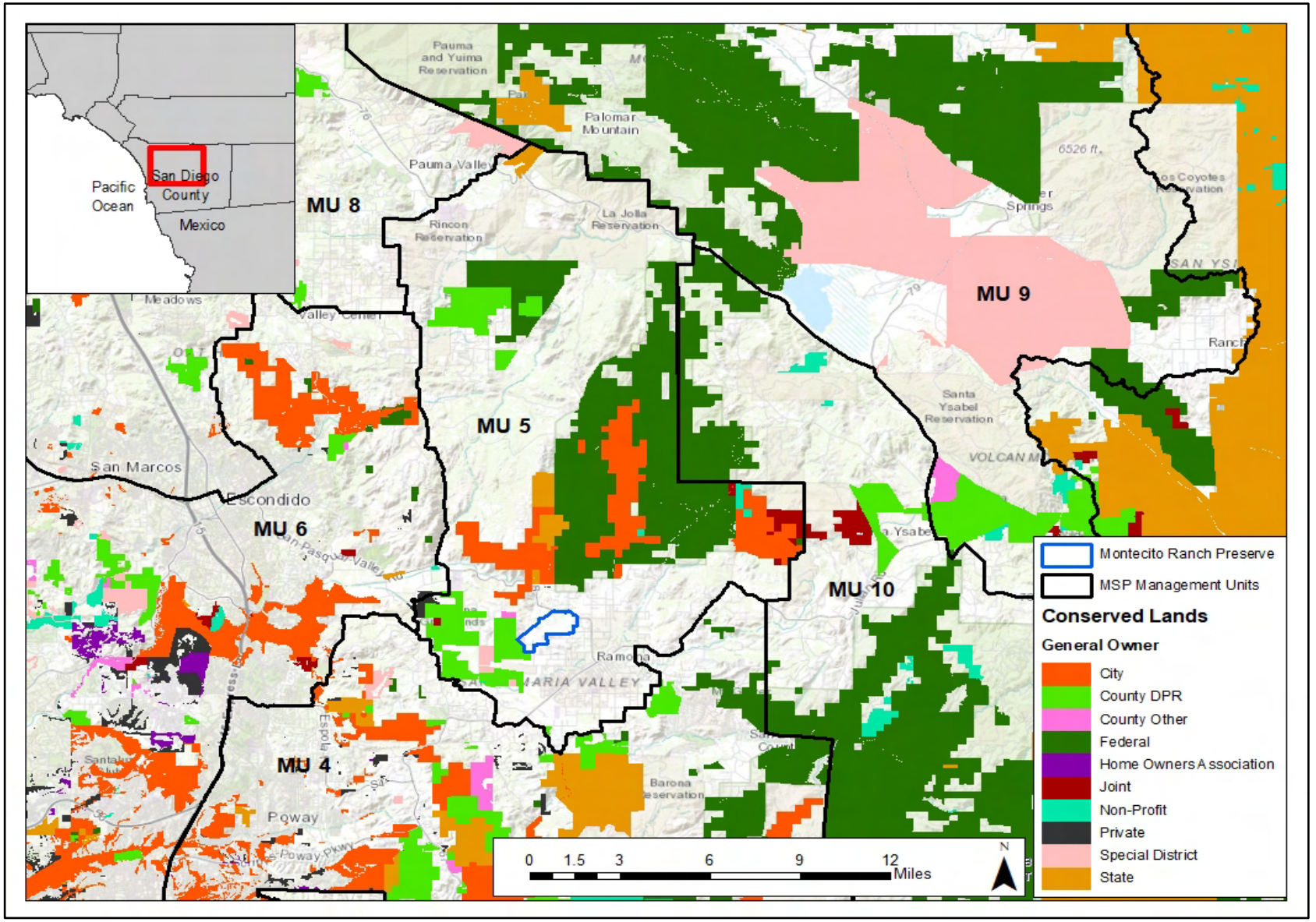

Figure 2. Conserved Lands in Relation to the Montecito Ranch Preserve

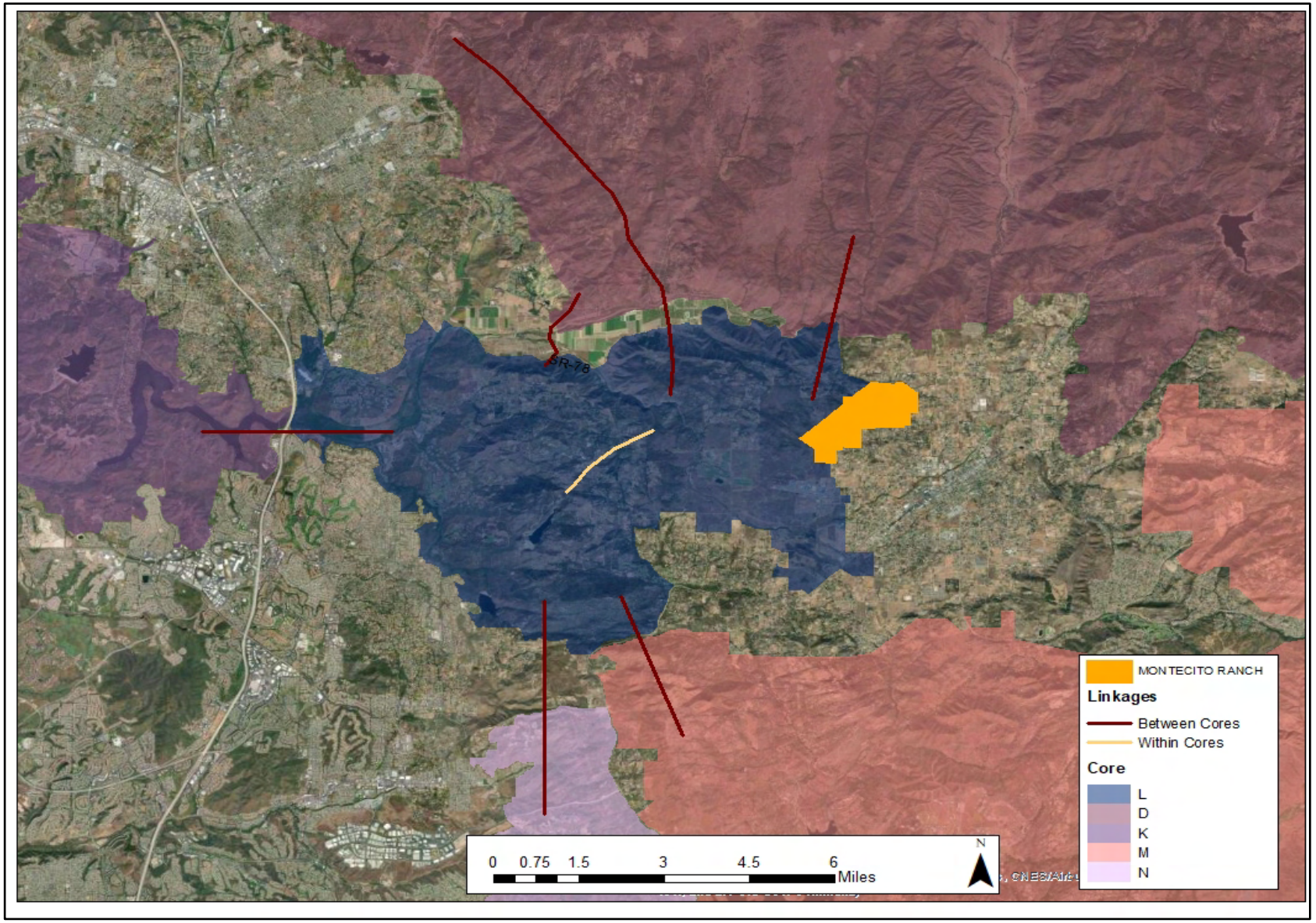

Figure 3. Biological Core Habitat Areas and Linkages in the Vicinity of the Montecito Ranch Preserve

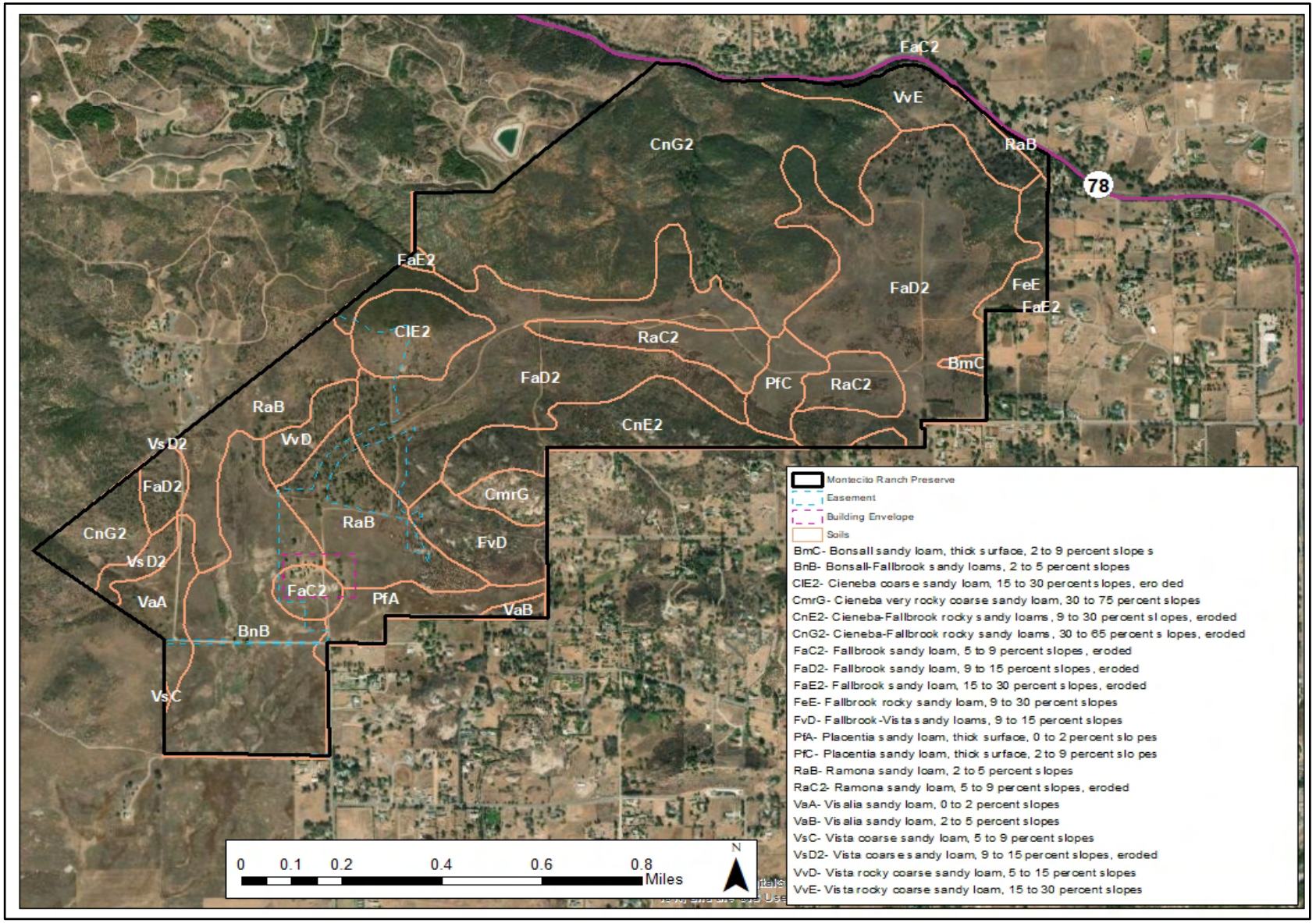

Figure 4. Soil Types on the Montecito Ranch Preserve

1.2.2 Hydrology

The Preserve is within the San Dieguito Hydrologic Unit (San Diego RWQCB 1995) and drains into two different subwatersheds (Figure 5). The northern half drains north through Clevenger Canyon in the Boden Hydrologic Subarea (HSA) within the Santa Ysabel Hydrologic Area (HA), while the southern half drains south across relatively level land towards Santa Maria Creek in the Ramona HSA of the Santa Maria HA. The 1997 United States Geologic Survey (USGS) 1:24000 San Pasqual quadrangle shows small blue line drainage segments in the northern and eastern portions of the Preserve that drain through Clevenger Canyon to Santa Ysabel Creek. The 1942 USGS 1:62500 Ramona topographic quadrangle shows intermittent blue lines draining the southern half of the Preserve south to Santa Maria Creek. REC Consultants created a layer depicting aquatic resources on the Preserve regulated by CDFW, United States Army Corps of Engineers (USACE) and the County of San Diego Resource Protection Ordinance (RPO) (Figure 5 inset) (Artemis 2020).

1.2.3 Fire History

Three recorded fires have burned portions of the Preserve since 1911 according to California Department of Forestry and Fire Protection (Cal Fire) (Cal Fire 2018) (Figure 6). An unnamed fire burned the entire northern half in 1911. The Weekend Fire burned about 138 acres in the northeast portion in 1987. Heritage Resources (2008) references this fire as a controlled burn, but the Cal Fire classified the ignition source as "miscellaneous." The Witch Fire burned most of the Preserve in 2007 except for the northeast portion and the Montecito Ranch house, which firefighters managed to save.

1.2.4 Land Uses

The Preserve and surrounding areas of the Santa Maria Valley have a long history of human land uses, including orchards and cultivation of portions of the property (Appendix A). Currently there are no active human land uses on the Preserve, other than existing public utility and private easements including San Diego Gas and Electric (SDG&E) power lines and poles, a Ramona Municipal Water District water pipeline, and various road easements. A number of additional easements occur on the Preserve, but most are very old and locality information is unavailable. Refer to Appendix A for further easement discussion and Artemis (2020) for detailed information on existing easements, including plotted locations. There are a number of man-made structures or remnants of structures on the Preserve, in addition to 39 recorded archaeological and historical sites (Appendix A). An 8-acre building envelope surrounding the historical Montecito Ranch house and other associated infrastructure (Figure 7) is excluded from the Preserve conservation easement, thus USMC funding will not support management activities proposed within the 8-acre building envelope. The remainder of the Preserve is conserved and managed by EHC in accordance with this F-RMP and associated encumbrances (i.e., conservation easement and grant/subgrant agreements).

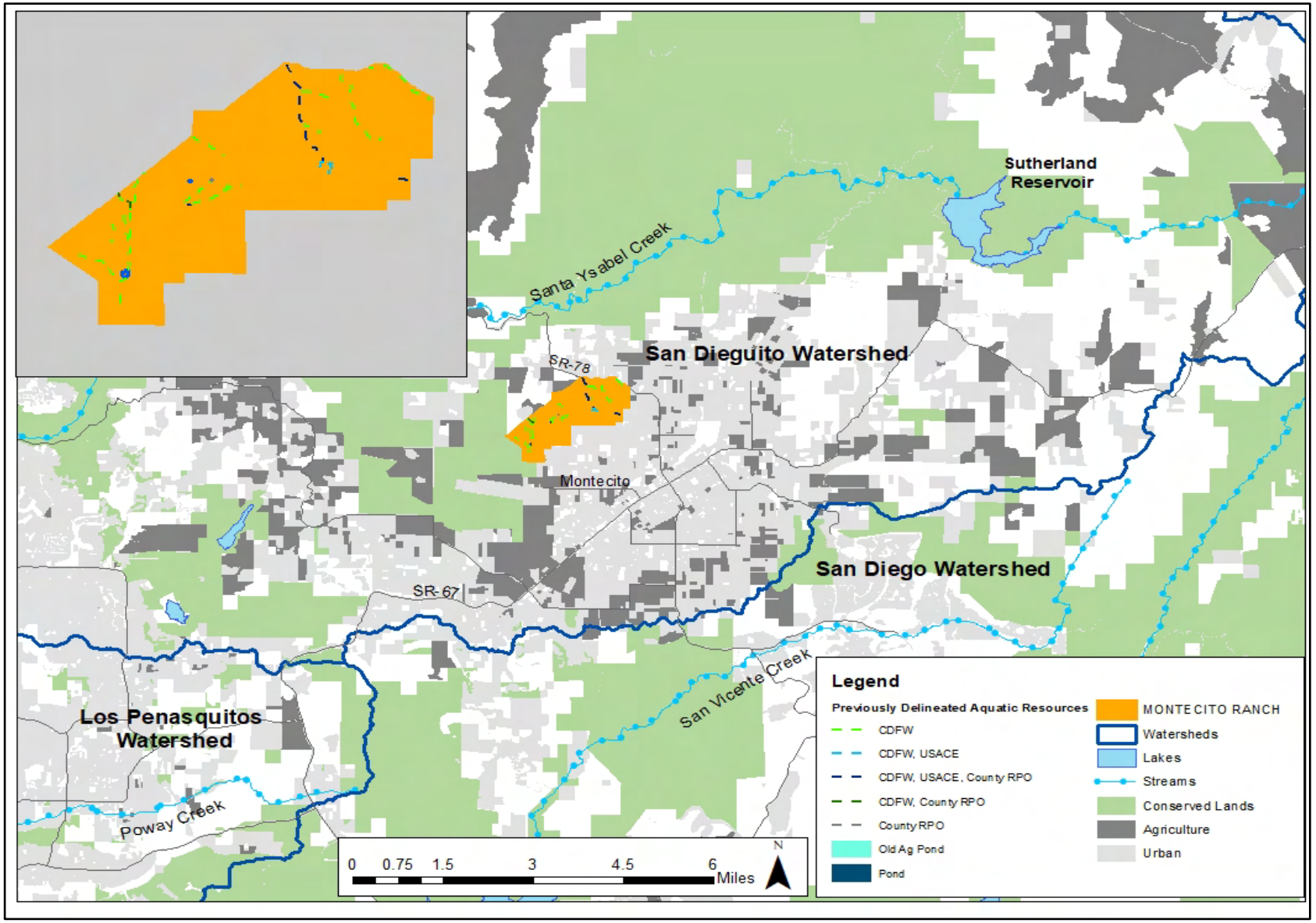

Figure 5. Hydrology in the Vicinity of the Montecito Ranch Preserve

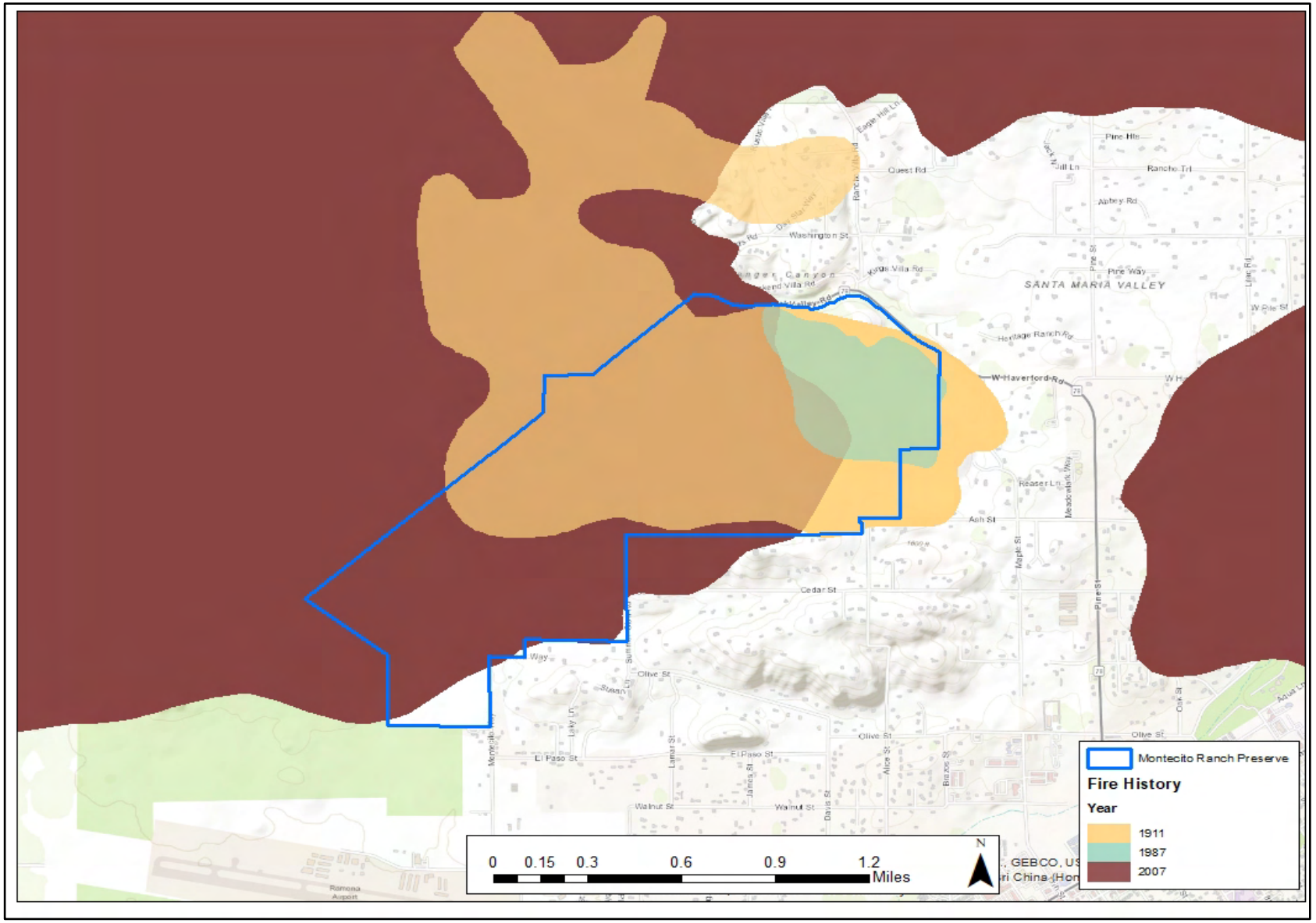

Figure 6. Fire History on the Montecito Ranch Preserve

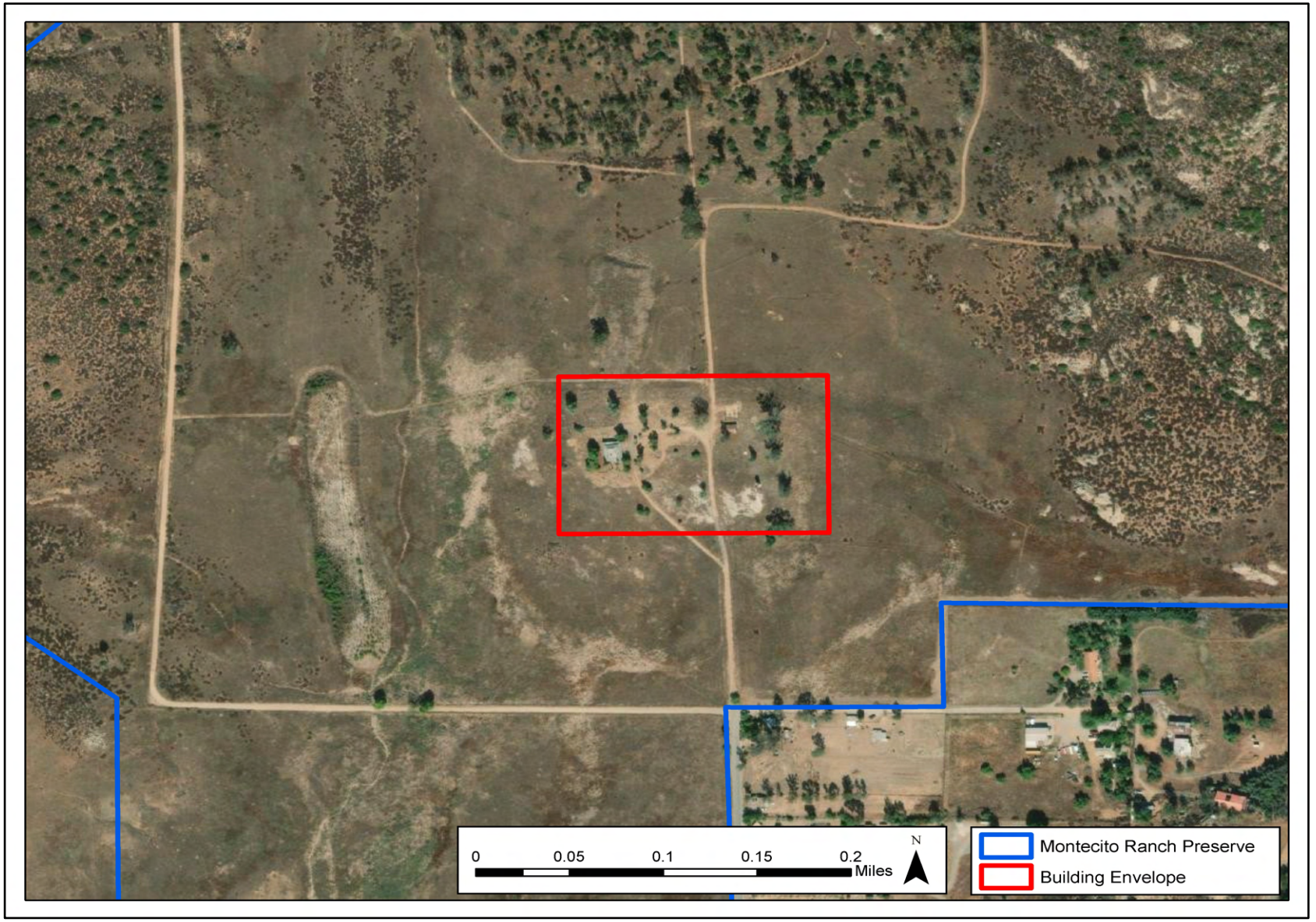

Figure 7. The Montecito Ranch Preserve Building Envelope

1.3 Regional Ecological Significance

1.3.1 Summary of Key Biological Resources

Conservation of Montecito Ranch effectively completes the vision presented in the Ramona Grasslands Conceptual Area Protection Plan (CBI 2004), which justifies preserving and managing one of the largest concentrations of grasslands in northern San Diego County. Loamy grasslands on the Preserve historically supported one of the southernmost populations of SKR. Illegal disking and rodenticide applications by the previous landowner likely extirpated SKR in the early 2000s (Wynn pers. comm.). Restoring and enhancing the habitat to conserve SKR within the Preserve is a high priority for EHC, USMC, and the Wildlife Agencies. The grasslands also provide foraging and wintering habitat for northern harrier (*Circus cyaneus*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos canadensis*), including eagles from the nearby Bandy Canyon nesting site. The vernal pools are a relatively unknown part of the Ramona vernal pool complex, with at least one of these pools supporting San Diego fairy shrimp and five supporting southern tarplant (*Centromadia parryi* subsp. *australis*) (CBI 2019, TAIC and EDAW 2005). Multiple CAGN territories and Blainville's horned lizard (*Phrynosoma blainvillii*) occupy coastal sage scrub that is contiguous with the slopes of the San Dieguito River Valley in core areas D and K to the west and north, respectively. Several Engelmann oak (*Quercus engelmannii*) stands occur in the northeastern portion of the Preserve. Engelmann oaks represent one of the rarest oak species in California. The north-to-south trending riparian woodland supported Harbison's dun skipper (*Euphyes vestris harbisoni*) in the late 1990s (REC 2008); however, recent surveys have not detected the species.

1.3.2 Relationship to Management Unit and Regional Goals and Objectives

Vernal pools, grasslands, coastal sage scrub, oak woodlands, riparian forest and scrub, and MSP Roadmap species are MU 5 management priorities. The Preserve contributes to an important linkage to other conserved land in MU 5 (e.g., Boden Canyon and Bandy Canyon areas). Table 1 lists MSP regional or MU 5 goals for vegetation communities and species detected in the Preserve as well as those with very high potential to occur, based on literature review, interviews with species experts, available habitats, and known proximity to the Preserve. Table 2 lists MSP objectives that are relevant to the Preserve and their current implementation status on the Preserve. We identify USMC focal species and associated habitats in Tables 1 and 2 (see footnotes). Objectives for potentially occurring MSP and USMC focal species will apply only if documented onsite in the future or if species experts have determined that presence is highly likely (i.e., pallid bat [*Antrozous pallidus*] and Townsend's big ear bats [*Plecotus townsendii pallescens*]). EHC, as the management entity, is responsible for implementing actions in accordance with grant agreements and to address preserve-level MSP and USMC objectives. EHC will participate in regional meetings or programs, share data, and allow researches or other investigators access to the Preserve.

MSP goals, objectives, and actions relevant to the Preserve and its resources are detailed under ASMDs (Section 4). ASMDs also include any additional preserve-specific goals, objectives, and actions identified during the development of the F-RMP.

1.3.3 REPI Program and USMC Training Relief

The WCB provided funding for Montecito Ranch, including the requisite non-federal matching funds for Section 6 grants and the DOD, through the REPI program, leveraged additional acquisition funding. The REPI program is designed to acquire and/or conserve land to mitigate encroachment on military readiness. The USMC provided funding for Preserve acquisition to contribute to the conservation of priority habitats and listed and sensitive species to offset future reductions in military training restrictions specifically on MCBCP. USMC focal species and associated habitats on the Preserve include CAGN, San Diego fairy shrimp, Stephens' kangaroo rat, coastal sage scrub, grasslands, and vernal pools.

2. Biological Resources and Threats

2.1 Vegetation

We refined the vegetation map in the Baseline Report for Montecito Ranch (Artemis 2020) to be consistent with the lowest hierarchical category of the Vegetation Classification Manual for Western San Diego County (SDVC, Sproul et al. 2011). Table 3 summarizes vegetation by both the generalized vegetation categories used in the MSP Roadmap (SDMMP and TNC 2017) and SDVC group-level vegetation categories, along with acreages and the contribution of the Preserve to conserved vegetation in MU 5. Figure 8 presents the MSP Roadmap generalized vegetation categories and Figure 9 presents the refined vegetation mapping based on the 2020-2021 rapid assessment field surveys. The refined vegetation map allows land managers and biologists to monitor vegetation changes on the Preserve over time and to correlate species presence with vegetation attributes. Table 4 lists vegetation alliances and associations per the SDVC and includes the vegetation codes depicted in the Figure 9 legend.

Table 1. Management Strategic Plan (MSP) Goals Relevant to the Montecito Ranch Preserve

Category	Regional or Management Unit Goal[1,2]
Vegetation	*Chaparral:* Maintain, enhance, and restore chaparral that supports or has the potential to support Vegetation Focus (VF) species (i.e., Blainville's horned lizard) and to incidentally benefit other MSP species (e.g., southern mule deer, Bell's sparrow) so that the vegetation community has high ecological integrity, and MSP species are resilient to environmental stochasticity, catastrophic disturbances and threats, and will be likely to persist over the long term (>100 years).
	Coastal sage scrub[3]: Maintain, enhance and restore coastal sage scrub that supports or has the potential to support VF species (i.e., western spadefoot toad, Blainville's horned lizard, coastal California gnatcatcher[3], golden eagle, San Diego black-tailed jackrabbit) and to incidentally benefit other MSP species (e.g., pallid bat, mountain lion, American badger) so that the vegetation community has high ecological integrity, and MSP species are resilient to environmental stochasticity, catastrophic disturbances and threats, and will be likely to persist over the long term (>100 years).
	Grassland[3]: Enhance and restore native grasslands and forblands and manage nonnative grasslands that support or potentially-support VF species (i.e., Engelmann oak, southern tarplant, San Diego black-tailed jackrabbit, Stephens' kangaroo rat[3], northwestern San Diego pocket mouse) and incidentally benefit other species (e.g., arroyo toad, two-striped garter snake, northern harrier, golden eagle) so that the vegetation community has high ecological integrity, and MSP species are resilient to environmental stochasticity and will be likely to persist over the long term (>100 years).
	Oak woodland: Maintain, enhance and restore oak woodlands that support or have the potential to support VF species (i.e., Engelmann oak) and coast live oak woodlands that incidentally benefit other MSP species (e.g., mountain lion, Harbison's dun skipper, western bluebird, southern mule deer) so that the vegetation community has high ecological integrity, and MSP species are resilient to environmental stochasticity, catastrophic disturbances and threats, and will be likely to persist over the long term (>100 years).
	Riparian forest and scrub: Maintain, enhance and restore riparian forest and scrub that supports or has the potential to support VF species and to incidentally benefit other MSP species (e.g., arroyo toad, Townsend's big-eared bat) so that the vegetation community has high ecological integrity, and MSP species are resilient to environmental stochasticity, catastrophic disturbances and threats, and will be likely to persist over the long term (>100 years).
	Vernal pools[3] *and alkali playa*: Protect, enhance, and restore vernal pool habitat that supports or has the potential to support VF (i.e., southern tarplant, western spadefoot toad) and Species at Risk of Loss (SL) (i.e., San Diego fairy shrimp[3]) so that the vegetation community has high ecological integrity and MSP species are resilient to environmental stochasticity and threats, and likely to persist over the long term (>100 years).

Category	Regional or Management Unit Goal[1,2]
Species	*San Diego fairy shrimp*[3]*:* Protect, enhance, and restore occupied and historically occupied habitat to create resilient, self-sustaining populations that persist long-term (>100 years).
	Golden eagle: Expand and maintain a self-sustaining population to ensure long-term persistence (>100 years) in the MSPA by protecting active and inactive nest sites to improve reproductive success and managing scrublands intermixed with open grassland patches to achieve optimal prey availability, especially during drought, and minimize human impacts to foraging eagles.
	Northern harrier: Protect, enhance, and restore northern harrier-occupied habitat and historically-occupied habitat to create resilient, self-sustaining populations that provide for persistence over the long-term (>100 years).
	Pallid bat, Townsend's big-eared bat: Protect diurnal, nocturnal, and maternity roosts from destruction and human disturbance and enhance foraging habitat within commuting distance of nocturnal and maternity roosts to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and improve long-term persistence (>100 years).
	Stephens' kangaroo rat[3]*:* Protect, enhance, and restore occupied habitat, historically occupied habitat, and the intervening landscape connections to create resilient, self-sustaining populations that persist long-term (>100 years).
	San Diego black-tailed jackrabbit: Maintain, enhance, and restore occupied habitat to create resilient, self-sustaining populations that persist long-term (>100 years).
Altered Fire Regime	*Fire management*: Maintain the long-term integrity and viability of ecosystems, MSP species, and vegetation communities on conserved lands in a cost-effective manner by returning the current human altered fire regime to a more natural fire regime, with lower fire frequency and reduced impacts (direct and indirect) to natural resources.
Connectivity	*Connectivity*: Ensure the persistence of species across the Preserve and maintain ecosystem functions across the landscape.
Invasive Plants	*Invasive plants*: Eradicate, control, or manage invasive species that are detrimental to the long-term viability of MSP species on conserved lands or are markedly increasing the costs of species and/or vegetation management needed to meet MSP goals and objectives.
Invasive Animals	*Invasive animals*: Protect intact habitat from new or expanding invasive animal species; detect new invasive species and new invasions early on and control them before they establish, address invasive species using the response appropriate for the level of invasiveness with higher priority invasive animal species addressed first.
Urban Development	*Urban edge*: Reduce urban edge effects where they negatively affect long-term viability of MSP species on conserved lands or markedly increase the costs of species or vegetation community management to meet MSP goals and objectives.

[1] Table includes only regional or management unit goals applicable to the Montecito Ranch Preserve.
[2] We provide MU 5 goals where available in the MSP Roadmap (TNC and SDMMP 2017); in all other cases, goals are regional.
[3] USMC focal species and habitats.

Table 2. Management Strategic (MSP) Objectives Relevant to the Montecito Ranch Preserve

MSP Category[1]	MSP Objective[2]	General MSP Objective[3]	Species-Specific MSP Objective[4]	Status[5]
Vegetation Communities	Monitor, assess, manage vernal pools[6].	MON-SURV-VEG MON-EVAL-DIST MGT-IMP-VPML1 MGT-IMP-VPML2 MGT-IMP-VPML3	VERPOO-1, 2, 3, 4, 5, 6	IP
Species	Inspect/manage MSP rare plants[6].	MON-IMP-IMG MON-IMP-MONPL	CENPAR-1 QUENENG-1	NS
	Survey San Diego fairy shrimp[6].	MON-IMP-MONPL	BRASAN-1	IP
	Survey/manage western spadefoot.	MON-IMP-MONPL	SPEHAM-1	NS
	Inspect/manage/monitor Northern harrier nests.	MGT-IMP-IMG MGT-IMP-MGTPL MON-IMP-MGTPL	CIRCYA-2, 3, 5, 6	NS
	Manage/monitor golden eagle status and foraging habitat.	MGT-PRP-MGTPL MON-PRP-MONPL	AQUCHR-3, 4	NS
	Inspect/manage/monitor pallid bat and Townsend's big-eared bat roost sites.	MON-IMP-IMG MGT-IMP-IMG MGT-IMP-MGTPL MON-IMP-MGTPL	ANTPAL-2, 3, 5, 6 PLETOW-2, 3, 5, 6	NS
	Inspect/manage Stephens' kangaroo rat[6].	MGT-IMP-IMG	DIPSTE-2	IP
Altered Fire Regime	Implement priority actions in the Fire Ignition Reduction Plan[6].	MGT-IMP-IGNPL	ALTFIR-2	NS
	Prepare RAA Map[6].	MGT-RSUP-RAAM	ALTFIR-3	NS
	Provide RAA Map to local, state, and federal wildfire management agencies[6].	MGT-IMP-RAAM	ALTFIR-4	NS
	Participate in WFRAP; work with RAs[6].	MGT-RSUP-WFRAP	ALTFIR-6, 9	NS
	Identify MSP species with high risk of impacts from fire[6].	MGT-PRP-FMGTPL	ALTFIR-7	NS

MSP Category[1]	MSP Objective[2]	General MSP Objective[3]	Species-Specific MSP Objective[4]	Status[5]
	Implement management actions to reduce fire risk for at-risk MSP species[6].	MGT-IMP-FMGTPL	ALTFIR-8	NS
	Monitor at-risk MSP species & vegetation first 3 years following a fire; control invasive plants[6].	MON-IMP-FMGT	ALTFIR-10, 11	NS
	Survey at-risk MSP species for 1-3 years following a fire[6].	MON-SURV-FMGT	ALTFIR-12	NS
Altered Hydrology	Implement BMPs to improve hydrology for MSP species[6].	MGT-IMP-BMP	ALTHYD-3	NS
Invasive Plants	Remove invasive plants/monitor effectiveness[6].	MGT-IMP-IPSP MON-IMP-INVPLA MGT-IMP-IPSP	INVPLA-1, 2, 7	IP
Invasive Animals	Implement/monitor IAMP actions.	MGT-IMP-IAPL MON-IMP-IAPL MGT-IMP-SHBMPL MON-IMP-SHBMPL	INVANI-2, 3, 5, 6	NS
Urban Development	Prevent/clean-up trash dump sites[6].	MGT-RSUP-TRASH	URBDEV-1	IP

[1] MSP Category: Vegetation communities refer to vernal pools and alkali playas, species refers to MSP species, and all other categories refer to threats.

[2] MSP Objective: **BMP** = Best Management Practices, **IAMP** = Invasive Animal Management Plan, **MSP** = Management Strategic Plan, **RA** = Resource Advisor, **RAA** = Resource Avoidance Area, **WFRAP** = Wildland Fire Resource Advisor Program.

[3] General MSP Objective (see SDMMP and TNC 2017 for full objective language): **BMP** = Best Management Practices, **DIST** = Topographic Disturbance, **EVAL** = Evaluate, **FMGT** = Fire Management, **FMGTPL** = Fire Management Plan, **IAPL** = Invasive Animal Plan, **IGNPL** = Ignition Plan, **IMG** = Inspect and Manage, **IMP** = Implementation, **INVPLA** = Invasive Plants**, IPSP** = Invasive Plant Strategic Plan, **MGT** = Management, **MGTPL** = Management Plan, **MON** = Monitoring, **MONPL** = Monitoring Plan, **PRP** = Prepare Plan, **RAAM** = Resource Avoidance Area **RSUP** = Regional Support, **SHBMPL** = Shot Hole Borer Management Plan, **SURV** = Survey, Map, **TRASH** = Trash, **VEG** = Vegetation, **VPML1, 2, 3** = Vernal Pool Management Levels 1, 2, and 3, **WFRAP** = Wildland Fire Resource Advisor Program.

[4] Species-specific MSP Objective: **ALTHYD** = Altered Hydrology, **ALTFIR** = Altered Fire Regime, **ANTPAL** = *Antrozous pallidus* (pallid bat), **AQUCHR** = *Aquila chrysaetos canadensis*, **BRASAN** = *Branchinecta sandiegoensis* (San Diego fairy shrimp), **CENPAR** = *Centromadia parryi* subsp. *australis* (southern tarplant), **CIRCYA** = *Circus cyaneus* (Northern harrier), **DIPSTE** = *Dipodomys stephensi* (Stephens' kangaroo rat), **INVANI** = Invasive Animals, **INVPLA** = Invasive Plants, **PLETOW** = *Plecotus townsendii pallescens* (Townsend's big-eared bat), **QUENENG** = *Quercus engelmannii,* **SPEHAM** = *Spea hammondii* **URBDEV** = Urban Development, **VERPOO** = Vernal Pools and Alkali Playas.

[5] Status in the Preserve: **IP** = In progress, **NS** = Not started.

[6] USMC objectives correspond with all or a portion of the MSP objective.

Table 3. Summary of Vegetation within the Montecito Ranch Preserve

Vegetation		Acres[4]	% of MU[5]
MSP Roadmap Category[1]	SDVC Category[2]		
Riparian Forest	Forests and Woodlands	3.2	0.
Oak Woodland	Forests and Woodlands	39.6	2.5
Disturbed Habitat[3]	Forests and Woodlands	42.4	---
Chaparral	Sclerophyllous, Evergreen Shrublands	236.1	0.9
Coastal Sage Scrub	Soft-leaved, Drought-Deciduous Shrublands	340.8	6.7
Grassland[4]	Herbaceous Vegetation	242.7	8.2
Vernal Pools and Alkali Playa	---	0.50	1.0
Total (Acres)		905.3[6]	19.6

[1] Vegetation category follows SANDAG 1995, Sawyer, Keeler-Wolf, and Evens 2009, SDMMP 2013, and SDMMP and TNC 2017.

[2] Group level category per San Diego Vegetation Classification (SDVC, Sproul et al. 2011).

[3] Disturbed habitat consists of *Eucalyptus* (*globulus, camaldulensis*) Semi-Natural Stands.

[4] Numbers represent acreage of vegetation type mapped on the Preserve in 2020-2021.

[5] Numbers represent percent (%) contribution of vegetation type on the Preserve to *conserved acreage* of that type within MU 5.

[6] Approximately 21.54 acres are roads, trails, and the developed area around the ranch house; this acreage is not included in the total.

2.2 Management Strategic Plan (MSP) and USMC Focal Species

We identified 21 MSP species, 3 of which are USMC focal species, through current and previous surveys efforts. Other rare and sensitive plants and animals occur on the Preserve; however, in the F-RMP we only discuss *MSP and USMC focal species detected on the Preserve* or species assumed to occur on the Preserve based on communication with species experts (i.e., pallid bat, Townsend's big-eared bat) according to these MSP Roadmap management categories (SDMMP and TNC 2017):

SL Species at risk of loss from the MSPA.

SO Species with significant occurrences at risk of loss from the MSPA.

SS Species stable but still requires species-specific management to persist in the MSPA.

VF Species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management.

VG Species not specifically managed for, but may benefit from vegetation management for VF species.

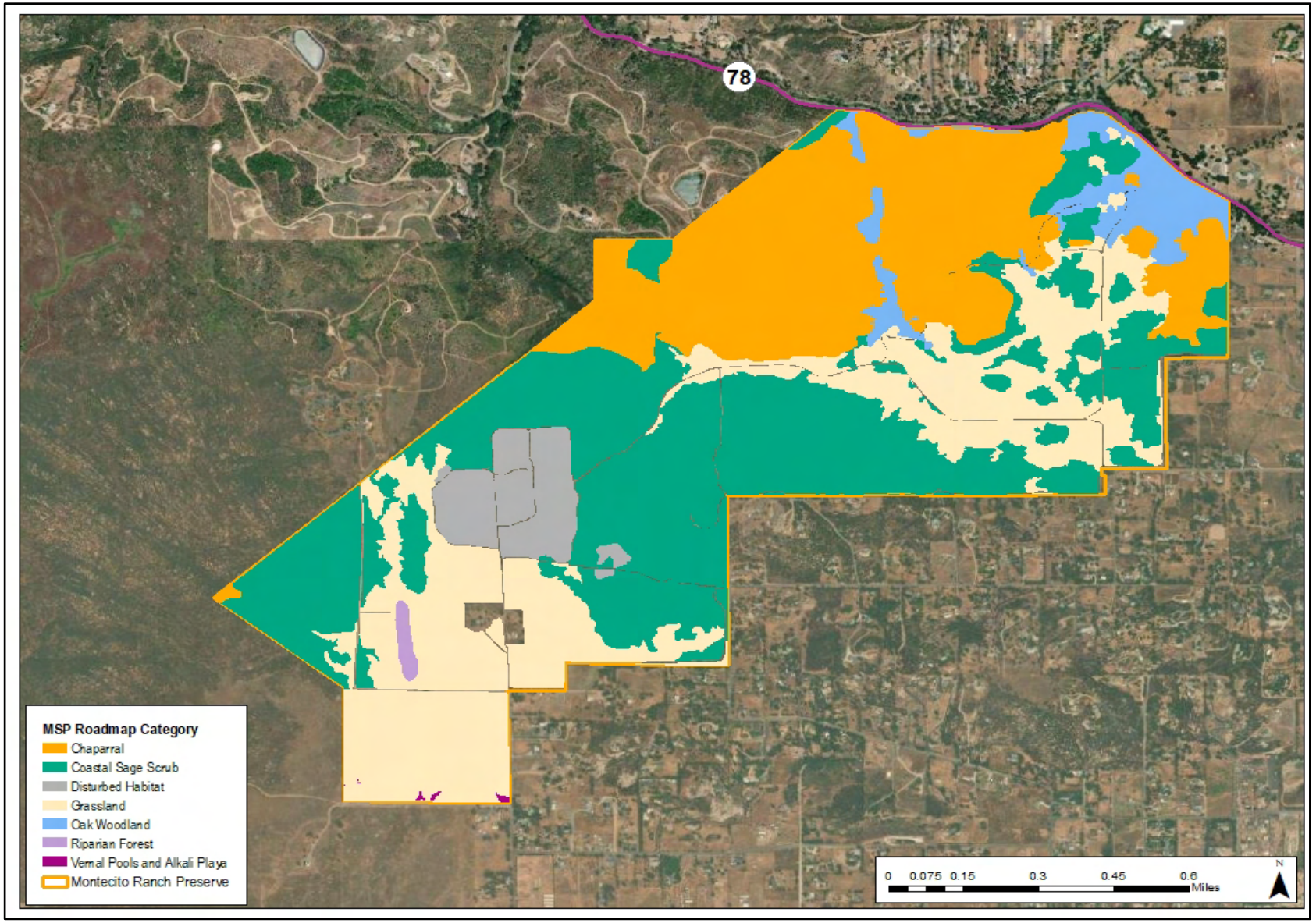

Figure 8. Management Strategic Plan (MSP) Roadmap Vegetation on the Montecito Ranch Preserve

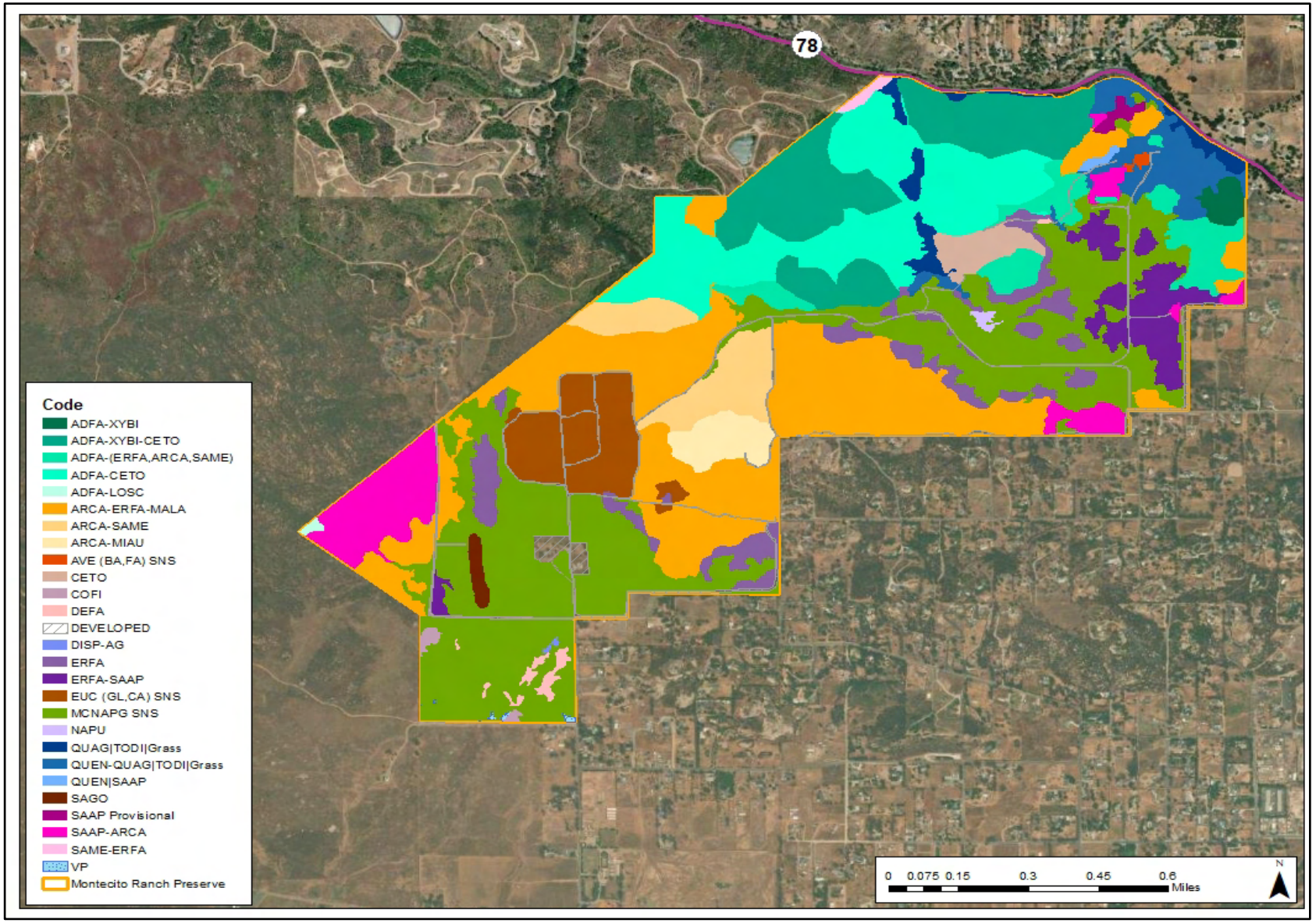

Figure 9. Vegetation Associations on the Montecito Ranch Preserve

Table 4. Vegetation Alliances and Associations on the Montecito Ranch Preserve

Group[1,2]	Alliance or Semi-Natural Stand[1,2,3]	Association or Semi-Natural Stand Type[1,2,3]	Acres
Soft-leaved, Drought-Deciduous Shrublands	*Artemisia californica-Eriogonum fasciculatum*	*Artemisia californica-Eriogonum fasciculatum-Malosma laurina*[6] (ARCA-ERFA-MALA)	178.9
	Artemisia californica	*Artemisia californica-Mimulus aurantiacus* (ARCA-MIAU)	14.0
	Artemisia californica-Salvia mellifera	*Artemisia californica-Salvia mellifera*[6] (ARCA-SAME)	32.3
	Eriogonum fasciculatum	*Eriogonum fasciculatum* (ERFA)	41.0
		Eriogonum fasciculatum-Salvia apiana[6] (ERFA-SAAP)	30.3
	Salvia apiana	*Salvia apiana* Provisional (SAAP Provisional)	2.5
		Salvia apiana-Artemisia californica[6] (SAAP-ARCA)	40.0
	Salvia mellifera	*Salvia mellifera-Eriogonum fasciculatum* (SAME-ERFA)	1.8
Herbaceous Vegetation	*Distichlis spicata*	*Distichlis spicata*-Annual Grasses (DISP-AG)	0.3
	Nassella pulchra	*Nassella pulchra* (NAPU)	1.1
	Avena (*barbata, fatua*) Semi-Natural Stands[3]	*Avena* (*barbata, fatua*) Semi-Natural Stands[3] (AVE [BA, FA] SNS)	0.8
	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands[3]	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands (MCNAPG SNS)	235.2
	Corethrogyne filaginifolia Provisional	*Corethrogyne filaginifolia* (COFI)	1.6
	Deinandra fasciculata Provisional	*Deinandra fasciculata* (DEFA)	3.7
Sclerophyllous, Evergreen Shrublands	*Ceanothus tomentosus*	*Ceanothus tomentosus* (CETO)	10.9
	Adenostoma fasciculatum	*Adenostoma fasciculatum-(Eriogonum fasciculatum, Artemisia californica, Salvia mellifera*) (ADFA-[ERFA, ARCA, SAME])	33.8
		Adenostoma fasciculatum-Ceanothus tomentosus[6] (ADFA-CETO)	100.8
		Adenostoma fasciculatum-Lotus scoparius (ADFA-LOSC)	0.8

Group[1,2]	Alliance or Semi-Natural Stand[1,2,3]	Association or Semi-Natural Stand Type[1,2,3]	Acres
	Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor* (ADFA-XYBI)	5.3
		Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus tomentosus (ADFA-XYBI-CETO)	84.5
Riparian Forest	*Salix gooddingii*	*Salix gooddingii*	3.2
Upland Forests & Woodlands	*Quercus agrifolia*	*Quercus agrifolia*|*Toxicodendron diversilobum*|Grass (QUAG|TODI|Grass)	11.5
	Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia*|*Toxicodendron diversilobum*|Grass (QUEN-QUAG|TODI|Grass)	27.0
		Quercus engelmannii|*Salvia apiana* (QUEN-SAAP)	1.1
	Eucalyptus (*globulus, camaldulensis*) Semi-Natural Stands[3]	*Eucalyptus* (*globulus, camaldulensis*) Semi-Natural Stands[3,6] (EUC [GL, CA] SNS)	42.4
---[4]	Vernal Pools[4]	---[4] (VP)	0.5
Other[5]	Developed Areas	Urban/Developed	21.5
Total Acres			926.8[7]

[1] San Diego Vegetation Classification System for Western San Diego County (Sproul et al. 2011).

[2] Classification level reflects hierarchy used at national, state, and local levels, i.e., National Vegetation Classification (FGDC 2008), Manual of California Vegetation (MCV) (Sawyer et al. 2009), and San Diego Vegetation Classification System for Western San Diego County (Sproul et al. 2011).

[3] Nonnative species dominate Semi-Natural Stands and Stand Types.

[4] Vernal pools are not included in the San Diego Vegetation Classification System for Western San Diego County; thus we do not provide a group or association. We include vernal pools under the 'Alliance or Semi-natural Stand' column for inclusion in total Preserve acreage.

[5] Other = developed or landscaped areas; not included in San Diego Vegetation Classification, such as the ranch house and surrounding areas, roads, and trails.

[6] Associations with known CAGN detections (see Figure 11). Note: CAGN observations occurred most frequently in soft-leaved, drought deciduous shrubland associations.

[7] Total vegetation acres do not sum to 955 (total Preserve acreage) due to differences between officially surveyed parcel and spatial boundaries and number rounding.

Table 5 lists detected and other potentially occurring MSP and USMC focal species. Refer to Figure 10 for locations of MSP, USMC focal, or other rare plants and Figure 11 for locations of MSP, USMC focal, or other rare animals. Refer to REC (2008) and Artemis (2020) for additional information on other rare plants and animals. Refer to Section 4 for ASMDs and survey needs specific to *MSP and USMC focal plants and animals* and Appendix B for additional MSP and USMC focal species information.

2.2.1 Species at Risk of Loss from MSPA (SL)

San Diego fairy shrimp. San Diego fairy shrimp is a federally endangered species, covered under the San Diego Multiple Species Conservation Program (MSCP) and the proposed NCMSCP. San Diego fairy shrimp is also a USMC focal species, thus conservation and management of fairy shrimp and vernal pools on the Preserve could offset future reductions in military training restrictions on MCBCP with Wildlife Agency and USMC concurrence. Surveys from the early 2000s failed to locate this species on the Preserve; however, USMC surveys in 2019 did detect this species in one vernal pool located in the southwestern portion of the Preserve (Asmus 2019, REC 2008). A second vernal pool may also support the species based on the presence of larval fairy shrimp (Asmus 2019).

Harbison's dun skipper. Harbison's dun skipper is not currently listed as threatened or endangered but is covered under the Multiple Habitat Conservation Program (MHCP). San Diego sedge (*Carex spissa*) is the host plant for skipper larvae. Dudek & Associates located a substantial population of Harbison's dun skipper in the large riparian woodland located in the north-central portion of the Preserve in 1997. REC did not relocate this species during biological surveys conducted in 2001 (REC 2008), and CBI did not detect San Diego sedge in a portion of the riparian woodland where Dudek & Associates located skipper in 1997. The 2007 Witch Fire burned through the population location on the Preserve, as well as Boden Canyon to the north. This fire and subsequent erosion may have killed or washed away San Diego sedge from the drainage that originally supported it. Additional surveys would determine if all San Diego sedge on the Preserve perished in the 2007 Witch Fire.

Pallid bat. Pallid bat is a California Species of Special Concern. Pallid bats have a limited distribution on the western slopes of San Diego County because grassland, a primary foraging habitat, is very limited in the county. Pallid bats occur at the Ramona Grasslands and likely forage on the Preserve due to close proximity with the Ramona Grasslands (Stokes pers. comm.).

Table 5. Detected and Potentially-occurring Management Strategic Plan (MSP) and USMC Focal Species on the Montecito Ranch Preserve.

MSP Category[1]	MSP Species[2]		Potential for Occurrence[4]
	Scientific Name[3]	Common Name	
SL	*Branchinecta sandiegonensis*	San Diego fairy shrimp[5]	Detected
SL	*Euphyes vestris harbisoni*	Harbison's dun skipper	Detected
SL	*Streptocephalus woottoni*	Riverside fairy shrimp	Moderate
SL	*Athene cunicularia hypugaea*	Western burrowing owl	Moderate
SL	*Antrozous pallidus*	Pallid bat	High
SL	*Puma concolor*	Mountain lion	High
SL	*Taxidea taxus*	American badger	High
SO	*Acanthomintha ilicifolia*	San Diego thornmint	Low
SO	*Anaxyrus californicus*	Arroyo toad	Moderate
SO	*Aquila chrysaetos canadensis*	Golden eagle	Detected
SO	*Circus cyaneus*	Northern harrier	Detected
SO	*Dipodomys stephensi*	Stephens' kangaroo rat[5]	Detected
SO	*Plecotus townsendii pallescens*	Townsend's big-eared bat	High
SS	*Odocoileus hemionus fuliginata*	Southern mule deer	Detected
VF	*Atriplex coulteri*	Coulter's saltbush	Moderate
VF	*Atriplex parishii*	Parish's brittlescale	Moderate
VF	*Ceanothus cyaneus*	Lakeside ceanothus	Moderate
VF	*Centromadia parryi subsp. australis*	Southern tarplant	Detected
VF	*Navarretia fossalis*	Spreading navarretia	Low
VF	*Quercus engelmannii*	Engelmann oak	Detected
VF	*Spea hammondii*	Western spadefoot toad	Detected
VF	*Phrynosoma blainvillii*	Blainville's horned lizard	Detected
VF	*Ammodramus savannarum perpallidus*	Grasshopper sparrow	High
VF	*Polioptila californica californica*	Coastal California gnatcatcher[5]	Detected
VF	*Lepus californicus bennettii*	San Diego black-tailed jackrabbit	Detected
VG	*Aspidoscelis hyperythra beldingi*	Belding's orange-throated whiptail	Detected

MSP Category[1]	MSP Species[2]		Potential for Occurrence[4]
	Scientific Name[3]	Common Name	
VG	*Crotalus ruber*	Red diamond rattlesnake	Detected
VG	*Thamnophis hammondii*	Two-striped garter snake	Detected
VG	*Haliaeetus leucocephalus*	Bald eagle	Detected
VG	*Accipiter cooperi*	Cooper's hawk	Detected
VG	*Artemisiospiza belli belli*	Bell's sparrow	Detected
VG	*Buteo regalis*	Ferruginous hawk	Detected
VG	*Sialia mexicana*	Western bluebird	Detected
VG	*Chaetodipus fallax fallax*	Northwestern San Diego pocket mouse	Detected

[1] Management Strategic Plan (MSP) management category: SL = species at risk of loss from Management Strategic Plan Area (MSPA); SO = species with significant occurrences at risk of loss from MSPA; SS = species stable but still requires species-specific management to persist in MSPA; VF = species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management; VG = species not specifically managed for, but may benefit from vegetation management for VF species. Note that VG species are included in this table but are not an MSP or USMC management priority.

[2] Per SDMMP 2013 and SDMMP and TNC 2017.

[3] Plant species nomenclature generally follows Rebman and Simpson 2014.

[4] Detected = species detected onsite; High = species has a high potential for occurrence due to suitable habitat and/or known occurrence in the vicinity, Moderate = species has a moderate potential for occurrence due to suitable habitat, Low = species has a low potential for occurrence due to lack of suitable habitat.

[5] USMC focal species.

2.2.2 Species with Significant Occurrences at Risk of Loss from MSPA (SO)

Golden Eagle. Golden eagle is listed as a fully protected species in California and covered under the MSCP, MHCP, and the proposed NCMSCP. Michael Beck, EHC Executive Director, observed one golden eagle perched on a fence post on Montecito Ranch in the early 2000s (Beck pers. comm.). AECOM documented year-round golden eagle use of the Ramona Grasslands, and while only a limited portion of Montecito Ranch was included in that study, golden eagles were documented to use Montecito Ranch (AECOM 2014). There are two active nesting territories in MU 5, both on private property (SDMMP and TNC 2017). The foraging territories for the eagles in these two territories likely overlap with Montecito Ranch.

Northern harrier. Northern harrier is not federally or state-listed, but is covered under the MSCP and the proposed NCMSCP. The San Diego Bird Atlas Project documented moderate numbers (0.10-0.25 birds per hour) in the Ramona Grassland area (Unitt 2012). Artemis and CBI

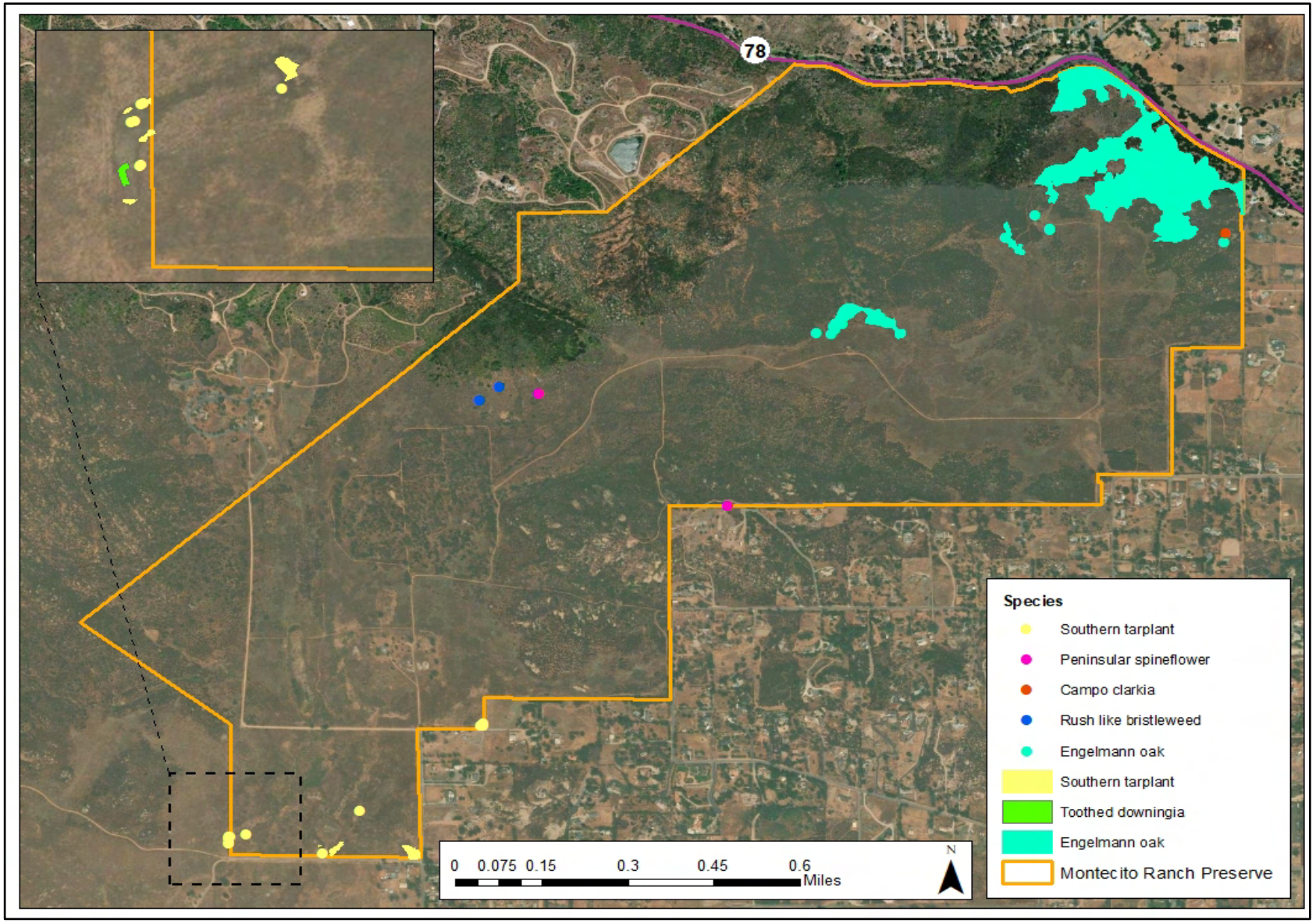

Figure 10. Rare Plants on the Montecito Ranch Preserve

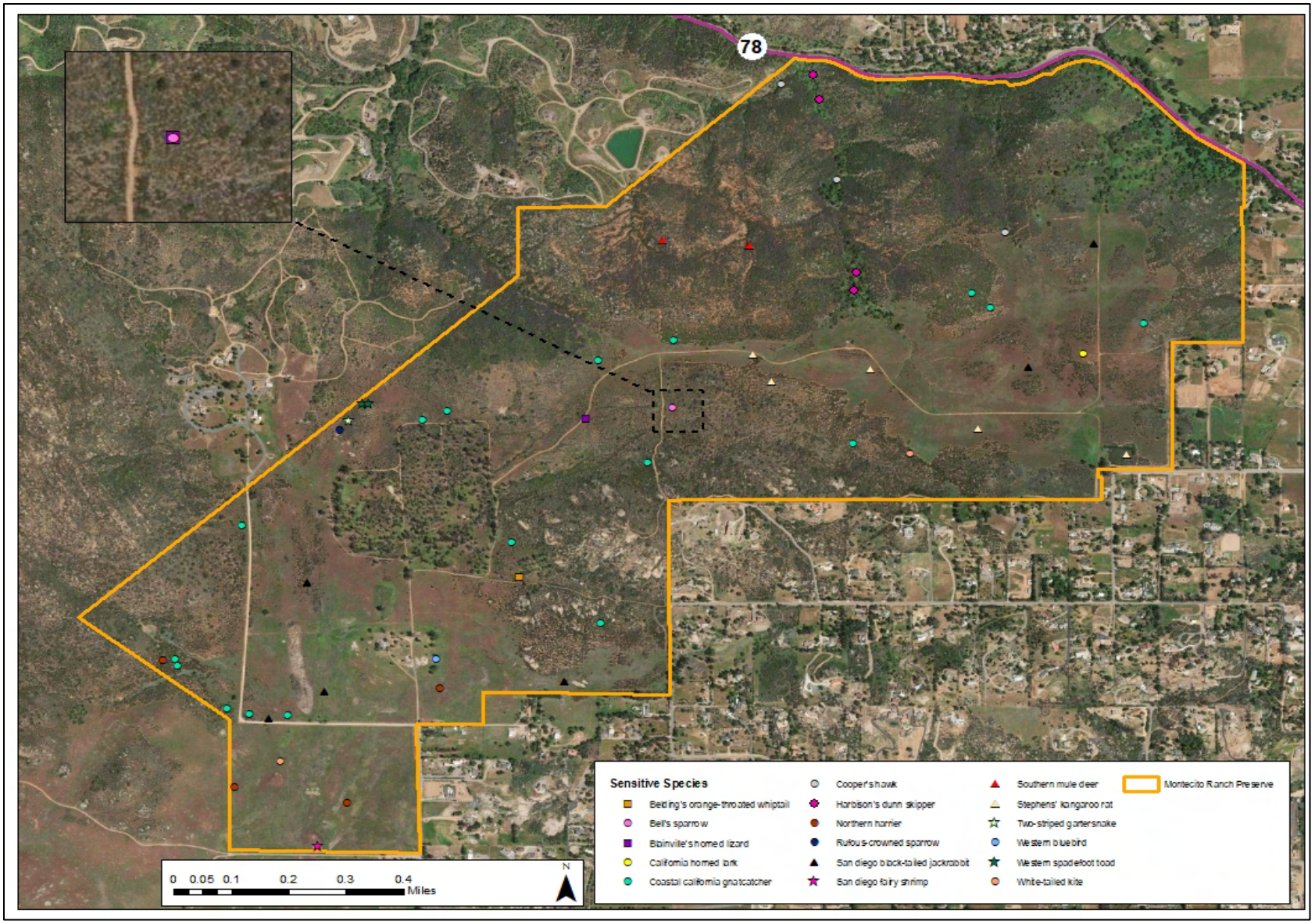

Figure 11. Rare Animals on the Montecito Ranch Preserve

biologists observed foraging individuals in the south and southwestern portions of the property during 2020 and 2021 field surveys (Artemis 2020), in addition to earlier detections by REC (2008).

Stephens' kangaroo rat. Stephens' kangaroo rat is currently listed as federally endangered and state threatened; however, USFWS proposed to down-list the species to threatened on August 19, 2020. SKR is also a USMC focal species, thus conservation and management of SKR and associated habitat on the Preserve will offset future reductions in military training restrictions specifically on MCBCP. Dr. Philip Behrends surveyed for Stephens' kangaroo rat in 1998 and identified six Stephens' kangaroo rat in the eastern portion of the Preserve based on morphological measurements (Dudek 1998a). O'Farrell Biological Consulting and SJM Consulting resurveyed the Preserve in 2001, 2007, and 2018, respectively, but did not relocate the species (REC 2008, SJM Consulting 2019, Artemis 2020). SJM Consulting located SKR in 2015 approximately 100 yards from the southwestern corner of the Preserve on the Ramona Grasslands Preserve (SJM Consulting 2015). Refer to Appendix C for additional discussion on Stephens' kangaroo rat history on the Preserve.

Townsend's big-eared bat. Townsend's big-eared bat is a California Species of Special Concern. It is widely distributed in western North America and uses a wide range of habitats across a broad elevational range. Populations are known from across San Diego County, including the Ramona Grasslands, and even though this species has a broader distribution in San Diego County, its populations are small (SDMMP 2021, Stokes pers. comm.). The species is strongly suspected to occur on the Preserve based on foraging and roosting habitat (Stokes pers. comm.).

2.2.3 Species Stable but Requires Species-Specific Management to Persist in MSPA (SS)

Southern mule deer. Southern mule deer is covered under the MHCP and MSCP. Biologists observed the highest concentrations of mule deer scat and tracks in the north, northwestern, and western portions of the Preserve during the 2020 field surveys (Artemis 2020) and 2021 rapid assessment field surveys conducted by CBI.

2.2.4 Species with Limited Distribution or Needing Specific Vegetation Characteristics Requiring Management (VF)

Southern tarplant. Southern tarplant is on California Native Plant Society (CNPS) List 1B.1 (rare or endangered in California and elsewhere; seriously endangered in California). It is not federally or state listed as endangered or threatened, but it is covered under the NCMSCP. REC biologists mapped the species on the Preserve in 2001 and estimated ~2,340 individuals (REC 2008). In 2019, CBI mapped the species, in and near the vernal pools in the southern part of the property, and estimated an overall population size of 9,500 individuals (CBI 2019). CBI detected an

additional ten plants in grassland in the southern portion of the Preserve and another five plants just north of Sonora Way during the 2020 and 2021 rapid assessment field surveys.

Engelmann oak. Engelmann oak is on CNPS list 4.2 (limited distribution in California) and a covered species under the MHCP and NCMSCP. REC counted approximately 290 Engelmann oaks on the Preserve in 2001 (REC 2008). CBI mapped individual trees and recorded approximately 28 acres of Engelmann oak woodland during the 2020 and 2021 rapid assessment field surveys.

Western spadefoot toad. Western spadefoot toad is a CDFW Species of Special Concern and covered under the MHCP and NCMSCP. Biologists observed an unknown number of spadefoot toads in 1998 on the western boundary in disturbed coastal sage scrub (CDFW 2020). Vernal pools have not been surveyed for western spadefoot since surveys in the early 2000s; however, the USMC identified potential spadefoot toad tadpoles in one vernal pool during fairy shrimp surveys (Asmus 2019).

Blainville's horned lizard. Blaineville's horned lizard is a CDFW species of special concern and a covered species under the MSCP and NCMSCP. REC found two Blaineville's horned lizards in coastal sage scrub during 2001 surveys (REC 2008), and EHC observed one individual in 2021.

Coastal California gnatcatcher. Coastal California gnatcatcher is federally threatened, a CDFW species of special concern, covered under the MHCP, MSCP and the proposed NCMSCP. CAGN is also a USMC focal species, thus conservation and management of CAGN and associated habitat on the Preserve will offset future reductions in military training restrictions specifically on MCBCP. Biologists observed several individuals and pairs throughout the property during 2020 field surveys, and REC observed four family groups and two pairs during 2001 USFWS protocol surveys (Artemis 2020, REC 2008). CBI observed several individuals and pairs during 2020 and 2021 rapid assessment field surveys.

San Diego black-tailed jackrabbit. San Diego black-tailed jackrabbit is a CDFW species of special concern and covered under the MHCP and NCMSCP. Biologists observed individuals during all survey events between 1997 and 2020 (Artemis 2020, REC 2008), and CBI observed several individuals in the southern portion of the Preserve during the 2020 and 2021 rapid assessment field surveys.

2.2.5 Species Benefits from Management for VF Species (VG)

Belding's orange-throated whiptail. Belding's orange-throated whiptail is a CDFW Watch List species and covered under the MSCP, MHCP, and the NCMSCP. USFWS staff observed a Belding's orange-throated whiptail on the Preserve in 2021 east of the eucalyptus grove.

Red-diamond rattlesnake. Red-diamond rattlesnake is a CDFW Species of Special Concern and a covered species under the proposed NCMSCP. Biologists documented the species from the Preserve in 1997 (REC 2008).

Two-striped garter snake. Two-striped garter snake is a CDFW Species of Concern and covered under the proposed NCMSCP. REC biologists observed the species in 2001 in coastal sage scrub (REC 2008).

Bald eagle. Bald eagle is federally protected under the Bald Eagle Protection Act and is a California Fully Protected Species. A pair of bald eagles has nested in eucalyptus trees near the Ramona Airport and used the Ramona Grasslands, including Montecito Ranch, year-round (AECOM 2014).

Cooper's hawk. Cooper's hawk is not federally or state-listed, but is a CDFW Watch List bird and covered under the MSCP. Biologists observed Cooper's hawk during 2020 surveys and the 2021 CBI rapid assessments (Artemis 2020).

Ferruginous hawk. Ferruginous hawk is not federally or state listed, but is covered under the MSCP. An iNaturalist observer photographed a ferruginous hawk flying over the Preserve in 2018. Ferruginous hawks also occur in the Ramona Grasslands (iNaturalist 2018).

Bell's sparrow. Bell's sparrow is not federally or state listed, but is a CDFW Watch List bird and covered under the NCMSCP. Artemis observed several individuals in the central portion of the Preserve during 2020 field surveys, and biologists also observed the species in 1997 (REC 2008).

Western bluebird. Western bluebird is covered under the MHCP and MSCP. During 2020 field surveys biologists observed one individual within the eucalyptus tree near the Montecito Ranch house (Artemis 2020).

Northwestern San Diego pocket mouse. Northwestern San Diego pocket mouse is a CDFW species of special concern and covered under the MHCP. Several pocket mice were trapped and observed during a 2018 SKR survey (SJM Consultants 2019).

2.2.6 Connectivity

Conservation of Montecito Ranch expands the Ramona Grasslands core area and augments the northern coastal sage scrub buffer (CBI 2004) within MSCP Core L. However, these grasslands are largely isolated from other grasslands in the region (e.g., Rancho Guejito in Core D), except through non-grassland connections. The sage scrub, chaparral, and oak woodland habitats on the Preserve are well-connected to similar habitats in the San Pasqual Valley in the western portion of Core L and the block of habitat surrounding Boden Canyon to the north via Bandy Canyon and Clevenger Canyon in Core D (Figure 3). State Route (SR) 78 may pose a crossing obstacle for some species.

Connectivity from the Ramona Grasslands and the Preserve to Mt. Woodson/Blue Sky Ranch Ecological Preserve to the southwest in Core D is likely compromised by rural residential and agricultural development. Small oak-lined drainages may facilitate movement of some species from the Ramona Grasslands through rural residential development into conserved lands to the southwest.

2.2.7 Primary Threats and Stressors

We identified threats to Montecito Ranch based on 2020 and 2021 field surveys, previous Preserve investigations and reports, and known site history. In this section, we summarize threats and stressors that will be managed at the preserve-level. The MSP Roadmap addresses regional threats and stressors (e.g., climate change, connectivity, nitrogen deposition, light pollution, urban runoff) (SDMMP and TNC 2017). Identified threats and stressors are discussed further below, and management priority levels for these threats and stressors are summarized in Table 6. Refer to Figure 12 for the locations of stewardship threats mapped during the 2020-2021 rapid assessment field surveys. Section 3.3 lists priority management actions to address these threats. Refer to Appendix B for additional information on threats and stressors.

Altered Fire Regime. Altered fire regimes may impact native species and habitat directly through species mortality or indirectly through reduction of the seed bank, facilitating colonization by invasive species, or habitat type conversion. Nonnative grass invasion increases fine fuel loads, which can alter fire frequency and intensity that creates positive feedback favoring nonnative grasses. Fire suppression can result in increased fuel loads and fire intensities, while increases in fire frequency from human ignition sources can prevent plants from reaching maturity and contributing to the soil seed bank. The majority of the Preserve last burned in the 2007 Witch Fire. The northern Preserve boundary is SR-78, a well-traveled, two-lane paved road connecting Ramona to the San Pasqual Valley and Interstate 15. SR-78 represents a potential source for wildfire ignitions from vehicular traffic. Rural residential land uses around the Preserve are not considered significant sources for wildfire ignitions. Herbaceous vegetation communities on the Preserve are dominated by nonnative annual grasses, and fine fuels (e.g., thatch) can accumulate in the absence of vegetation management.

The largest threats to altering fire regimes are offsite fires that spread onto the Preserve and unnaturally intense fires that are fueled by the accumulation of herbaceous thatch. Current fuels management areas exist on the Preserve and EHC mows or line trims herbaceous vegetation annually in these areas (Figure 13). During the rapid assessments, we noted two locations where an adjacent landowner illegally removed fence and Preserve vegetation for fuel management purposes (Figure 12). The removal of Preserve vegetation and associated soil disturbance can increase nonnative herbaceous vegetation (fine fuels) and thatch accumulation thus expanding wildfire ignition sources in this portion of the Preserve.

Table 6. Primary Threats and Stressors on the Montecito Ranch Preserve

Threats and Stressors	Priority Level[1]
Altered Fire Regime	
Frequent Fires	Moderate
Fuel Modification[2]	High
Altered Hydrology/Erosion	High
Genetic Consequences	Unknown
Human Use of Preserves	
Management, Monitoring, & Maintenance Activities	Low
Recreational Use/Unauthorized Trails	High
Road Maintenance	Low
Utilities (power lines, transmission towers)	High
Past Agricultural Activities	High
Past Mining Activities	Low
Invasive Animal Species	
Argentine Ants	Low
Goldspotted Oak Borer, Oak Pit Scale	Low
Kuroshio Shot Hole Borer + Fusarium Dieback	Low
Wild Turkeys	Unknown
Invasive Plant Species	
Management Level 3	High
Management Level 4	High
Other Invasive Species	Moderate
Urban Development	
Dumping/Trash	High
Edge Effects[3]	High

[1] Priority Level based on current information and may change over time. **Low** = threat is potential (versus observed) and/or measures are currently in place to minimize impacts; **Moderate** = some threat to species or habitats from past events that may warrant monitoring or restoration if additional events occur; **High** = observed, current threat or stressor that warrants management actions, **Unknown** = potential threat identified, but biological information not yet available to determine if threat adversely affects species in question.

[2] Vegetation removal and associated soil disturbance can increase fine fuels (including nonnative species) and thatch accumulation thus increasing wildfire ignition sources. Thus, fuel modification is included under Altered Fire Regime per the MSP Roadmap (SDMMP and TNC 2017).

[3] Edge effects can include encroachment, unauthorized vegetation clearing (including fuel modification), horticultural plantings, and barriers to species movement and dispersal.

Altered Hydrology/Erosion. The Preserve lies in the headwaters of Clevenger Canyon and Santa Maria Creek; thus, offsite land uses generally do not affect its hydrology. Preserve slopes are well vegetated with no obvious erosion problems; however, we noted erosion in and along dirt access roads, drainages, and in oak woodlands (Figure 12). In some cases, native vegetation is being affected through loss of soil, shrubs, and undercutting of oak trees.

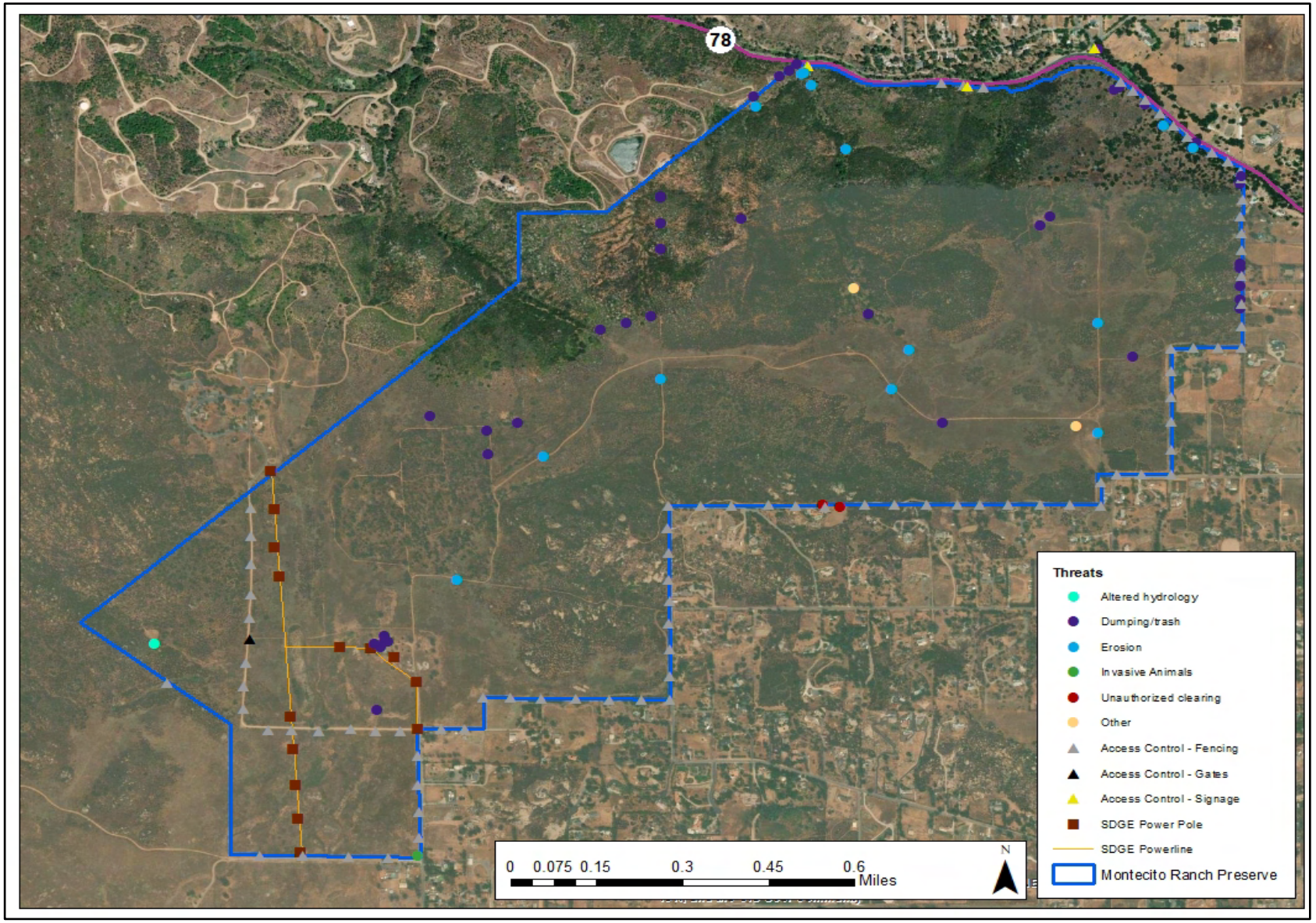

Figure 12. Stewardship Threats on the Montecito Ranch Preserve

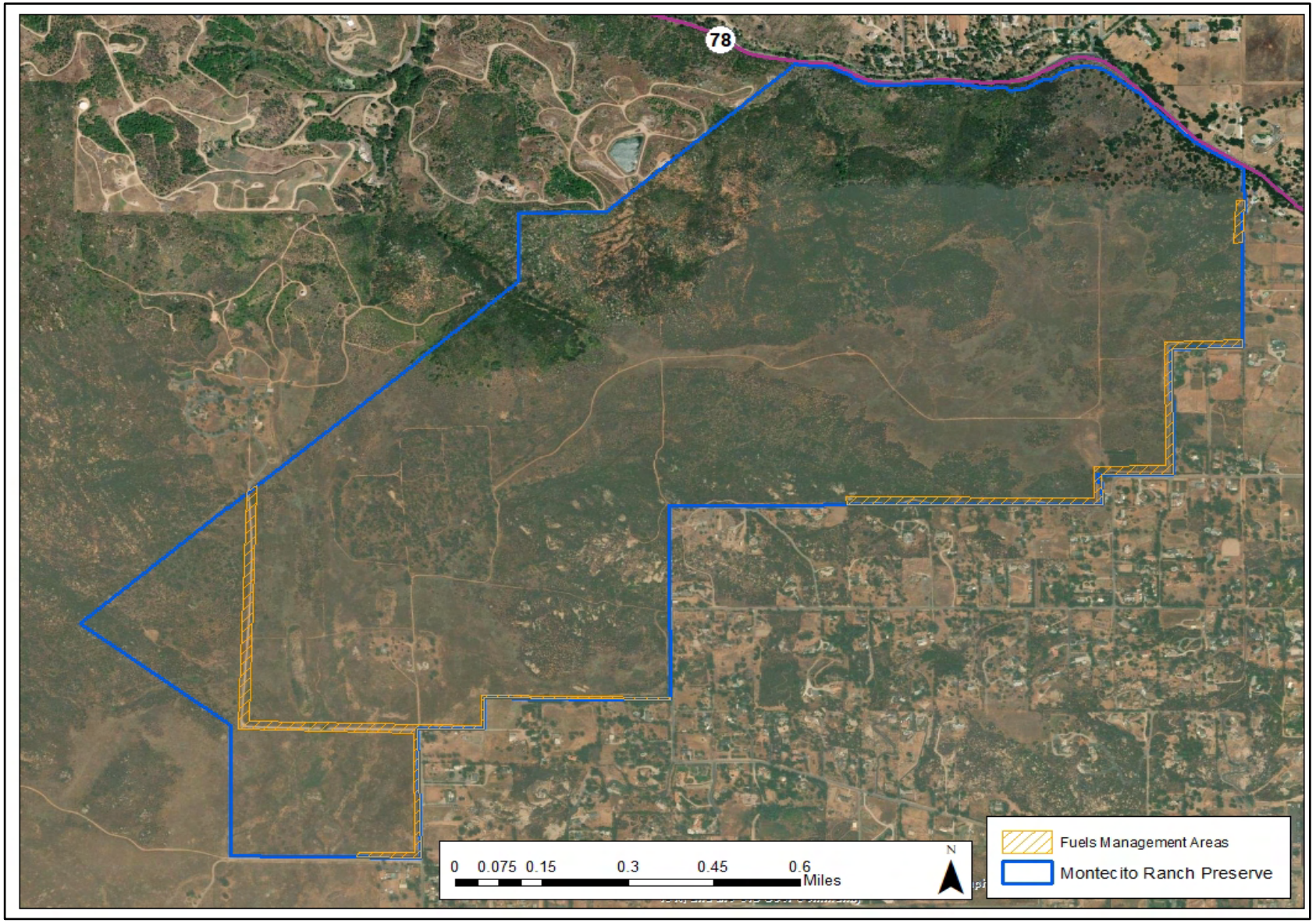

Figure 13. Fuels Management Areas on the Montecito Ranch Preserve

A small, earthen reservoir (altered hydrology) (Figure 12), historical well (location unknown), and the removal of native vegetation and associated increase in impermeable surfaces at the ranch house have altered groundwater and drainage to Santa Maria Creek in the southern portion of the Preserve; however, we do not consider these modifications significant stressors.

Human Use of Preserve. Authorized or unauthorized human uses can adversely affect biological resources.

Monitoring, Management, and Maintenance Activities. Personnel involved in monitoring, managing, and maintaining resources or facilities may unintentionally introduce nonnative species, physically disturb sensitive species or habitats by trampling or vehicle use, or disturb wildlife.

Recreational Use/Unauthorized Trails. Unauthorized users of the Preserve may introduce invasive species, disturb or trample sensitive species and cultural resources, disturb or poach wildlife, and increase risk of fires. We have noted adjacent land-owners walking on Preserve access routes, and we identified locations where a gate and signs are needed and fence installed or repaired to control unauthorized access (Figure 12). Unauthorized recreational use (e.g., unleashed dogs, off-highway vehicles, mountain and electric bikes) is a high priority threat and installation of new fence or repair of existing fence is recommended for most of the external Preserve boundary (Figure 12) where unauthorized public access is probable (i.e., interface between the Preserve, public roads, and private residences).

Road Maintenance. This is a potential threat where it removes native vegetation or impacts MSP and USMC focal species. A number of road easements exist on the edges of the Preserve adjacent to residential areas and public roads. SDG&E maintains the roads associated with the overhead powerlines and poles (Figure 12). Refer to Artemis 2020 for easement descriptions and detailed locations. We also noted rills, gullies, and erosion on access routes during the rapid assessments (Figure 12). All maintenance activities conducted by EHC will be restricted to the few existing access routes and roads. EHC will coordinate with adjacent landowners on any proposed road easement activities that could affect the Preserve.

Utilities. Several active pole line, underground conduit, and ingress and egress utility easements exist on the Preserve. Refer to Artemis 2020 for easement descriptions and detailed locations. SDG&E currently services two active overhead power lines and associated poles (Figure 12). The north-south powerline easement is 12 ft wide and approximately 3,915 ft long, while the east-west powerline easement is 10 ft wide and approximately 840 ft long. SDG&E recently changed the power poles from wood to steel and restored native habitat around these poles post-construction. Additional pole lines, underground conduits, and ingress and egress utility easements exist on the Preserve, but their current status is unknown. Refer to Artemis 2020 for easement descriptions and detailed locations.

SDG&E easements stipulate day and night access to the Preserve. Ongoing operations and maintenance (O&M) and vegetation management activities associated with SDG&E easements may threaten resources by removing vegetation, unintentionally killing or injuring animals along access roads, and introducing invasive plant species on vehicle tires or equipment. Typical SDG&E O&M and vegetation activities and associated schedules include but are not limited to:

- Annual facility inspections by vehicle or drone and associated facility repairs.
- Visual facility inspections prior to high-wind events and subsequent to unplanned power outages.
- Site inspections before and during routine vegetation management and tree trimming (May, June, July – August, September).
- Managing vegetation around high-priority poles (early spring).

Past Agricultural Activities. The Preserve has a long history of active agricultural uses, although there are none currently. While the nature and extent of agriculture is unclear, historical photos from the early 20th century show extensive fruit tree orchards over much of the western portion of the Preserve. Livestock grazing occurred historically, and previous land owners disked most of the level terrain and potentially applied rodenticides in the early 2000s. The existing perimeter fence is in disrepair in many locations (Figure 12) and would require repair and maintenance to support livestock grazing.

Past Mining Activities. We located one exploratory mining pit on the Preserve; however datasets and records do not depict or list any historic mineral claims. The cultural resources report lists two quarries, but does not discuss them further (Heritage Resources 2008). We do not consider the pit a threat to wildlife since it is shallow and filled with rocks.

Invasive Animal Species. The SDMMP is developing an invasive animal management plan to provide clear steps for managing these species. Species that pose the greatest threat to biological resources are summarized below.

Argentine Ants. Argentine ants (*Linepithema humile)* occur throughout urban San Diego County, and conserved lands bordering urban areas and riparian corridors are at greatest risk of infestation (SDMMP and TNC 2017). Argentine ants are swarming ants that can result in almost complete loss of the native ant community, which includes both solitary foragers and swarming ants. Ant specialists such as the Blaineville's horned lizard rely on solitary foraging ants for food, and do poorly or do not persist in Argentine ant-invaded regions. Argentine ants are common predators in riparian habitat and may prey on Harbison's dun skipper larvae (Marschalek and Deutschman 2017). Argentine ants are also known to opportunistically depredate nests of ground- and shrub-nesting birds (e.g., Bell's sparrow, coastal California gnatcatcher). Other groups, such as spiders, shrews, and other invertebrates, decline or become

absent in the presence of Argentine ants. Thus, Argentine ants are a primary risk to biodiversity and ecological integrity of southern California reserves. In eastern San Diego County, Argentine ants are more restricted to riparian or artificially wet areas due to their moisture needs.

Although we did not survey for Argentine ants, we expect them predominantly along Preserve boundaries that border residential areas and wet or moist habitats (i.e., wetlands, vernal pools), rather than in more xeric, shrub-dominated areas.

Goldspotted Oak Borer. The goldspotted oak borer (*Agrilus auroguttatus)* (GSOB) is an invasive beetle that attacks mature coast live oaks (*Quercus agrifolia*), resulting in tree damage and mortality, as well as loss of wildlife foraging and nesting habitat, increased fuel for fires, and possibly, gaps for invasive plant establishment. While it occurs in Engelmann oaks, it does not appear to adversely affect that species (UCANR 2016a). The Preserve lies within the GSOB zone of infestation (Cal Fire 2016), and the owner of Green Tree Forest Service indicated that GSOB is present in the Ramona area (Manzuk pers. comm.). EHC staff have monitored select coast live oaks within the Preserve for GSOB and to date, have not detected it

Kuroshio Shot Hole Borer + Fusarium Dieback. Another invasive beetle, Kuroshio shot hole borer (*Euwallacea* sp.) (KSHB), tunnels into host trees and shrubs and deposits its associated fungi that causes fusarium dieback, a disease that kills many native and nonnative tree and shrub species (Dimson et al. 2014). California sycamore (*Platanus racemosa*), willows (*Salix* sp.), and coast live oak are suitable host trees. The nearest reported detections of KSHB were from trees located in eastern Escondido (UCANR 2016b). EHC staff have monitored select coast live oaks, California sycamore, and willow within the Preserve for KSHB and to date, have not detected it.

Oak Pit Scale. Oak pit scale (*Asterolecanium* sp.) insects attack many deciduous and evergreen oak species in California (Geisel and Perry 2013). Pit scales cause twig dieback by sucking juices from twigs and severe infestations can delay leafing out of deciduous oaks. Ongoing heavy infestations can kill young oak trees. In San Diego county, pit scale is known to attack Engelmann oaks; however, pruning isolated areas of infestation can temporarily eliminate pit scale from oak trees and treatment of Engelmann oaks with insecticides is effective at preventing tree mortality if detected early (Geisel and Perry 2013; Manzuk pers.comm.). EHC staff have monitored select Engelmann oak trees within the Preserve for oak pit scale and to date, have not detected it.

Wild Turkeys. Turkeys (*Meleagris gallopavo)* prey on small animals and can adversely impact rare plant species. Wild turkeys have been documented on the Preserve (Figure 12) and are now common in the Ramona area. At this time, we do not consider turkeys a significant stressor to MSP and USMC focal species; however, currently it is unclear what level of impact

these nonnative predators have on native species populations. Monitoring their presence on the Preserve is warranted.

Invasive Plant Species. Nonnative, invasive plants pose one of the greatest threats to the biological integrity of natural lands because of their ability to displace native species, degrade wildlife habitat, and alter ecosystem processes (e.g., Huenneke et al. 1990, Vitousek 1990, D'Antonio and Vitousek 1992, Wilcove et al. 1998, Cox 1999, Evans et al. 2001, Ehrenfeld 2003, Belnap et al. 2005).

We detected 31 invasive or ornamental plants on the Preserve in 2021 (Table 7), including 7 "high priority" species (Figure 14), 14 "other priority" species, and 10 "lower priority and ornamental" species (Figure 15). High priority species are included in the Management Priorities for Invasive Non-native Plants: A Strategy for Regional Implementation (IPSP) (CBI et al. 2012;), other priority species are listed as invasive or potentially invasive by the California Invasive Plant Council (Cal-IPC), and lower priority invasive and ornamental plants are a management issue where they potentially impact MSP and USMC focal species. We did not map naturalized nonnative species (e.g., annual brome grasses). Table 8 presents a Watch List for Early Detection Rapid Response (EDRR) and additional invasive plants that would be a concern if detected on the Preserve.

Urban Development. Dumping trash and edge effects are potential threats to Montecito Ranch. The previous owners of the property left numerous trash piles and other debris (e.g., a trailer, corrugated steel, culverts and pipes, and old fencing) scattered across the property (Figure 12). Some of this trash is considered a high threat to Preserve resources. Appropriate access control (i.e., fencing, signs) and land manager presence will prevent future unauthorized dumping and recreational access. Down and damaged sections of fences and gates (Figure 12) need repair, signage, and posting of Preserve rules to deter trespassing and illegal dumping.

Edge effects can include encroachment, unauthorized vegetation clearing, horticultural plantings, and barriers to species movement and dispersal. Land-owners adjacent to the Preserve have cut and removed fence in three locations (Figure 12) and removed vegetation for fuel and fire risk reduction (see Altered Fire Regime) along the southeastern boundary (Figure 12). They also graded the road on the Preserve adjacent to their property. In other cases, nonnative trees and shrubs are growing onto the Preserve from adjacent private property.

The impact of roads, particularly on wildlife mortality, is a regional issue and beyond preserve-level management. Locally, SR-78 may be a potentially significant source of edge effects at Montecito Ranch (e.g., Figure 3) and merits monitoring.

Table 7. Invasive Plant Species on the Montecito Ranch Preserve

Scientific Name[1]	Common Name[1]	Invasive Plant Ranking[2]	
		IPSP	Cal-IPC
IPSP Priority Species[3]			
Management Level 3[4]			
Arundo donax	Giant reed	Very High	High
Cynara cardunculus	Artichoke thistle	Very High	Moderate
Lepidium latifolium	Perennial pepperweed	Very High	High
Oncosiphon pilulifer	Stinknet	Medium	High
Management Level 4[4]			
Dittrichia graveolens	Stinkwort	High	Moderate – Alert
Foeniculum vulgare	Fennel	Very High	Moderate
Silybum marianum	Milk thistle	High	Limited
Other Priority Invasive Species[5]			
Ailanthus altissima	Tree-of-heaven	---	Moderate
Anthemis cotula	Mayweed chamomile	---	---
Asphodelus fistulosus	Onion weed	---	Moderate
Brassica tournefortii	Sahara mustard	---	High
Carduus pycnocephalus	Italian thistle	---	Moderate
Cirsium vulgare	Bull thistle	---	Moderate
Nicotiana glauca	Tree tobacco	---	Moderate
Olea europaea	Olive	---	Limited
Phoenix canariensis	Canary Island Palm	---	Limited
Ricinus communis	Castor bean	---	Limited
Schinus molle	Peruvian pepper tree	---	Limited
Stipa miliacea var. *miliacea*	Smilo grass	---	Limited
Tamarix aphylla	Athel	---	Limited
Tamarix sp.[6]	Salt cedar	---	High[6]
Lower Priority Species			
Brahea sp.	Palm	---	---
Calocedrus decurrens	Western incense cedar	---	---
Catalpa speciosa	Western catalpa	---	---
Eucalyptus sp.	Eucalyptus	---	---
Juglans sp.	Walnut	---	---

Scientific Name[1]	Common Name[1]	Invasive Plant Ranking[2]	
		IPSP	Cal-IPC
Opuntia fiscus-indica	Prickly pear	---	---
Opuntia robusta	Wheel cactus	---	---
Parkinsonia sp.	Palo verde	---	---
Pinus sp.	Pine	---	---
Washingtonia filifera	California palm	---	---

[1] Species nomenclature generally follows Rebman and Simpson 2014.

[2] Invasive Plant Ranking:

IPSP = San Diego Invasive Plant Strategic Plan; rankings indicate regional management priority based on regional (versus Cal-IPC) Plant Assessment Form (PAF) score and management feasibility (CBI et al. 2012).

Cal-IPC: California Invasive Plant Council; rankings indicate statewide priority based on Cal-IPC PAF score (Cal-IPC 2006): **High** = Severe ecological impacts, **Moderate** = Substantial and apparent—but generally not severe—ecological impacts, **Limited** = Invasive but ecological impact minor statewide or not enough information to justify a higher score; species may be locally persistent and problematic.

[3] IPSP species = priority invasive species for mapping during rapid assessment field surveys.

[4] Management Levels per regional Invasive Plant Strategic Plan (IPSP) (CBI et al. 2012):

Management Level 3 – Containment: eradication with coordinated programs by management unit or watershed.

Management Level 4 – Directed Management: control within reserve or sub-management unit to benefit NCCP resources.

[5] Other invasive species = invasive species not included in the IPSP but recognized as invasive or potentially invasive by Cal-IPC.

[6] We have not identified the species of *tamarisk*. Cal-IPC rankings for *T. chinensis*, *T. gallica*, *T. parviflora*, and *T. ramosissima* are all high.

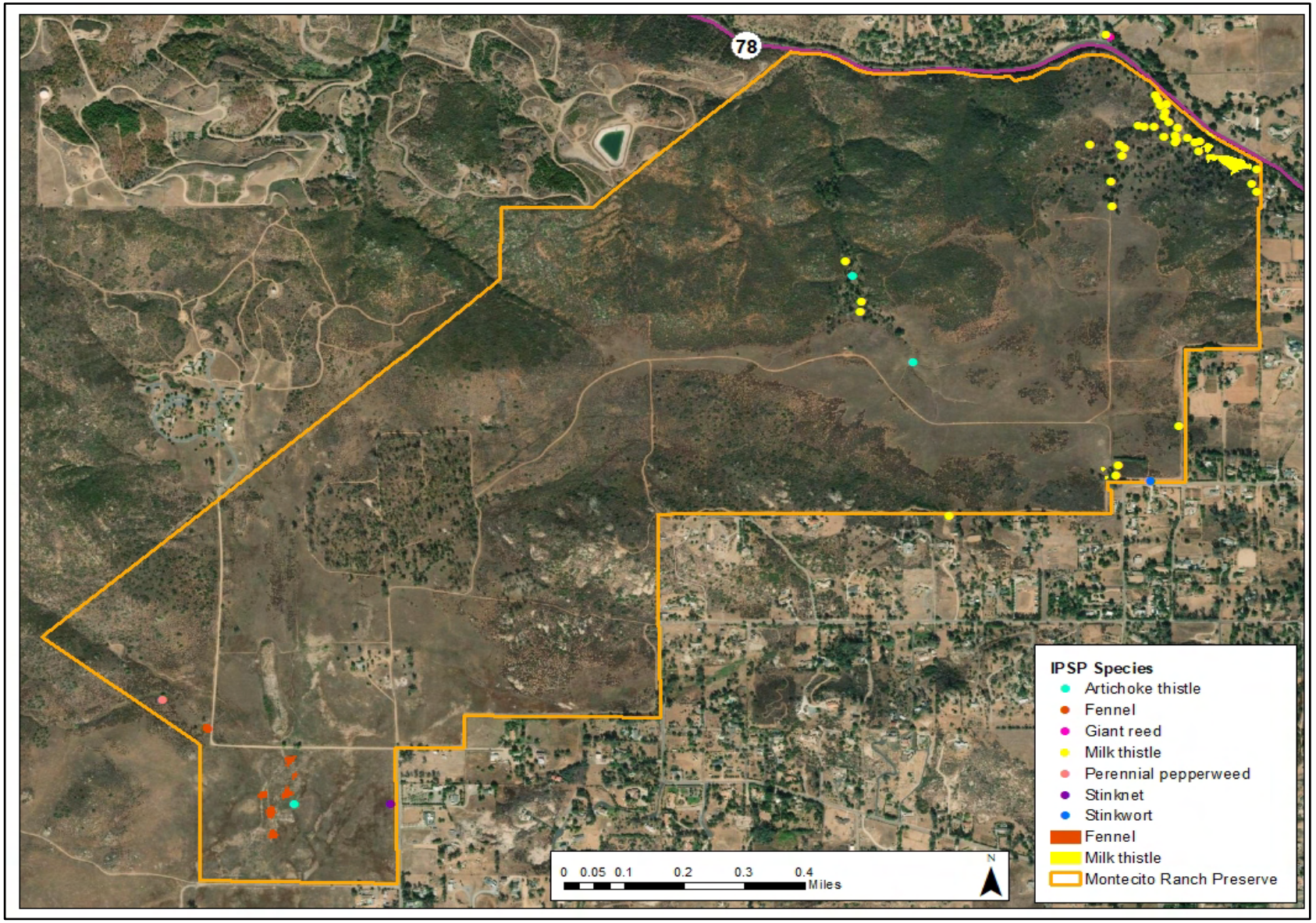

Figure 14. IPSP Plants on the Montecito Ranch Preserve

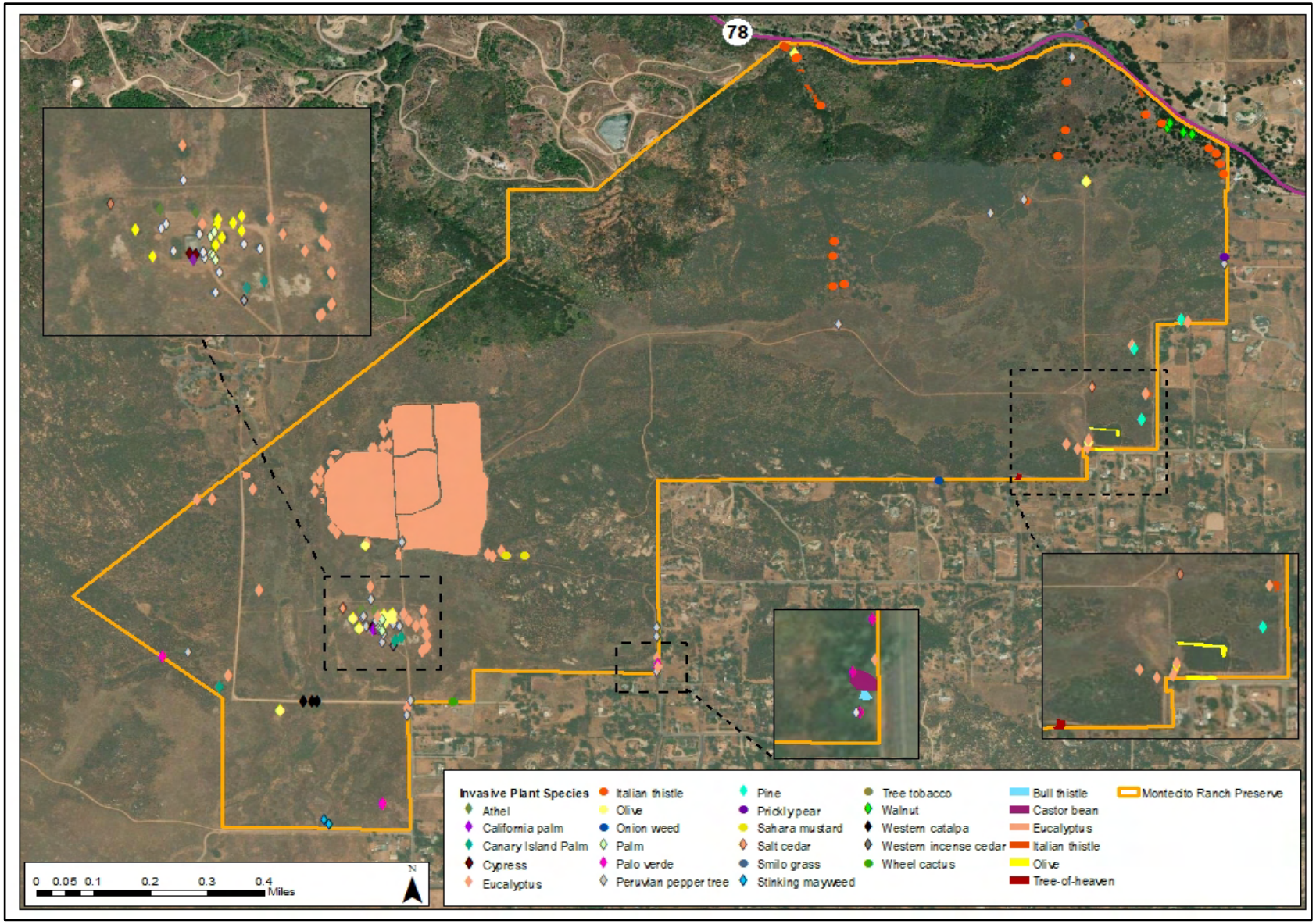

Figure 15. Other Invasive Plants on the Montecito Ranch Preserve

Table 8. Invasive Plant Watch List

Scientific Name	Common Name
Early Detection Rapid Response Species[1]	
Acroptilon repens	Russian knapweed
Aegilops triuncialis	Barb goatgrass
Ageratina adenophora	Eupatory
Agrostis avenacea	Pacific bentgrass
Carrichtera annua	Ward‘s weed
Carthamus creticus	Smooth distaff thistle
Centaurea solstitialis	Yellow starthistle
Centaurea stoebe subsp. *micranthos*	Spotted knapweed
Chrysanthemoides monilifera	Boneseed
Elymus caput-medusae	Medusahead
Enchylaena tomentosa	Ruby saltbush
Euphorbia terracina	Carnationweed
Euphorbia virgata	Leafy spurge
Genista monosperma	Bridal broom
Genista monspessulana	French broom
Hypericum canariense	Canary Island St. John‘s wort
Limonium duriusculum	European sea lavender
Limonium ramosissimum	Algerian sea lavender
Lythrum salicaria	Purple loosestrife
Myoporum acuminatum	Strichnine bush
Parthenium hysterophorus	Santa Maria feverfew
Pentameris airoides subsp. *airoides*	False hair-grass
Senecio quadridentatus	Cotton burnweed
Sesbania punicea	Rattlebox
Spartium junceum	Spanish broom
Volutaria tubuliflora	Volutaria knapweed
Additional Invasive Species[2]	
Cortaderia selloana	Pampasgrass
Cytisus scoparius	Scotch broom
Ehrharta calycina	Purple veldtgrass,
Ehrharta longiflora	Long-flowered veldtgrass
Emex spinosa	Devil‘s thorn
Melinis repens	Natal grass

[1] Per Giessow 2019; includes primarily species that are active EDRR targets.

[2] Includes widely distributed invasive species that have some potential to occur on the Montecito Ranch Preserve.

3. Management and Monitoring Strategy

3.1 Summary and Vision Statement

The conservation vision for the Preserve is to maintain and enhance core habitat for key species and live-in habitat for species populations on other conserved lands that may use the Preserve for inter-generational movement (i.e., dispersal). This vision aligns with MSP MU 5 goals and objectives for species, habitats, and connectivity. The Preserve lies at the northern edge of the San Diego County Ramona Grasslands and serves to augment this conservation area at the eastern edge of MSCP Core L. The Preserve supports high-quality coastal sage scrub occupied by CAGN that connects to a block of coastal sage scrub at the eastern end of the San Pasqual Valley within MU 5. The Preserve also supports grassland habitat historically reported to have been occupied by SKR and is used by a diverse raptor assemblage, including northern harrier, golden eagle and bald eagle. Other grasslands on the Preserve support southern tarplant and San Diego fairy shrimp-occupied vernal pools located on the northern edge of the Ramona Grasslands vernal pool complex. The Preserve oak woodlands support the rare Engelmann oak.

Preserving, managing, and monitoring priority habitats and species in perpetuity to offset future reductions in military training restrictions specifically on MCBCP is the USMC vision for the Preserve. The USMC provided funding for Preserve acquisition thorough the REPI program to contribute to the conservation of listed and sensitive species. The USMC's funding of management and restoration/enhancement actions will improve resource values and increase conservation credits to further benefit threatened and endangered species on the Preserve.

The Preserve is surrounded by rural residences to the north, east and south east, large lot rural residential/agricultural (e.g., avocado orchards) to the northwest, and conserved land to the south and southwest. Management and monitoring will protect and enhance resource values within the Preserve and promote connectivity beyond the Preserve (e.g., to the Ramona Grasslands and San Pasqual Valley), thus, contributing to MSP regional goals for key resources.

3.2 Authorized Land Uses

Authorized land uses include surveys, management, monitoring, and stewardship activities, road and utility maintenance (i.e., power lines and poles), and scientific research. The historic ranch house will likely undergo restoration within the existing footprint, but is located within an 8-acre area that is excluded from the Preserve conservation easement. Public access is not currently planned for the Preserve.

3.3 Priority Management Actions

We identified near-term (immediate) priority management actions and longer-term management actions based on the threats and stressors described in Section 2.2.7. We summarize near-term

priority management actions that address biological resources below; refer to Section 3.4 for near-term management actions that address property stewardship issues and Section 4 for detailed management objectives and implementation tasks.

Fire Management. EHC staff will implement fire management actions to reduce impacts to MSP and USMC focal species and habitats before, during, and after fire events and promote post-fire recovery (Section 4.6). These actions will address threats and stressors from altered fire regimes. Priority management actions include:

- Prepare a Resource Avoidance Area (RAA) map for the Preserve (Section 4.6.2).
- Coordinate annually (or as needed) to review or update RAA map with fire agencies and the local Resource Advisor (RA) (Section 4.6.1).
- Convene/participate in a regional Wildfire Resource Advisor Program (WFRAP) (Section 4.6.1).
- Harden roads, clear vegetation selectively, or install signs to reduce ignition probability (Section 4.6.3).
- Coordinate with California Department of Transportation (Caltrans) on vegetation/fuels management along SR-78 (Section 4.6.3).
- Maintain existing fuel breaks and contact adjacent land owners and local fire authorities to discuss additional fuel breaks, as needed (Section 4.6.3).
- Prevent thatch accumulation in grasslands to reduce fire risk to at-risk MSP and USMC focal species and adjacent habitats (Section 4.1.1).

Invasive Animals. EHC will address the threat of invasive animals by surveying and monitoring for potentially occurring invasive animals and disease (Section 4.2.1), xerifying developed areas to reduce Argentine ant invasion (Section 4.2.3), and implementing biosecurity measures for authorized Preserve users (Sections 4.4.3 and 4.8).

Invasive Plants. Invasive plant management will focus on eradicating or controlling invasive plants that pose the greatest threat to MSP and USMC focal species and habitats (SDMMP 2013, SDMMP and TNC 2017). CBI et al. (2012) defined the following regional management strategies for invasive plants:

- Management Level 1 – Surveillance – regional surveillance, early detection, rapid response.
- Management Level 2 – Eradication – eradication with regionally coordinated control program.
- Management Level 3 – Containment: eradication with coordinated programs by management unit or watershed.

- Management Level 4 – Directed Management: control within reserve or sub-management unit to benefit NCCP resources.
- Management Level 5 – Directed Suppression: suppression to allow recovery of disturbed sites, improve revegetation success, or benefit NCCP resources.

In prioritizing invasive plant management, we assessed (1) regional management level (if assigned), (2) risk to MSP and USMC focal species (as identified through San Diego Plant Assessment Form [SD PAF] score) (CBI et al. 2012), (3) co-occurrence with MSP and USMC focal species and habitats (identified through mapping), (4) invasive plant population size, distribution, and rate of spread, and (5) treatment feasibility and level of effort. Thus, preserve-level management will not always follow regional management levels precisely. For example, land managers may eradicate or control very small populations of Management Level 3, 4, or 5 species at the preserve-level or novel species that pose significant risk to MSP and USMC focal species and habitats (i.e., stinknet [*Oncosiphon pilulifer*]).

We prioritized the IPSP species and several other priority invasive plant species for management (Section 4.1.3). Near-term invasive plant priorities are to eradicate at least 17 priority invasive plant species from the Preserve and manage others (Figure 14 and Figure 15).

Additional near-term management actions related to invasive plants include biosecurity measures (Sections 4.4.3 and 4.8) and EDRR surveys (Section 4.1.3).

3.4 Property Stewardship

Management actions related to property stewardship are described briefly below. Refer to Section 4.5 for detailed objectives and tasks for property stewardship.

Access Control. Fencing, gates, and signs control entry into the Preserve, inform users of rules and regulations, and protect MSP and USMC focal species and habitats at the following locations:

- Install new fencing and repair existing fencing along the northern, eastern, southern and western Preserve boundaries and other key locations as needed.
- Install a new gate along Sonora Way and maintain existing, functioning gates at Montecito Way and the intersection of Ash and Alice streets.
- Install signs at Preserve entrances and key areas around perimeter fence.

Enforcement/Security. EHC land managers or the contracted security firm will patrol the Preserve monthly, inspecting Points of Entry, perimeter fencing, interior access roads, and the ranch house. Existing enforcement issues include:

- Encroachment (damage to fencing, illegal vegetation removal and ornamental vegetation encroachment, dumping).
- Trespassing.

EHC staff will work with the San Diego County Sheriff's Department on any encroachment issues and communicate with SDG&E and contractors on gate/lock issues and adhering to existing easement restrictions and requirements. In addition, land managers are improving the ranch house for possible occupation by a land manager in the future. An onsite presence would likely reduce the potential for enforcement issues.

Road Maintenance. SDG&E and their sub-contractors maintain the utility line service road on the Preserve. EHC staff will maintain other roads on the Preserve.

Trash Removal. EHC land managers will remove trash and debris scattered around the Preserve. Trash prioritized for removal consists of old wire, a tire, and a television. Other types of trash will be removed opportunistically.

Erosion Control. Most erosion issues on the Preserve occur on dirt roads, where rills and gullies form. There is also a large gully affecting oak woodlands in the northern portion of the Preserve.

Facilities Maintenance. There is a historic ranch house on the Preserve, along with outbuildings, including a historic steel-sided barn, and perimeter fencing and gates. The ranch house and outbuildings are excluded from the conservation easement area. EHC may restore the ranch house for future caretaker or land manager occupation.

Fire Management. Management of fine fuels in grassland habitats and reducing threats of human-caused ignitions to reduce risk of catastrophic fire is a priority.

Public Outreach and Research. Public access to the Preserve is not currently planned; however, controlled access for biologists, researchers, and contractors is permitted.

3.5 Preserve-level, Regional-level, and Entity-specific Monitoring Strategy

Monitoring strategies are multi-tiered to accommodate local (preserve-level), regional, and entity-specific (i.e., USMC) objectives. This F-RMP identifies resources and threats and prioritizes management and monitoring based on MSP and USMC goals and objectives for priority species and habitats. In some cases, preserve-level and entity-specific actions contribute data to regional monitoring programs (Section 4).

Preserve-level monitoring generally occurs on a single preserve but may be coordinated and implemented with other preserves and entities to benefit species that cross preserve boundaries and to provide regulatory training relief, as needed. For example, the County of San Diego manages other conserved lands adjacent to the Preserve in the Ramona Grasslands, and monitoring of common resources could be coordinated. Furthermore, monitoring data collected for USMC focal species and habitats on the Preserve will offset future reductions in military training restrictions on MCBCP.

Preserve-level monitoring informs management needs, priorities, and effectiveness. Monitoring uses standardized data collection methods or protocols, where available (e.g., regional rare plant Inspect and Manage [IMG] monitoring protocol), and results may contribute to regional and USMC priorities. EHC staff and contractors are responsible for most preserve-level monitoring, although regional support may be available for prioritized objectives identified in the MSP. Preserve-level monitoring that contributes to regional monitoring efforts includes:

- Vegetation mapping/monitoring
- Invasive species mapping/monitoring
- Focused species surveys using standardized or regionally-accepted protocols
- Priority MSP and USMC focal species monitoring
- Post-fire surveys to assess impacts and recovery
- Threats and habitat assessments to inform management needs and priorities

Preserve-level monitoring assesses the effectiveness of management actions, including:

- Invasive species control
- Access control
- Enforcement/security
- Road maintenance
- Trash removal
- Erosion control
- Fire management

Regional monitoring includes studies designed to answer questions at a broader geographic scale than preserve-level monitoring, such as status and trend of a species across the region. Contracted experts and scientists typically conduct this monitoring rather than land managers, although land managers may participate in or coordinate with regional efforts. Regional monitoring may occur at the preserve-level where monitoring results would benefit the region or feed into a region-wide monitoring program. Future regional monitoring within the Preserve may include one or more of the following:

- Community level response to changing environmental conditions
- Species-specific information gaps to guide management across the MSPA
- Early Detection Rapid Response program for invasive species

4. Area-Specific Management Directives

ASMDs provide guidance to maintain, enhance, and monitor the conservation values of biological resources within the Preserve. This document provides a framework for Preserve ASMDs in the

context of adaptive management. Where we identified management issues, ASMDs are specific and detailed. Where information is not yet available, we provide generalized ASMDs to be refined in the future, if needed. Thus, this plan provides the framework for current and future management needs.

We present ASMDs as goals, objectives, and implementation tasks, following guidelines in Adamcik et al. 2004, Deutschman et al. 2012, and Lewison and Deutschman 2014. Per the USFWS (Adamcik et al. 2004):

> ***Goals*** *are broad, concise, visionary statements that set overall direction for monitoring and management.*
>
> ***Objectives*** *are concise statements of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work (refer to Table 9 for SMART Criteria, which are used to ensure that objectives are adequately detailed and achievable).*
>
> ***Implementation Tasks*** *(Task) are specific actions, tools, and techniques – including monitoring – used to meet the objectives.*

Each ASMD may have one or more goal, objective, and implementation task. Where data exists, objectives and implementation tasks are detailed. Other objectives and tasks will be refined as additional information is collected. In the following sections, we group ASMDs into biological, coordination, stewardship, cultural, outreach/education/research, and administrative categories. In many cases, an ASMD in one category may benefit or overlap with an ASMD in another category (e.g., invasive plant control and fuel management); in these cases, we reference the complementary objective and/or task. All ASMDs will be implemented by the land manager (or representative), unless otherwise noted.

Table 9. SMART Objective Definitions.

SMART Objectives[1]	Objective Definition[1]
Specific	Detailed, clear, concise, and unambiguous
Measurable	Criteria for measuring progress
Achievable	Realistic to achieve
Results-oriented	Specify an end result
Time-fixed	Specify an end-point

[1] From Lewison and Deutschman 2014.

We refer to regional versus preserve-specific monitoring and management actions in this document. Regional actions apply to the MSP region and are the responsibility of regional entities alone or in cooperation with land managers or their representatives. Results contribute to regional

analyses and management strategies. Preserve actions are specific to a preserve and are the responsibility of the land manager or its representatives.

We use the terms routine and intensive to differentiate between levels of management effort. In general, routine management is accommodated within the annual preserve budget and work plan, whereas intensive management refers to a larger effort that may require phasing over a number of years and/or outside funding or partnerships to implement fully.

We present the following, structured adaptive management approach to implementing preserve ASMDs and have tailored the implementation tasks in each section as such:

1. Survey: Identify MSP and USMC focal species and understand their ecology through literature review, rapid assessments, focused and species-specific surveys, coordination, and communication.
2. Monitor: Monitor MSP and USMC focal species and associated vegetation communities to assess status and threats, and identify management actions.
3. Prioritize Management Actions: Prioritize management actions based on our understanding of MSP and USMC focal species ecology and associated vegetation communities, survey and monitoring results, management feasibility, and associated Preserve funding.
4. Implement Management Actions: Implement management actions in compliance with Preserve-specific avoidance and minimization measures.
5. Monitor Management Actions: Monitor effectiveness of management actions.
6. Manage Adaptively: Prescribe alternative or additional management actions, and update understanding of MSP and USMC focal species ecology and associated vegetation communities (adaptive management).

Land managers have the flexibility to address discrete or emerging management issues (e.g., trespass, new invasive species) without going through the entire monitoring and management process, but should (at a minimum) document and track results of management actions and incorporate these management issues into future revisions of the F-RMP.

Refer to Section 4.9 (Program Administration and Reporting) for data management and reporting recommendations for ASMDs. Refer to Section 4.10 for a tabular summary of all ASMDs and an implementation schedule. The startup tasks (2021-2024) are the initial monitoring and management priorities. EHC will revisit and realign priorities every 5 years after the start-up period ends in coordination with the Wildlife Agencies.

4.1 Vegetation Communities

Vegetation ASMDs address regional and management unit goals specific to chaparral, coastal sage scrub, grassland, oak woodland, riparian forest and scrub, and vernal pools (Table 3), and

additional, preserve-specific goals. The vegetation management strategy for the Preserve includes (1) maintaining accurate vegetation and invasive plant maps as tools for identifying and prioritizing management issues and tracking management success, (2) monitoring and managing vegetation and vernal pools to protect and enhance habitat for MSP and USMC focal plants and animals, (3) treating invasive species to protect "at-risk"[4] species and habitats, and (4) managing habitat in selected locations to improve habitat quality and connectivity for target MSP and USMC focal animals. In 2020-2021, we updated the existing Preserve-level vegetation map and mapped invasive plants to provide an existing conditions baseline and to inform recommendations on habitat restoration and invasive plant control. In 2021, we met with members of the Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan Technical Team (SKR Technical Team) to discuss managing grassland habitat for SKR using a variety of methods, including herbicide applications, mechanical, grazing, and fire.

Invasive plants will be a perpetual management issue. We recommend a phased approach to eradicate or control (1) high priority invasive species and (2) lower priority invasive species where they impact MSP and USMC focal species, habitats, and linkages. This phased approach ensures that invasive plants are treated in an efficient and cost-effective manner that most benefits sensitive resources. High priority or other priority invasive plants may be targeted individually (e.g., stinknet, milk thistle [*Silybum marianum*]) or as part of a broader restoration effort, while lower priority invasive species (e.g., brome grasses, nonnative forbs) will be treated during vegetation management and restoration efforts (VEG-3, VP-5, RS-1), MSP and USMC focal species management (AN-7, PL-4), or pre- or post-fire invasive plant control (FM-5, FM-6, FM-8).

4.1.1 Natural Vegetation Communities

Vegetation Goal (VEG): Maintain, enhance, manage, and restore natural vegetation communities to benefit native species and habitats, sustain ecosystem functions, and promote connectivity to other conserved lands.

Objective 1 (VEG-1). Vegetation Mapping. Prepare a preserve-level vegetation map using the Vegetation Classification Manual for western San Diego County (Sproul et al. 2011), and preserve-level minimum mapping units (MMUs; 1-2 acres for scrub and grassland, 0.5-acre for oak woodland, riparian forest, and wetlands). Review and update the map at 10-year intervals (if necessary) or more frequently in the event of disturbance (e.g., fire) or changed conditions, and identify and prioritize management actions for disturbed or degraded habitat.

Task 1.1 (VEG-1.1): Prepare a Refined Vegetation Map. In 2021, CBI finalized the refined, preserve-level vegetation map. This map serves as the baseline for assessing broad-scale vegetation changes over time.

[4] The term "at-risk" is used in this document to indicate resources (MSP species, habitats) that are most threatened by altered fire regimes per the Altered Fire Regime Element of the MSP for western San Diego County (SDMMP AND TNC 2017) (see Section 4.6.1).

Task 1.2 (VEG-1.2): Update Vegetation Map. Review the vegetation map in 2031 in the absence of disturbance or changed conditions, or at 5-year intervals following a disturbance event (e.g., fire, intentional or unintentional vegetation clearing). Using the 2021 vegetation map as a baseline, quantify vegetation changes since the last mapping period (VEG-1.1), including vegetation loss, type conversion, or succession. Maintain a spatial dataset of updated vegetation. Determine whether changes are human-related or due to natural succession, and refine vegetation targets.

Task 1.3 (VEG-1.3): Identify and Prioritize Vegetation Management. Where vegetation mapping (VEG-1.1 or 1.2) indicates vegetation disturbance or degradation (e.g., semi-natural stands or invasive plant cover estimates), identify and prioritize management actions, including (but not limited to) invasive plant control (INV), habitat restoration or fencing/signage (PS).

Refer to INV-3 for invasive plant control tasks recommended to control invasive plants, VEG-3, AN-7, and PL-4 for tasks recommend to manage vegetation for target MSP and USMC focal plants and animals, and VP-5 for tasks recommend to manage vernal pools.

Objective 2 (VEG-2). Vegetation Monitoring. Between 2021 and 2024 and in subsequent management periods, provide access to the Preserve (if requested) for entities engaged in regional vegetation monitoring, monitor vegetation within restoration sites (if any) to assess success, and monitor vegetation within burn areas (if any) to assess post-fire vegetation recovery.

Task 2.1 (VEG-2.1): Coordinate with Regional Vegetation Monitoring Program. Provide access to the Preserve for regional vegetation monitoring that targets specific vegetation communities or vegetation-dependent species (e.g., coastal California gnatcatcher) if requested. SDMMP will develop monitoring protocols for the coastal sage scrub, chaparral, grassland, and oak and riparian habitats; however, preparation of these protocols is currently on hold (Preston pers. comm.).

Task 2.2 (VEG-2.2): Coordinate with Regional Grazing, Prescribed Fire, and Landscape Level Invasive Species Control Program. Provide access to the Preserve for the SDMMP regional program targeting enhancement of degraded coastal sage scrub and grasslands and reduction of fire risk, if requested. SDMMP will prepare a pilot plan in 2021 to test control of invasive grasses and forbs to enhance coastal sage scrub and grassland habitats and reduce fire risk. Plan implementation will begin in 2022.

Task 2.3 (VEG-2.3): Conduct Preserve-level Vegetation Monitoring. Select vegetation monitoring methods specific to the habitat and restoration/recovery objectives (e.g., VEG-3, VP-5, RS-1, FM-5, FM-6, FM-8). Methods may include established Best Management Practices (BMPs) to assess restoration success or regional monitoring protocols (e.g.,

SDMMP vegetation monitoring plan [to be developed], SDMMP pilot grazing program, modified Burned Area Emergency Response [BAER] program, modeled habitat evaluation for SKR) that contribute to regional and local vegetation trend analyses. Monitoring methods may include (but are not limited to):

- Photomonitoring
- Transects (e.g., permanent line or point intercept)
- Quadrats
- Relevés (e.g., 9-m diameter circular relevés)
- Residual Dry Matter (RDM)
- Ratio of forbs to herbs (CBI 2004)

Record monitoring locations with a Geographic Positioning System (GPS) device or receiver, and mark permanently in the field to facilitate re-location. Collect covariate data (e.g., plant community composition and cover) at monitoring locations. Analyze data for site-specific trends or provide data to SDMMP or another regional entity to analyze for local or regional trends, including shifts in species composition or richness. Based on results, recommend actions, including (but not limited to) modifying vegetation management methods (VEG-3, VP-5), controlling invasive species (INV-3), and restoring habitat (RS-1).

In the event of fire, conduct vegetation monitoring or coordinate with regional entities to conduct vegetation monitoring within burned habitat to assess post-fire vegetation recovery and management needs (FM-8).

Objective 3 (VEG-3). Manage Vegetation using Mechanical Methods and Herbicide. Beginning in 2021, implement an annual vegetation management program to enhance MSP and USMC focal species (i.e., SKR, pallid bat), native plants and animals, and natural ecosystem process and to reduce fire fuels and fire intensity by controlling nonnative grasses and thatch in the southern and eastern grasslands. Refer to the Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan (SKR MMP) for additional information on mechanical and herbicide methods (Spencer et al. 2021).

Task 3.1 (VEG-3.1): Coordinate with Experts. In winter 2021 EHC met with members of the SKR Technical Team to discuss managing grassland habitat for SKR using herbicides and mechanical methods. Continue coordination with regional experts and the SKR Technical Team before and during vegetation management using herbicides and mechanical methods. Discuss, analyze, and modify (if needed) mechanical and herbicide methods for managing vegetation in the Preserve-specific SKR plan (AN-5.5, AN-7.6).

Task 3.2 (VEG-3.2). Manage Vegetation with Herbicide. Manage nonnative grassland annually for target MSP and USMC focal animals (i.e., SKR, pallid bat) using a grass-

specific herbicide. Focus initial treatments in the SKR habitat management area (Figure 16) moving into adjacent nonnative grassland habitat over time. While all grassland habitat on the Preserve is considered suitable (Spencer et al. 2021), focusing initial treatments in the SKR habitat management area would allow SKR to quickly colonize from adjacent, off-site SKR populations and disperse north into the Preserve. Follow herbicide label directions to determine application rates, timing, and limitations/restrictions, and proper personal protection equipment. Apply a grass-specific herbicide over the top of nonnative grasses in the winter, when grasses are 4-6 inches tall and before (or just after) grasses produce fruit. If fruit is hardened and seed is beginning to form, do not apply herbicide, as seed will continue to mature and the treatment will be ineffective.

Apply herbicide at least once, and possibly a second time if grasses germinate again after a late winter or early spring rain. Apply herbicide annually for 5 years, then reduce applications to every 1-2 years.

Control problematic nonnative forbs (e.g., black mustard [*Brassica nigra*], short podded mustard [*Hirschfeldia incana*]) with a broad-spectrum systemic herbicide, as needed.

The herbicide applicator(s) should be experienced and possess a Qualified Applicator License (QAL).

Tasks 3.3 (VEG-3.3). Manage Vegetation Mechanically. Manage nonnative grass and forb thatch annually in summer or early fall. Focus initial management in the SKR habitat management area (Figure 16) moving into adjacent nonnative grassland habitat over time. While all grassland habitat on the Preserve is considered suitable to varying degrees (Spencer et al. 2021), focusing initial efforts in the SKR habitat management area would allow SKR to quickly colonize the Preserve from adjacent, off-site SKR populations and disperse north into the Preserve. Manage nonnative grass and forb thatch using the following or comparable methods consistent with the SKR MMP:

- Create a matrix of perpendicular, 'linear swaths' (2.5-6m wide), alternating between scraped (bare ground) and unscraped (vegetated) pathways resulting in a "criss-cross" pattern of bare ground and vegetated habitat suitable for small mammal dispersal, foraging, and burrowing. Create 'linear swaths' by removing dry herbaceous vegetation using two methods: (1) drag a piece of heavily weighted chain link fence to remove dry forbs or (2) scrape the soil surface with a dozer bucket to remove dense grass thatch (>2 inches thick) (Innovative Inclosures 2013). Coordinate with the Wildlife Agencies on discontinuing this management action if SKR are detected in managed habitat.
- Mow nonnative grass with a rotary or flail attachment before seed set at the flowering and early fruit stage.

The following recommendations and avoidance and minimization measures apply to vegetation management:

- To the extent possible, manage vegetation outside of the avian nesting season (i.e., February 15 – August 31; however raptors may begin breeding as early as January) or ensure a qualified biologist is either present during vegetation management or responsible for vegetation management (e.g., land manager is also a qualified biologist).
- If vegetation management occurs during the bird breeding season and an active nest is located, cease vegetation management and establish a buffer around the active nest. Establish a 500-foot buffer around active raptor nests and a 100-foot buffer around other active bird nests. Maintain the buffer until the nest is inactive.
- When managing vegetation, consider potential effects on native species, including sensitive plants and animals.

Objective 4 (VEG-4). Vegetation Management using Grazing. Between 2021 and 2024, investigate a livestock grazing vegetation management program to promote MSP and USMC focal species (e.g., SKR, pallid bat), native plants and animals, and natural ecosystem processes and to reduce fine fuels and fire intensity by controlling nonnative grasses and thatch in grassland and coastal sage scrub habitat.

Task 4.1 (VEG-4.1): Coordinate with Grazing Community and Local and Regional Experts. In winter 2021 EHC met with members of the SKR Technical Team to discuss managing grassland habitat for SKR using grazing. Continue coordinating with local experts, grazing operators, range advisors, and regional entities (e.g., SDMMP, Riverside County Habitat Conservation Agency, SKR Technical Team) that are testing, or using grazing to manage grassland and coastal sage scrub habitat for conservation values. Discuss (1) management goals and objectives and the appropriate grazing regime type of livestock (sheep or cattle), and necessary infrastructure to support the desired grazing operation, (2) vegetation resources and targets, (3) resource concerns, and (4) potential benefits to MSP and USMC focal species at the Preserve. Determine if livestock grazing is a desirable management strategy for the Preserve. Refer to the SKR MMP for additional information on grazing for habitat management (CBI 2021). Discuss and analyze grazing as a vegetation management tool in the Preserve-specific SKR plan (AN-5.5, AN-7.6).

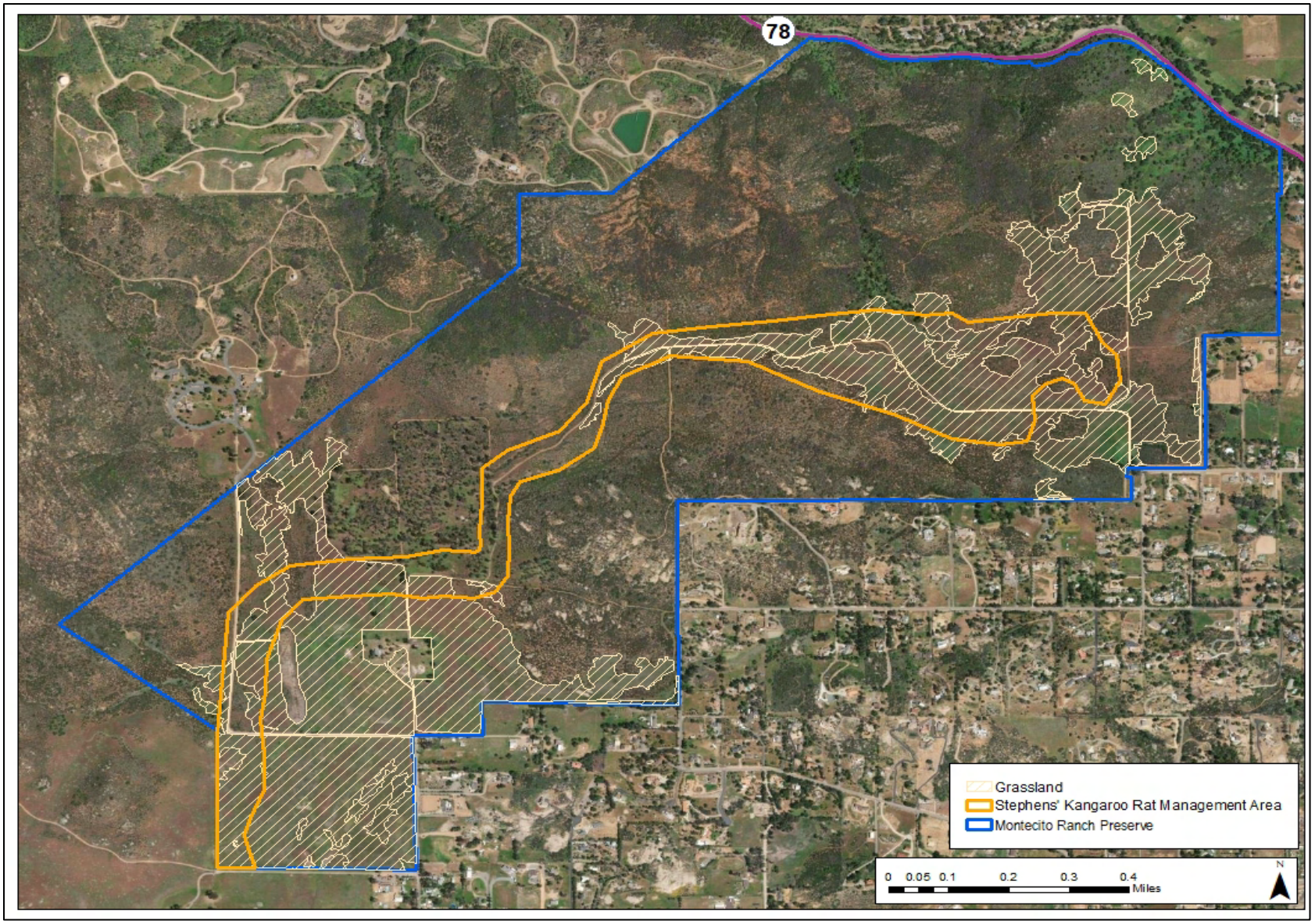

Figure 16. Stephens' Kangaroo Rat Management Areas on Montecito Ranch Preserve

Task 4.2 (VEG-4.2): Prepare and Implement a Targeted Grazing Plan. If grazing will be used to manage vegetation and MSP and USMC focal species (based on VEG-4.1), negotiate with a grazer operator, and prepare and implement a Preserve-specific grazing plan with input from a Certified Rangeland Manager, a local University of California Cooperative Extension Livestock Advisor, or a local Natural Resource Conservation Service (NRCS) Range Conservationist, the SKR Technical Team, and existing relevant plans (e.g., SDMMP grazing plan) and scientific literature. The plan should include, at a minimum, (1) management goals and objectives, (2) a resource and existing conditions inventory, (3) type, stocking, and movements of livestock, (4) infrastructure needs and improvements, (5) management targets, (6) monitoring protocol (VEG-2.3), and (7) contingency measures. **A targeted grazing plan will likely produce supplemental management cost requirements that are not captured in the ongoing fund analysis for the Preserve (Section 5.2).**

Task 4.3 (VEG-4.3): Update the Targeted Grazing Plan. Update the Preserve-specific grazing plan every 5 years or as needed to modify goals, objectives, grazing strategy and targets, update the resource and existing conditions inventory, and monitoring protocol, at a minimum, if grazing is used to manage vegetation and MSP and USMC focal species. **Updates to a targeted grazing plan will likely produce supplemental management cost requirements that are not captured in the ongoing fund analysis for the Preserve (Section 5.2).**

Objective 5 (VEG-5). Vegetation Management using Fire. Between 2021 and 2024, investigate using prescribed fire to promote MSP and USMC focal species (e.g., SKR, pallid bat), native plants and animals, and natural ecosystem process and to reduce fine fuels and fire intensity by controlling nonnative grasses and thatch in grasslands.

Task 5.1 (VEG-5.1): Coordinate with Agencies and Experts. In winter 2020 EHC met with members of the SKR Technical Team to discuss managing grassland habitat for SKR using prescribed fire. Prescribed and natural wildfire benefit SKR by reducing nonnative grasses and forbs, preventing thatch buildup, increasing bare ground, stimulating seed germination, and improving forage and overall habitat conditions (Spencer et al. 2021). Coordinate with Cal Fire, wildlife agencies, and local and regional experts (e.g., SDMMP, Riverside County Habitat Conservation Area, SKR Technical Team) to determine if using prescribed fire to manage vegetation is more desirable and feasible than other management approaches. Discuss and analyze using fire as a vegetation management tool in the Preserve-specific SKR plan (AN-5.5, AN-7.6).

Task 5.2 (VEG-5.2): Use Prescribed Fire to Manage Vegetation. If prescribed fire will be used to manage vegetation (e.g., nonnative grassland) and MSP and USMC focal species, coordinate with local fire and resource agencies, species-specific experts (VEG-5.1), and

existing plans (e.g., SDMMP grazing plan) to discuss preparation and implementation of a Preserve-specific prescribed fire plan.

4.1.2 Vernal Pools

Vernal pool ASMDs address regional, management unit, and preserve-specific goals based on the City of San Diego's Vernal Pool Management and Monitoring Plan (VPMMP) (City of San Diego 2020). Although the Preserve is not within the City of San Diego or managed by the City of San Diego, we use the goals and objectives from the VPMMP to maintain consistency with the regional MSP Roadmap. The vernal pool management strategy for the Preserve includes (1) qualitative and quantitative monitoring of threats, vegetation, habitat conditions, and MSP and USMC focal species, (2) baseline hydrology surveys, (3) assessing topographic disturbances (if warranted), and (4) managing by maintaining, stabilizing, or restoring vernal pools. In 2019, CBI mapped vernal pools in the southern portion of the Preserve to serve as a baseline of existing conditions and to inform monitoring protocols and management activities.

Vernal Pool Complex Goal: (VP) Survey, protect, enhance, and restore vernal pool habitat that supports or has the potential to support southern tarplant, San Diego fairy shrimp, and western spadefoot toad.

Objective 1 (VP-1): Vernal Pool Surveys. Survey the grassland habitat north of Montecito Way and Sonora Way and east and west of the ranch house entrance in winter 2021 or spring 2022 to identify vernal pools not located in the 2019 survey effort (CBI 2019).

Task 1.1 (VP-1.1): Identify Vernal Pools. Survey grassland habitat during the wet season (February – May) to identify new vernal pools by (1) reviewing existing Preserve reports and data, (2) reviewing aerial imagery, and (3) using methods included in the Ramona Vernal Pool Study (TAIC and EDAW 2005). Each potential vernal pool must support at least one indicator plant species (Bauder 1993). Photograph and map all confirmed vernal pools and record presence of fairy shrimp and spadefoot toads.

Objective 2 (VP-2): Vernal Pool Monitoring. Beginning in 2021, establish and implement a perpetual annual qualitative and quantitative monitoring program that includes using standardized protocols in the VPMMP.

Task 2.1 (VP-2.1): Conduct Qualitative Monitoring. During 2021, establish an annual qualitative monitoring program to document vernal pool threats, inundation, complex disturbance, habitat conditions, and disturbance category (i.e., Levels 1-3) and management actions (i.e., Levels 1-3) (Table 10). See Appendix D for an example of the City of San Diego Vernal Pool Habitat Conservation Plan Monitoring Form. Perform tri-annual monitoring in perpetuity during the wet season (February – May) using VPMMP protocols to achieve VPMMP standards.

- Establish permanent photomonitoring locations at all vernal pools.

- During each monitoring event, note topographic disturbances, invasive species, pool inundation, and other disturbances at each vernal pool.
- Inspect fencing and signs, identify edge effects, and monitor for signs of trespass at all vernal pools.
- Perform a visual assessment to document San Diego fairy shrimp presence and viability and reproduction (i.e., observation of gravid females) in occupied pools (AN-5.2).
- Document western spadefoot distribution, status, and threats (AN-5.4).

Task 2.2 (VP-2.2): Conduct Quantitative Monitoring. During year one, establish an annual quantitative monitoring program to record plant species and cover and to verify San Diego fairy shrimp viability and reproduction. Monitor at the frequencies specified below using VPMMP protocols to achieve VPMMP standards. See Appendix D for an example of the City of San Diego Vernal Pool Habitat Conservation Plan Monitoring Form. Only qualified biologists will conduct fairy shrimp surveys according to the schedule and methods in the USFWS survey protocol. Based on the vernal pool monitoring results, determine management recommendations and tailor monitoring to level of threats.

- Establish one IMG plot (SDMMP 2021) in one vernal pool that supports southern tarplant, and collect data every 2 years in late summer through fall (PL-2.2).
- Level 1 Vernal Pools: Annually (June – October) collect cover class data for all plant species in at least one pool known to support southern tarplant. Data collection can occur concurrently with IMG monitoring (PL-2.2). Conduct protocol-level fairy shrimp surveys only if qualitative surveys detect changes in hydrology or other vernal pool functions that trigger a Level 2 or Level 3 management response.
- Levels 2 and 3 Vernal Pools: Annually (June – October) collect cover class data for all plant species in pools known to support southern tarplant. Data collection can occur concurrently with IMG monitoring (PL-2.2). Conduct protocol-level fairy shrimp surveys in vernal pools that support San Diego fairy shrimp.

Objective 3 (VP-3). Baseline Hydrology Surveys. Between 2021 and 2024, conduct one baseline hydrological survey using VPMMP protocols and methods to characterize hydrology and geomorphic setting of known and potential vernal pools in the southern grasslands and any areas identified in VP-1.

Task 3.1 (VP-3.1): Conduct Baseline Hydrologic Surveys. Use the Hydrogeomorphic Model (HGM) (Bauder et al. 2009) described in the VPMMP to conduct baseline

hydrology surveys of known and potential vernal pools during the wet season. Use data to evaluate potential topographic and/or hydrologic disturbances and to inform management decisions associated with maintaining, stabilizing, or restoring vernal pools.

- Measure maximum pool depth, pool inlet and outlet, and geomorphic setting of vernal pool complex using the HGM Guidebook (Bauder et al. 2009).

Table 10. Vernal Pool Management Levels.

Management Level[1]	Objective[1]	Definition[1]	Management[1]
1	Maintain existing habitat conditions and status of listed vernal pool species.	Pools function at optimal condition and management actions result in maintaining optimal conditions.	Routine stewardship activities and enforcement.
2	Stabilize habitat conditions and listed vernal pool species.	Pools function at an unacceptable condition; habitat quality and listed vernal pool species are declining.	Level 1 management plus habitat and species enhancement to achieve habitat and species-level objectives (i.e., San Diego fairy shrimp).
3	Restore habitat conditions and listed vernal pool species.	Pools are highly degraded and require restoration to meet habitat and species-specific objectives.	Level 1 management, pool restoration, topographic reconstruction, weed control, dethatching, & species reintroductions.

[1] Refer to City of San Diego Vernal Pool Management and Monitoring Plan (VPMMP) (City of San Diego 2020 for further information on vernal pool management levels.

Objective 4 (VP-4). Topographic Disturbance Assessment. Conduct a topographic disturbance assessment using VPMMP protocols and methods within the first 3 years, if needed, based on the results of VP-2 and VP-3.

Task 4.1 (VP-4.1): Conduct Topographic Disturbance Assessment. If surveys and monitoring indicate topographical or hydrological disturbances, conduct an assessment that includes maximum pool depth and inlet and outlet locations. Compare results against the baseline hydrology survey (VP-3) to inform management decisions including reconstruction of basins, if necessary. Monitor restored pools to determine if pools have achieved hydrological function.

This task is a placeholder in the event that the topographical or hydrological disturbances are observed.

Objective 5 (VP-5). Vernal Pool Management. Based on results from VP-2, VP-3, and VP-4 (if needed), begin managing vernal pools by (1) maintaining existing habitat conditions and

MSP and USMC focal species populations (Level 1), (2) stabilizing MSP and USMC focal species populations (Level 2), and (3) restoring habitat conditions to increase MSP and USMC focal species populations (Level 3).

Task 5.1 (VP-5.1): Maintain Level 1 Vernal Pools. Manage Level 1 vernal pools twice a year by patrolling, removing trash and debris, managing edge effects (e.g., control offsite erosion), maintaining fences and signs, repairing trespass damage and minor topographic disturbances, and controlling invasive plants for MSP and USMC focal species and vernal pool habitat (PL-4.2).

Task 5.2 (VP-5.2): Stabilize Level 2 Vernal Pools. Implement all Level 1 actions as appropriate (VP-5.1). In addition, manage Level 2 vernal pools by (1) repairing pools, if needed, using mechanized equipment or hand tools to improve pool integrity, ponding potential and overall size as defined in the VPMMP, (2) dethatching bi-annually within pools that support MSP and USMC focal species and an adjacent 20-ft buffer, (3) treating nonnative plants tri-annually in pools and management buffer, and (4) restoring MSP and USMC focal species populations. Obtain required state and federal permits, if needed, before stabilizing vernal pools.

Southern Tarplant: If monitoring indicates a decline in southern tarplant, collect seed from a nearby genetically appropriate source, bank, bulk (if necessary), and redistribute seed in vernal pools (PL-4.3, PL-4.5).

San Diego Fairy Shrimp and *Western Spadefoot*: If monitoring indicates a decline not associated with natural population fluctuations or climatic conditions (i.e., drought), conduct additional monitoring to determine the cause for decline, and implement appropriate habitat management actions, if determined necessary (AN-7.2).

Task 5.2 is a placeholder in the event that Level 1 vernal pools degrade to Level 2 vernal pools. We assume that all vernal pools on the Preserve are currently Level 1.

Task 5.3 (VP-5.3): Restore Level 3 Vernal Pools. Implement all Level 1 and Level 2 actions. In addition, (1) dethatch four times a year within pools that support MSP species and an adjacent 35-ft buffer, (2) treat nonnative plants four times a year in pools and management buffer, and (3) restore MSP and USMC focal species populations.

Southern Tarplant: If monitoring indicates absence of southern tarplant from the soil seedbank (i.e., lack of emergence/germination) after a minimum of two monitoring events conducted during years with average rainfall, collect seed from a nearby genetically appropriate source and bank, bulk (if necessary). Redistribute in restored vernal pool(s) (PL-4.3, PL-4.5).

San Diego Fairy Shrimp: If monitoring indicates a decline, conduct additional monitoring to determine the cause, and implement appropriate management actions. After implementing management actions, collect cysts from within the vernal pool complex or from a nearby source and redistribute to the affected pool(s) (AN-7.2).

Western Spadefoot: If monitoring indicates a decline not associated with natural population fluctuations or climatic conditions (i.e., drought), conduct additional monitoring to determine the cause for decline and implement appropriate habitat management actions, if determined necessary.

Task 5.3 is a placeholder in the event that Level 1 and Level 2 vernal pools degrade to Level 3 vernal pools. We assume that all vernal pools on the Preserve are currently Level 1.

The following recommendations and avoidance and minimization measures apply to vernal pool management:

- Avoid producing water runoff into vernal pools during management activities. Temporarily fence vernal pools if necessary.
- Avoid or minimize management activities that will result in fugitive dust adjacent to vernal pools.
- Maintain and stage equipment, dispense fuel and oil, and mix herbicides in previously compacted and disturbed areas outside of vernal pools.
- Do not use or install artificial lighting adjacent to vernal pools.
- Obtain required state and federal permits and coordinate with the Wildlife Agencies before stabilizing or restoring Level 2 and Level 3 vernal pools.

4.1.3 Invasive Plants

Invasive Plant Goal (INV): Protect biological resources within the Preserve by treating invasive plant species to eliminate or reduce threats to MSP and USMC focal species, habitats, and linkages, using BMPs and the response appropriate to the level of invasiveness. Detect new invasive species and new invasions early on, and control them before they establish and/or spread.

Objective 1 (INV-1). Invasive Plant Mapping. Maintain and update the invasive plant spatial dataset, invasive plant lists, and invasive plant map as tools for management by (1) conducting comprehensive invasive plant and EDRR surveys every 3 years, (2) mapping invasive plants opportunistically during annual monitoring, management, and stewardship activities, (3) mapping invasive plants post-fire, (4) updating invasive plant lists annually, and (5) uploading invasive plant spatial data and updating the invasive plant map every 3 years or after a fire event.

Task 1.1 (INV-1.1): Prepare a Refined Invasive Plant Map. In 2021, CBI prepared an invasive plant map that focuses on priority invasive plant species but includes other invasive plants where they threaten or potentially threaten sensitive resources (Table 7). The spatial dataset includes invasive plant attribute data (Appendix B). Use the invasive plant map to identify priority locations for invasive plant control and assess management effectiveness over time.

Task 1.2 (INV-1.2): Update Invasive Plant Map. Map invasive plants opportunistically during routine Preserve activities. If there is a wildfire on the Preserve, conduct invasive plant surveys within the burn perimeter during the first 3 years (FM-6.2).

Incorporate new invasive plant information into the spatial dataset and update the invasive plant map at 3-year intervals or after a fire event. Maintain a spatial dataset of invasive plant data.

Task 1.3 (INV-1.3): Maintain Invasive Plant Lists. In 2021, CBI prepared an Invasive Plant Watch List and EDRR list (Table 7 and Table 8). Review and update these lists annually based on new information acquired during surveys or land manager patrols. Coordinate with the regional invasive plant program annually regarding invasive species status and emerging (new) invasive species in the region.

Objective 2 (INV-2). Invasive Plant Priorities. Prioritize invasive plants for treatment and maintenance at 3-year intervals or in the first season following a fire event, based on regional invasive plant guidelines (e.g., IPSP and updates), impacts to MSP and USMC focal species and habitats, and management feasibility.

Task 2.1 (INV-2.1): Identify Invasive Plant Management Priorities. Prioritize invasive plants for treatment based on distribution (INV-1.1), invasive plant risk (Table 7 and Table 8), co-occurrence with or potential to adversely affect MSP and USMC focal species or habitats, and effectiveness of management measures (INV-3).

Task 2.2 (INV-2.2): Identify Invasive Plant Treatment and Maintenance Areas. For prioritized invasive plant species (INV-2.1), identify new or continuing management actions, and develop or update treatment plans and schedules (as needed).

Table 11 and INV-3 list prioritized invasive plant control management actions. Land managers may control additional invasive plants during this period or in subsequent 5-year management periods.

Objective 3 (INV-3). Invasive Plant Control. Eradicate, contain, manage, or suppress priority perennial, annual, or herbaceous perennial plants (listed below) annually or as-needed through herbicide application, mechanical control, or hand-weeding.

Task 3.1 (INV-3.1): Eradicate Tree-of-Heaven. We mapped ~60 tree-of-heaven plants near the northeastern portion of the Preserve. Treat tree-of-heaven with mechanical methods and herbicide, monitor treated plants and re-treat, as needed, until eradicated.

Task 3.2 (INV-3.2): Eradicate Mayweed Chamomile. We mapped mayweed chamomile in and adjacent to the vernal pools in the southern portion of the Preserve. Treat mayweed chamomile with mechanical methods in the vernal pools, and with herbicide or mechanical methods, outside of the vernal pools until eradicated.

Task 3.3 (INV-3.3): Eradicate Giant Reed. Treat the small patch of giant reed in Clevenger Canyon north of SR-78 with herbicide and mechanical methods. Monitor treated plants and re-treat, as necessary, until eradicated.

Task 3.4 (INV-3.4): Eradicate Onion Weed. Onion weed established from an adjacent private residence and is present in low numbers near the northeastern boundary. Although difficult to eradicate, it is possible because of the small population size. Remove onion weed by hand and monitor for seedlings and re-spouts; remove until eradicated.

Task 3.5 (INV-3.5): Eradicate Saharan Mustard. We mapped trace amounts of Saharan mustard in two locations, so eradication is feasible if land managers apply treatments consistently. Left unchecked, this species has the potential to spread quickly through scrub habitat. Treat Saharan mustard with herbicide early in the season (winter) or hand-pull plants later in the season, after fruit formation but prior to seed dispersal. Monitor treated areas and re-treat annually, until eradicated.

Task 3.6 (INV-3.6): Manage Italian Thistle. We located many stands of Italian thistle throughout the Preserve, but primarily in the coast live oak and Engelman oak woodlands, adjacent to drainages, and in disturbed areas. Treat Italian thistle where it threatens MSP priority and USMC focal animals and plants (i.e., Engelmann oak). Monitor treated areas and re-treat annually.

Task 3.7 (INV-3.7): Eradicate Bull Thistle. We mapped only one occurrence of bull thistle; therefore, eradiation is possible. Treat bull thistle with herbicide in the spring and before plants bolt. Monitor treated areas and re-treat annually, until eradicated.

Task 3.8 (INV-3.8): Eradicate Artichoke Thistle. We located several artichoke thistle in the southern and eastern grasslands. Treat artichoke thistle in the spring before bolting. Monitor treated plants and re-treat as needed, until eradicated.

Task 3.9 (INV-3.9): Eradicate Stinkwort. We located one stinkwort plant that we hand-pulled; however, additional plants may germinate in the same location. If EHC locates additional plants, hand-pull or treat with herbicide prior to flowering during the growing

season. If plants have formed seed, remove from site after pulling. Monitor treated areas for re-infestation and re-treat annually, until eradicated.

Task 3.10 (INV-3.10): Eradicate Eucalyptus. We mapped many eucalyptus trees, including scattered individuals, small stands, and a very large stand north of the ranch house. Remove scattered eucalyptus trees first using mechanical methods and herbicide treatments, then remove additional trees from the large eucalyptus stand. Annually remove trees until eradicated from the Preserve. Refer to avoidance and minimization measures below for bat-specific conservation measures before removing eucalyptus trees.

Task 3.11 (INV-3.11): Eradicate Fennel. Treat large fennel occurrences with herbicide and mechanical methods in the southern grassland. Monitor treated plants, and re-treat annually, until eradicated.

Task 3.12 (INV-3.12): Eradicate Perennial Pepperweed. We located one small patch of perennial pepperweed underneath dense vegetation in the western portion of the Preserve. Treat with herbicide and monitor for regrowth. If herbicide proves ineffective, remove underground stolons by hand. Monitor for regrowth and remove until eradicated.

Task 3.13 (INV-3.13): Eradicate Tree Tobacco. Small numbers of tree tobacco occur along SR-78 and on the southeastern boundary. Treat tree tobacco using mechanical methods followed by herbicide applications. Monitor treated plants and re-treat annually, until eradicated.

Task 3.14 (INV-3.14): Eradicate Olive. We located olive trees in several locations throughout the Preserve, including one large stand on the eastern boundary. Treat olives with mechanical methods and herbicide. Monitor treated plants and re-treat, as needed, until eradicated.

Task 3.15 (INV-3.15): Eradicate Stinknet. We hand-pulled one stinknet plant; however, additional plants may germinate in the same location. If EHC locates additional plants, hand-pull or treat with herbicide prior to flowering during the growing season. If plants have formed seed, remove from site after pulling. Monitor treated areas for re-infestation and re-treat annually, until eradicated.

Task 3.16 (INV-3.16): Eradicate Castor Bean. One stand of castor bean occurs along the southeastern boundary. Treat castor bean with mechanical methods followed by herbicide applications. Monitor treated plants and re-treat annually, until eradicated.

Table 11. Invasive Plant Management Priorities, 2021 – 2024.

Invasive Species	Treatment Timing	Treatment Method	Recommended Action And Location	Status [1]
Ailanthus altissima (Tree-of-heaven)	Spring (after leaves are fully expanded)	Chemical	Apply herbicide directly onto seedlings and on stems after cutting near the northeastern boundary; monitor and re-treat annually.	NS
		Mechanical	Hand pull or dig out small seedlings or saplings; monitor and remove annually.	
*Anthemis cotula (*Mayweed chamomile*)*	Prior to fruit formation (spring)	Chemical	Apply herbicide to seedlings and young and flowering plants *outside* of vernal pools; monitor and re-treat until eradicated. Do not apply herbicide to plants in vernal pools.	NS
		Mechanical	Hand pull, bag, and remove plants from vernal pools and mapped location(s); monitor and remove.	NS
Arundo donax (Giant reed)	August-November (year-round if leaves are green)	Chemical	Apply herbicide directly onto seedlings and stems after cutting in Clevenger Canyon north of SR-78; remove cut biomass; monitor and re-treat annually.	NS
		Mechanical	Hand pull or dig out small seedlings or saplings in Clevenger Canyon north of SR-78; monitor and remove annually.	
Asphodelus fistulosus (Onion weed)	Year-round	Mechanical	Hand pull or dig out plants near northeastern boundary; monitor and remove annually.	NS
Brassica tournefortii (Saharan mustard)	Prior to fruit formation (winter)	Chemical	Apply herbicide to seedlings and young and flowering plants in mapped location(s); monitor and re-treat until eradicated.	NS
	After fruit formation	Mechanical	Hand pull, bag, and remove plants from mapped location(s); monitor and remove.	
Carduus pycnocephalus (Italian thistle)	Prior to fruit formation (spring)	Chemical	Apply herbicide to young plants in mapped location(s) that co-occur with MSP priority and USMC focal animals and plants (i.e., Engelmann oak); monitor/re-treat.	NS
Cirsium vulgare (Bull thistle)	Prior to fruit formation (spring)	Chemical	Apply herbicide to young plants in mapped location(s); monitor and re-treat.	NS
	After fruit formation	Mechanical	Hand pull, bag, and remove seeding inflorescences from mapped location(s); monitor and remove.	

Invasive Species	Treatment Timing	Treatment Method	Recommended Action And Location	Status [1]
Cynara cardunculus (Artichoke thistle)	Prior to fruit formation (spring)	Chemical	Apply herbicide to seedlings and young and flowering plants in mapped location(s); monitor and re-treat.	NS
	After fruit formation	Mechanical	Hand pull, bag, and remove seeding inflorescences from mapped location(s); monitor and remove until eradicated.	
Dittrichia graveolens (Stinkwort)	Prior to fruit formation (early summer)	Chemical	Apply herbicide to seedlings and young and flowering plants along northeastern Preserve boundary; monitor and re-treat.	IP
	After fruit formation	Mechanical	Hand pull, bag, and remove plants along northeastern Preserve boundary; monitor and remove.	
Eucalyptus spp. (Eucalyptus)	Year-round	Chemical	Apply herbicide directly onto seedlings and stems either in drilled holes or after cutting throughout the Preserve; monitor and remove annually until eradicated.	IP
		Mechanical	Hand pull or dig out small seedlings or saplings throughout the Preserve; monitor and remove annually as needed to contain or suppress spread.	
Foeniculum vulgare (Fennel)	Prior to fruit formation (spring)	Chemical	Apply herbicide to cut stalks and seedlings in and near the southern grassland; monitor for re-growth and re-treat annually.	NS
	After fruit formation (spring)	Mechanical	Cut stalks with fruits, bag, and remove from the southern grassland; monitor for re-growth and re-treat annually	
Lepidium latifolium (Perennial pepperweed)	Prior to fruit formation (spring)	Chemical	Apply herbicide to leaves on plants located in the western portion of the Preserve; monitor for re-growth and re-treat annually.	NS
		Mechanical	Remove underground stolons by hand if herbicide applications prove ineffective; monitor for re-growth and re-treat annually.	
Nicotiana glauca (Tree tobacco)	Year-round	Chemical	Apply herbicide directly onto seedlings and cut stems in mapped locations; remove all cut biomass; monitor and re-treat annually.	NS
		Mechanical	Hand-pull seedlings in mapped locations; monitor and remove annually.	
Olea europaea (Olive)	Year-round	Chemical	Apply herbicide directly onto seedlings and on stems after cutting in mapped locations; monitor and re-treat annually.	NS

Invasive Species	Treatment Timing	Treatment Method	Recommended Action And Location	Status [1]
Oncosiphon pilulifer (Stinknet)	Prior to fruit formation (spring)	Chemical	Apply herbicide to seedlings and young and flowering plants in mapped location; monitor and re-treat.	IP
	After fruit formation (spring)	Mechanical	Hand pull, bag, and remove plants from mapped location; monitor and remove.	
Phoenix canariensis (Canary Island date palm) & California fan palm (*Washingtonia filifera*)	Year-round	Chemical	Apply herbicide after cutting; monitor and remove annually. Consider removal of California fan palm as species may have been present since the early 1900s.	NS
Ricinis communis (Castor bean)	Year-round	Chemical	Apply herbicide directly onto seedlings and on stems after cutting near the southeastern Preserve boundary; monitor and re-treat annually	NS
		Mechanical	Hand-pull seedlings in and adjacent to the southeastern boundary; monitor and remove annually. Cut and remove seeds.	
Schinus molle (Peruvian pepper tree)	Year-round	Chemical	Apply herbicide directly onto seedlings and stems after cutting throughout the Preserve; monitor and re-treat annually.	NS
		Mechanical	Hand-pull seedlings; monitor and remove annually.	
Silybum marianum (Milk thistle)	Prior to fruit formation (spring)	Chemical	Apply herbicide to seedlings and young and flowering plants in the oak woodlands; monitor and re-treat.	NS
	After fruit formation (spring)	Mechanical	Hand pull, bag, and remove plants from mapped locations; monitor and remove.	
Stipa miliacea var. *miliacea* (Smilo grass)	Year-round	Chemical	Apply herbicide directly onto plants in Clevenger Canyon north of SR-78; monitor and re-treat annually.	NS
Tamarix sp. (Salt cedar) & *Tamarix aphylla* (Athel)	November – January (winter)	Chemical	Apply herbicide directly onto seedlings and on stems after cutting throughout the Preserve; monitor and re-treat annually.	NS
		Mechanical	Hand-pull seedlings; monitor and remove annually.	

[1] Status: IP = In-progress; NS = Not started.

Task 3.17 (INV-3.17): Manage Peruvian Pepper. Peruvian pepper trees occur in the Preserve and around the ranch house. Remove trees using mechanical methods and treat with herbicide. Subsequent to removal, monitor and re-treat individual trees as necessary, until dead. Leave several live trees to support and sustain insect food sources for foraging bats (Stokes pers. comm.).

Tasks 3.18 (INV-3.18). Manage Milk Thistle. We located many stands of milk thistle primarily in the coast live oak and Engelman oak woodlands. Treat milk thistle in the spring, prior to bolting. Monitor and re-treat until eradicated, if possible. Cut and bag any inflorescences that are flowering or seeding.

Task 3.19 (INV-3.19): Eradicate Smilo Grass. Treat smilo grass in Clevenger Canyon north of SR-78 with herbicide. Monitor treated plants and re-treat until eradicated.

Task 3.20 (INV-3.20). Eradicate Salt Cedar. We located two salt cedar (*Tamarix* sp.) trees. Salt cedar is different from the athel (*Tamarix aphylla*) trees near the ranch house. Athel is not considered invasive and is therefore a lower priority. Treat salt cedar with mechanical methods and herbicide. Monitor treated plants and re-treat until dead.

Task 3.21 (INV-3.21). Remove Invasive Trees Surrounding the Ranch House. Removal of target invasives near the ranch house is a lower priority. However, California fan palms [*Washingtonia filifera*]) should be considered before removal, as they may have been present since the early 1900s based on photos from Heritage Architecture and Planning (2015) and those taken by CBI during rapid assessment field surveys.

In general, other mapped invasive plants mapped are a lower priority for treatment at this time, although land managers may treat these species during clearing for fuel breaks or fuel reduction around the ranch house, or in association with other invasive plant removal efforts.

The following recommendations and avoidance and minimization measures apply to invasive plant treatment:

- To the extent possible, remove nonnative trees outside of the avian nesting season (i.e., February 15 – August 31; however raptors may begin breeding as early as January) or ensure a qualified biologist is either present during tree removal or responsible for tree removal (e.g., land manager is also a qualified biologist).
- If nonnative trees are removed during the bird breeding season and an active nest is located, cease removing nonnative trees and establish a buffer around the active nest. Establish a 500-foot buffer around active raptor nests and a 100-foot buffer around other active bird nests. Maintain the buffer until the nest is inactive.

- Remove eucalyptus trees from October – November to avoid breeding bats (i.e., March – September) and hibernating bats during the coldest winter months (i.e., December – February).
- Partially delimb eucalyptus trees by removing several of the larger branches 1-2 days prior to complete removal to encourage bats to relocate.
- Phase eucalyptus tree removal over multiple years and coordinate annually with the Wildlife Agencies on tree removal progress.
- When selecting invasive plant treatments (type, method, timing), consider potential effects on native species, including sensitive plants and animals.
- Where invasive species treatment is phased, focus initial control in or near MSP priority and USMC focal species or habitats, with subsequent control targeting roads, trails, and drainages (conduits for dispersal), upslope areas (for gravity-dispersed species), and outliers.
- Maintain an herbicide log for invasive plant treatments that includes treatment area, treatment date, treatment type (e.g., name of herbicide, mechanical method such as weed whipping), amount (ounces/gallons) of herbicide used, applicator, and target species. Applicators should have a state license for herbicide application or work under someone with a state license and follow all herbicide label directions.
- Where large stands of invasive plants are removed (i.e., eucalyptus, milk thistle), restore gaps with native species (seed, container plantings) if passive restoration is absent, to minimize erosion and invasive species re-colonization. Use genetically appropriate planting materials (e.g., propagules collected onsite or in proximity, using seed zone concept; RS-1.1). Plant native trees to benefit MSP or USMC focal species, if applicable.

Task 3.22 (INV-3.22): Respond Rapidly to New or Expanding Invasions. Treat new or rapidly expanding infestations of invasive plant species where these species pose a risk to sensitive resources, regardless of IPSP ranking (INV-3.1). Where treatment cannot be accommodated within the annual budget, contact the regional invasive plant program for on-the-ground assistance or apply for regional funding (e.g., San Diego Association of Governments [SANDAG] Environmental Mitigation Program land management grants) to control the infestation. Coordinate with adjacent property owners for control beyond the Preserve boundary.

Task 3.23 (INV-3.23): Reduce Fire Risk from Invasive Plants. Treat selected invasive plant species proactively where they pose a fire risk (e.g., urban-preserve boundary, under or near powerlines, in the developed area near the ranch house or other facilities) or have the potential to expand rapidly and extensively into natural communities following fire (e.g., mustards) (CO-2.2, CO-3.2, FM-5.2).

Task 3.24 (INV-3.24): Monitor Invasive Plant Treatments. Monitor invasive plant treatments qualitatively or semi-quantitatively (e.g., photographs, occupied acreage, counts, estimates of percent cover) to assess effectiveness. Re-treat per treatment strategy (e.g., eradicate, contain, manage, suppress).

4.1.4 Habitat Restoration

Restoration Goal (RS): Enhance degraded coastal sage scrub, chaparral, oak woodlands, grasslands, and riparian habitat within the Preserve to benefit MSP and USMC focal species, improve species diversity (including pollinator habitat) and connectivity, and reduce threats from invasive species.

Objective 1 (RS-1). Vegetation Enhancement. Identify vegetation enhancement needs/opportunities at 5-year intervals or after disturbance (e.g., wildfire, illegal vegetation clearing) based on vegetation mapping (VEG-1.2, 1.3), vernal pool enhancement (VP-5), invasive plant prioritization and treatment (INV-2.1, 2.2), and coordination with entities (e.g., SDMMP, fire agencies) on regional or post-fire restoration recommendations (FM-6, FM-8).

Task 1.1 (RS-1.1). Enhance Vegetation. We have not identified any enhancement priorities for native vegetation at this time beyond prioritizing and treating invasive plants (INV-2). This is a placeholder for future restoration efforts. Develop and implement vegetation-specific objectives and implementation tasks as needed and based on results of vegetation, vernal pool, invasive plant management, and regional restoration recommendations (e.g., coastal sage scrub enhancement or restoration for coastal California gnatcatchers), and consider the following.

- Identify and prioritize enhancement areas based on proximity and benefits to MSP and USMC focal species and habitats, threats from invasive species, or lack of natural recruitment of native species.
- Develop and implement an enhancement plan describing existing conditions, management goals and objectives, enhancement specifications and methods (acreage, planting palette, planting and maintenance methods and schedule), success criteria, monitoring methods, and adaptive management.
- Procure genetically appropriate native plant propagules (seed, container plants, cuttings). Collect seed onsite or in proximity, using the seed zone concept.
- Inspect plant stock for insects or disease (i.e., phytophthora) prior to planting, and eliminate infected individuals from outplantings.
- Monitor enhancement area(s) using appropriate monitoring methods (VEG-2).
- Manage enhancement area(s) using appropriate vegetation and vernal pool methods (VEG-4.2 and VP-5.2, 5.3) and invasive plant prioritization and treatment (INV-2.1, INV-2.2, INV-3).

- Follow applicable avoidance and minimization measures during enhancement activities (VEG-4.2, VP-5.2, VP-5.3 and INV-3).

4.2 MSP and USMC Focal Animal Species

MSP and USMC Animal Goal (AN): Survey, maintain or enhance MSP and USMC focal animal populations (including habitat) to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and ensure persistence over the long-term (>100 years).

4.2.1 Surveys and Inventories

Objective 1 (AN-1). MSP and USMC Focal Animal Species and Habitat Surveys. During the first 3 years and in subsequent management periods, conduct or allow species-specific surveys in appropriate habitat or acquire survey data from regional programs, identify threats, and develop management actions to maintain existing populations of MSP and USMC focal species and their habitat, including (but not limited to) western spadefoot toad, northern harrier, and CAGN (if threatened by development or stewardship actions).

Task 1.1 (AN-1.1): Facilitate Regional Surveys. Provide access to researchers or biologists to conduct regional distribution and abundance surveys and habitat and threats assessments for (1) Harbison's dun skipper, (2) golden eagle, (3) northern harrier, (4) pallid bat, and (5) Townsend's big-eared bat. Incorporate any forthcoming Preserve-specific monitoring and management actions into stewardship activities.

Task 1.2 (AN-1.2): Survey for Western Spadefoot Toad. During the first 3 years, conduct bi-annual surveys for western spadefoot in potential breeding pools (e.g., depressions in compacted roads or trails) using methods described by Fisher et al. (2004) to establish known breeding locations. Survey for toads in conjunction with vernal pool monitoring (VP-2), and record spadefoot activity, including egg masses and larvae. Where spadefoot toads are detected, record life stage (e.g., tadpoles, adults), estimate number of individuals, and map pools supporting spadefoot with a GPS unit.

Task 1.3 (AN-1.3): Coastal California Gnatcatcher Surveys. Conduct surveys to detect CAGN nests before implementing stewardship activities, and avoid stewardship activities near active nests.

Task 1.4 (AN-1.4): Anticipate Animal Species Listings. Coordinate with federal and state wildlife agencies and the SDMMP regarding changes in the listing status (e.g., listed, proposed listed, or candidate species) of detected or potentially occurring animal species and their management needs.

Objective 2 (AN-2). General Animal Species List. Develop an animal species list for the Preserve by 2025 and add to this list annually through survey results from biologists, researchers, land managers, or other contractors.

Task 2.1 (AN-2.1): Develop/Maintain Animal Species List. We prepared a preliminary animal species list based on 2020 and 2021 observations (Appendix B.2). Annually update this list based on general surveys, species-specific surveys (AN-1), biological monitoring (AN-5), Preserve patrols (PS-2), post-fire surveys (FM-8.4), research studies (OER-2), and incidental observations. Provide this list to contractors or others conducting surveys on the Preserve.

Objective 3 (AN-3). Invasive Animal Surveys. Conduct surveys for Argentine ants, oak borers, and oak pit scale by 2025 to determine presence or absence within the Preserve, and assess the threat to MSP and USMC focal species and habitats.

Task 3.1 (AN-3.1). Conduct Argentine Ant Surveys. Between 2021 and 2024, conduct Argentine ant surveys along the Preserve boundary where it meets residential areas and near riparian habitat per USGS Argentine Ant Rapid Assessment protocol (Matsuda et al. 2016) to determine presence or absence and identify locations where ant levels are high. Refer to AN-7.7 for management recommendations that address Argentine ants, if present.

Repeat surveys for Argentine ants every 5 years to determine the rate of spread of ants into the Preserve, effectiveness of management actions, and the need to refine or alter management practices.

Task 3.2 (AN-3.2): Conduct Oak Borer and Oak Pit Scale Surveys. Between 2021 and 2024, survey oak trees or other suitable host trees for signs of infestation (including exit holes, die-back) from GSOB (target species: coast live oak), KSHB and its fungal symbiont (target species: California sycamore, coast live oak), other harmful shot hole borers or fungal pathogens, and oak pit scale (target species: Engelmann oak). Install traps where appropriate to determine distribution and density of infestations. Refer to AN-7.8 for management recommendations that address oak borers and pit scale, if present.

Repeat tree assessments every 3 years to identify presence or absence of oak borers, associated fungal symbionts, other fungal pathogens, and oak pit scale; determine effectiveness of management actions; and assess the need to refine or alter management practices.

Coordinate with regional experts and a local pest control advisor on regional management strategies (e.g., draft Southern California Shot Hole Borers/Fusarium Dieback Management Strategy for Natural and Urban Landscapes, August 2016) on detecting or verifying infestations and determining short- and long-term monitoring and management actions.

Objective 4 (AN-4). Maintain Ecosystem Functions for Wildlife Movement. Between 2021 and 2024, assess wildlife movement between the Preserve and adjacent conserved lands to identify impediments to movement and opportunities to enhance movement for wide-ranging animal species.

Task AN-4.1. Conduct/Assess Wildlife Movement. Assess wildlife movement within and through the Preserve based on existing studies, survey efforts (e.g. San Diego Tacking Team, USGS), and stewardship activities. Improve connectively by identifying barriers to movement (e.g., fencing) and identify opportunities to enhance movement for wide-ranging animals (e.g., mountain lion).

Refer to Task AN-7.9 for management actions to improve movement opportunities for wide-ranging animals.

4.2.2 Monitoring

Objective 5 (AN-5). MSP and USMC Focal Animal Monitoring. Between 2021 and 2024 and in subsequent management periods, (1) facilitate access for regional monitoring, (2) monitor detected MSP and USMC focal animal species using species-specific or regional inspect and manage monitoring protocols and frequencies (City of San Diego 2020, SDMMP and TNC 2017) to assess status and threats, and (3) monitor the effectiveness of management actions using qualitative or quantitative methods.

Task 5.1 (AN-5.1): Facilitate Regional Monitoring. Provide access to researchers or biologists for regional monitoring efforts, and implement preserve-specific monitoring methods that arise from species-specific plans (i.e., Golden Eagle Monitoring Plan [in progress]). Coordinate with regional entities (i.e., SDMMP) to determine appropriate preserve-specific monitoring methods including, but not limited to:

- Establishing wildlife cameras to track golden eagle foraging and nesting habits.
- Identifying management actions to support expansion of northern harrier nesting occurrences to self-sustaining levels.

Task 5.2 (AN-5.2): Monitor San Diego Fairy Shrimp in Level 1 Vernal Pools. Beginning in 2021, conduct annual visual assessments of San Diego fairy shrimp and reproduction in occupied Level 1 vernal pools (VP-2.1, 2.2). Record estimated number of individuals and gravid females in each pool.

Conduct annual protocol level fairy shrimp surveys only if qualitative surveys detect changes in hydrology or other vernal pool functions that trigger a Level 2 or Level 3 management response (VP-2.1, 2.2).

Task 5.3 (AN-5.3): Monitor San Diego Fairy Shrimp in Level 2 and 3 Vernal Pools. Based on results of VP-2.1, 2.2 and AN-5.2, annually monitor San Diego fairy shrimp in occupied Level 2 and 3 vernal pools (VP-2.2) until management actions result in Level 1 vernal pools.

- Level 2 and 3 Vernal Pools: If monitoring indicates a decline not associated with natural population fluctuations or climatic conditions (i.e., drought), monitor to determine the cause for decline, and implement appropriate habitat management actions (VP-5, AN-7.2).
- Level 2 Vernal Pools: After implementing management actions, determine if collecting cysts from within the vernal pool complex or from a nearby source is warranted and redistribute to the affected pool(s). Ensure that collections do not occur in pools supporting Lindahl's fairy shrimp (AN-7.2).
- Level 3 Vernal Pools: After implementing management actions, collect cysts from within the vernal pool complex or from a nearby source and redistribute to the affected pool(s). Ensure that collections do not occur in pools supporting Lindahl's fairy shrimp (AN-7.2).

Refer to the City of San Diego VPMMP (2020) for additional discussion on vernal pool monitoring and Appendix D for an example of the City of San Diego Vernal Pool Habitat Conservation Plan Monitoring Form.

Only permitted biologists will conduct protocol level fairy shrimp surveys according to the schedule and methods in the USFWS survey protocol.

Task 5.4 (AN-5.4): Monitor Western Spadefoot Toad. Annually record spadefoot toad activity in vernal pools, including egg masses and larvae (AN-1.2, VP-2.1). Record life stage (e.g., tadpoles, adults), estimate number of individuals, and map pools supporting spadefoot toads with a GPS unit.

Task 5.5 (AN-5.5): Monitor Stephens' Kangaroo Rat. Between 2021 and 2024, in coordination with the SKR Technical Team, prepare a Preserve-specific Stephens' kangaroo rat monitoring and management plan that tiers off of the Rangewide SKR MMP (Spencer et al. 2021) (AN-7.6) and details SKR management and monitoring methods. Monitoring data will be used to manage SKR on the Preserve and contribute to rangewide management efforts. The Preserve-specific plan will document how to accommodate and monitor potential SKR occupation and population expansion in perpetuity. It will be phased to first investigate natural re-colonization and population expansion from the Ramona Grasslands and then discuss whether there should be active translocation. If appropriate, the Preserve-specific plan will include translocation methods, including monitoring of animal's post-translocation per SKR MMP guidance (Spencer et al. 2021). **The Preserve-specific Stephens' kangaroo rat monitoring and management plan will**

likely produce supplemental management cost requirements that are not captured in the ongoing fund analysis for the Preserve (Section 5.2).

Task 5.6 (AN-5.6): Monitor Coastal California Gnatcatcher. Conduct CAGN monitoring in coastal sage scrub habitat beginning in 2023 and every three years thereafter. Only permitted biologists will conduct protocol level CAGN surveys according to the schedule and methods in the USFWS survey protocol.

Task 5.7 (AN-5.7): Monitor Management Effectiveness. Monitor the effectiveness of management actions for MSP and USMC focal animal species including, but not limited to San Diego fairy shrimp (AN-5.2 and AN-5.3), western spadefoot toad (AN-5.4), SKR (AN-5.5), and CAGN (AN-5.6). Based on this evaluation, refine, expand, and extend management and Preserve-specific plans (VEG-3, 4, 5, AN-5.5). In general, the level of monitoring effort will be greater with intensive versus routine management.

Effectiveness monitoring addresses the success of a management action in achieving the stated objective (e.g., invasive species removal, population size increase) and provides recommendations to increase management effectiveness. Effectiveness monitoring may include qualitative methods that compare pre- and post-treatment variables or quantitative methods that require detailed data to draw statistically valid conclusions.

Identify methods for effectiveness monitoring and thresholds for remedial actions in annual work plans or management plans prior to implementing management.

4.2.3 Management

Objective 6 (AN-6). Management Prioritization. Prioritize management of MSP priority and USMC focal animals and habitats and invasive animals annually (routine management) and at 5-year intervals (intensive management) based on species status and threats (as determined through surveys and monitoring), management feasibility, and available funding.

Task 6.1 (AN-6.1): Prioritize Management Actions. Determine whether management actions are routine (annual) or intensive (5-year intervals or longer). For routine management, identify methods, timing, frequency, schedule, and costs in annual work plans. For intensive management, develop management plans, coordinate with regional entities, and pursue funding prior to implementation. Examples include fencing or trail closures (routine), and habitat restoration or MSP and USMC focal species augmentation (intensive).

Objective 7 (AN-7). Management Implementation. Implement management actions annually or as-needed to maintain MSP and USMC focal animal species and habitats, control invasive animals (if detected), and enhance wildlife connectivity.

Task 7.1 (AN-7.1): Implement Regional Management Recommendations: Implement preserve-specific management actions resulting from regional survey and monitoring efforts (AN-1.1 and AN-5.1). Coordinate with regional entities and experts to determine species-specific BMPs including methods, timing, frequency, schedule, and cost.

Task 7.2 (AN-7.2): Manage San Diego Fairy Shrimp. Based on results of VP-5, determine San Diego fairy shrimp management level: (1) maintenance (Level 1 vernal pools), (2) stabilization (Level 2 vernal pools), and (3) restoration (Level 3 vernal pools), and implement appropriate management actions.

Maintain San Diego Fairy Shrimp (Level 1). Annually maintain San Diego fairy shrimp in Level 1 vernal pools twice a year by patrolling, removing trash and debris, managing edge effects (e.g., control offsite erosion), maintaining fences and signs, repairing trespass damage and minor topographic disturbances, and controlling invasive plants (VP-5.1).

Stabilize San Diego Fairy Shrimp (Level 2). Stabilize San Diego fairy shrimp by implementing all Level 1 actions (VP-5.2). In addition, (1) repair vernal pools, if needed, using mechanized equipment or hand tools to improve pool integrity, ponding potential, and overall size as defined in the VPMMP, (2) dethatch bi-annually within pools and an adjacent 20-ft buffer, (3) treat nonnative plants tri-annually in pools and management buffer, and (4) restore San Diego fairy shrimp. Obtain required state and federal permits before stabilizing vernal pools.

Restore San Diego Fairy Shrimp (Level 3). Implement all Level 1 and Level 2 actions (VP-5.1, 5.2). In addition, (1) dethatch four times a year within pools that support San Diego fairy shrimp and an adjacent 35-ft buffer, (4) treat nonnative plants four times a year in pools and management buffer, and (5) restore San Diego fairy shrimp by collecting cysts from within the vernal pool complex or from a nearby source and redistribute to the affected pool(s) (AN-5.3, VP-5.3).

- Obtain required state and federal permits and coordinate with the Wildlife Agencies before stabilizing or restoring Level 2 and Level 3 vernal pools.

Task 7.3 (AN-7.3): Manage Western Spadefoot Toad. Annually manage threats to western spadefoot toads in vernal pools according to pool management level (Level 1, 2, or 3) (VP-5).

Task 7.4 (AN-7.4): Manage Coastal California Gnatcatcher. Manage threats to CAGN habitat as part of biological resource and Preserve stewardship activities (e.g., invasive plant control and wildfire prevention [INV-3, FM-5.2, 7.1], access control [PS-1], and trash removal [PS-4]). Conduct stewardship activities outside of the breeding season if working in known or potential CAGN habitat.

Integrate management recommendations from the California Gnatcatcher South Coast Regional Monitoring Program into management actions.

Task 7.5 (AN-7.5): Manage Pallid and Townsend's Big-eared Bats: Provide year-round water sources by monitoring, repairing, and filling the concrete cistern near the steel-sided barn and concrete cement silo. Locate additional water sources on the Preserve and repair (if needed), maintain, fill, and monitor. Ensure that water sources are close to Preserve boundaries or the ranch house to reduce Argentine ant invasions into the Preserve interior (Task AN-7.7).

Create suitable Townsend's big-eared bat roosting habitat by repairing the wooden roof on the concrete cement silo and modifying the current sidewall opening to prevent human entry. Maintain potential roosting habitat for pallid bats by surveying the steel-sided barn before modifying. Create pallid bat roosting habitat by installing bat panels on the outside sidewall of the concrete cement silo. Coordinate with the San Diego Natural History Museum bat expert (Drew Stokes) on bat panel design and placement.

Task 7.6 (AN-7.6): Manage Stephens' Kangaroo Rat. Between 2021 and 2024, in coordination with the SKR Technical Team, prepare a Preserve-specific SKR monitoring and management plan based on the Rangewide SKR MMP (Spencer et al. 2021) (AN-5.5). Assess the effectiveness of ongoing SKR habitat management (multiple tasks in VEG-3, 4, and 5), and adjust management techniques or recommend additional techniques, based on monitoring results. Identify and maintain dirt roads that could facilitate movement and connection between occupied SKR habitat (PS-3.2). If appropriate, include road maintenance activities and methods, and frequency in the Preserve-specific SKR monitoring and management plan. Include contingency measures to address the possibility of extirpation or significant SKR population reduction associated with severe, prolonged drought or prolonged rainfall. If active SKR translocation is appropriate, describe specific and appropriate translocation methods including monitoring of animal's post-translocation status following guidance in the SKR MMP (Spencer et al. 2021). **The Preserve-specific Stephens' kangaroo rat monitoring and management plan will likely produce supplemental management cost requirements that are not captured in the ongoing fund analysis for the Preserve (Section 5.2).**

Task 7.7 (AN-7.7): Control Argentine Ants. Reduce or eliminate irrigation around the ranch house to prevent excess water that could attract Argentine ants. Inspect irrigation left in place quarterly to ensure it is functioning properly. Work with adjacent land owners to eliminate or reduce landscaping and watering adjacent to the Preserve to lessen the risk of Argentine ant invasion into the interior of the Preserve to avoid impacts to the San Diego horned lizard food source and Harbison's dun skipper larva.

Task 7.8 (AN-7.8). Treat Oak Borers and Oak Pit Scale. Treat oak borer and oak pit scale infestations (if detected; AN-3.2) using BMPs, including (but not limited to) insecticide application or a combination of solarization, wood chipping, and removal of infected twigs and limbs, and monitor for re-infestation (AN-3.2). Discontinue insecticide application if future studies or experts identify detrimental effects to MSP and USMC focal animal species (e.g., effects to food sources for Townsend's big-eared and pallid bats).

Task 7.9 (AN-7.9): Improve Connectivity. Connectivity between the Preserve and other conserved lands will require regional or local solutions that address targeted conservation acquisitions, or depend on adjacent land owners or regional entities to implement management actions in the vicinity. Potential regional or preserve-level actions to improve connectivity include, but are not limited to:

- Removing all trash, debris, and down barbed wire fence that could entangle wildlife.
- Ensuring that new or repaired fence along the northern boundary is 'wildlife friendly' to allow wildlife ingress and egress. Examples of 'wildlife friendly' fence include bars of galvanized steel, smooth wire, and 2-strand barbed wire. Place strategic gaps in locations that allow for safe passage across SR-78, to the extent possible.
- Avoiding and minimizing impacts to animals including MSP and USMC focal species while driving on Preserve access roads.
- Closing selected dirt roads or trails to reduce internal fragmentation. Detailing road or trail closures in the Roads and Trails Plan (PS-3). Do not create new access trails or dirt roads.
- Shielding, directing downward, or eliminating unnecessary lighting on the ranch house to avoid impacting foraging and movement of nocturnal MSP and USMC focal animals. Use lighting only where needed and ensure that lighting is timer- or motion-activated. Coordinate with the Wildlife Agencies before installing new lighting.
- Working with adjacent landowners to eliminate unnecessary light sources, lower light intensity, reduce duration of night lighting, screen lamps to focus light where it is needed but not into the Preserve, and switch to light sources low in blue, violet, and ultraviolet wavelengths. See (Commonwealth of Australia 2020) for stepwise guidelines and prescriptions for reducing light effects on wildlife, and Gaston et al. (2012) for a scientific review of methods for mitigating their impacts.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for MSP and USMC focal animal management recommendations and avoidance and minimization measures.

4.2.4 Research

Objective 8 (AN-8). Facilitate Research Studies. Coordinate with SDMMP or other entities as-requested to facilitate regional and species-specific research that informs monitoring and management, including development of BMPs.

Task 8.1 (AN-8.1): Facilitate MSP and USMC Focal Animal Research Studies. Coordinate with researchers and provide access to the Preserve for research studies (e.g., distribution, behavior, genetics, translocation studies, or connectivity) that inform management of MSP and USMC focal animals.

4.3 MSP and USMC Focal Plant Species

Biologists have conducted baseline surveys for MSP, USMC focal, and regionally rare plant species. We surveyed and mapped MSP priority and USMC focal plants during rapid assessment field surveys. We recommend (1) monitoring to track MSP priority and USMC focal plant status and threats, and assess management effectiveness, (2) managing to address threats to MSP priority and USMC focal plant species, and (3) recording common plant species during surveys, monitoring, management, or patrol events.

MSP Plant Species Goal (PL): Maintain, enhance, and restore MSP priority and USMC focal plant populations to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and ensure persistence over the long-term (>100 years) within the Preserve.

4.3.1 Surveys and Inventories

Objective 1 (PL-1). General Plant Species List. Document plant diversity by developing a plant species list for the Preserve and adding to it annually through survey results from biologists, researchers, land managers, or other contractors.

Task 1.1 (PL-1.1): Maintain Existing Plant Species List. Maintain the existing list (Appendix B.1) of plant species observed or otherwise documented on the Preserve based on vegetation mapping (VEG-1), invasive plant mapping (INV-1.1), general surveys, species-specific surveys (PL-1.1), biological monitoring (VP-2, PL-2), Preserve patrols (PS-2.1), post-fire surveys (FM-8.4), research studies (OER-2), and incidental observations. Provide this list to contractors or others conducting surveys. Update the species list annually.

4.3.2 Monitoring

Objective 2 (PL-2). Monitoring MSP Priority and USMC Focal Plants. Monitor MSP priority and USMC focal plants as specified below and in Table 12 to assess status and threats, and prioritize and implement management actions.

Tasks below refer only to MSP priority and USMC focal plants currently known from the Preserve. If additional MSP and USMC focal plants are detected in the future, establish appropriate tasks and inspect plant occurrences according to MSP monitoring methods, schedules, and frequencies (SDMMP AND TNC 2017). In the event of fire or other catastrophic disturbance, implement contingency monitoring for MSP priority and USMC focal plant species and other MSP plant species (FM-8.5, AR-4).

Southern tarplant and Engelmann oak are designated as vegetation focus (VF) species per the MSP Roadmap (Table 5). Monitoring for southern tarplant is currently on-hold; however, we recommend initiating bi-annual monitoring of the species per the SDMMP rare plant IMG protocol. The SDMMP regional vegetation monitoring program will monitor Engelmann oak once regional protocols are established; however, Preserve land managers will qualitatively monitor Engelmann oak to track status and detect threats.

Table 12. Monitoring Schedule for MSP Priority and USMC Focal Plant Species.

Species	Year	Monitoring Frequency	Responsibility[1]	Contingency Monitoring
Centromadia parryi subsp. *australis* (Southern tarplant)	2021	Biannual	Local	None
Quercus engelmannii (Engelmann oak)	2022	Annual	Local and Regional	See FM-8.5

[1] Local = land managers or their representatives will monitor the species; Regional and local = land managers or their representatives will monitor the species and the regional monitoring program will monitor the species once protocols are complete.

Task 2.1 (PL-2.1): Coordinate with Regional Vegetation Monitoring Program. Provide access to the Preserve for regional vegetation monitoring that targets Engelmann oak woodlands (VEG-2.1). If needed, adjust Preserve-level Engelmann oak monitoring based on guidance from the regional vegetation monitoring program.

Task 2.2 (PL-2.2): Monitor Southern Tarplant. Establish one monitoring plot in a vernal pool that supports southern tarplant, and assess status every 2 years in late summer through fall, beginning in 2021, by photographing, inspecting, surveying, mapping, and documenting populations, identifying threats, and recommending management actions using the SDMMP IMG monitoring protocol. Modify southern tarplant monitoring based on SDMMP IMG frequency. Submit qualitative and quantitative data including

monitoring plot- and occurrence-specific data, photographs, and spatial layers to SDMMP.

Refer to tasks related to monitoring and managing vegetation (VEG-3) and vernal pools (VP-5) that could affect southern tarplant.

Task 2.3 (PL-2.3): Monitor Engelmann Oak. Establish photo-documentation points in the Engelmann oak woodlands, and photograph the woodlands annually beginning in spring 2022 to provide a visual baseline record of the status and health of oak trees. Visually inspect a representative sample of trees annually for signs of damage and signs of recruitment.

1. Select three different photo-documentation locations and ensure that each photograph depicts at least two Engelmann oak trees. Record photo-documentation locations using a hand-held GPS receiver, mark permanently to facilitate re-location, and record the camera height from the ground and angle.
2. Identify each photograph with a unique identifier following a standardized naming protocol (e.g., QUEN_Photopoint_#_Photograph_#_ddmmyear: QUEN = *Quercus engelmannii*; Photopoint # = Photopoint 1, 2, or 3; Photograph # = Photograph 1, 2, 3, 4; ddmmyear = date).
3. Monitor each spring on the same day to the extent possible. Use established photo-documentation information (#1) and printed copies of each photograph to match photograph location, height and angle.
4. Visually inspect trees at each photo-documentation location and a representative sample of trees located elsewhere in the Engelmann oak woodlands for signs or damage (e.g., drought stress, vandalism, disease, pests, pathogens) and signs of recruitment.

Refer to tasks related to monitoring and managing invasive animals (AN-3.2, AN-7.8) and plants (INV-3) that could affect Engelmann oak trees.

Task 2.4 (PL-2.4): Monitor Management Actions for MSP Priority and USMC Focal Plants. Monitor the effectiveness of species-specific management actions (PL-3, FM-8.5) annually, and manage adaptively based on results (e.g., refine or expand management). In general, the level of monitoring effort will be greater with intensive versus routine management.

Identify monitoring methods in annual work plans or management plans prior to management implementation. Monitoring methods may include qualitative, semi-quantitative, or quantitative measures, including (but not limited to) photomonitoring, direct counts or estimates, relevés, IMG monitoring plots, quadrats, or transects. Potential monitoring targets include (1) plant growth (2) direct counts or estimates of population size, (3) species diversity or richness, and (4) vegetative and edaphic cover.

Monitor invasive plant control and dethatching efforts that enhance MSP priority and USMC focal plants and re-treat as needed (PL-4).

4.3.3 Management

Objective 3 (PL-3). Management Prioritization. Prioritize management for MSP priority and USMC focal plant species annually (routine management) and at 3-5-year intervals (intensive management) based on species status and threats (as determined through surveys and monitoring), management feasibility, and available funding.

Task 3.1 (PL-3.1): Prioritize MSP and USMC Focal Plant Management Actions. Determine whether prioritized management actions for MSP priority and USMC focal plant species are routine (annual) or intensive (3-5 year intervals or longer). For routine management, identify management methods, timing, frequency, schedule, and costs in annual work plans. For intensive management, develop management plans in coordination with the Wildlife Agencies and secure funding prior to implementation. Examples of routine management include fencing, signs, or trail closures. Examples of intensive management include large-scale invasive plant control, species augmentation, or habitat restoration.
Priority management actions identified to date include:

- Implement routine stewardship activities in MSP and USMC focal plant occurrences.
- Annually control invasive plants and thatch in the southern tarplant populations (routine).
- Annually control invasive plants in Engelmann oak woodlands (routine).

Objective 4 (PL-4). Management Implementation. Continue routine stewardship activities and invasive plant control annually, and implement intensive management as-needed to protect MSP and USMC focal plants from habitat degradation, competition, and loss from the Preserve. Coordinate with regional entities to establish offsite propagule sources for MSP priority plants by 2025.

Task 4.1 (PL-4.1): Implement Routine Stewardship Management. Based on the results of monitoring efforts (VP-2, PL-2), annually manage MSP plants by patrolling, removing trash and debris, managing edge effects (e.g., controlling offsite erosion), maintaining fences and signs, repairing trespass damage and topographic disturbances, and controlling invasive plants.

Task 4.2 (PL-4.2): Treat Invasive Plants. Control invasive plants using herbicides (if appropriate) and mechanical methods, and dethatch beginning in 2021 and as outlined in

VP-5, INV-3, and FM-5.2. Ongoing invasive plant control measures specific to MSP and USMC focal plants include:

Southern Tarplant: Control invasive plants that compete with southern tarplant using herbicide or mechanical methods and dethatch if needed.

Engelmann Oak: Eradicate milk thistle and manage Italian thistle where these species grow with Engelmann oak.

Task 4.3 (PL-4.3): Regional Seed Bank Coordination. Coordinate with SDMMP, San Diego Zoo Global, or other entities developing conservation and propagation seed banks for MSP and USMC focal plant species. The highest priorities for seed banking are those species at-risk from fire. Seed from other MSP and USMC focal plants should be banked where possible as a hedge against catastrophic loss, to retain genetic diversity, and to provide a source of propagules for future restoration, enhancement, or reintroduction on the Preserve.

Refer to the MSP Seed Collection, Banking, and Bulking Plan (CBI and AECOM 2021) for seed collecting and banking protocols. Seed collections for long-term storage and conservation needs are appropriate for southern tarplant.

Task 4.4 (PL-4.4): Regional *Ex Situ* Nursery Stands Coordination. Coordinate with the SDMMP or other entities to establish regional *ex situ* (off-site) nursery stands (if determined necessary) to provide a source of living seeds and genetic material for at-risk MSP and USMC focal plants with recalcitrant seed (i.e., seed cannot be stored long-term due to desiccation sensitivity). Collect seed or facilitate access for other entities to collect seed. Engelmann oak is a candidate for *ex situ* nursery stands.

Task 4.4 is a placeholder in case ex situ nurseries are determined necessary in the future to offset losses (e.g., wildfire) or increase genetic diversity of MSP and USMC focal plants.

Task 4.5 (PL-4.5): Augment MSP and USMC Focal Plant Populations. Where monitoring or research indicate the need to enhance or restore rare plant populations (VP-2, PL-2, FM-8.6) or increase genetic diversity, develop and implement species-specific plans that identify propagule type (e.g., seed, container plants) and source, propagation and out-planting methods, and a post-planting management and monitoring plan. Incorporate species-specific BMPs, provide supplemental watering and weed control, and include 3-5 years of monitoring to document success and manage adaptively.

Where nursery-grown plants or seed bulking are required, grow plants and bulk seed at a qualified facility using seed collected from the Preserve or from genetically appropriate accessions in a regional seed bank (PL-4.3). Plant materials may also come from *ex situ* nursery stands (PL-4.4, FM-7.2, FM-8.6). Augment (if needed) the southern tarplant

occurrence using collected and/or bulked seed, and outplant Engelmann oak container plants propagated using seed collected from the Preserve.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for MSP and USMC focal plant management recommendations and avoidance and minimization measures.

4.3.4 Research

Objective 5 (PL-5). Facilitate Research Studies. Coordinate with SDMMP and other entities to facilitate regional and species-specific research within the Preserve that informs monitoring and management, including development of BMPs.

Task 5.1 (PL-5.1): Facilitate MSP and USMC Focal Plant Research Studies. Coordinate and provide access to the Preserve for research studies (e.g., distribution, ecology, pollinator, genetics, or translocation studies) that inform management of MSP plants and their habitat.

4.4 Coordination

The Preserve is adjacent to rural residential areas and other conserved lands. Developing and sustaining strong positive relationships with adjacent landowners/managers can be beneficial in maintaining the integrity and conservation values of the complex. Experience at other preserves has shown that an engaged, local community often provides an 'extra set of eyes' in monitoring unauthorized Preserve uses. In addition, the Preserve is in a high and very high wildfire threat area (SDMMP and TNC 2017); thus, coordination with local fire agencies is necessary for both public safety and resource protection. Finally, coordination with authorized Preserve users (e.g., SDG&E, contractors, researchers) will help avoid or minimize impacts to key resources during access, management, or research activities.

Coordination Goal (CO): Communicate and coordinate regularly with adjacent landowners/managers and authorized users of the Preserve to protect and enhance Preserve resources while allowing for other necessary uses.

4.4.1 Adjacent Landowners

Objective 1 (CO-1). Landowner Coordination. Establish contact with adjacent landowners by 2025 and maintain contact as-needed thereafter to (1) update landowners on Preserve regulations, (2) resolve and/or assist with boundary encroachment, fuel management, or trespass issues, and (3) provide technical expertise on management issues that affect the Preserve and/or adjacent lands (e.g., invasive species control).

Task 1.1 (CO-1.1): Contact Landowners. Contact residential landowners adjacent to the Preserve to inform them of Preserve boundaries, rules and regulations, and access

restrictions (PS-1.2), and discuss encroachment or management issues that may affect their lands. After the initial contact, meet with landowners on an as-needed basis.

Task 1.2 (CO-1.2): Develop and Maintain Landowner Contact List. Develop and maintain a list of adjacent landowners (including phone numbers) for contact in the event of Preserve management issues, access needs, or wildfire. Review the list annually to update contact information.

Task 1.3 (CO-1.3): Develop and Maintain Landowner Reporting System. Provide adjacent landowners with a 24-hour staff cell phone number and/or online website for reporting incidents or emergencies related to the Preserve, including (but not limited to) unauthorized access, off-highway vehicle (OHV) activity, dumping, shooting, or wildfire. Include an EHC land manager cell phone number on rules and regulations signs (PS-1.4) to further facilitate reporting.

Objective 2 (CO-2). Edge Effects. Coordinate with adjacent landowners by 2025 to reduce or eliminate identified edge effects at the urban-preserve boundary that impact or potentially impact MSP species and habitats or impede connectivity, and maintain contact thereafter to prevent further edge effects.

Task 2.1 (CO-2.1): Resolve Encroachment Issues. Contact landowners by 2023 to resolve encroachment issues at the preserve boundary. We identified encroachment issues on the Preserve (vegetation clearing, landscaping, dumping) associated with adjacent residences, particularly along the southern (Cedar Summit Drive) and eastern Preserve boundaries (Crosswinds Road). Specific management actions to resolve encroachment issues include:

- Working directly with landowners to address ornamental vegetation (1) hanging over boundary fencing (i.e., trees), (2) escaping from residences and establishing on the Preserve (i.e., cacti), and (3) dumping onto the Preserve.
- Discussing fuel abatement concerns with landowners clearing vegetation on the southern Preserve boundary. Determine strategies to alleviate landowner concerns over fire while ensuring protection of Preserve resources. Involve fire agencies if needed (CO-2.2).

Task 2.2 (CO-2.2): Coordinate Fuel Modification. Coordinate with adjacent landowners (CO-1.1, FM-5.1), fire agencies (CO-3.1), and other Preserve users (CO-4.1) annually to (1) identify fuel modification needs, limits, and responsibilities and (2) minimize impacts to natural vegetation, MSP species, and USMC focal species during fuel modification, to the degree feasible.

4.4.2 Fire Agencies

Objective 3 (CO-3). Fire Agency Coordination. Coordinate with appropriate fire agency annually or bi-annually to ensure (1) all parties have up-to-date contact information and gate/lock codes, (2) fuel modification at the urban-preserve boundary is implemented in accordance with fire agency standards and with minimal impacts to sensitive biological resources, and (3) roads used for fire suppression or emergency egress are identified and maintained by the designated parties.

Task 3.1 (CO-3.1): Contact Fire Agencies. Contact fire agencies to develop and maintain a list of fire agency contacts in the event of fire, and ensure that fire personnel have access to the Preserve through designated gates. Contact fire agencies regarding installing their locks on any new gates (PS-1.3).

Task 3.2 (CO-3.2): Identify Fuel Modification Needs. Contact fire agencies to review fuel modification requirements and existing fuels management locations at the urban-preserve boundary (Figure 13) or within the Preserve. Coordination may occur in conjunction with adjacent land owner/managers (CO-2.2) or utility companies (CO-4.1).

Task 3.3 (CO-3.3): Identify Roads for Fire Suppression or Emergency Egress. Meet with the appropriate fire agencies (FM-1.4) to identify Preserve roads for fire suppression activities or emergency egress.

4.4.3 Other Preserve Users

Objective 4 (CO-4). Coordination. Coordinate with other Preserve users (e.g., SDG&E, Ramona Municipal Water District, other easement holders, contractors, and researchers) on an annual or as-needed basis to establish (1) road and utility maintenance and fuel management responsibilities and schedules, (2) Preserve access protocols, and (3) biosecurity measures.

Task 4.1 (CO-4.1): Contact Utilities and Other Easement Holders. Establish or update email and cell phone contacts with SDG&E, the Ramona Municipal Water District, and other utility personnel and private easement holders responsible for utility and roads maintenance, and coordinate annually regarding Preserve access (e.g., gates/locks, O&M activities and schedules) (PS-1.3), utility and road maintenance (PS-3.1), fuel modification around utilities (CO-3.2), and biosecurity measures (CO-4.2).

Task 4.2 (CO-4.2): Provide Biosecurity and Avoidance and Minimization Measures. Provide all Preserve users with written biosecurity and avoidance and minimization measures to prevent the introduction and spread of invasive species, pests, or pathogens (OER-1.2, 2.2) and impacts to plants and animal including MSP and USMC focal species. Biosecurity and avoidance and minimization measures include (but are not necessarily limited to):

- Clean dirt, vegetation, or seeds off vehicles and vehicle tires, equipment, and personal gear (e.g., boots) prior to entering the Preserve.
- Spray tires and shoes with a 10% bleach and water solution before entering the Preserve to eliminate transmission of Rabbit Hemorrhagic Disease Virus Type 2 (RHDV2).
- Place domestic grazing animals (e.g., sheep) from outside the region in a disturbed and fenced location on the Preserve for 3 days before allowing grazing on the Preserve. Treat all germinating invasive species in the enclosure with herbicide after releasing the animals (see VEG-4).
- Inspect animals for disease prior to introduction within the Preserve (e.g., SKR), and eliminate infected individuals from introductions.
- Inspect plant stock for insects or disease (i.e., phytophthora) prior to planting within the Preserve, and eliminate infected individuals from outplantings.
- Ensure that imported soil is clean and fee of foreign debris and nonnative plant material.
- Refer to VEG-3, VP-5, and INV-3 for additional avoidance and minimization measures.

4.5 Property Stewardship

Property stewardship includes long-term, routine management that protects and maintains biological values, while allowing for non-impactive, authorized uses. Activities include the following general categories: access control, erosion control, enforcement/security, roads, trash removal, and facilities maintenance.

Property Stewardship Goal (PS): Maintain the physical condition of the Preserve through stewardship actions that allow for authorized uses while protecting biological resources and ecological functions.

4.5.1 Access Control

Objective 1 (PS-1). Access Control. Install new fencing, gates, and signs (as specified below) by 2025 to restrict access or activities that may impact resources, and inspect and maintain existing infrastructure monthly, quarterly, or annually (as specified below) to protect resources from intentional and unintentional impacts.

Task 1.1 (PS-1.1): Install and Maintain Fencing. Install and maintain fencing to (1) restrict unauthorized access or activities, (2) discourage off-trail use that may impact MSP and USMC focal species or habitats, and (3) address specific stewardship activities (e.g., grazing). Select fencing that allows for wildlife ingress and egress, where feasible, and install strategically to minimize the amount (length) of fencing necessary and to address

specific stewardship activities. For example, interior fencing may consist of four- to five-strand barbed wire to facilitate grazing activities, while boundary fencing may include two- to three-strand barbed (to accommodate cattle grazing) or smooth wire to restrict unauthorized access, while allowing for wildlife movement. Specific measures include:

- Beginning in 2021, install or repair fencing in select locations along the northern, eastern, southern and western boundaries and along Montecito Road to restrict unauthorized access (Figure 12).
- Ensure that fencing along the northern boundary allows wildlife ingress and egress by leaving strategic gaps in Preserve fencing. Place strategic gaps in locations that allow for safe passage across SR-78, to the extent possible.
- Inspect and maintain fencing quarterly to ensure it is intact and undamaged. Replace or repair damaged sections.

Task 1.2 (PS-1.2). Coordinate with Adjacent Landowners. Chained link fencing along the eastern boundary is damaged in several locations (Figure 12), allowing private land owners and domestic animals (e.g., dogs) to enter the Preserve. Coordinate with landowners by 2022 living along the eastern boundary to repair damaged chained link fence to prevent unauthorized entry.

Task 1.3 (PS-1.3): Install and Maintain Gates. Install a new gate and maintain all gates annually to restrict unauthorized access into the Preserve, and ensure authorized users can access the Preserve.

- In 2022 install one new gate along Sonora Way to prevent unauthorized vehicle access into the Preserve (Figure 12). Coordinate with SDG&E on access to utility poles located between the gate and the ranch house.
- There are two functioning gates on the Preserve at: (1) the entrance from Montecito Way and (2) the intersection of Alice and Ash streets. Inspect these and newly installed gates monthly to ensure that the gates and EHC locks are intact and undamaged. Repair damaged gates and replace locks, as needed.

Task 1.4 (PS-1.4): Install and Maintain Signs. Install and maintain several types of signs including (1) Preserve ownership, (2) restricted access (or *No Trespassing*), and (3) road and trail closures for staff, SDG&E, and contractors (PS-3.2).

Include Preserve name, EHC contact phone number, Preserve rules and regulations, with state and municipal code(s) (as applicable), and all Preserve acquisition funders on Preserve ownership signs. List unauthorized activities, including (but not necessarily limited to) access, OHV and electric bike activity, shooting, campfires, camping, smoking, and dumping.

- Beginning in 2021 install Preserve ownership signs on boundary fences and other key locations (e.g., Preserve entrance).
- Beginning in 2021 install restricted access signs in areas supporting MSP and USMC focal plant and animal species (i.e., vernal pools).
- Install road and trail closure signs as needed, to prevent authorized vehicle entry into MSP and USMC focal habitats and areas known to support MSP and USMC focal plants and animals (PS-3.2).
- Inspect and maintain signs quarterly, and replace or repair missing or damaged signs.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for applicable avoidance and minimization measures.

4.5.2 Enforcement and Security

Objective 2 (PS-2). Patrol and Enforce Rules and Regulations. Patrol the Preserve monthly (or more frequently, if needed) to identify and address stewardship issues, including (but not limited to) invasive plants and animals, disease (e.g., RHDV2), access control, unauthorized land uses, trash, fuel modification, and erosion.

Task 2.1 (PS-2.1): Conduct Routine Patrols. EHC staff or the contracted security firm will patrol the Preserve to identify and address stewardship issues in a timely fashion. Where issues are identified (e.g., repeated, unauthorized access), increase patrol frequency until the issue is resolved.

- Maintain a patrol log that includes date, location, management issue(s) identified, and management actions taken.
- Annually assess the need for continued patrols by the contracted security firm. Consider ceasing contracted services if EHC establishes a permanent on-site presence (e.g., ranch house occupant).

Task 2.2 (PS-2.2): Enforce Rules and Regulations. Enforce Preserve rules and regulations by implementing management actions, engaging adjacent landowners and managers or the public directly, and coordinating with law enforcement agencies.

- Install and maintain signs along boundaries and other key locations to ensure that Preserve boundaries and access restrictions are displayed visibly (PS-1.4).
- Engage with the public during patrols to explain access restrictions and stop unauthorized activities.
- Contact law enforcement agencies (e.g., San Diego County Sheriff's Department) to assist with unlawful or unauthorized activities where the land manager judges it

unsafe to approach the offender or in the event of repeated, destructive activities (e.g., OHV activity, vandalism).

- Maintain an incident log of all encounters with the public regarding unauthorized activities.

4.5.3 Roads

Objective 3 (PS-3). Roads. Develop and implement a roads plan for the Preserve by 2025 that (1) includes a roads map, (2) designates road closures and re-routes, and (3) identifies sensitive areas to be avoided or protected during road maintenance activities.

Task 3.1 (PS-3.1): Conduct Roads Inventory. Identify current (authorized, unauthorized, open, closed) status of Preserve roads using the existing spatial layer (Appendix B, Figure A-3). In coordination with fire agencies, SDG&E, and biologists, identify and prioritize roads for continued use, closure, or re-routing, and target areas for erosion control and revegetation. Use information to develop a roads map for inclusion in the roads plan (PS-3.2).

Task 3.2 (PS-3.2): Develop Roads Plan. Using the roads map, develop a roads plan for the Preserve that includes the following elements:

- Determine if any existing roads impact MSP and USMC focal species or habitats. Based on findings, identify road closures or re-routes necessary to protect resources.
- Identify and maintain specific dirt roads to facilitate movement and connection between occupied MSP and USMC focal species habitat (e.g., grassland habitat for SKR). If appropriate, identify roads, maintenance activities, methods, and frequency in the Preserve-specific SKR monitoring and management plan (AN-7.6).
- Identify permanent road closures that could improve internal wildlife connectivity.
- Where appropriate, coordinate with SDG&E to ensure that any proposed road closures do not conflict with roads needed to service utilities.
- Identify whether proposed closures will require active or passive restoration. Natural barriers (e.g., rocks, brush) may be effective in some cases.
- Develop a habitat restoration plan for road closures that require active restoration. Plan elements include seed source, seed palette, seeding method and timing, weed control, and monitoring (RS-1).
- Prioritize management actions for implementation. Roads used for Preserve management, utility service, fire suppression, and emergency egress have the highest priority for maintenance. Roads that impact MSP and USMC focal species or habitat have the highest priority for closure/restoration/re-routing.

- Include applicable avoidance and minimization measures listed in VEG-3, VP-5, INV-3, and CO-4.2.

Task 3.3 (PS-3.3): Implement Roads Plan. Implement roads plan according to prioritized tasks and schedules developed as part of the Roads Plan (PS-3.2).

4.5.4 Trash Control

Objective 4 (PS-4). Trash Removal. Remove priority trash to a landfill or offsite disposal container by 2025, and remove other (non-priority) trash to an on- or offsite disposal container during routine stewardship patrols.

Task 4.1 (PS-4.1): Remove Trash. Remove all Priority Level 1 trash (unless impeded by topography or excessive cost) (Figure 17). Priority 1 trash mapped on the Preserve primarily includes old, rusted barbed wire. The wire is lying on the ground, partially buried, or remains on fence posts, but is in disrepair and hazardous to wildlife and people. Other Priority 1 trash includes a tire and an old television located in the play house near the ranch house. Remove Priority Level 2 trash on a case-by-case basis. Pick up newly disposed of trash during Preserve patrols. Refer to Appendix B for a description of trash at each location. Remove trash only if authorized through National Historic Preservation Act, Section 106 consultation with the State Historic Preservation Officer (SHPO).

4.5.5 Erosion Control

Objective 5 (PS-5). Erosion Control. Reduce or eliminate erosion that impacts MSP and USMC focal species or habitats, access, or safety by repairing erosion and/or installing erosion control measures by 2025 or the subsequent 5-year management period, and maintaining erosion control in all locations.

Task 5.1 (PS-5.1): Prioritize Erosion Control. Assess erosion control issues mapped during reconnaissance surveys and any new erosion issues through regular Preserve

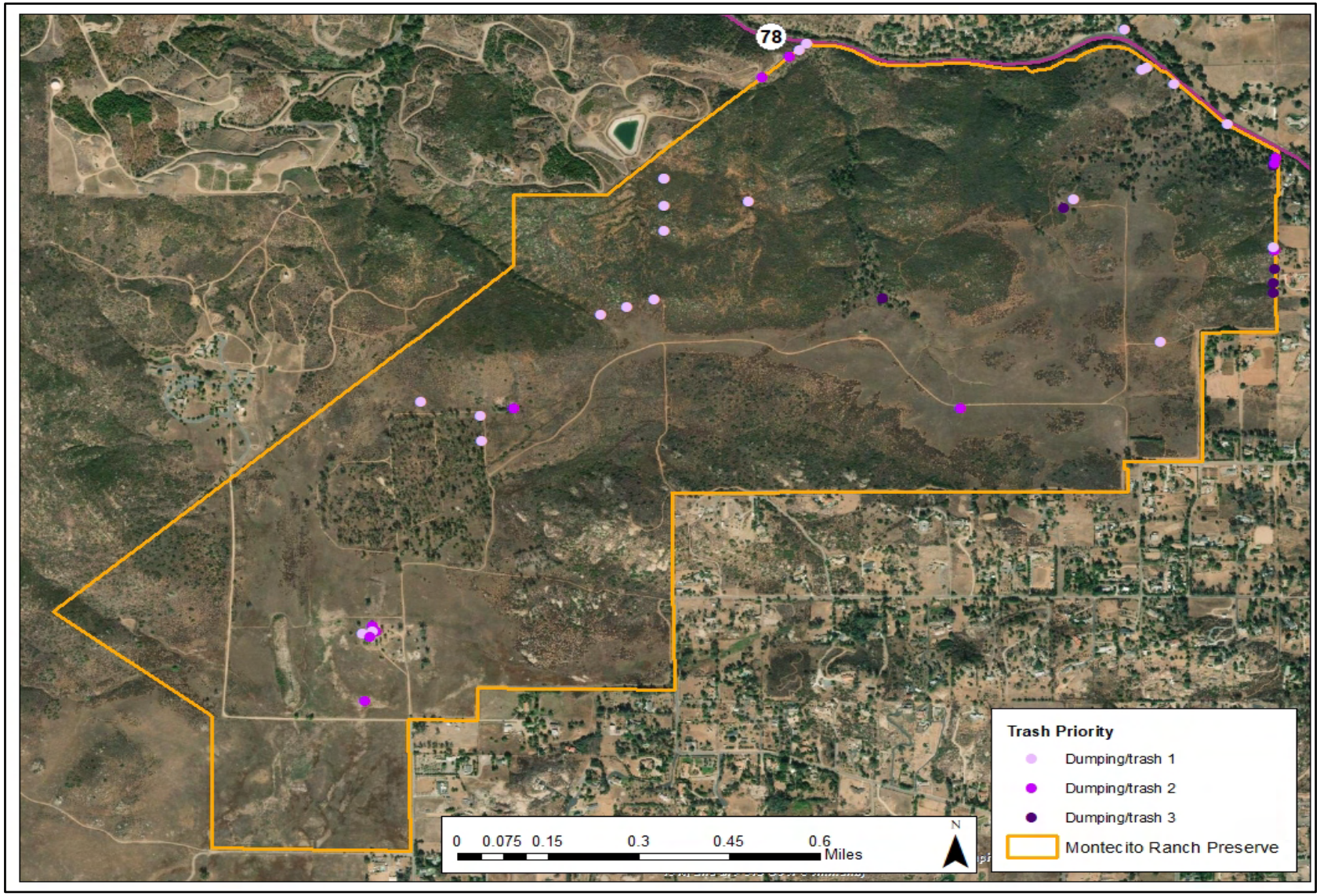

Figure 17. Trash on the Montecito Ranch Preserve

patrols (PS-2.1) or post-fire monitoring (FM-8.5); prioritize management actions and timelines based on impacts and funding requirements. Prioritize routine erosion control by need, and pursue funding for intensive erosion control (PS-5.2). Coordinate with SDG&E to implement erosion control on access roads used for facilities maintenance.

Task 5.2 (PS-5.2): Install and Maintain Erosion Control. Install erosion control devices (gravel or gravel bags, hay bales, water bars, check dams) in select locations to reduce or eliminate adverse effects from erosion. Priority locations for erosion control are adjacent or in proximity to MSP and USMC focal species or habitat and on designated access roads to ensure they remain passable (PS-3.2). Erosion control may be required following a fire event (FM-8.10). Erosion control actions identified to date include:

- Along and adjacent to primary roads used for stewardship activities (Figure 12).
- In the large gully affecting oak woodlands along the northern portion of the Preserve, south of SR-78 (Figure 12).

For routine erosion control measures implemented by EHC, include a list of equipment, materials, and type(s) of erosion control devices to be installed in annual work plans.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for applicable avoidance and minimization measures.

4.5.6 Facilities Maintenance

Objective 6 (PS-6). Facilities Maintenance. Maintain and/or repair the ranch house and ancillary structures (steel-sided barn, concrete cement silo) by 2025 or the subsequent 5-year management period to minimize risk from fire, trespass, or vandalism, and maintain these facilities thereafter.

Task 6.1 (PS-6.1): Repair/Maintain House and Ancillary Structures. Make any necessary repairs to structural or electrical components of the ranch house and steel-sided barn to ensure they are safe for use. Maintain locks or other security devices to prevent trespass and vandalism. Conform with the Historic Structure Plan prior to repairing the ranch house and concrete cement silo (CUL-2.1).

Task 6.2 (PS-6.2). Trim Vegetation. Remove or trim vegetation around the ranch house to reduce risk from fire. See also INV-3.20 and FM-5.1.

4.6 Fire Management

Fire management measures for the Preserve align with the Altered Fire Regime Element of the MSP (SDMMP and TNC 2017). Although we focus on preserve-level management actions, we

include regional actions that may require land manager participation or coordination. Actions in this section provide the foundation for a comprehensive fire management plan.

The Altered Fire Regime Element addresses a number of "at-risk" MSP and USMC focal species and vegetation communities (SDMMP and TNC 2017). Threats to at-risk resources include post-fire expansion of invasive species, thatch buildup, short fire return intervals, or proximity to ignition sources or flashy fuels. High fire risk vegetation includes scrub associations. At-risk species detected on the Preserve include Harbison's dun skipper (high risk), western spadefoot toad (high risk), Bell's sparrow (high risk), red diamond rattlesnake (high risk), pallid bat and Townsend's big-eared bat (medium risk), San Diego black-tailed jackrabbit (high risk), coastal California gnatcatcher (medium risk), and Engelmann oak (medium risk).

We categorize fire management measures as general or species-specific. Within each category, measures are either regional (i.e., implemented by regional entities or land managers with regional or preserve funding) or preserve-specific (addressed by land managers at the preserve-level with preserve funding). EHC may contribute to regional measures directly (e.g., monitoring data), through coordination with regional entities, or by allowing regional entities access to the Preserve. EHC is responsible for preserve-specific measures; preserve-specific fire management may require additional funding (e.g., grants, contingency funds).

We include species-specific fire management measures relevant to the Preserve per the MSP Roadmap (SDMMP and TNC 2017). Most of these measures are preserve-level responsibilities. We include regional-level responsibilities only where they might require coordination and/or assistance from the land manager. Table 13 summarizes pre- and post-fire management tasks for at-risk MSP and USMC focal species.

Some monitoring and management actions occur in multiple categories. We include these redundancies per the MSP Altered Fire Regime Element and to provide a checklist or "flag" for land managers; however, we provide details only where we first reference the action.

The need for post-fire management actions is dependent on the severity of fire impacts, as determined by post-fire surveys.

Fire Management Goal (FM): Maintain the long-term integrity and viability of MSP and USMC focal species and habitats through pre-fire management to lower fire frequency and intensity and post-fire management to reduce direct and indirect fire impacts to Preserve resources.

4.6.1 Regional and Preserve Coordination

Objective 1 (FM-1): Pre-fire Coordination. Coordinate with regional programs and local, state, or federal fire agencies annually or as-needed to ensure that pre-fire management actions within the Preserve minimize impacts to MSP and USMC focal species and habitats, while providing effective fire risk management.

Task 1.1 (FM-1.1): Coordinate with Wildland Fire Resource Advisor Program (WFRAP). Coordinate with local Resource Advisors (i.e., San Diego USGS staff) annually or as-needed to clarify fire management roles and responsibilities, and familiarize them with sensitive resources, including cultural, and approved fire suppression areas and activities on the Preserve.

Table 13. Summary of Pre- and Post-fire Management Tasks for At-Risk MSP and USMC Focal Species on the Montecito Ranch Preserve.

Management Task	Task Description[1]	Species	Timing[2]
FM-4.1	Prepare Resource Avoidance Area map	• All High and Medium at-risk MSP and USMC focal plant and animal species	Pre
FM-5.2, 7.1	Treat invasive plants that increase fire risk	• All High and Medium at-risk MSP and USMC focal plant and animal species	Pre
FM-5.2, 7.1	Monitor for oak pests	• Engelmann oak	Pre
FM-7.2	Establish *ex situ* nursery stands	• Engelmann oak	Pre
FM-8.1	Assess/map fire suppression impacts	• All High and Medium at-risk MSP and USMC focal plant and animal species	Post
FM-8.2	Identify/prioritize invasive plants	• See above	Post
FM-8.3	Treat invasive plants	• See above	Post
FM-8.4	Conduct post-fire surveys	• See above	Post
FM-8.5	Monitor population recovery	• Engelmann oak • Coastal California gnatcatcher[3] • Harbison's dun skipper • Other at-risk species, as needed.	Post
FM-8.6	Augment MSP plant populations	• Engelmann oak	Post
FM-8.7	Augment MSP animal populations	• Harbison's dun skipper	Post
FM-8.8	Restore wildlife habitat	• Coastal California gnatcatcher[3] • Harbison's dun skipper • Pallid and Townsend's big-eared bats	Post
FM-8.10	Install erosion control	• Western spadefoot toad	
FM-8.11	Provide temporary habitat	• Red diamond rattlesnake	Post
FM-8.12	Manage vegetation to promote connectivity	• All High and Medium at-risk MSP and USMC focal plant and animal species	Post

[1] Management task is per the Altered Fire Regime Element of the MSP (SDMMP and TNC 2017). Refer to Sections 4.6.2-4.6.4 for detailed descriptions of management tasks.

[2] Timing: Pre = pre-fire management measure; post = post-fire management measure.

[3] USMC focal species.

Task 1.2 (FM-1.2): Participate in Fire Safety Organizations. Participate in local fire safety organizations (e.g., California Wildland Fire Coordination Group) to foster coordination with and learn from experience of fire management personnel.

Task 1.3 (FM-1.3): Participate in a Modified Burn Area Emergency Response (BAER) Program. Once established, participate in regional meetings and workshops to establish a modified BAER program for non-federal lands, including (1) action plans for at-risk resources that can be implemented immediately post-fire and (2) funding mechanisms and procedures for post-fire response and recovery efforts. The BAER program may be delayed until the 2022-2026 MSP update (SDMMP AND TNC 2017).

Task 1.4 (FM-1.4): Coordinate with California Department of Forestry and Fire Protection (Cal Fire). Meet with Cal Fire by 2023 to review and finalize a Resource Avoidance Area map for the Preserve (FM-4.1). Meet annually or bi-annually thereafter to review and update the map. Coordinate with Cal Fire unit headquarters:

California Department of Forestry and Fire Protection (Cal Fire)	**619-590-3100 (Unit Headquarters)**

Objective 2 (FM-2). Fire Event Coordination. Coordinate with local Resource Advisor(s) or fire agencies during a fire event to ensure fire suppression actions within the complex avoid or minimize impacts to MSP and USMC focal species, habitats, and cultural resources while allowing for effective event response and emergency egress.

Task 2.1 (FM-2.1): Coordinate with Local Resource Advisor. Provide local Resource Advisor with spatial data, hardcopy maps, or access codes to gates during a fire event, if not provided prior to the fire event (FM-1.1).

Objective 3 (FM-3): Post-fire Coordination. Coordinate with regional programs within 3-6 months of a significant fire event on the Preserve to identify post-fire monitoring targets and data collection protocols. We define a significant event as a fire that extends well beyond the Preserve boundaries and affects multiple species and habitats (e.g., 2003 Cedar Fire).

Task 3.1 (FM-3.1): Coordinate with Modified BAER Program. Coordinate with the modified BAER program and SDMMP following a significant fire event and prior to monitoring to ensure that preserve-level, post-fire monitoring targets, and protocols align with regional monitoring targets and protocols (FM-6.1, FM-8.1, FM-8.4).

4.6.2 Environmentally Sensitive Areas

Objective 4 (FM-4). Resource Avoidance Area Map. Develop a Resource Avoidance Area map by 2023 that includes (1) pre-approved fire suppression staging areas, (2) approved fire suppression activities (e.g., equipment staging, dozer line construction, retardant drops), and (3) avoidance areas to protect sensitive and culturally-significant resources. Update the map

annually or as-needed to incorporate additional MSP and USMC focal species or habitats to be avoided during fire suppression activities.

Task 4.1 (FM-4.1): Prepare Resource and Cultural Avoidance Area Map. Develop a Resource and Cultural Avoidance Area map in coordination with the appropriate fire agencies and in a format compatible with the Fire Management Agency GIS Wildland Decision Support System. Use existing spatial data to identify sensitive avoidance areas (e.g., MSP and USMC focal species and habitats, cultural resources). Specific recommendations include, but are not limited to:

- Designate medium-to-high at-risk animal occurrences or habitats as *no dozer/no retardant* areas, or otherwise restrict fire suppression activities in key habitats.
- Designate occupied SKR habitat as *no dozer/no retardant* areas.
- Designate Engelmann oak locations as *no dozer/no retardant* areas.
- Designate vernal pool locations as *no dozer/no retardant* areas.
- Designate cultural resource locations as *no dozer/no retardant* areas.

4.6.3 General Fire Management Measures

Objective 5 (FM-5). Pre-fire Management. Implement general fire management actions (e.g., road hardening, invasive plant control) annually or as-needed to reduce fire ignition probability and intensity. Finalize a fire management plan by 2023.

Task 5.1 (FM-5.1): Reduce Fire Ignition Probability. Implement or work with responsible agencies to implement priority actions identified in the regional Fire Ignition Reduction Plan to reduce catastrophic wildfire ignitions. Actions may include:

- Harden roads through paving or gravel installation, clear vegetation selectively, or install signs to reduce ignition probability at identified "hotspots" and priority locations with at-risk MSP and USMC focal species and habitats.
- Coordinate with Caltrans on vegetation/fuels management along SR-78 at the Preserve boundary to ensure risk of human-caused ignitions vehicle traffic on the highway is minimized.
- Prevent thatch accumulation in grasslands to reduce fire risk to at-risk MSP and USMC focal species and adjacent habitats.
- Clear vegetation selectively around the ranch house and outbuildings to reduce fire ignition probability. Consider removing California fan palm, as it may have been present since the early 1900s based on historical photos (INV-3.20).
- Maintain existing fuel breaks along Montecito Way and Sonora Way, and contact adjacent land owners to discuss additional fuel breaks, as needed.

- Contact adjacent landowners to educate them on the dangers of using power equipment at or near the urban-preserve edge during high fire risk conditions (CO-1.2, FM-1.2).
- Work with the Cal Fire and other local organizations to establish a volunteer "Fire Watch Program" to assist in wildfire prevention during red flag events (FM-1.2).

Task 5.2 (FM-5.2): Reduce Fire Intensity. Reduce fire risk for at-risk MSP and USMC focal species by treating selected invasive plants, managing habitat, and eradicating eucalyptus, fennel, and milk thistle (INV-3.9, 3.10, 3.17).

Reduce fire risk for western spadefoot toad, Bell's sparrow, pallid and Townsend's big-eared bat, San Diego black-tailed jackrabbit, and SKR by managing vernal pools (VP-5.1, 5.2, and 5.3) and grassland habitat (VEG-3.2, 3.3).

Monitor and manage invasive animal species (e.g., oak borer, oak pit scale) that kill oaks and other trees, thereby increasing available fuel for fires (AN-3.2, 6.8).

Task 5.3 (FM-5.3): Finalize Fire Management Plan. Finalize a fire management plan by 2025 and update every five years. Fire management plan elements detailed or identified as action items include:

- Prioritized at-risk MSP and USMC focal species
- Regional and local coordination (FM-1.3)
- Resource Avoidance Area map (FM-4.1)
- Pre-fire, suppression, and post-fire management actions (FM-7, FM-8)

Objective 6 (FM-6). Post-fire Management. Assess post-fire impacts the spring following a fire event, develop rehabilitation, invasives control, and species augmentation plans within 1 year of a fire event, and implement these plans within 1-5 years of a fire event (subject to funding) to protect at-risk MSP and USMC focal species and habitats.

Task 6.1 (FM-6.1): Implement Post-fire Modified BAER Program. Assess and map damage to at-risk MSP and USMC focal species and habitats from fire suppression activities the spring following a fire event (FM-3.1, FM-8.1, FM-8.4). Impacts may include (but are not limited to) hand/dozer lines, off-road vehicle use, staging areas, fire retardant drops, burn severity, erosion, and sedimentation.

Based on impacts, develop and implement a remediation plan for MSP and USMC focal species and habitats within 1 year of the fire event; monitor habitat rehabilitation efforts adaptively. Seek additional funding or cooperative partnerships for remediation.

Task 6.2 (FM-6.2): Identify and Prioritize Invasive Plants. Conduct invasive plant surveys for 3 years after a fire event, focusing on IPSP invasive plants (Levels 1-4) and other

priority invasives identified by the regional invasive plant program. Prioritize invasive plant control based on threat to MSP species and habitats (FM-8.2).

Task 6.3 (FM-6.3): Treat Invasive Plants. Treat prioritized invasive plants at burn sites using BMPs for 3-5 years post-fire or until invasive plants are eradicated or controlled at low levels (e.g., <10% total cover). See INV-3.1 for treatment methods for priority invasives and FM-8.3 for at-risk MSP species and habitats of concern.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for applicable avoidance and minimization measures.

4.6.4 Species-specific Fire Management Measures

Objective 7 (FM-7). Pre-Fire Management. Between 2021 and 2024 and in subsequent management periods, reduce fire impacts and promote post-fire recovery of at-risk MSP and USMC focal species through invasive plant control, *ex situ* nursery stand establishment, and MSP priority animal baseline surveys.

Task 7.1 (FM-7.1): Identify and Treat Invasive Species and Habitat. See Task FM-5.2.

Task 7.2 (FM-7.2): Establish *Ex Situ* Nursery Stands. See Task PL-4.4, FM-8.6.

Task 7.3 (FM-7.3): Conduct Baseline Surveys for MSP and USMC Focal Animals. See AN-1.2.

Objective 8 (FM-8). Post-Fire Management. Implement post-fire monitoring and management after a fire event to (1) assess at-risk MSP and USMC focal species, invasive species, and sensitive habitat in the first year following the fire, (2) monitor MSP and USMC focal species and habitat recovery for up to 5 years post-fire, (3) augment species or restore habitat through post-fire monitoring, and (4) protect species and habitats from altered hydrology and/or post-fire erosion, if determined necessary through post-fire studies.

Task 8.1 (FM-8.1): Assess/Map Fire Suppression Impacts. See FM-6.1.

Task 8.2 (FM-8.2): Identify/Prioritize Invasive Plants. See FM-6.2.

Task 8.3 (FM-8.3): Treat Invasive Plants. See FM-6.3. Invasive plant control will target invasives that impact the following MSP species, USMC focal species, and their habitats, as determined necessary through post-fire surveys and monitoring:

- Engelmann oak
- Harbison's dun skipper
- Western spadefoot toad
- Bell's sparrow

- Coastal California gnatcatcher
- Pallid and Townsend's big-eared bats
- San Diego black-tailed jackrabbit
- Stephens' kangaroo rat

Task 8.4 (FM-8.4): Conduct Post-fire Surveys. Conduct post-fire surveys within and adjacent to the fire perimeter for 1-3 years following a fire event to map the extent and status of known populations of at-risk MSP and USMC focal species and identify new occurrences or refugia.

Task 8.5 (FM-8.5): Monitor Population Recovery. Monitor the post-fire recovery of at-risk MSP and USMC focal species using regional IMG monitoring protocols or other plant or animal protocols recommended by regional entities specifically for post-fire monitoring (FM-3.1). Identify threats and determine management needs, including (but not limited to) invasive control, erosion control, and species augmentation.

Implement the following species-specific measures:

- Assess/map Engelmann oak tree survival and recruitment (resprouting, seedlings) for 3 years post-fire, and assess the need for augmentation.
- Monitor established photo-point locations to document post-fire recovery of Engelmann oak (PL-2.3). Photograph recovery at photo-points annually for 3-5 years following fire, and then at 5-year intervals until shrubs or trees are well-established and/or threats reduced or eliminated.
  Where photo-monitoring indicates an increase in threats (e.g., invasive plants) or lack of recovery, implement management measures including (but not limited to) invasive plant control (FM-6.3, 8.3) or species augmentation (FM-8.6, FM-8.7).
- Assess Harbison's dun skipper recovery (pending results of regional survey, see AN-1.1) or coordinate with other entities conducting regional post-fire monitoring. Specifically monitor recovery of San Diego sedge, the host plant for Harbison's dun skipper, if present, (AN-1.1) for 3-5 years. Augment San Diego sedge if monitoring determines a lack of recovery (FM-8.8).
- Assess CAGN recovery or coordinate with other entities conducting regional post-fire monitoring.
- Monitor Stephens' kangaroo rat recovery using methods included in the Montecito-specific SKR monitoring and management plan (AN-5.5).

Post-fire monitoring of other at-risk MSP and USMC focal animal species may occur at the regional or preserve-level, using standardized protocols.

Task 8.6 (FM-8.6): Augment MSP and USMC Focal Plant Populations. See PL-4.4 and 4.5 for guidelines on augmenting Engelmann oak impacted by fire, if determined necessary through post-fire monitoring (FM-8.5).

Task 8.7 (FM-8.7): Augment MSP and USMC Focal Animal Populations. *This task is a placeholder pending results of surveys for Harbison's dun skipper*.

Coordinate with regional entities and researchers to identify appropriate translocation methods for skipper larva, if the species is detected and subsequently affected by fire, as determined through post-fire monitoring (FM-8.5).

Task 8.8 (FM-8.8): Restore Wildlife Habitat. Restore wildlife habitat for at-risk MSP and USMC focal species as follows, if monitoring indicates natural revegetation is not sufficient to restore suitable habitat (FM-6.1, FM-8.1, FM-8.5):

- Use genetically appropriate container stock and/or seed to restore occupied California gnatcatcher habitat.
- Augment Harbison's dun skipper habitat with San Diego sedge. Provide supplemental water to sedge for 3-5 years until oak trees impacted by fire provide shade. Temporarily fence sedge from herbivores for 3-5 years post-fire and augment with additional sedge plants and potential nectar sources for skipper.
- Ensure water sources remain for pallid and Townsend's big-eared bat post-fire.
- Restore Stephens' kangaroo rat habitat following guidelines in the Montecito-specific SKR monitoring and management plan (AN-5.5).

Task 8.9 (FM-8.9): Conduct Hydrology Studies. Coordinate with regional program(s) or pursue funding to conduct hydrology studies if determined necessary through post-fire site assessments (FM-6.1) and monitoring (FM-8.5) that inform post-fire erosion control actions for western spadefoot toad.

Task 8.10 (FM-8.10): Install Erosion Control. Install erosion control devices if determined necessary through post-fire site assessments (FM-6.1) or monitoring in key locations including roads or slopes to protect habitat and upstream of detected western spadefoot toad populations.

Task 8.11 (FM-8.11): Provide Temporary Habitat. Create brush and/or wood piles, if needed, until habitat structure (e.g., vegetation, dead fall) provides natural cover for MSP at-risk and USMC focal species, including red-diamond rattlesnake.

Task 8.12 (FM-8.12): Promote Foraging Habitat and Connectivity. Manage vegetation for wildlife species by treating invasive plants (FM-6.3, FM-8.3) and restoring habitat (FM-8.8), as determined through post-fire monitoring. These actions will protect and enhance foraging habitat and connectivity for USMC focal, MSP, and non-MSP animal species.

Refer to VEG-3, VP-5, INV-3, and CO-4.2 for applicable avoidance and minimization measures.

4.7 Cultural Resources

Field surveys, record searches, reviews and evaluations, and a complete archaeological significance testing program identified numerous prehistoric and historic sites on the Preserve, including significant and not significant sites. A Native American outreach effort was also initiated during the cultural resource investigation effort. As such, we recommend several cultural ASMD's. Refer to Appendix B for a summary of cultural resources and a discussion on the outreach effort.

Cultural Resources Goal (CUL): Identify, stabilize, avoid, protect or recover archaeological and architectural resources eligible for listing or listed in the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and/or other local registers, as appropriate, and identify and protect tribal cultural resources important to the local Native American community.

4.7.1 Archaeological Resources

Objective 1 (CUL-1). Conduct Resource Surveys, Stabilization, Avoidance, and Protection. Identify, stabilize, and avoid ground disturbance in and near important archaeological resources. Protect archaeological resources to avoid impacts associated with stewardship activities.

Task 1.1 (CUL-1.1): Survey, Stabilize, Avoid and Protect Archaeological Resources. Hire a qualified professional (i.e., meets Secretary of the Interior's standards in archaeology) to conduct surveys and stabilization techniques (if needed). Prepare an archaeological resource avoidance map and protect these resources (if appropriate) with fencing and signs, if needed, to avoid impacts associated with stewardship activities. Consult with the SHPO and other stakeholders (e.g., Native American tribes, local agencies).

Objective 2 (CUL-2). Stabilize and Recover Archaeological Resources. Stabilize and recover identified archaeological resources where ground disturbance is planned as part of Preserve stewardship activities (e.g., grazing), annually or as needed.

Task 2.1 (CUL-2.1): Stabilize and Recover Resources. Based on the results of CUL-1, hire a qualified professional (i.e., meets Secretary of the Interior's standards in archaeology) to conduct stabilization techniques and/or data recovery efforts prior to stewardship activities that involve ground disturbance (e.g., grazing). Consult with the SHPO and other stakeholders (e.g., Native American tribes, local agencies).

4.7.2 Architectural Resources

Objective 3 (CUL-3). Resource Management. Develop a Historic Structure Management Plan in accordance with the Secretary of the Interior's Standards for Historic Preservation with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings by 2025 for historic structures including the Montecito Ranch house and steel-sided barn, and any additional historic structures or landscape features identified on the Preserve. Implement the historic structure management plan in subsequent management years.

Task 3.1 (CUL-3.1): Develop Historic Structure Management Plan. Hire a qualified professional (i.e., meets Secretary of the Interior's standards in architectural history) to review the Historic Structure Report and other Preserve documents to guide development of the Historic Structure Management Plan (Helix 2010, Heritage Architecture and Planning 2015 [Appendix G]). Review rehabilitation codes, guidelines, work recommendations, and alternatives in the Historic Structure Report and consult with the SHPO during management plan preparation.

Task 3.2 (CUL-3.2): Implement Historic Structure Management Plan. Implement the historic structure management plan and consult with SHPO prior to implementation. Secure funding for plan implementation.

4.8 Public Outreach, Education, and Research

Although there is no planned public access within the Preserve, targeted outreach, education, and research are important for (1) protecting biological resources, (2) fostering appreciation for open space areas in general and Preserve lands and resources specifically, (3) involving citizens in stewardship activities ("citizen science"), and (4) furthering our understanding of adaptive management, species, habitats, and ecosystem processes.

Public Outreach, Education, and Research Goal (OER): Sustain strong positive relationships with Preserve neighbors and users (including but not limited to adjacent landowners/managers, utility companies, biologists, and researchers) through direct communications, informational materials, and educational, volunteer, and research opportunities.

4.8.1 Public Outreach and Education

Objective 1 (OER-1). Public Outreach and Education. Conduct public outreach annually or at frequencies specified below to educate the public on rules, regulations, and resources.

Task 1.1 (OER-1.1): Promote Public Stewardship. Engage with the public as appropriate during monthly patrols (PS-2.1) to ensure that Preserve neighbors and contractors follow Preserve rules and regulations and avoid impacts to sensitive biological resources.

Task 1.2 (OER-1.2): Provide Informational Materials. Prepare and disseminate informational and educational materials (or provide links to these materials) as-needed to adjacent landowners on (1) Preserve establishment, rules, regulations, and resources, (2) invasive species and biosecurity and avoidance and minimization measures (CO-4.2), and (3) fire safety. Include relevant information on signage (PS-1.4, CO-4.2).

Task 1.3 (OER-1.3): Attend Community Meetings. Attend community meetings annually (or more frequently, if needed) to educate local communities on (1) Preserve rules, regulations, and resources, (2) invasive species and biosecurity measures, (3) fire safety and emergency egress, and other issues that affect the Preserve (FM-1.2).

4.8.2 Research

Objective 2 (OER-2). Facilitate Research. Coordinate with researchers annually or as-requested to facilitate research on the Preserve that increases our understanding of adaptive management, biological resources, linkages, and ecosystem processes at regional or preserve-levels.

Task 2.1 (OER-2.1): Review and Prioritize Research Requests. Review research requests, and provide researcher(s) with a verbal or written response of approval or denial within 2-4 weeks of the request. Prioritize requests that develop or refine BMPs or improve our understanding of species, habitats, linkages, or ecosystem processes. As a condition of research, researcher(s) should provide EHC with a digital copy of their data and/or final report.

Task 2.2 (OER-2.2): Provide Researcher Access. For approved research requests, provide researcher(s) with a right-of-entry letter, gate codes, and biosecurity protocols and avoidance and minimization measures (CO-4.2). Accompany researchers in the field initially to orient them to the Preserve.

Task 2.3 (OER-2.3). Maintain Research Log. Maintain a log of all research activities, including subject, status, timeline, key personnel, and data and report(s) received.

4.9 Program Administration and Reporting

Administration and reporting provide the foundation for Preserve management by maintaining and sharing data used to manage adaptively, demonstrating progress in achieving goals and objectives, and supporting staff and funding allocations.

Program Administration and Reporting Goal (AR): Establish, implement, and maintain a data management and reporting system to (1) organize, analyze, and share data, (2) identify management needs, (3) track management progress, and (4) allocate staff and funding appropriately.

4.9.1 Data management

Objective 1 (AR-1). Data Entry, Storage, and Review. Establish a data management and reporting system by 2025, and maintain this system annually by uploading or editing spatial data, Preserve documents, and other relevant information.

Task 1.1 (AR-1.1): Create and Maintain Website. Create a website or identify an existing online platform for the Preserve. This can be a stand-alone website, an expansion of an existing website (e.g., http://earthdiscovery.org/crestridge-reserve/), or a dedicated group on CBI's Data Basin website (https://databasin.org/).

Task 1.2 (AR-1.2): Create and Maintain Data Management System. Using CBI's Data Basin website or another online data management system, maintain spatial datasets, reports, and other Preserve documents in a central location for access by EHC staff, contractors, regulatory agencies, and other conservation practitioners. Spatial data and reports for other EHC-owned or managed preserves are currently stored on Data Basin, under the San Diego Conservation group:

https://databasin.org/groups/92c7bce8d88d43b3a800dd686195007e

Task 1.3 (AR-1.3): Manage Data. Upload spatial data (including attribute data) to CBI's Data Basin website or another data management system annually. Spatial datasets may include (but are not limited to):

- Vegetation
- Invasive Species
- Restoration Sites
- MSP and USMC Focal Plant and Animal Species
- Threats (erosion, trash)
- Roads and Trails
- Resource Avoidance Areas

Review spatial data annually to ensure (1) recent data are uploaded and available, (2) out-of-date datasets are removed, (3) datasets are in the appropriate locations, and (4) datasets are labelled consistently to facilitate use. At a minimum, dataset labels should include the subject (e.g., species, species group, management issue) and date.

Update MSP and USMC focal plant and animal maps with new MSP and USMC focal species occurrences and Resource Avoidance Area map with new MSP at-risk and USMC focal species occurrences annually or as collected.

Maintain records for collected seed to document donor sites and collection dates and amounts. Maintain records of donor and receptor sites for outplantings as part of augmentation efforts.

Review, analyze, and summarize monitoring data at the preserve-level and include results in the Annual Report (AR-2.2). Submit data to SDMMP and the Regional SKR Data Management System for regional or rangewide analyses and/or data sharing (AR-2.3) annually or at the completion of a monitoring project.

Review, analyze, and summarize management data at the preserve-level, and include results and recommendations in the Annual Report (AR-2.2). Submit management data to SDMMP annually or at the completion of a management project (AR-2.3).

Upload annual work plans, annual reports, monitoring and management reports, and research studies to the online data management system annually or as-produced.

4.9.2 Reporting

Objective 2 (AR-2). Reporting. Prepare annual work plans and reports to (1) ensure F-RMP implementation is consistent with goals and objectives, (2) demonstrate management progress in achieving goals and objectives, (3) assess management needs and effectiveness, and (4) establish budgets and schedules for implementation.

Task 2.1 (AR-2.1): Prepare Annual Work Plan. Based on priorities and/or monitoring and management results, develop a list of proposed management actions for the next calendar year (Reporting Period). Prepare an Annual Work Plan that allocates funding for monitoring and management actions, staff, contractors, and equipment, and include a schedule for implementing the proposed actions during the upcoming Reporting Period. Finalize the work plan by December 31 so land management can begin immediately.

Task 2.2 (AR-2.2): Prepare Annual Report. Prepare an annual report summarizing land management activities (ASMDs) implemented during the immediately preceding calendar year (Reporting Period) and management recommendations for the next Reporting Period. Reporting should follow the general ASMD format (e.g., Vegetation, Animals, Plants, Coordination, Property Stewardship, Fire Management, Outreach, Education, and Research), and reference specific objectives and tasks.

Provide all information, documents, records, and reports relating to natural resource management on the Preserve, collected or created by or on behalf of EHC during the Reporting Period, including (but not limited to) herbicide logs, patrol logs, incident report logs, and research activity logs as appendices to the annual report.

Describe discrepancies in planned work (per Annual Work Plan) and work actually performed during the Reporting Period.

Identify any instances of non-performance or unresolved management problems, and consult with the Wildlife Agencies and the USMC to determine appropriate actions to correct the issue(s).

For intensive management projects, grants, or research projects, prepare stand-alone reporting documents under the respective task, and include a summary of these works in annual reports.

Submit the annual report by December 31 to the USMC, USFWS, and CDFW.

Task 2.3 (AR-2.3): Share Data. Submit project metadata, spatial data, data forms, invasives treatment data, Resource Avoidance Area map (and updates), reports, and management recommendations to the MSP Web Portal annually or upon project completion.

Submit seed collection, bulking, and storage data to the MSP Web Portal annually or as collected (if collected by EHC or representatives).

Submit all SKR monitoring data on an annual basis or as specified in the Preserve-specific SKR plan (AN-5.5, AR-7.6) to the Regional SKR Data Management System.

Attend regional meetings (e.g., SDMMP monthly meetings, land manager meetings) (as feasible), coordinate with other land managers to review survey results and management effectiveness, and explore opportunities for collaboration on management issues.

4.9.3 Framework Resource Management Plan Updates

Objective 3 (AR-3). Framework Resource Management Plan Updates. Review and update the F-RMP at 5-year intervals in coordination with the Wildlife Agencies, beginning in 2026, to ensure that objectives and implementation tasks (1) reflect current or changed conditions and newly detected resources, (2) align with regional MSP updates, and (3) incorporate new preserves, as appropriate.

Task 3.1 (AR-3.1): Review and Refine Existing ASMDs/Tasks. In 2026 review and refine existing objectives and tasks based on survey or monitoring data, align tasks with MSP updates, and revise task status and schedule, as appropriate.

Task 3.2 (AR-3.2): Develop New ASMDs/Tasks. In 2026 develop new objectives and tasks based on survey or monitoring data, addition of new preserves, or changed conditions due to fire or other catastrophic events.

4.9.4 Contingency Measures

Objective 4 (AR-4). Contingency Measures. Implement contingency measures annually (as needed) to address unanticipated or severe management issues that cannot be accommodated

within the annual budget in a timely fashion to prevent or minimize impacts to Preserve resources or public safety.

Task 4.1 (AR-4.1): Identify and Implement Contingency Measures. Contingency measures provide a short-term solution to prevent severe damage or impacts, while recognizing that longer-term solutions and funding sources may be required to address the management issue(s) comprehensively. Identify contingency tasks, and implement tasks to minimize impacts. Contingency tasks may address fire impacts, new or rapidly spreading invasive species, unauthorized vegetation clearing and subsequent erosion, excessive, unforeseen damage to infrastructure (e.g., fences) or species die-offs due to severe drought or climate change, among other potential management issues.

Include a contingency line item and budget in annual work plans, with flexibility to use the funding if needed, or roll-over the funding into the next year's budget if unused.

4.10 Summary of ASMDs

Refer to Table 14 for a summary of all ASMDs, along with a schedule for implementation.

Table 14. Summary of Area-specific Management Directives (ASMDs) for the Montecito Ranch Preserve

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
4.1	Vegetation Communities (VEG, VP, INV, RS)						
4.1.1	Natural Vegetation Communities	VEG-1	Vegetation Mapping	VEG-1.1	Refine Baseline Vegetation Map	2021	C
				VEG-1.2	Update Vegetation Map	2031 or following disturbance	NS
				VEG-1.3	Identify and Prioritize Vegetation Management	Annually (as-needed)	IP
		VEG-2	Vegetation Monitoring	VEG-2.1	Coordinate with Regional Vegetation Monitoring Program	As-needed	NS
				VEG-2.2	Coordinate with Regional Grazing, Prescribed Fire, and Invasive Species Control Program	As-needed	NS
				VEG-2.3	Conduct Preserve-level Vegetation Monitoring	As-needed	NS
		VEG-3	Manage Vegetation using Mechanical Methods and Herbicide	VEG-3.1	Coordinate with Experts	2021-2024 (as-needed)	IP
				VEG-3.2	Manage Vegetation with Herbicide	Annually	IP
				VEG-3.3	Manage Vegetation Mechanically	Annually	IP
		VEG-4	Vegetation Management using Grazing	VEG-4.1	Coordinate with Grazing Community and Local and Regional Experts	2021-2024	IP
				VEG-4.2	Prepare and Implement a Targeted Grazing Plan	As-needed	NS
				VEG-4.3	Update the Targeted Grazing Plan	As-needed	NS
		VEG-5	Vegetation Management using Fire	VEG-5.1	Coordinate with Agencies and Experts	2021-2024	NS
				VEG-5.2	Use Prescribed Fire to Manage Vegetation	As-needed	NS
4.1.2	Vernal Pools	VP-1	Vernal Pool Surveys	VP-1.1	Identify Vernal Pools	2021-2022	NS
		VP-2	Vernal Pool Monitoring	VP-2.1	Conduct Qualitative Monitoring	Annually	NS
				VP-2.2	Conduct Quantitative Monitoring	Annually	NS
		VP-3	Baseline Hydrology Surveys	VP-3.1	Conduct Baseline Hydrologic Surveys	2021-2022	NS
		VP-4	Topographic Disturbance Assessment	VP-4.1	Conduct Topographic Disturbance Assessment	If needed based on VP-1, VP-2, and VP-3	NS

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
		VP-5	Vernal Pool Management	VP-5.1	Maintain Level 1 Vernal Pools	Annually	NS
				VP-5.2	Stabilize Level 2 Vernal Pools	As-needed	NS
				VP-5.3	Restore Level 3 Vernal Pools	As-needed	NS
4.1.3	Invasive Plants	INV-1	Invasive Plant Mapping	INV-1.1	Prepare a Refined Invasive Plant Map	2021	C
				INV-1.2	Update Invasive Plant Map	Every 3 years	NS
				INV-1.3	Maintain Invasive Plant Lists	Annually	NS
		INV-2	Invasive Plant Priorities	INV-2.1	Identify Invasive Plant Management Priorities	Annually	NS
				INV-2.2	Identify Invasive Plant Treatment and Maintenance Areas	Annually	NS
		INV-3	Invasive Plant Control	INV-3.1	Eradicate Tree-of-Heaven	2021-2024	NS
				INV-3.2	Eradicate Mayweed Chamomile	2021-2024	NS
				INV-3.3	Eradicate Giant Reed	2021-2024	NS
				INV-3.4	Eradicate Onion Weed	2021-2024	NS
				INV-3.5	Eradicate Saharan Mustard	2021-2024	NS
				INV-3.6	Manage Italian Thistle	Annually	NS
				INV-3.7	Eradicate Bull Thistle	2021-2024	NS
				INV-3.8	Eradicate Artichoke Thistle	2021-2024	NS
				INV-3.9	Eradicate Stinkwort	2021-2024	NS
				INV-3.10	Eradicate Eucalyptus	Annually	IP
				INV-3.11	Eradicate Fennel	2021-2024	NS
				INV-3.12	Eradicate Perennial Pepperweed	2021-2024	NS
				INV-3.13	Eradicate Tree Tobacco	2021-2024	NS
				INV-3-14	Eradicate Olive	2021-2024	NS
				INV-3-15	Eradicate Stinknet	2021-2024	NS
				INV-3.16	Eradicate Castor Bean	2021-2024	NS
				INV-3.17	Eradicate Peruvian Pepper	2021-2024	NS
				INV-3.18	Mange Milk Thistle	2021-2024; annually as needed	NS
				INV-3.19	Eradicate Smilo Grass	2021-2024	NS
				INV-3.20	Eradicate Salt Cedar	2021-2024	NS
				INV-3.21	Manage Invasive Trees Surrounding the Ranch House	As-needed	NS
				INV-3.22	Respond Rapidly to New or Expanding Invasions	Annually	NS
				INV-3.23	Reduce Fire Risk from Invasive Plants	Annually	NS

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
				INV-3.24	Monitor Invasive Plant Treatments	Annually	NS
4.1.4	Habitat Restoration	RS-1	Vegetation Enhancement	RS-1.1	Enhance Vegetation	Annually (as-needed)	NS
4.2	MSP and USMC Focal Animal Species (AN)						
4.2.1	Surveys and Inventories	AN-1	MSP Animal Species and Habitat Surveys	AN-1.1	Facilitate Regional Surveys	As-needed	IP
				AN-1.2	Survey for Western Spadefoot Toad	2021-2024	NS
				AN-1.3	Coastal California Gnatcatcher Surveys	Annually (as-needed, pre-disturbance)	NS
				AN-1.4	Anticipate Animal Species Listings	Annually (as-needed)	NS
		AN-2	General Animal Species List	AN-2.1	Develop/Maintain Animal Species List	Annually	NS
		AN-3	Invasive Animal Surveys	AN-3.1	Conduct Argentine Ant Surveys	2021-2024 (once); every 5 years	NS
				AN-3.2	Conduct Oak Borer, Oak Pit Scale Surveys	2021-2024 (once); every 3 years	IP
		AN-4	Maintain Ecosystem Functions for Wildlife Movement	AN-4.1	Conduct/Assess Wildlife Movement	Annually	IP
4.2.2	Monitoring	AN-5	MSP and USMC Focal Animal Monitoring	AN-5.1	Facilitate Regional Monitoring	As-needed	NS
				AN-5.2	Monitor San Diego Fairy Shrimp in Level 1 Vernal Pools	Annually	NS
				AN-5.3	Monitor San Diego Fairy Shrimp in Level 2 and 3 Vernal Pools	Annually (as-needed)	NS
				AN-5.4	Monitor Western Spadefoot Toad	Annually	NS
				AN-5.5	Monitor Stephens' Kangaroo Rat	Annually	NS
				AN-5.6	Monitor Coastal California Gnatcatcher	Every 3 years	IP
				AN-5.7	Monitor Management Effectiveness	Annually (as-needed)	NS
4.2.3	Management	AN-6	Management Prioritization	AN-6.1	Prioritize Management Actions	Annually; 5-year intervals	NS
		AN-7	Management Implementation	AN-7.1	Implement Regional Management Recommendations	Annually (as-needed)	NS

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
				AN-7.2	Manage San Diego Fairy Shrimp	Annually	NS
				AN-7.3	Manage Western Spadefoot Toad	Annually	NS
				AN-7.4	Manage Coastal California Gnatcatcher	Annually	NS
				AN-7.5	Manage Pallid and Townsend's Big-eared Bats	Annually	NS
				AN-7.6	Manage Stephens' Kangaroo Rat	Annually	NS
				AN-7.7	Control Argentine Ants	Annually if detected	NS
				AN-7.8	Treat Oak Borers, Oak Pit Scale	Annually if detected	NS
				AN-7.9	Improve Connectivity	Annually, (as needed)	IP
4.2.4	Research	AN-8	Research Studies	AN-8.1	Facilitate MSP and USMC Focal Animal Research Studies	As-needed	IP
4.3	MSP and USMC Focal Plant Species (PL)						
4.3.1	Surveys and Inventories	PL-1	General Plant Species List	PL-1.1	Maintain Existing Plant Species List	Annually	IP
4.3.2	Monitoring	PL-2	Monitoring MSP Priority and USMC Focal Plants	PL-2.1	Coordinate with Regional Vegetation Monitoring Program	As-needed	NS
				PL-2.2	Monitor Southern Tarplant	2021; biannually	NS
				PL-2.3	Monitor Engelmann Oak	2022; annually	NS
				PL-2.4	Monitor Management Actions for MSP Priority and USMC Focal Plants	Annually	NS
4.3.3	Management	PL-3	Management Prioritization	PL-3.1	Prioritize MSP and USMC Focal Plant Management Actions	Annually; every 3-5 years	NS
		PL-4	Management Implementation	PL-4.1	Implement Routine Stewardship Management	Annually	NS
				PL-4.2	Treat Invasive Plants	Annually	NS
				PL-4.3	Regional Seed Bank Coordination	As-needed	NS
				PL-4.4	Regional *Ex Situ* Nursery Stands Coordination	As-needed	NS
				PL-4.5	Augment MSP and USMC Focal Plant Populations	As-needed	NS
4.3.4	Research	PL-5	Research Studies	PL-5.1	Facilitate MSP and USMC Focal Plant Research Studies	As-needed	NS
4.4	Coordination (CO)						
4.4.1	Adjacent Landowners	CO-1		CO-1.1	Contact Landowners	By 2025	IP

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
			Landowner Coordination	CO-1.2	Develop and Maintain Landowner Contact List	By 2025	NS
				CO-1.3	Develop and Maintain Landowner Reporting System	By 2025	NS
		CO-2	Edge Effects	CO-2.1	Resolve Encroachment Issues	By 2023	IP
				CO-2.2	Coordinate Fuel Modification	Annually	IP
4.4.2	Fire Agencies	CO-3	Fire Agency Coordination	CO-3.1	Contact Fire Agencies	Annually or bi-annually	IP
				CO-3.2	Identify Fuel Modification Needs	Annually or bi-annually	IP
				CO-3.3	Identify Roads for Fire Suppression or Emergency Egress	Annually or bi-annually	NS
4.4.3	Other Preserve Uses	CO-4	Coordination	CO-4.1	Contact Utilities and Other Easement Holders	Annually	NS
				CO-4.2	Provide Biosecurity and Avoidance and Minimization Measures	Annually	IP
4.5	Property Stewardship (PS)						
4.5.1	Access Control	PS-1	Access Control	PS-1.1	Install and Maintain Fencing	2021; annually; replace fencing every 25 years	IP
				PS-1.2	Coordinate with Adjacent Landowners	2022	NS
				PS-1.3	Install and Maintain Gates	By 2022; annually; replace gates every 25 years	IP
				PS-1.4	Install and Maintain Signage	By 2022; quarterly; replace signs every 15 years	IP
4.5.2	Enforcement and Security	PS-2	Patrol and Enforce Rules and Regulations	PS-2.1	Conduct Routine Patrols	Monthly	IP
				PS-2.2	Enforce Rules and Regulations	As-needed	IP
4.5.3	Roads	PS-3	Roads	PS-3.1	Conduct Roads Inventory	By 2025	IP
				PS-3.2	Develop Roads Plan	By 2025	NS
				PS-3.3	Implement Roads Plan	By 2025	NS
4.5.4	Trash Control	PS-4	Trash Removal	PS-4.1	Remove Trash	Annually	IP
4.5.5	Erosion Control	PS-5	Erosion Control	PS-5.1	Prioritize Erosion Control	By 2025	NS
				PS-5.2	Install and Maintain Erosion Control	Annually	IP

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
4.5.6	Facilities Maintenance	PS-6	Facilities Maintenance	PS-6.1	Repair/Maintain House and Ancillary Structures	As-needed	NS
				PS-6.2	Trim Vegetation	Annually (as needed)	NS
4.6	Fire Management (FM)						
4.6.1	Regional and Preserve Coordination	FM-1	Pre-fire Coordination	FM-1.1	Coordinate with Wildland Fire Resource Advisor Program	As-needed	NS
				FM-1.2	Participate in Fire Safety Organizations	Annually (as needed)	NS
				FM-1.3	Participate in a Modified Burn Area Emergency Response	As-needed	NS
				FM-1.4	Coordinate with Fire Agencies	By 2023	NS
		FM-2	Fire Event Coordination	FM-2.1	Coordinate with Local Resource Advisor	As-needed	NS
		FM-3	Post-fire Coordination	FM-3.1	Coordinate with Modified BAER Program	3-6 months post-fire	NS
4.6.2	Environmentally Sensitive Areas	FM-4	Resource Avoidance Area Map	FM-4.1	Prepare Resource and Cultural Avoidance Area Map	By 2023	NS
4.6.3	General Fire Management Areas	FM-5	Pre-fire Management	FM-5.1	Reduce Fire Ignition Probability	Annually	IP
				FM-5.2	Reduce Fire Intensity	Annually	IP
				FM-5.3	Finalize Fire Management Plan	By 2025	NS
		FM-6	Post-fire Management	FM-6.1	Implement Post-fire Modified BAER Program	Post-fire	NS
				FM-6.2	Identify and Prioritize Invasive Plants	Post-fire	NS
				FM-6.3	Treat Invasive Plants	Post-fire	NS
4.6.4	Species-specific Fire Management Measures	FM-7	Pre-Fire Management	FM-7.1	Identify and Treat Invasive Species and Habitat	Annually	IP
				FM-7.2	Regional *Ex Situ* Nursery Stands Coordination	Pre-fire (as needed)	NS
				FM-7.3	Conduct Baseline Surveys for MSP and USMC Focal Animals	Pre-fire	IP
		FM-8	Post-Fire Management	FM-8.1	Assess/Map Fire Suppression Impacts	Post-fire	NS
				FM-8.2	Identify/Prioritize Invasive Plants	Post-fire	NS
				FM-8.3	Treat Invasive Plants	Post-fire	NS
				FM-8.4	Conduct Post-fire Surveys	Post-fire	NS
				FM-8.5	Monitor Population Recovery	Post-fire	NS

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
				FM-8.6	Augment MSP and USMC Focal Plant Populations	Post-fire (as needed)	NS
				FM-8.7	Augment MSP and USMC Focal Animal Populations	Post-fire (as needed)	NS
				FM-8.8	Restore Wildlife Habitat	Post-fire (as needed)	NS
				FM-8.9	Conduct Hydrology Studies	Post-fire (as needed)	NS
				FM-8.10	Install Erosion Control	Post-fire (as needed)	NS
				FM-8.11	Provide Temporary Habitat	Post-fire (as needed)	NS
				FM-8.12	Promote Foraging Habitat and Connectivity	Post-fire (as needed)	NS
4.7	Cultural Resources (CUL)						
4.7.1	Archaeological Surveys	CUL-1	Conduct Resource Surveys, Stabilization, Avoidance and Protection	CUL-1.1	Survey, Stabilize, Avoid and Protect Archaeological Resources	By 2025	NS
		CUL-2	Stabilize and Recover Archaeological Resources	CUL-2.1	Stabilize/Recover Resources	By 2025	NS
4.7.2	Architectural Resources	CUL-3	Resource Management	CUL-3.1	Develop Historic Structure Management Plan	By 2025	NS
				CUL-3.2	Implement Historic Structure Management Plan	Post CUL-3.1; as needed	NS
4.8	Public Outreach, Education, and Research (OER)						
4.8.1	Public Outreach and Education	OER-1	Public Outreach and Education	OER-1.1	Promote Public Stewardship	Monthly (as needed)	IP
				OER-1.2	Provide Informational Materials	Annually (as needed)	IP
				OER-1.3	Attend Community Meetings	Annually (as needed)	NS

Section[1]		Objective		Task	Task Description	Schedule[2]	Status[3]
4.8.2	Research	OER-2	Research	OER-2.1	Review and Prioritize Research Requests	Annually (as requested)	IP
				OER-2.2	Provide Researcher Access	Annually (as requested)	IP
				OER-2.3	Maintain Research Log	Annually (as requested)	NS
4.9	Program Administration and Reporting (AR)						
4.9.1	Data Entry, Storage, and Review	AR-1	Data Entry, Storage, and Review	AR-1.1	Create and Maintain Website	By 2025 (annually thereafter)	NS
				AR-1.2	Create and Maintain Data Management System	By 2025 (annually thereafter)	NS
				AR-1.3	Manage Data	Annually	NS
4.9.2	Reporting	AR-2	Reporting	AR-2.1	Prepare Annual Work Plan	Annually	NS
				AR-2.2	Prepare Annual Report	Annually	NS
				AR-2.3	Share Data	Annually	NS
4.9.3	Framework Management Plan Updates	AR-3	Framework Management Plan Updates	AR-3.1	Review and Refine Existing ASMDs/Tasks	2026 (every 5 years thereafter)	NS
				AR-3.2	Develop New ASMDs/Tasks	2026 (every 5 years thereafter)	NS
4.9.4	Contingency Measures	AR-4	Contingency Measures	AR-4.1	Identify and Implement Contingency Measures	Annually (as needed)	NS

[1] Section: Refers to Section 4.0 (ASMDs) of the Framework Resource Management Plan (F-RMP) for Montecito Ranch Preserve.

[2] Schedule: Indicates estimated implementation schedule within the startup (2021-2024) or ongoing periods (>2025). Note that schedule may be (1) dependent on completion of other regional or preserve-level objectives, so is subject to change, (2) implementation may occur more quickly than noted, and (3) implementation of some tasks may not be warranted based on surveys or monitoring.

[3] Status: IP = In-progress, NS = Not started, C = Complete.

5.0 Property Analysis Record Funding (PAR)

We determined the Preserve startup (first 3 years) and ongoing costs (endowment) using the Property Analysis Record program. These costs include estimates of time and funding needed to conduct comprehensive preserve management as described in Section 4 including but not limited to surveys, monitoring, invasive plant control, trash removal, fence and sign installation and repair, coordination, and reporting. The total funding requirement for Preserve stewardship is **$4,176,301**, which includes a startup cost of **$971,421** and an endowment of **$3,204,879**.

5.1 Startup Fund Analysis and Schedule

The total startup financial requirement is **$971,421** for three years of initial management, which includes management costs **($767,922**), contingency expense **($76,792**), and administrative costs **($126,707**).

5.2 Ongoing Fund Analysis and Schedule

The total annual Preserve funding anticipated is approximately **$120,183**; therefore, using a capitalization rate of 3.75% the total endowment amount required will be **$3,204,879**.

6.0 Literature Cited

Adamcik, R.S., Bellantoni, E.S., DeLong, D.H., Jr., Schomaker, J.H., Hamilton, D.B., Laubhan, M.K., and R.L. Schroeder. 2004. Writing refuge management goals and objectives: a handbook. U.S. Fish and Wildlife Service, National Wildlife Refuge System, Washington, DC.

AECOM. 2014. Ramona Grasslands Preserve raptor surveys summary report. Prepared for County of San Diego Department of Parks and Recreation, San Diego, CA. December.

Artemis Environmental. 2020. Baseline report for Montecito Ranch, San Diego County, California. March.

Asmus, J. 2019. Report on fairy shrimp survey on Montecito Ranch on 7 Feb 2019. Appendix E in Artemis Environmental. 2020. Baseline report for Montecito Ranch, San Diego County, CA. March.

Bauder, E.T. 1993. Coastal San Diego vernal pool species. San Diego State University, San Diego, CA. *In*: City of San Diego guidelines for mima mound vernal pool habitat. City of San Diego Planning Department, San Diego, CA. July.

Bauder, E.T., Bohonak, A.J., Hecht, B., Simovich, M.A., Shaw, D., Jenkins, D.J., and M. Rains. 2009. A draft regional guidebook for applying the hydrogeomorphic approach to assessing wetland functions of vernal pool depressional wetlands in Southern California. San Diego State University, San Diego CA. 73 pp.

Beck, M. 2021. San Diego Director, Endangered Habitats League & President, Endangered Habitats Conservancy. Personal communication with Jessie Vinje. January.

Belnap, J., Phillips, S.L., Sherrod, S.K., and A. Moldenke. 2005. Soil biota can change after exotic plant invasions: does this affect ecosystem processes? Ecology 86:3007-3017.

California Department of Fish and Wildlife (CDFW). 2018. California Natural Diversity Database (CNDDB). Rarefind Database Program. Version 5.2.14. October.

California Department of Forestry and Fire Protection (Cal Fire). 2016. Gold-spotted oak borer zone of infestation map. http://ucanr.edu/sites/gsobinfo/files/232575.pdf

California Department of Forestry and Fire Protection (Cal Fire). 2018. Fire perimeters 2017, California. https://databasin.org/datasets/26f9cbfda94d4bc0bce7328e654fe51b

California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory. Cal-IPC publication 2006-02. California Invasive Plant Council, Berkeley, CA. https://www.cal-ipc.org.

Commonwealth of Australia. 2020. National Light Pollution Guidelines for Wildlife, including Marine Turtles and Migratory Shorebirds. Department of the Environment and Energy, Department of Biodiversity, Conservation, and Attractions.

Conservation Biology Institute (CBI). 2004. Framework management and monitoring plan: Ramona Grasslands Open Space Preserve, San Diego County, CA. Prepared for The Nature Conservancy. August.

Conservation Biology Institute (CBI). 2019. Montecito Ranch vernal pool and rare plant assessment. Prepared for Endangered Habitats Conservancy.

Conservation Biology Institute (CBI) and AECOM 2021. Management strategic plan seed collection, banking and bulking plan for conserved lands in western San Diego County. Prepared for San Diego Association of Governments in collaboration with San Diego Management and Monitoring Program. March.

Conservation Biology Institute (CBI), Dendra, Inc., and California Invasive Plant Council (Cal-IPC). 2012. Management priorities for invasive non-native plants: a strategy for regional implementation, San Diego County, California. Prepared for San Diego Association of Governments (SANDAG), contract no. 5001322. 83 pp.

City of San Diego. 2020. Revised final City of San Diego vernal pool habitat conservation plan vernal pool management and monitoring plan. January.

Cox, G.W. 1999. Alien species in North America and Hawaii: impacts on natural ecosystems. Island Press, Washington, DC. 400 pp.

D'Antonio, C.M., and P.M. Vitousek. 1992. Biological invasions by exotic grasses, the grass/fire cycle, and global change. Annual Review of Ecology and Systematics 23:63-87.

Deutschman, D.H., Lewison, R., Marnocha, E., McIntyre, P., Strahm, S. and C. Tredick. 2012. Development of reserve-level species and habitat monitoring strategies: workshops and scientific support for monitoring in an adaptive management context. Final report. Prepared for California Department of Fish and Game, Natural Communities Conservation Planning Program, Local Assistance Grant #P0982020. 150 pp. March.

Dimson, M., Kabashima, J., and A. Eskalen. 2014. Polyphagous shot hole borer + fusarium dieback: a new pest complex in Southern California. University of California Agriculture and Natural Resources and University of California, Riverside, CA.

Dudek and Associates. (Dudek). 1998a. Stephens' kangaroo rat assessment for Montecito Ranch, San Diego County, California. Prepared for Caprock Three, LLC. June.

Dudek and Associates, Inc. 1998b. Revised biological resources report and impact analysis for Montecito Ranch, San Diego County, California.

Ehrenfeld, J.G. 2003. Effects of exotic plant invasions on soil nutrient cycling processes. Ecosystems 6(6):503-523.

Evans, R.D., Rimer, R., Sperry, L., and J. Belnap. 2001. Exotic plant invasion alters nitrogen dynamics in an arid grassland. Ecological Applications 11:1301-1310.

Federal Geographic Data Committee (FGDC). 2008. National vegetation classification standard. USDA Forest Service. FGDC-STD-005-2008.

Gaston, K. J., T. W. Davies, J. Bennie, and J. Hopkins. 2012. Reducing the ecological consequences of night-time light pollution: options and development. The Journal of Applies Ecology 49:1256-1266.

Geisel, P. M. and M. L. Flint. 2013. Oak pit scale. Integrated pest management for home gardeners and landscape professionals. Pest Notes: publication 7470. University of California Agriculture and Natural Resources Statewide Integrated Pest Management Program.

Giessow, J. 2019. Invasive non-native plant early detection and rapid response (EDRR) targets in western San Diego County. Version 2019-7-25.

Helix Environmental Planning, Inc. (Helix). 2010. Final environmental impact report, Montecito Ranch. Prepared for Montecito Ranch LLC. 1052 pp.

Heritage Architecture and Planning. 2015. Montecito Ranch historic structure report. Prepared for Montecito Ranch L.L.C. June.

Heritage Resources. 2008. Archaeological resources review, impact assessment, and preservation plan for the Montecito Ranch. Appendix G, Cultural Resources Reports for the Draft Environmental Impact Report for the Montecito Ranch. May.

Huenneke, L.F., Hamburg, S.P., Koide, R., Mooney, H.A., and P.M. Vitousek. 1990. Effects of soil resources on plant invasions and community structure in Californian serpentine grassland. Ecology 71:478-491.

iNaturalist observation. 2018. Ferruginous hawk. February.

Innovative Inclosures. 2013. Stephens' kangaroo rat habitat enhancement at Naval Weapons Station Seal Beach Detachment Fallbrook: 2008-2009 Season. Final report. Prepared for

Naval Weapons Station Seal Beach Detachment Fallbrook under contract with Naval Facilities Engineering Command Southwest. August.

Lewison, R.L., and D.H. Deutschman. 2014. Framework management: guidelines for best practices with examples of effective monitoring and management. Prepared for San Diego Association of Governments, MOU #5001562. March.

Manzuk, C. 2021. Land Manager, Endangered Habitats Conservancy. Personal communication with Jessie Vine. January.

Marschalek, D., and D. Deutschman. 2017. San Diego County Harbison's dun skipper (*Euphyes vestris harbisoni*) habitat conservation and management plan. San Diego State University. Prepared for San Diego Association of Governments, SanDiego, CA.

Matsuda, T., Brehme, C.S., and R. Fisher. 2016. Determining presence of Argentine ants using the rapid assessment protocol. U.S. Geological Survey, Western Ecological Research Center. 9 pp.

REC Consultants, Inc. 2008. Montecito Ranch conceptual revegetation plan, TM 5250. Prepared for Montecito Ranch LLC. 34 pp.

San Diego Association of Governments (SANDAG). 1995. Vegetation communities of San Diego County. https://databasin.org/datasets/ff2825e4cd144125b4acdf5e15755cdf

San Diego Association of Governments (SANDAG). 2020. Fire burn history. https://rdw.sandag.org/Account/gisdtview?dir=Fire

San Diego Management and Monitoring Program (SDMMP). 2011. Connectivity monitoring strategic plan for the San Diego preserve system. Prepared for the San Diego Environmental Mitigation Program Working Group. January 11.

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), version 08.27.2013.

San Diego Management and Monitoring Program (SDMMP). 2020. Advanced GIS viewer. https://sdmmp.com/gis_viewer.php.

San Diego Management and Monitoring Program (SDMMP). 2021. Management and monitoring strategic plan (MSP Roadmap) 2021 rare plant inspect and manage monitoring protocol for occurrences on conserved lands in western San Diego County. March

San Diego Management and Monitoring Program and The Nature Conservancy (SDMMP and TNC). 2017. Management and monitoring strategic plan for conserved lands in western

San Diego County: a strategic habitat conservation roadmap. 3 volumes. Prepared for the San Diego Association of Governments, San Diego, CA.

San Diego Regional Water Quality Control Board (RWQCB). 1995. Water Quality Control Plan for the San Diego Basin (9).

Sawyer, J.O., Keeler-Wolf, T., and J.M. Evens. 2009. A manual of California vegetation. Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

SJM Biological Consultants (SJM). 2015. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat for a proposed staging area at the Ramona Grasslands Preserve. Letter report to Jennifer Price, Land Use/Environmental Planner for the County of San Diego Department of Parks and Recreation. January 11.

SJM Biological Consulting. 2019. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat (*Dipodomys stephensi*) at the Montecito Ranch property, Ramona, California.

Spencer, W.D., DiPietro, D., Romsos, H., Shier, D., and R. Chock. 2021. Stephens' kangaroo rat rangewide management and monitoring plan. Unpublished report prepared by the Conservation Biology Institute for Bureau of Land Management and Riverside County Habitat Conservation Agency. March.

Sproul, F., Keeler-Wolf, T., Gordon-Reedy, P., Dunn, J., Klein, A., and K. Harper. 2011. Vegetation classification manual for western San Diego County. First edition. Prepared for San Diego Association of Governments, San Diego, CA. February.

Stokes, D. 2021. Biologist, San Diego Natural History Museum. Personal communication with Jessie Vinje. March.

TAIC and EDAW. 2005. Ramona vernal pool conservation study, Ramona, CA. Prepared for County of San Diego, CA. January.

University of California, Agriculture and Natural Resources (UCANR). 2016a. Goldspotted oak borer. http://ucanr.edu/sites/gosbinfo/

University of California, Agriculture and Natural Resources. 2016b. PSHB/FD distribution map. http://ucanr.maps.arcgis.com/apps/Viewer/index.html?appid=3446e311c5bd434eabae98937f085c80.

United States Department of Agriculture (USDA) Natural Resources Conservation Service. 2019. Web Soil Survey. https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/

Unitt, P. 2012. The birds of San Diego County. San Diego County bird atlas and bird atlas list. http://sdplantatlas.org/BirdAtlas/BirdPages.aspx. Accessed February 2019.

Vitousek, P.M. 1990. Biological invasions and ecosystem processes: towards an integration of population biology and ecosystem studies. Oikos 57:7-13.

White, M. 2021. Consultant. Personal communication with S. Tellam. February.

Wilcove, D.S., Rothstein, D., Dubow, J., Phillips, A., and E. Losos. 1998. Quantifying threats to imperiled species in the United States. BioScience 48:607-615

Wynn, Susan. 2020. Fish and Wildlife Biologist. United States Fish and Wildlife Service. Personal communication with Jessie Vinje. November.

Appendix A. Land Use History and Physical Characteristics

The Montecito Ranch Preserve
Land Use History and Physical Characteristics

1.0 Onsite Land Uses

The Endangered Habitats Conservancy (EHC) acquired the 955-acre Montecito Ranch Preserve (Preserve) (Figure A-1) on June 10, 2020 with acquisition funding from the United States Department of Defense (DOD), a USFWS section 6 grant, and the California Wildlife Conservation Board. Development was proposed on the Montecito Ranch property consisting of a 417-unit single family home community prior to its purchase. The approximate eight-acre envelope around the existing historical ranch house (building envelope) (Figure A-2) would remain undeveloped. The Preserve is now protected by a perpetual conservation easement along with subgrant/grant agreements that identify EHC as the owner. The DOD holds the conservation easement.

1.1 Previous Land Uses

The earliest human occupation of southern California was likely nine to ten thousand years before present (Heritage Resources 2008). During the late prehistoric period, and possibly earlier, the Santa Maria Valley likely supported a number of villages or *rancherias* that relied on local resources (e.g., acorns, game, stone quarries), as well as trade with rancherias in other parts of the region for subsistence (e.g., coastal, mountain, and desert areas). The prehistoric rancheria of Pamo was likely situated at the west end of the Santa Maria Valley (Carrico and Cooley 2002 in Heritage Resources 2008). Spanish padres and soldiers noted rancherias in the Santa Maria Valley between 1778 and the mid-1800s and the Rancheria de Pamo appears in the Mission Basilica San Diego de Alcalá Baptismal Register. It is unclear whether the Mission Basilica San Diego de Alcalá ran livestock in the Santa Maria Valley as they did in other portions of San Diego County at that time.

Mexico became independent from Spain in 1810 and the secularization of mission lands and granting of land grants to private individuals by the Mexican governors of *Alta California* began. Governor Micheltorena granted *Rancho Valle de Pamo* (also called Rancho Santa Maria) to José Joaquin Ortega and his son-in-law Edward Stokes in 1843. In 1852, following the Mexican-American War, José Joaquin Ortega and Eduardo Stokes (Edward Stokes' son) filed a claim with the United States Public Land Commission to the Santa Maria Rancho land grant. They received title and patented the Santa Maria Rancho land grant in 1872.

By 1870, Adolfo Stokes (brother of Eduardo) was the sole owner of Rancho Valle de Pamo and he sold it to Juan B. Arribe in 1872. Arribe subsequently sold the property to Bernard Etcheverry in 1878 and Etcheverry successfully ran sheep and a share-cropping operation in the Santa Maria

Valley. Farmers planted vineyards, orchards, barley, and wheat in the Santa Maria Valley during the same time.

In August 1887, Etcheverry sold 3,000 acres to the C.T. Signor group for $20/acre. In October 1887 he sold 6,000 acres to the Signor group for $32/acre, and in December 1887 he sold 3,000 acres to the B.H. Davis group for $20/acre. These transactions eventually became the Montecito Ranch and the adjacent Davis Tract (LeMenager 1989 in Winwood Design 2016).

By the 1890s Montecito Ranch supported large scale fruit orchards and wheat operations run by local farmers for George W. Bissell, the absentee owner. The Preserve house was built during this period with a possible construction date of 1897 when a deed for the property references the improvements. The 1903 United States Geologic Survey (USGS) Ramona quadrangle map also documents the Montecito Ranch house. It is unclear who built the Montecito Ranch house, but some evidence suggests E.L. "Roy" Maydole may have built it since he lived on the property at the Montecito Ranch house site when it was likely built (Winwood Design 2016). Others credit Augustus Barnett, an influential rancher, financier, officer of the San Diego Savings Bank, and prominent figure in the history of Ramona. Construction dates are unknown for the detached barn, silo and cistern; therefore, they are not considered historical, however the barn is visible on USGS maps as far back as 1903. The silo and cistern do not appear to be as old as the barn and the Montecito Ranch owner or resident likely added the other sheds and outbuildings after 2007. Several California fan palm trees (*Washingtonia filifera*), visible in a photograph from the early 1900's (Heritage Architecture and Planning 2015), are still present in front of the southern side of the ranch house.

After the turn of the century, orchard and grain crops declined in importance in the Santa Maria Valley and the Montecito Ranch owners raised poultry, sheep, horses and cattle. However, the Wieslander Vegetation Type Mapping project produced maps of the area in the 1930s showing "cropland" in the southern portion of Montecito Ranch (Kelly et al. 2005). Property records show the Montecito Ranch passing through several ownerships until William Cagney and the Cagney family purchased it in 1966. Actor James Cagney owned Montecito Ranch in 1970. Following his death, the Chevron Land and Development Company purchased the Montecito Ranch in 1986 thus initiating the first residential development plans for the property.

1.2 Current Land Uses

The Preserve is zoned S88; Specific Plan Land Use Designation, and permitted land uses include residential, civic services, and agricultural uses. The Ramona Community Plan (RCP item #54, Ramona Historic Preservation Areas) identifies the Montecito Ranch House as a Historic Preservation Area site determined important or potentially important under the County Resource Protection Ordinance. Existing land uses include public utility and private easements, fallow agricultural fields, the ranch house complex and associated structures, and open spaces. Agricultural activities are not currently practiced on the Preserve.

A number of utility easements exist on the Preserve; most are old with little or no locality, width, or length information. SDG&E powerlines and poles were visible during the rapid assessment surveys; however, other powerlines and poles associated with existing easements were not detected or visible. SDG&E currently services two active overhead power lines and associated poles. The north-south easement is approximately 3,915 ft long and 12 ft wide, while the east-west easement is approximately 840 ft long and 10 ft wide. Easements to the Pacific Telephone and Telegraph company and the Ramona Municipal Water District exist on the Preserve and correspond closely with existing public and private dirt access roads.

Several private and public ingress/egress easements exist on the Preserve and in most cases correspond with existing dirt access roads, but as with the utility easements, exact location, width and length is unknown in some instances. Refer to Artemis (2020) for detailed easement discussion and locations.

1.3 Management History

Portions of the Preserve were historically grazed and farmed. Historic photos show orchards, likely citrus (Winwood Design 2016), and the Wieslander Vegetation Type Mapping project mapped "crops" in the southern portion of the Ranch in the 1930s. Steve Tellam, a San Diego cattle rancher, indicated that a small herd of cattle (10-12 mother cows) historically grazed on the Preserve (White pers. comm.). The previous property owner allowed unauthorized disking of the grasslands (pasturelands) in 2001-2002 for agricultural purposes (Artemis Environmental 2020).

1.4 Existing Facilities and Fencing, Gates, and Signage

A variety of structures, improvements, and dirt access roads exist on the Preserve (Figure A-3). Buildings include the Montecito Ranch house, a children's playhouse, barn, silo, out-building, concrete cistern, and flagpole. Other structures include a concrete livestock trough, several pipeline vaults east of the ranch house and east of the eucalyptus grove, PVC irrigation lines east of the ranch house, and pipelines along the northwest boundary of the Preserve. An overhead power line and power poles cross the west end of the Preserve. Several signs are posted on the Preserve including a "no trespassing" sign along the Driving Access Road north of Ash Street, a large sign advertising the Lemurian Fellowship at the corner of Montecito Way and Sonora Way, and "restricted access" signs along the boundary of the Preserve. Multiple dirt access road traverse the Preserve.

Barbed wire or mixed-wire fence demarcates much, but not all, of the Preserve boundary (Figure A-3). Much of this fence is in disrepair and not functional (Artemis Environmental 2020). Segments of internal fencing are present in several locations. There is a locked (combination) gate at the primary access point to the Montecito Ranch at Montecito Way and Sonora Way. Other known gates include a functional gate at the intersection of Alice and Ash streets and a non-functional gate along the western portion of the Preserve.

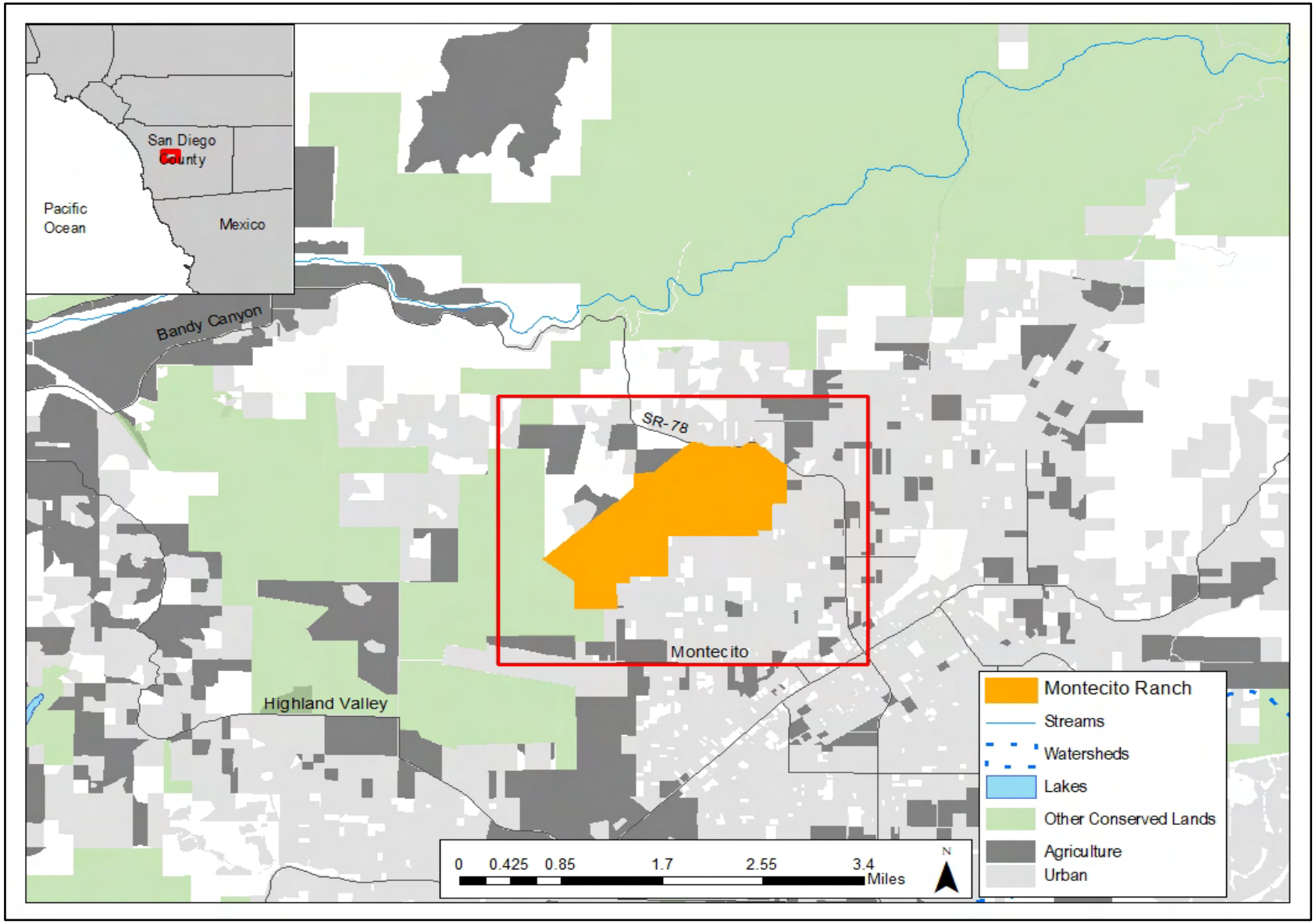

Figure A-1: Location of Montecito Ranch Preserve

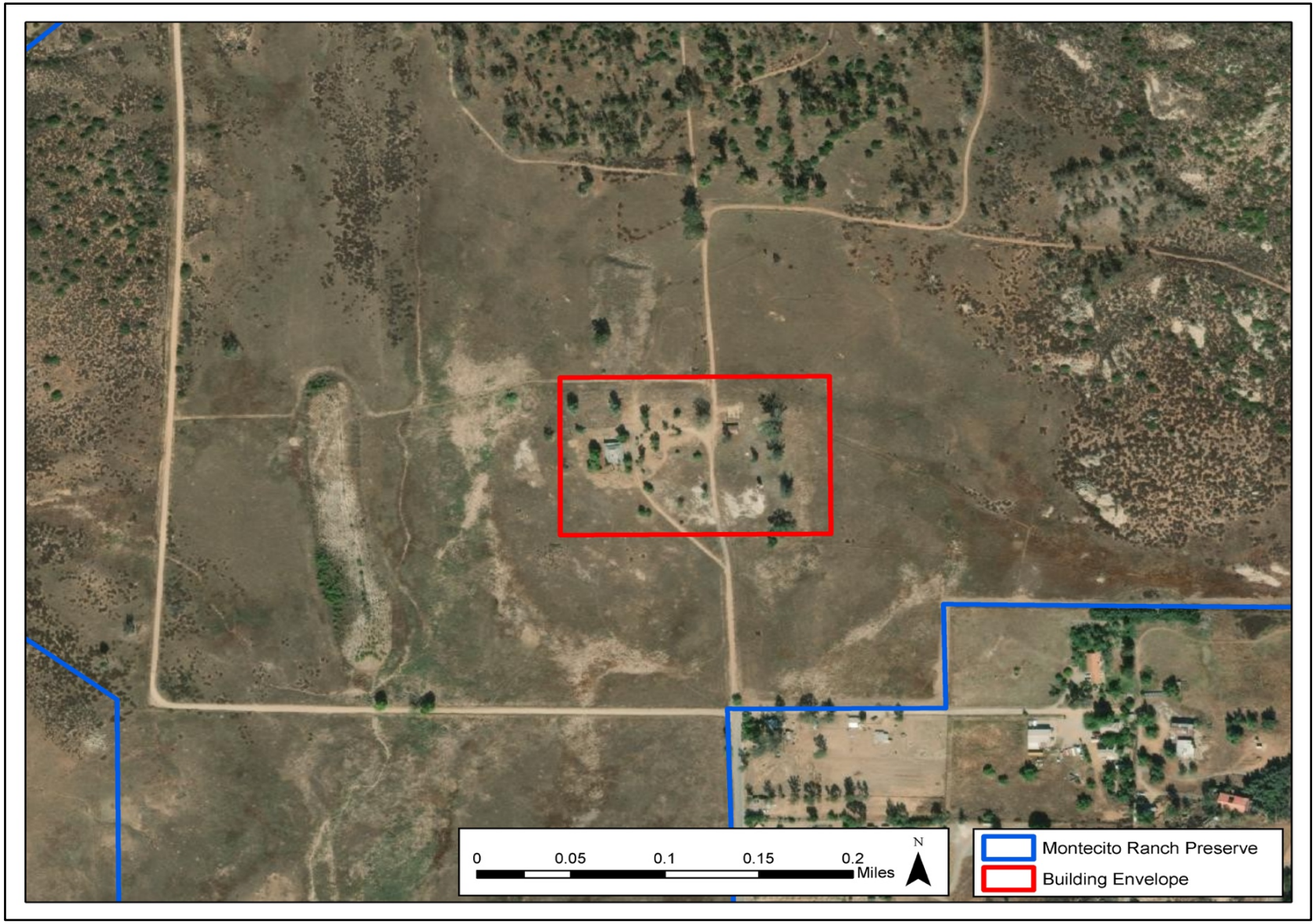

Figure A-2: Montecito Ranch Preserve Building Envelope

2.0 Adjacent Land Uses and Parcelization

2.1 Adjacent Land Uses

The Preserve is contiguous with the Ramona Grasslands Preserve, conserved land owned and managed by the County of San Diego Department of Parks and Recreation (DPR), to the south and southeast (Figure A-4). Funding from California Department of Fish and Wildlife/Wildlife Conservation Board and the USFWS contributed to the acquisition of the Ramona Grassland Preserve. State Route 78 borders the Preserve to the north and the Lemurian Fellowship property to the west. The Preserve is largely surrounded by rural residential development on the other sides (Figure A-4).

2.2 Parcelization

The Preserve is comprised of nine parcels and associated Assessor Parcel Numbers (APNs, Table A-1, Figure A-5).

Table A-1. The Montecito Ranch Preserve Parcels, Acreages, and APNs

Parcel[1]	Acreage[1,2]	APNs[1]
1	65.01	279-071-26, 279-072-01, 279-072-02, 279-072-03, 279-072-04, 279-072-05, 279-072-06, 279-072-07, 279-072-08, 279-072-09, 279-072-10, 279-072-11, 279-072-12, 279-072-13, 279-072-14, 279-072-15, 279-072-16, 279-072-17, 279-072-18, 279-072-27, 279-072-28, 279-072-29, 279-072-30, 279-072-31, 279-072-32, 279-072-33, 279-072-34
2	47.28	279-093-10, 279-093-37
3	0.57	279-093-38
4	6.51	280-010-08
5	*	A portion of 280-010-09
6	690.44	280-010-03, 280-010-09, 280-030-04, 280-030-10, 280-030-15, 280-031-01, 280-031-02, 280-031-03, 280-031-04, 280-031-05, 280-031-06, 280-031-07
7	39.42	280-030-05, 280-030-060
8A	9.59	280-030-24
8B	9.50	280-030-25
9A	50.91	281-521-01, 281-521-02, 281-521-03

[1.] The Assessor Parcel Number (APN) acreage from SanGIS does not include road easements, thus total acreage and Preserve acreage do not match.

[2.] Data from Artemis, Inc. 2020.

*The acreage for Parcel 5 is included in the acreage for Parcel 6.

3.0 Fire History

We obtained fire history data from San Diego Association of Governments (SANDAG) (2020), which are derived from California Department of Forestry and Fire Protection (CalFire) data dating back to 1878. This database only reports fires above 50 acres in size. Since 1911 three recorded

fires have burned portions of Montecito Ranch (Figure A-6). An unnamed fire burned the entire northern half of the Preserve in 1911. The Weekend Fire burned about 138 acres in the northeast portion of the Preserve in 1987. Heritage Resources (2008) referred to this fire as a controlled burn, but CalFire classified the ignition source as "miscellaneous." The Witch Fire burned most of the Preserve in 2007 except for the northeast portion and the Montecito Ranch house, which firefighters managed to save.

4.0 Cultural Features

4.1 Previous Studies

Gallegos and Strudwick conducted an initial cultural resources survey of Montecito Ranch, including field surveys and a record search in 1991 (Gallegos and Strudwick 1992 in Heritage Resources 2008). Results of that survey identified 36 archaeological and historical sites and one isolate. Caltrans previously recorded one of the 36 sites along SR-78. Following this survey, Cook and Saunders conducted a complete archaeological significance testing program for the Preserve (Cook and Saunders 1995 in Heritage Resources 2008). The prehistoric portion of that project served as a Master's thesis (Saunders 1993 in Heritage Resources 2008). During the significance testing, one additional site was recorded, and two of the original 36 sites were combined for a total of 36 archaeological sites on the Ranch. Cook and Saunders tested all sites for significance (Cook and Saunders 1995 in Heritage Resources 2008). According to Heritage Resources (2008) a 2001 cultural resources field review of the Preserve evaluated the status of resources and the previously recorded site boundaries (Heritage Resources 2008). This review identified three new sites: one archaeological site and two historical sites for a total of 39 archaeological and historical sites on the Preserve (36 original sites + 3 new sites = 39 sites).

4.2 Previously Recorded Cultural Resources

The 1991 cultural resources surveys of the Preserve identified 36 archaeological and historical sites (SDI-12,472 through SDI-12,506) and an isolate (I-385). Caltrans previously recorded one (SDI-9901) of the 36 sites along SR-78. These 36 sites include four habitation sites, nine temporary camps, 16 milling stations, five lithic scatters, and two quarries (Heritage Resources 2008). The four historical sites include the Montecito Ranch house, the historic mapped locations of a schoolhouse and farmhouse, and a trash dump. The historical sites are contiguous in site area with four of the prehistoric sites and were recorded under those site numbers. Cultural resources significance testing of the 36 sites identified 14 significant and 22 not significant sites. We describe significant sites at Montecito Ranch in Table A-2. The 2001 cultural resources field review identified three new sites: one new milling site (SDI-16,095); an earthen dam, spillway, and reservoir (SDI-16,096); and a quail guzzler constructed in 1950 (P-37-24,282) – the latter considered significant (Heritage Resources 2008).

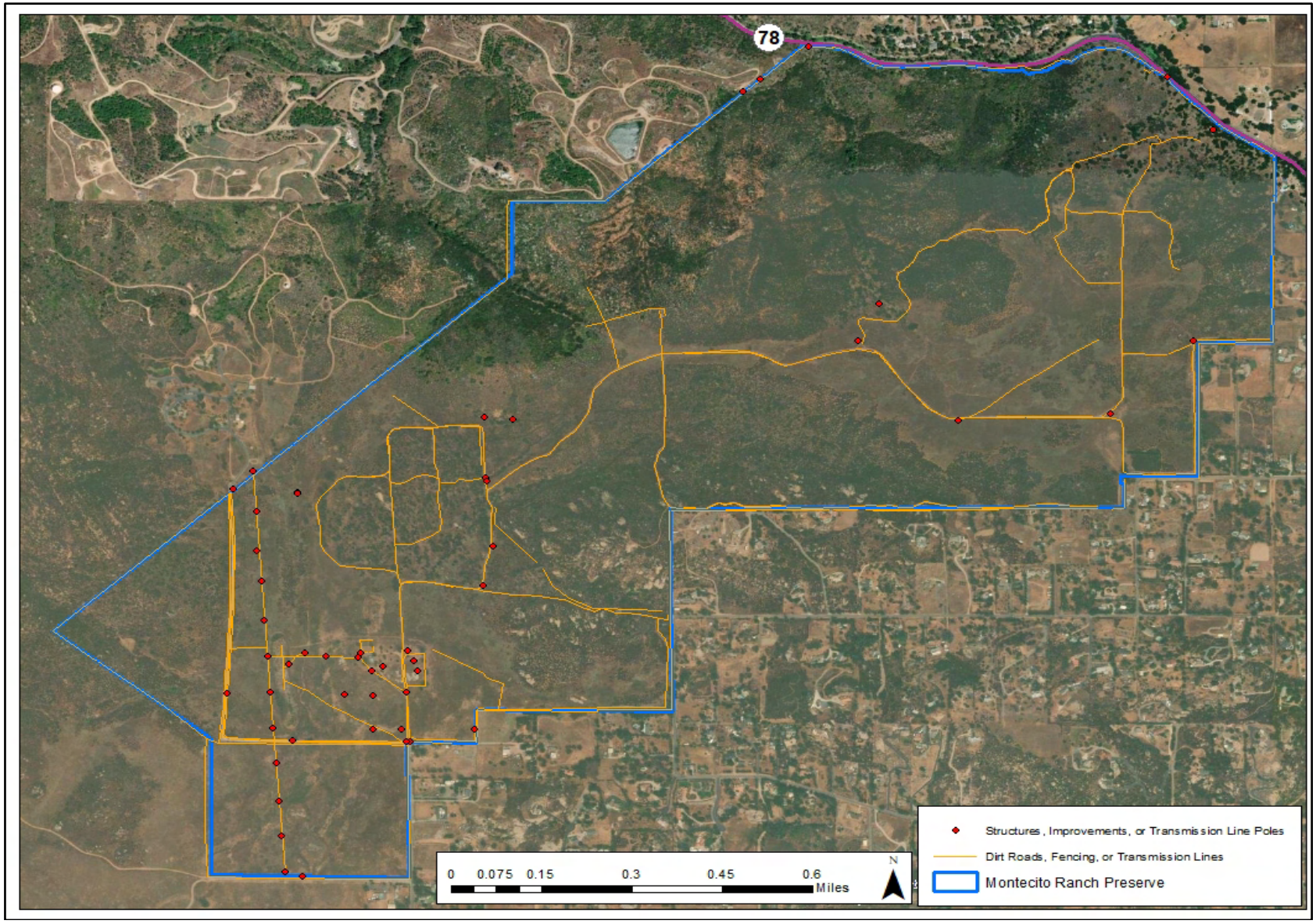

Figure A-3: Existing Anthropogenic Developments on the Montecito Ranch Preserve

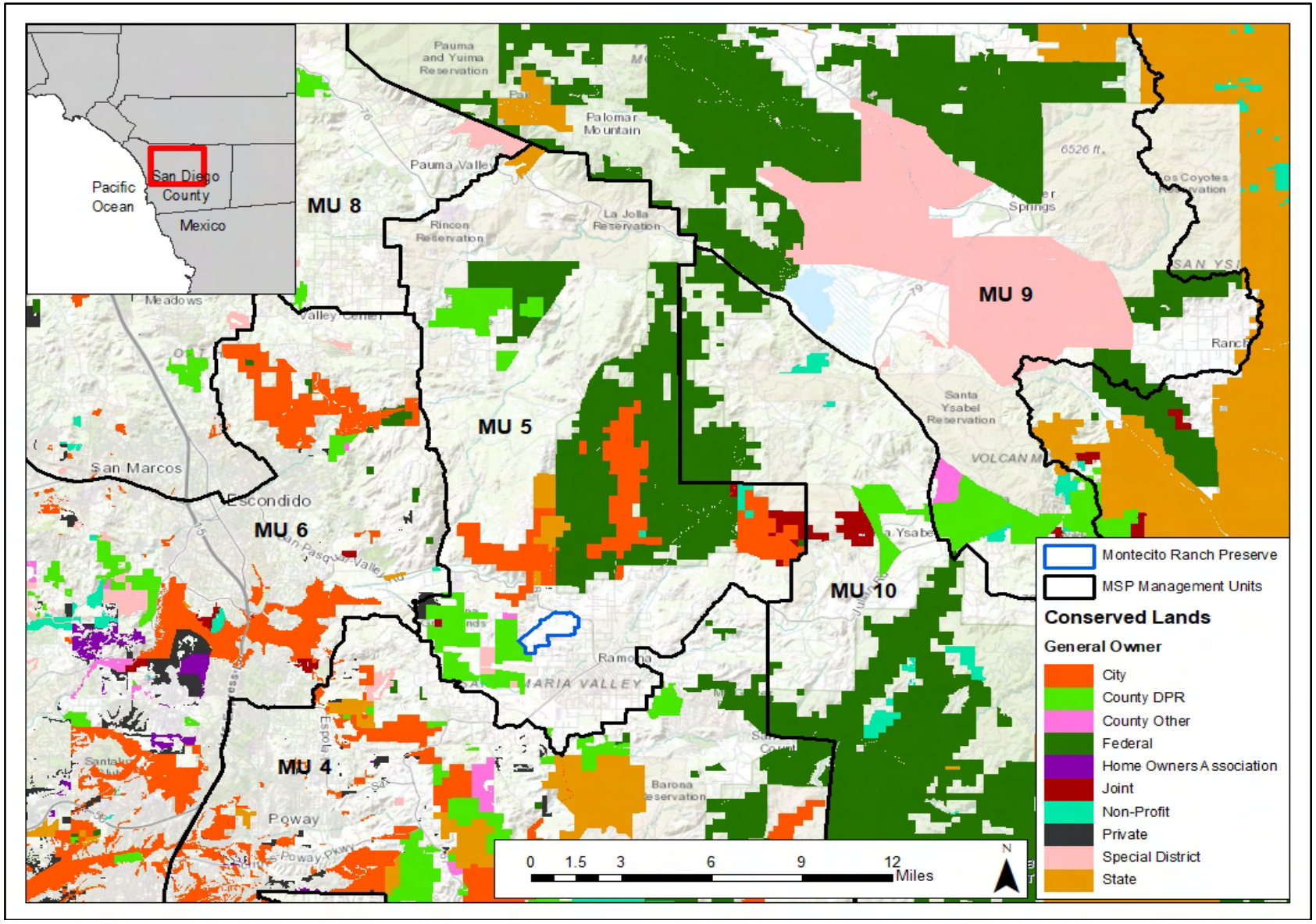

Figure A-4: Conserved Lands in the Vicinity of the Montecito Ranch Preserve

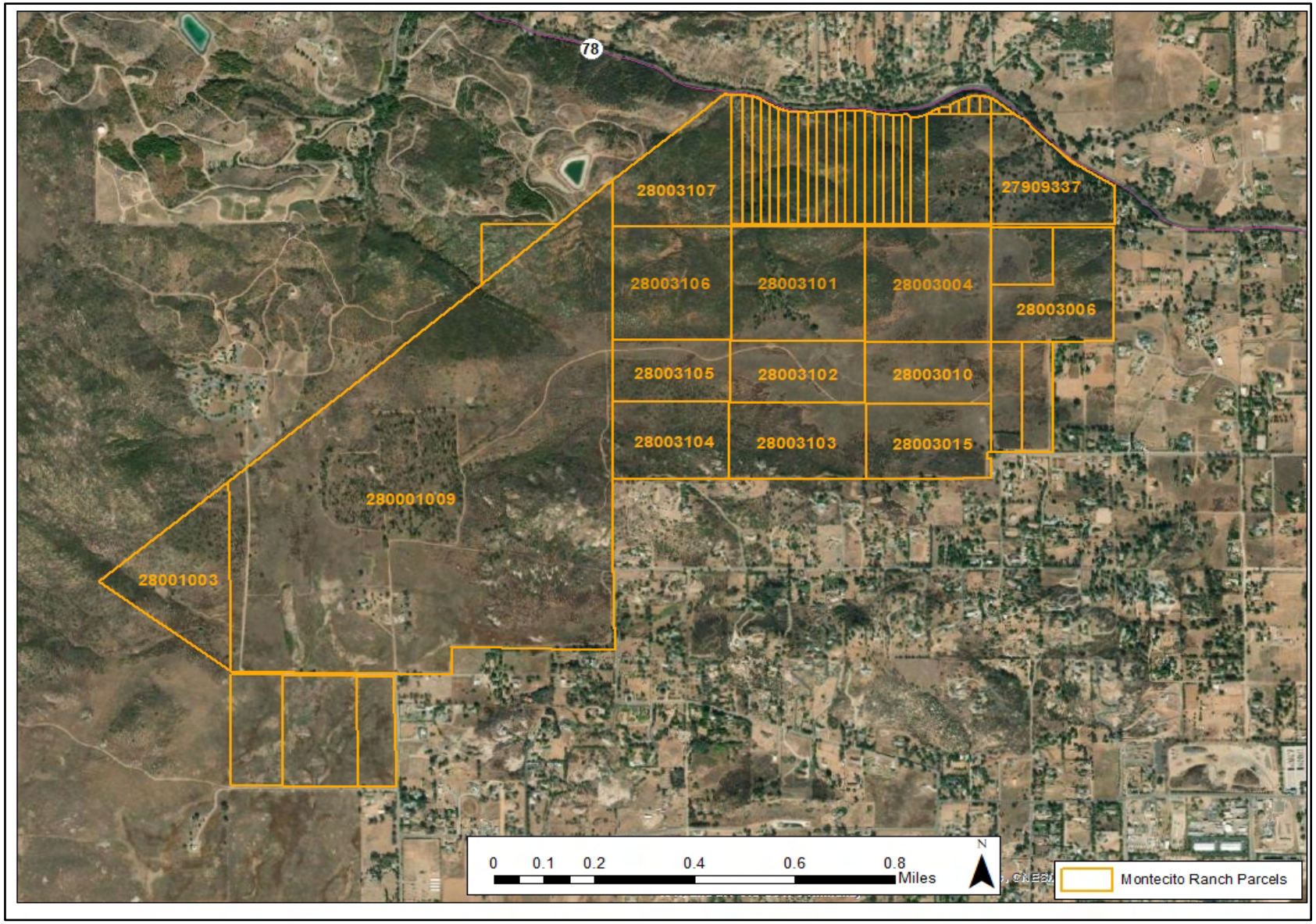

Figure A-5: Montecito Ranch Preserve Parcels

4.3 Native American Contact Program

EHC has not established a Native American Contact Program for Montecito Ranch, but will do so if soil disturbing activities are planned. The County of San Diego mailed notification letters to the Native American Heritage Commission and subsequently to nearby Native American Tribes, Committees, and interested representatives during the Environmental Impact Report process for the Montecito Ranch development project (Helix Environmental 2010). The San Pasqual Band of Mission Indians responded requesting that the tribe be informed about the discovery of any funerary items or cultural remains.

5.0 Geology and Soils

The Preserve lies in the northwest outskirts of the Santa Maria Valley. It ranges in elevation from approximately 1,300 feet (ft) to 1,769 ft and varies topographically from flat alluvial valleys to rolling and steep rocky slopes. Granitic (quartz monzonite/granodiorite/quartz diorite) basement rock that intruded around 100 million years ago (Mesozoic) underlays the alluvial valleys on the Preserve and forms the exposed hills and rocky slopes (Figure A-7). Three hills over 1,700 ft and several over 1,600 ft occur on the Preserve (Figure A-7). Flatter alluvial valleys at 1,400-1,500 ft elevation are filled with sandy sediments eroded from these granitic rocks during the Pleistocene and into the Holocene.

The United States Department of Agriculture, Natural Resources Conservation Service Web Soil Survey mapped the soils on Montecito Ranch (Figure A-8, Table A-3) (University of California, Davis 2019 in Artemis Environmental 2020). The soil survey did not locate or map hydric soils on the Preserve. There are seven major soil series represented on Montecito Ranch. The most extensive soils series on the Preserve are the Cieneba and Fallbrook series (311 acres total). These are sandy loams derived from weathered granitic rock found on the rocky knolls and ridges on the Preserve. The Vista series (45 acres) is associated with the Cieneba series on these hilly lands. The Ramona series (121 acres) are fine sandy loams formed from granitic alluvium and characterize the relatively level central valley and area around the Ranch house and eucalyptus grove. The Bonsall series (97 acres) are granitic-derived sandy loams with a clayey B horizon found in concave positions on gentle to moderate slopes. The area of Montecito Ranch mapped as Bonsall-Fallbrook sandy loams support clay-pan vernal pools. The Placentia series (34 acres) is a coarse sandy loam with clayey B horizon derived from weathered granitic rocks and are on gentle to level slopes. The Visalia series is a sandy loam that occurs on a small (20 acres), gently sloped area in the southwest portion of the Preserve.

Table A-2. Significant Cultural Resources Features on the Montecito Ranch Preserve

Site Number[1]	Prehistoric Components[1]	Historical Components[1]
SDI-12,473	2 loci; bedrock milling, surface artifact scatter, subsurface materials.	2 loci; schoolhouse/farmstead structure remains, landscape features, subsurface materials.
SDI-12,474	Artifact scatter, subsurface materials.	---
SDI-12,475	2 loci; surface artifact scatter, subsurface materials (locus 2).	---
SDI-12,476H	Bedrock milling, subsurface materials.	Montecito Ranch house ranch outbuildings, historical landscapes, likely subsurface.
SDI-12,480	3 loci; bedrock milling surface artifact scatter, subsurface materials (locus 1).	Surface artifact scatter, subsurface materials (locus 1).
SDI-12,481	Bedrock milling, surface artifact scatter, subsurface materials, human remains.	---
SDI-12,484H	Bedrock milling, surface artifact scatter, subsurface materials.	Surface artifact scatter, subsurface materials.
SDI-12,486	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,489	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,494/9901	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,496	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,497	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,498	Bedrock milling, surface artifact scatter, subsurface materials.	---
SDI-12,506	Bedrock milling, surface artifact scatter, subsurface materials.	---
P-37-024282	---	Quail guzzler.

[1] Data from Heritage Resources 2008.

Table A-3. Soils on the Montecito Ranch Preserve

Soil Series	Area (Acres)
Bonsall-Fallbrook sandy loams, 2 to 5 percent slopes	95.24
Bonsall sandy loam, thick surface, 2 to 9 percent slopes	1.83
Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded	223.25
Cieneba-Fallbrook rocky sandy loams, 9 to 30 percent slopes, eroded	45.87
Cieneba coarse sandy loam, 15 to 30 percent slopes, eroded	25.33
Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes	9.53
Fallbrook-Vista sandy loams, 9 to 15 percent slopes	23.49
Fallbrook rocky sandy loam, 9 to 30 percent slopes	12.01
Fallbrook sandy loam, 15 to 30 percent slopes, eroded	1.46
Fallbrook sandy loam, 5 to 9 percent slopes, eroded	8.55
Fallbrook sandy loam, 9 to 15 percent slopes, eroded	261.15
Placentia sandy loam, thick surface, 0 to 2 percent slopes	20.55
Placentia sandy loam, thick surface, 2 to 9 percent slopes	13.78
Ramona sandy loam, 2 to 5 percent slopes	85.29
Ramona sandy loam, 5 to 9 percent slopes, eroded	35.38
Visalia sandy loam, 0 to 2 percent slopes	17.09
Visalia sandy loam, 2 to 5 percent slopes	3.08
Vista coarse sandy loam, 5 to 9 percent slopes	0.41
Vista coarse sandy loam, 9 to 15 percent slopes, eroded	6.70
Vista rocky coarse sandy loam, 15 to 30 percent slopes	26.53
Vista rocky coarse sandy loam, 5 to 15 percent slopes	11.81
TOTAL	**928.33**[1]

[1] The GIS boundary for the soils layer is varies from the officially recorded property acreage of 955 acres (Artemis 2020).

6.0 Hydrology

Montecito Ranch lies in the San Dieguito Hydrologic Unit (San Diego RWQCB 1995). The Preserve drains into two different subwatersheds (Figure A-9); the northern half of the Preserve drains north through Clevenger Canyon in the Boden Hydrologic Subarea (HSA) within the Santa Ysabel Hydrologic Area, while the southern half of the Preserve drains south across relatively level land towards Santa Maria Creek in the Ramona HSA of the Santa Maria Hydrologic Area. The 1997 USGS 1:24000 San Pasqual quadrangle map shows small blue line drainage segments in the northern and eastern parts of the Preserve that drain through Clevenger Canyon to Santa Ysabel Creek. The 1942 USGS 1:62500 Ramona topographic quadrangle map shows intermittent blue lines draining the southern half of the Preserve south to Santa Maria Creek.

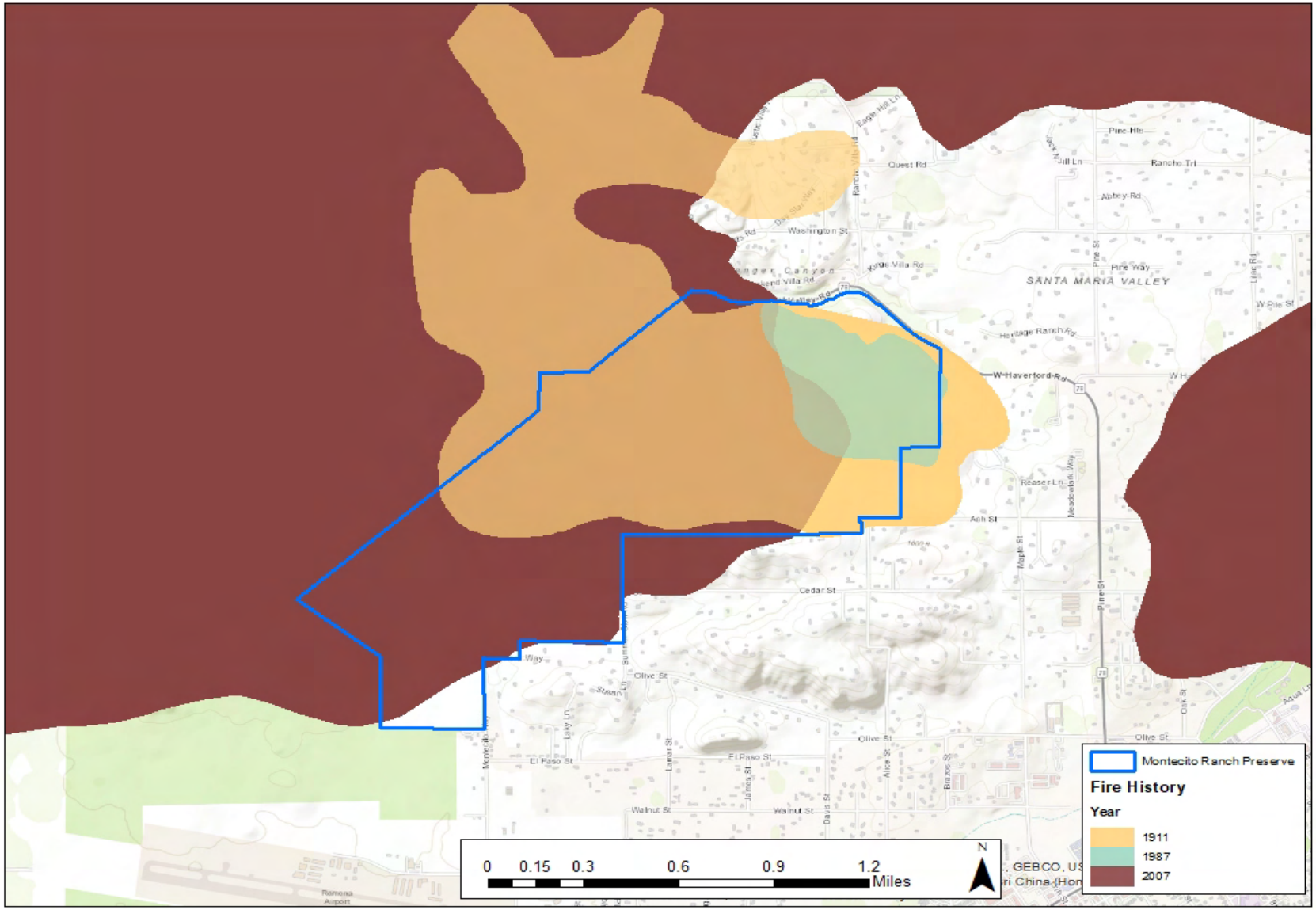

Figure A-6: Fire History on the Montecito Ranch Preserve

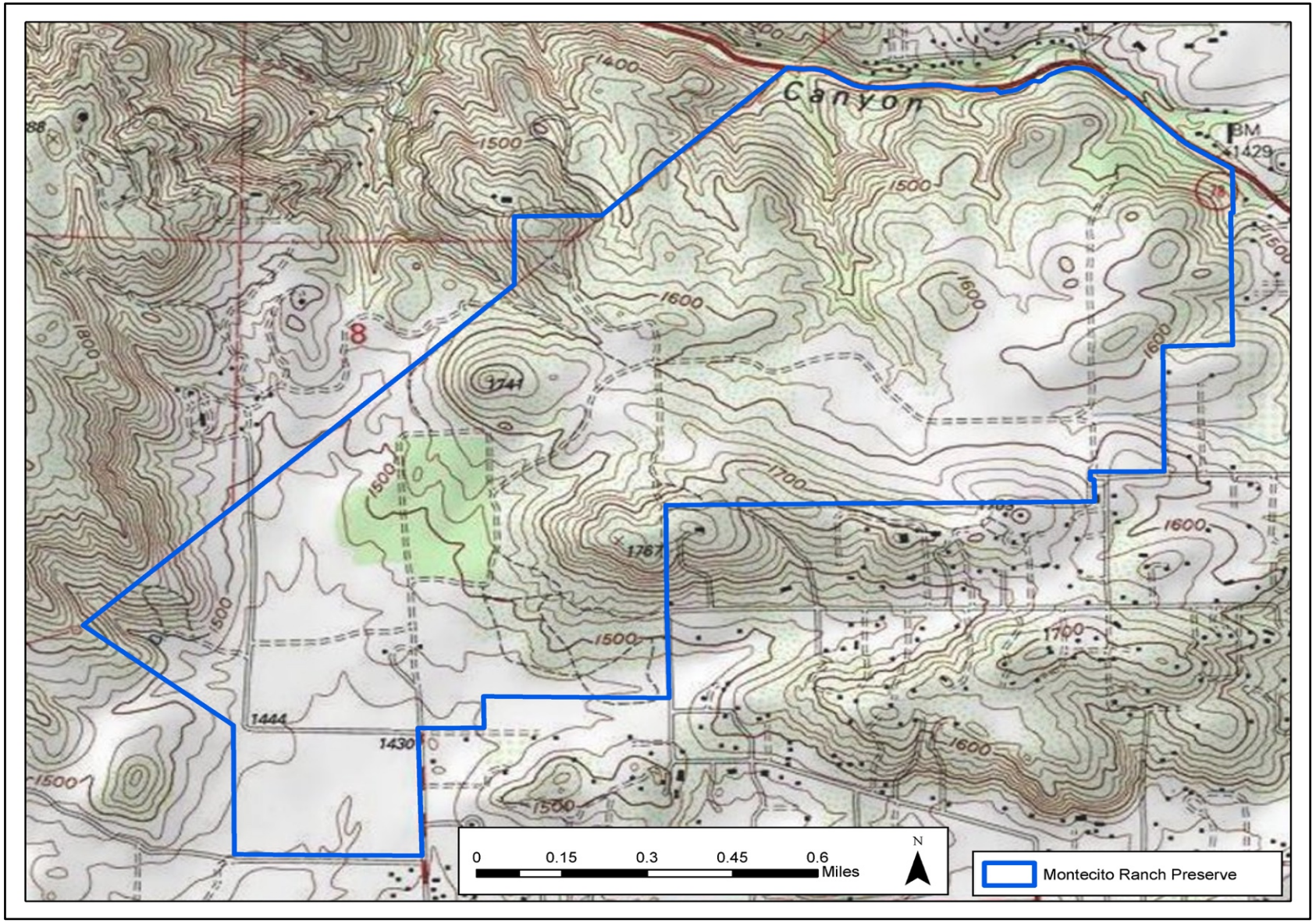

Figure A-7: Topography on the Montecito Ranch Preserve

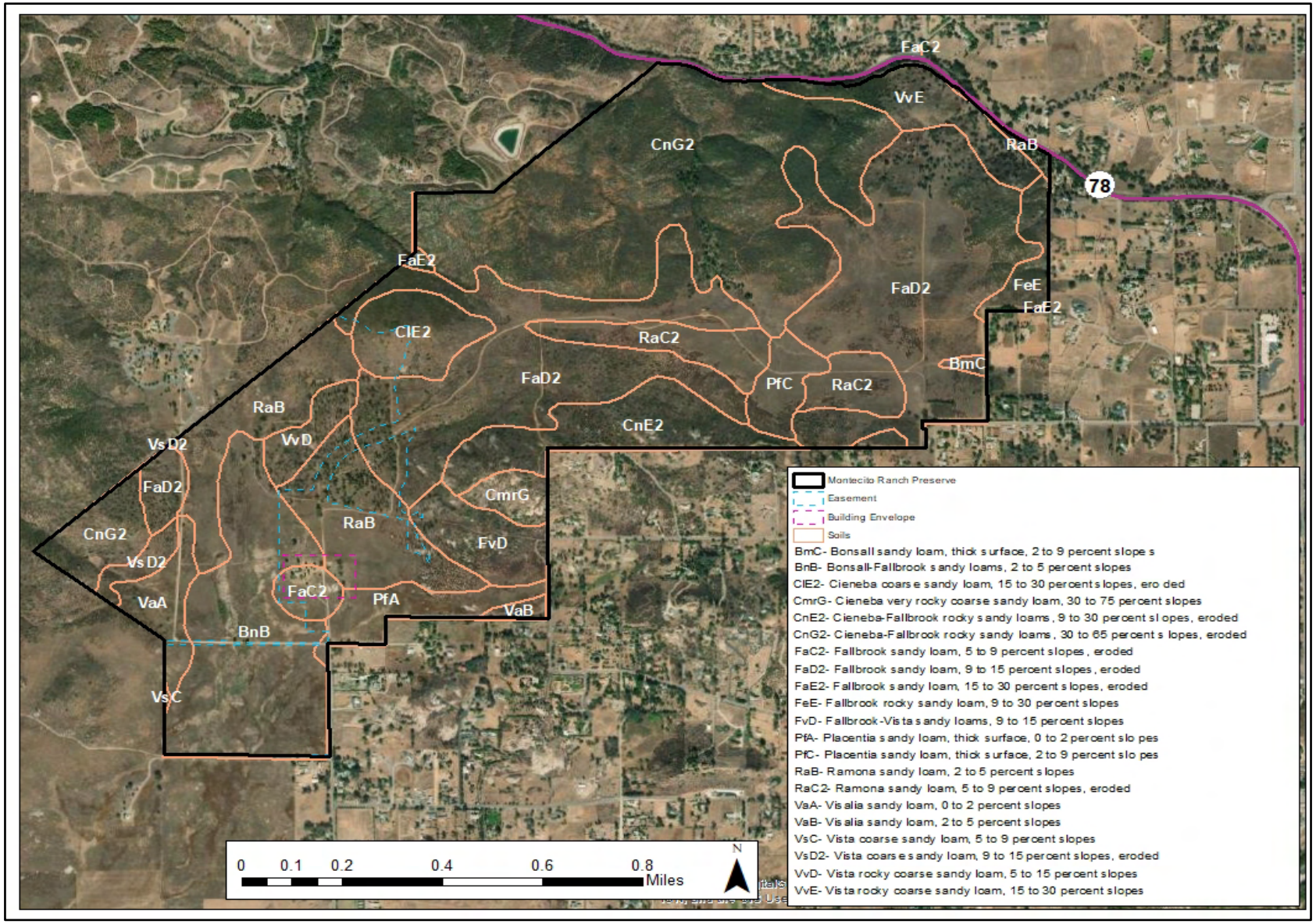

Figure A-8: Soils on the Montecito Ranch Preserve

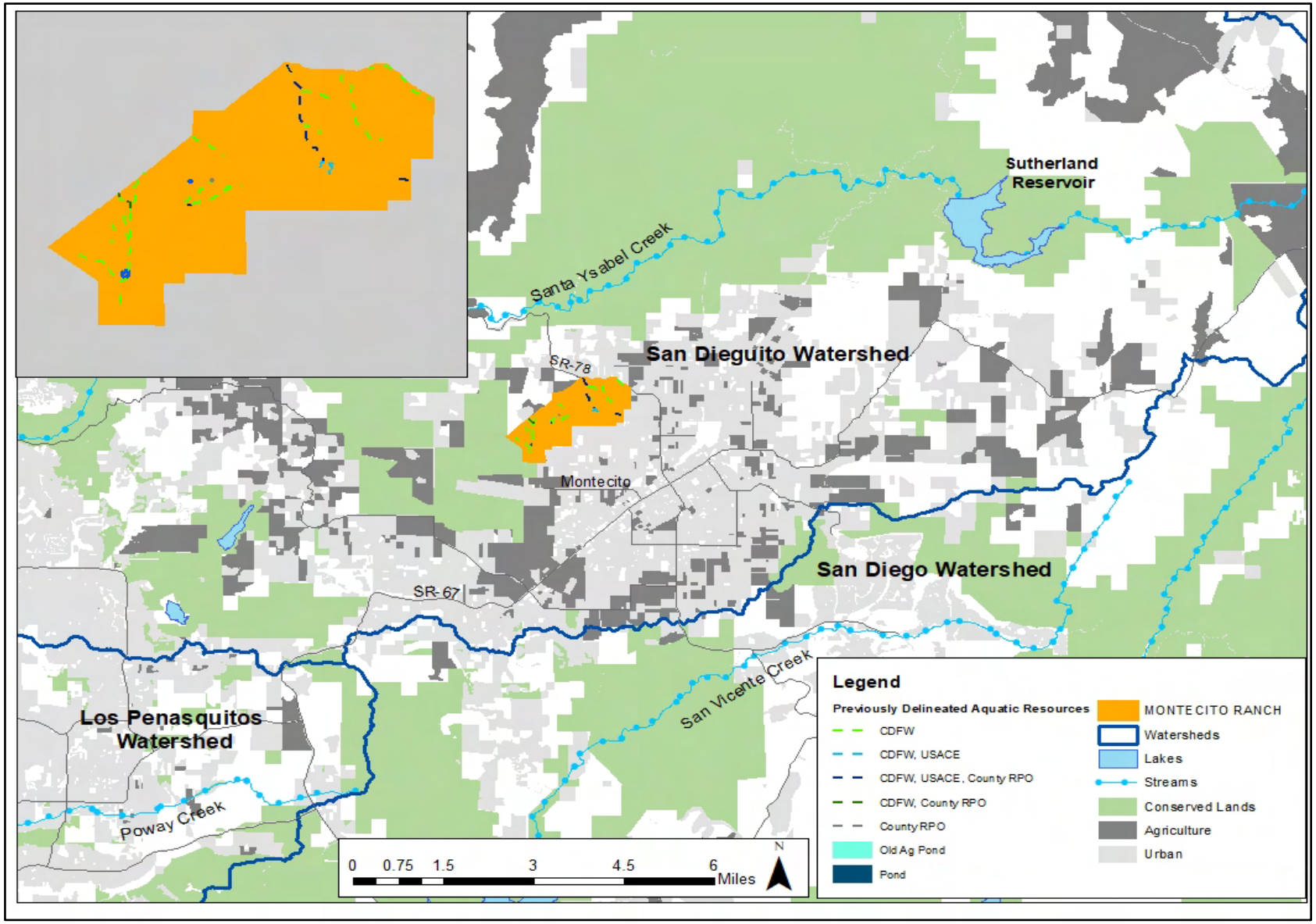

Figure 9: Hydrology in the Vicinity of the Montecito Ranch Preserve

Literature Cited

Artemis Environmental. 2020. Baseline Report for Montecito Ranch, San Diego County, California. March.

Carrico, R.L. and T.G. Cooley. 2002. Cultural Resources Report of Survey and Testing Programs for the Oak Country Estates Development in Ramona, San Diego County, California.

Cook, J.R. and D.M. Saunders. 1995. A cultural resources evaluation of Montecito Ranch, San Diego County, California.

Gallegos, D.R. and I. Strudwick. 1992. Historical/archaeological survey report for the Montecito Ranch property.

Helix Environmental Planning, Inc. 2010. Final Environmental Impact Report Montecito Ranch. Prepared for County of San Diego, Department of Planning and Land Use. August.

Heritage Architecture and Planning. 2015. Montecito Ranch historic structure report. Prepared for Montecito Ranch L.L.C. June.

Heritage Resources. 2008. Archaeological resources review, impact assessment, and preservation plan for the Montecito Ranch. Appendix G, Cultural Resources Reports for the Draft Environmental Impact Report for the Montecito Ranch. May.

Kelly, M., B. Allen-Diaz, and N. Kobzina. 2005. Digitization of a historic dataset: the Wieslander California vegetation type mapping project. Madroño 52(3):191-201.

LeMenager, C.R. 1989. Ramona and Round About: A history of San Diego County's little know back country. Eagle Peak Publishing Company, Ramona, CA.

San Diego Association of Governments (SANDAG). 2020. Fire burn history. https://rdw.sandag.org/Account/gisdtview?dir=Fire

San Diego Regional Water Quality Control Board (RWQCB). 1995. Water Quality Control Plan for the San Diego Basin (9).

Saunders, D.M. 1993. A Regional Spectrum: archaeological evaluation of the Montecito Ranch property in Ramona, California. Master of Arts Thesis San Diego State University.

United States Department of Agriculture (USDA) Natural Resources Conservation Service. 2019. Web Soil Survey. https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/

White, M. 2021. Consultant. Personal communication with S. Tellam. February.

Winwood Design. 2016. Historic Site Resource Evaluation Report: Montecito Ranch house complex. Prepared for Montecito Properties LLC. September.

Appendix B. Rapid Assessment Results

Rapid Assessment Results

1.0 Introduction

Appendix B presents results of rapid assessment surveys for biological resources on the Montecito Ranch Preserve (Preserve). We used these survey results to inform preparation of the Preserve Framework Resource Management Plan (F-RMP). The rapid assessment surveys align with regional recommendations for preserve-level surveys (SDMMP and TNC 2017).

This document addresses all 955 acres of the Preserve (Figure B-1), and considers adjacent preserves when discussing connectivity and other biological issues (Figure B-2). Refer to Appendix A for a discussion of additional factors that affect biological resources, such as topography, soils, fire history, and land use.

2.0 Methods

2.1 Background Review

CBI compiled and reviewed existing documentation and spatial datasets, including regional planning documents and studies, biological inventories and reports, research studies, and species and vegetation data. Key documents and datasets included:

- Management Strategic Plan (SDMMP and TNC 2017)
- Invasive Plant Strategic Plan (IPSP) (CBI et al. 2012)
- Connectivity Monitoring Strategic Plan (SDMMP 2011)
- Biological Reports (e.g., Artemis 2020, CBI 2019, Helix 2010, REC 2008a,b)
- Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan (Spencer et al. 2021)
- Regional Datasets and Databases: California Natural Diversity Database (CDFW 2020), iNaturalist (2018), California Invasive Plant Council [Cal-IPC] (2006), Giessow 2019, San Diego Management and Monitoring Program GIS Viewer (SDMMP 2020)
- Conserved Lands Dataset (SANDAG 2015)

2.2 Field Meetings

CBI held several field meetings with regional and local experts to discuss monitoring and management of key resources on the Preserve. Members of the Stephens' Kangaroo Rat Working Group including mammologists and land managers and a bat biologist from the San Diego Natural History Museum attended these field meetings (Table B-1).

2.3 Vegetation Mapping

In 2019, consulting biologists mapped vegetation according to the Manual of California Vegetation (MCV) (Sawyer et al. 2009) (Artemis 2020). To ensure consistency with regional vegetation mapping protocols, CBI botanists updated and refined the MCV vegetation mapping using the Vegetation Classification System Manual for Western San Diego County (SDVC) (Sproul et al. 2011). The SDVC is the current standard for vegetation classification in San Diego County, and is compatible with state and national vegetation classification standards. In the field we refined existing vegetation polygon boundaries and collected attribute data using ESRI's Collector for ArcGIS. In general, we used a minimum mapping unit of 0.5-acre, although we used smaller minimum mapping units occasionally to delineate wetlands and unusual or uncommon vegetation associations. We used a separation distance of approximately 10 meters to determine when to split vegetation into separate polygons or combine vegetation into one polygon. We recorded visual estimations of absolute percent cover of all dominant and subdominant or indicator plant species. We used the SDVC to determine vegetation groups, alliances, associations, or special stands. We began mapping vegetation in the field in October 2020 and completed mapping by February 2021 (Table B-1). All of the dominant and subdominant species were present and identifiable during this time period.

Table B-1. Survey Schedule and Personnel

Survey Date	Task	Personnel[1]
10/20/2020	Reconnaissance Survey	Jessie Vinje
10/23/2020	Rapid Assessment Survey	Jessie Vinje
10/27/2020	Rapid Assessment Survey	Jessie Vinje
11/10/2020	Rapid Assessment Survey, Vegetation Mapping	Jessie Vinje, Spring Strahm
11/11/2020	Rapid Assessment Survey, Vegetation Mapping	Jessie Vinje, Spring Strahm
11/20/2020	Stephens' Kangaroo Rat Site Meeting, Vegetation Mapping	Jessie Vinje, Chris Manzuk, Steve Montgomery
2/10/2021	Stephens' Kangaroo Rat Site Meeting, San Diego Natural History Museum Site Meeting, Vegetation Mapping	Jessie Vinje, Wayne Spencer, Michael Beck, Chris Manzuk, Steve Montgomery, Brian Shomo, Harry Sandoval, James Gannon, Drew Stokes
2/23/2021	Rapid Assessment Survey, Vegetation Mapping	Jessie Vinje
5/3/2021	Rapid Assessment Survey, Rare Plant Surveys, Species Lists	Jessie Vinje, Margie Mulligan

[1] Jessie Vinje, Wayne Spencer, and Spring Strahm = Conservation Biology Institute, Michael Beck and Chris Manzuk = Endangered Habitats Conservancy, Brian Shomo and Harry Sandoval = Riverside County Habitat Conservation Agency, James Gannon = Bureau of Land Management, Drew Stokes = San Diego Natural History Museum, Margie Mulligan = Mulligan Biological Consulting.

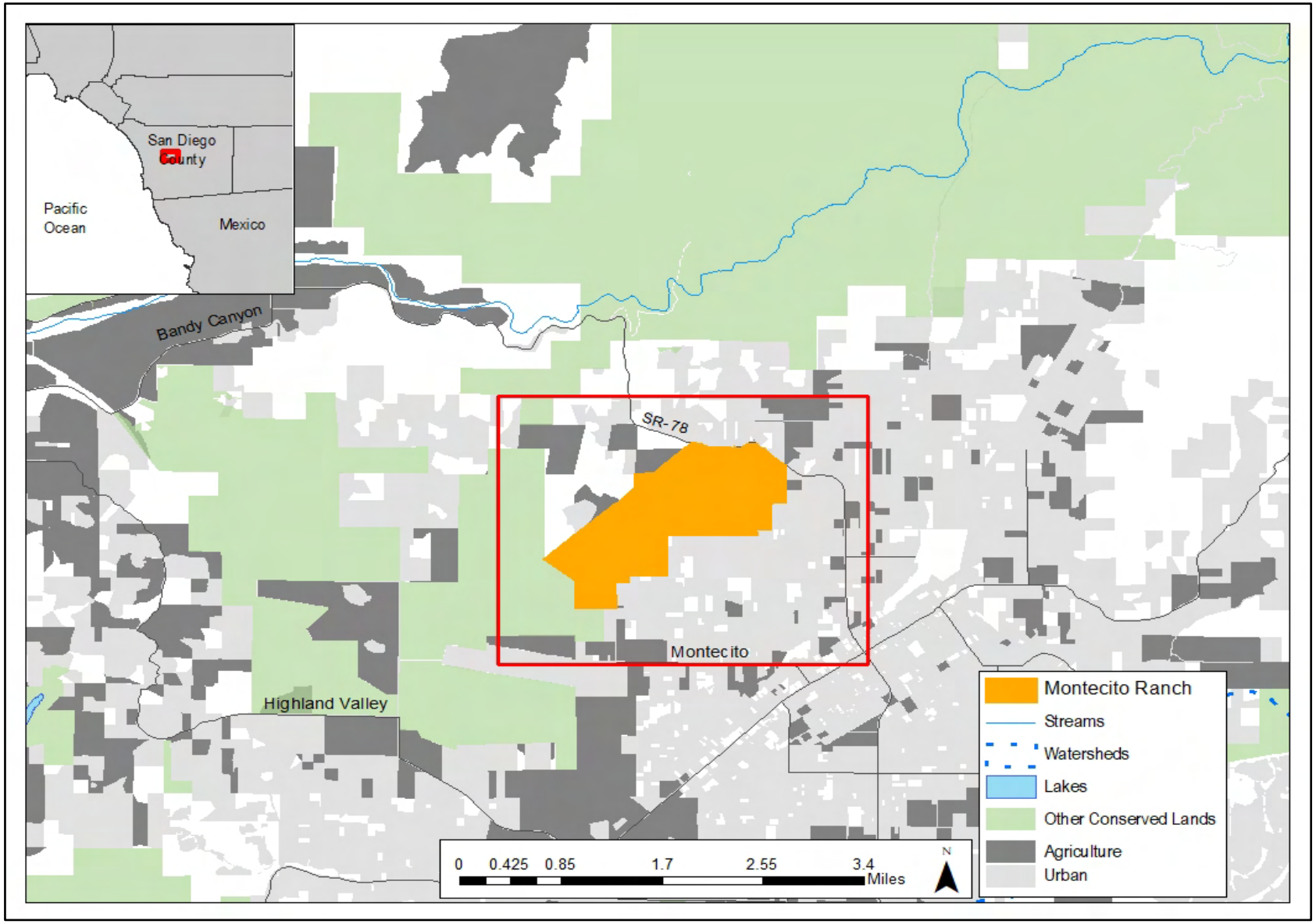

Figure B-1. Location of the Montecito Ranch Preserve

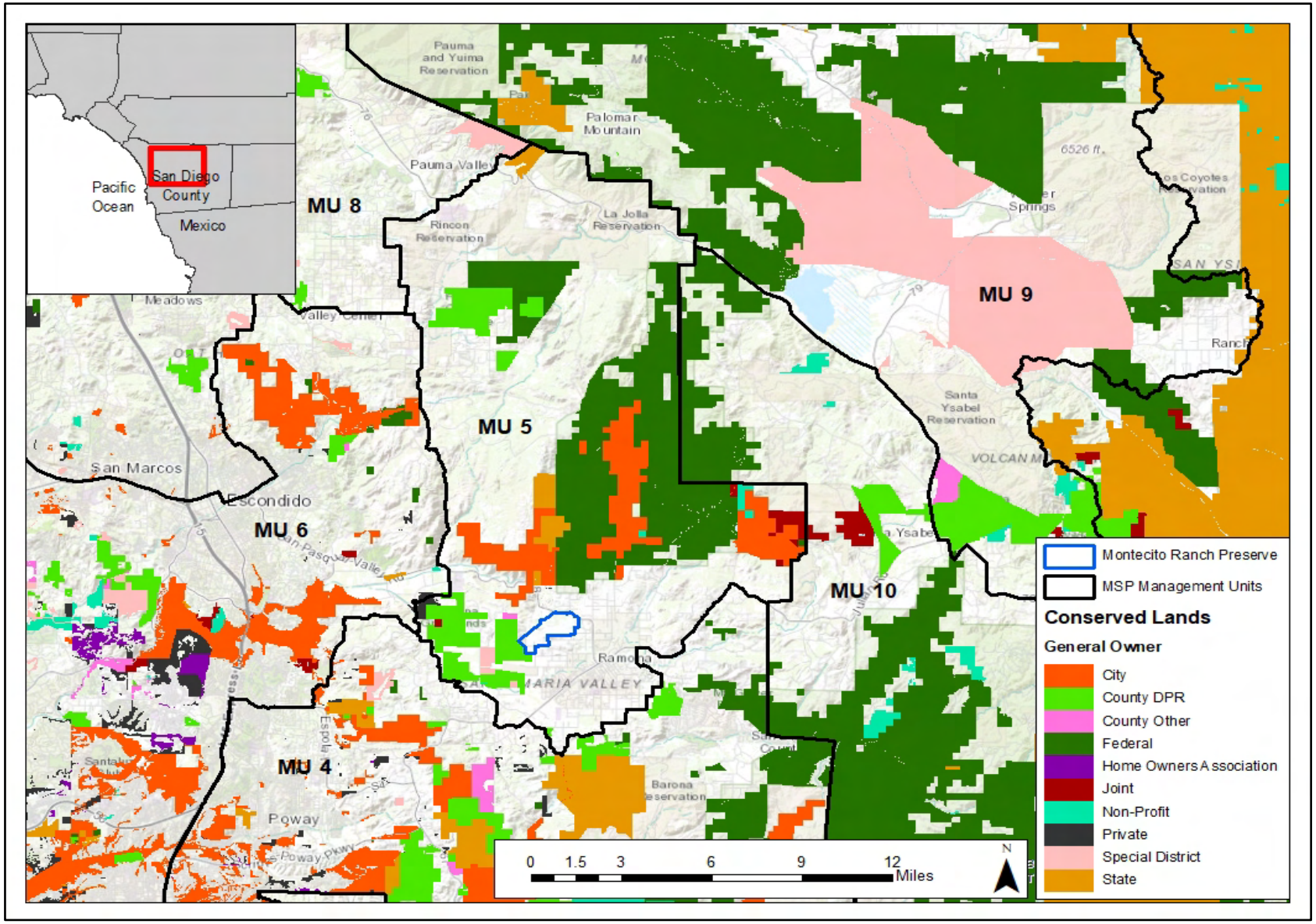

Figure B-2. Conserved Lands in Relation to the Montecito Ranch Preserve

2.4 Reconnaissance and Rapid Assessment Surveys

CBI conducted a site reconnaissance visit with EHC land manager Chris Manzuk to identify/discuss Preserve boundaries, access protocols, site history, stewardship issues and biological concerns, management and monitoring history, and existing projects. We obtained lock combinations to ensure we could access the Preserve and coordinated with the security patrol service before each survey.

CBI conducted rapid assessment surveys in October and November 2020 and February and May 2021 (Table B-1). The focus of these surveys was to map key invasive plants, assess habitat for MSP species, and identify and map stewardship issues (e.g., fencing, gates, and signage needs, trash, and erosion). MSP species include species covered or proposed for coverage under San Diego County Natural Community Conservation Programs (NCCPs), including the San Diego Multiple Species Conservation Plan (MSCP). MSP species are prioritized for management based on risk of loss and are categorized by whether they need species-focused management or vegetation-focused management (SDMMP 2013, SDMMP and TNC 2017).

Rapid assessment surveys differ from traditional survey approaches by focusing on high priority resources and issues likely to require management, rather than all resources. This approach allows management to proceed quickly and directs management funding where it is most needed in a timely fashion. Land managers or biologists can then conduct additional surveys not expected to trigger management actions (e.g., comprehensive surveys of common plant and animal species) at a later date or over time.

For invasive plant mapping, we focused on IPSP and San Diego County Early Detection Rapid Response (EDRR) invasive plants (CBI et al. 2012, Giessow 2019). We mapped other nonnative, ornamental, or invasive plants where they impacted or potentially impacted MSP species and habitats or other Preserve resources. We recorded invasive plant attribute information for each invasive plant (point) or stand of invasive plants (polygons).

We mapped erosion where significant or potentially significant (e.g., large, deep gullies, rills in roads) and a potential threat to MSP resources or safety. We mapped all observed trash, recorded the trash item(s) at each location, and prioritized the trash into priority levels for removal based on threat (i.e., dangerous or toxic) to MSP resources or public safety.

We also mapped and collected attribute information for access control issues and edge effects (illegal vegetation clearing or dumping by adjacent landowners).

Biologists with Artemis mapped existing anthropogenic features (i.e., fences, signs, structures, trash, roads) in 2019 as part of a baseline conditions report for Montecito Ranch (Artemis 2020). In some cases, we used this data to augment our rapid assessment data (i.e., trash locations).

2.5 Management Strategic Plan (MSP) Surveys

The Management Strategic Plan for western San Diego County (MSP Roadmap, SDMMP and TNC 2017) prioritizes a number of sensitive species (MSP species) for management based on risk of loss and further categorizes them depending on whether they require species-focused management or vegetation-focused management. MSP species are covered or proposed for coverage under several Natural Community Conservation Plans (NCCPs) in San Diego County. Many of the MSP species discussed in this document are covered species under the San Diego Multiple Species Conservation Plan (MSCP).

Consulting biologists conducted surveys for, and mapped MSP plant and animals on the Preserve as part of biological surveys conducted for the Montecito Ranch Development Project (Helix 2010, REC 2008b). CBI mapped additional MSP plants in 2019 (CBI 2019) and during the rapid assessment surveys (Table B-1). Steve Montgomery, a consulting biologist, performed Stephens' kangaroo rat (*Dipodomys stephensi*) trapping in 2018 (SJM Biological Consultants 2019) and Jim Asmus of Marine Corps Base Camp Pendleton conducted San Diego fairy shrimp (*Branchinecta sandiegonensis*) surveys in 2019 (Asmus 2019).

2.6 Data Collection and Management

Prior to surveys, we created a Geographic Information System (GIS) project geodatabase that allowed us to rapidly and accurately collect spatial data. We created and used the following spatial data for the geodatabase:

- San Diego Monitoring and Management Program (SDMMP) 50-m^2 survey grid
- Preserve boundary
- Aerial imagery
- Vegetation (polygons)
- Invasive species (points and polygons)
- MSP-covered plants and animals (points and polygons)
- Stewardship issues (points only)
- Anthropogenic features (points, lines) (Artemis 2020)

We collected specific attribute data in the field for each mapping category. Table B-2 lists attribute data categories; refer to Table B-3 for attribute definitions.

We used +/- 1-meter Global Positioning System (GPS) Bad Elf receivers in conjunction with ESRI's Collector for ArcGIS running on Samsung Galaxy Tab3 and TabA devices. We collected some of the information listed in Table B-2 in the field (e.g., percent cover) and entered other information (e.g., vegetation alliance/association) in the CBI ArcGIS online account. After each field day, we uploaded field data to the CBI ArcGIS online account to ensure that data would not be lost.

Table B-2. Attribute Data Collection

Attribute	Data Collection Type				
	Vegetation Mapping	MSP Plants[1]	MSP Animals[2]	Invasive Species[3]	Stewardship[4]
Species	X	X	X	X	---
Category	---	---	---	---	X
Number of Individuals (Exact or estimated)	---	X	X	X	---
Percent Cover	X	---	---	X	---
Date	X	X	X	X	X
Surveyor and Affiliation	X	X	X	X	X
Notes	X	X	X	X	X
Trash Priority	---	---	---	---	X
Vegetation Alliance/Association	X	---	---	---	---

[1] MSP Plants = Management Strategic Plan plants.
[2] MSP Animals = Management Strategic Plan animals.
[3] Invasive Species = Invasive Plant Strategic Plan, Early Detection Rapid Response, and other invasive plants.
[4] Stewardship = Stewardship issues (e.g., access control, trash, erosion).

Table B-3. Attribute Definitions

Attribute	Definition
Species	Record the target species using pre-determined drop-down menus. Add additional species if needed.
Category	Record the stewardship category (trash, erosion, fencing, gates).
Number of Individuals (Exact or estimated)	Record the exact or estimated number of target individuals (for MSP and IPSP/EDRR species).
Percent Cover	Record a visual percent (%) cover value for species in vegetation polygon, or for IPSP/EDRR species. We recorded exact percent cover values, but one could use cover categories if desired. For vegetation, the percent cover value by species refers to the cover in the mapped polygon.
Date	Record the site reconnaissance date.
Observer and Affiliation	Record the observer name and affiliation.

Attribute	Definition
Notes	Record any pertinent notes. For stewardship issues record the type of trash encountered to ensure that trash can be categorized and prioritized for cleanup. Record any best management practices, remedial actions, or preserve/management recommendations in the notes section.
Trash Priority	Record trash priority level. Use the following priority levels: Priority 1, Priority 2, and Priority 3. Priority levels can be assigned in the office versus in the field.
Vegetation Alliance/Association	Record the vegetation alliance/association.

3.0 Results

3.1 Vegetation Mapping

The refined vegetation map will serve as the baseline vegetation map for Preserve monitoring and management, and will be updated at 10-year intervals or after significant disturbance events (e.g., wildfire). Table B-4 lists mapped vegetation categories per the SDVC (Sproul et al. 2011). Figure B-3 depicts vegetation on the Preserve. We identified 14 vegetation alliances, 2 provisional alliances, 3 semi-natural stands, 25 associations, and vernal pools, as described below. Coastal sage scrub is the dominant habitat. Additional acreage within the Preserve is developed and does not fit into a vegetation category; these 'other' areas include structures, areas around the ranch house and associated landscaping, and roads and trails.

3.1.1 Upland Forests and Woodlands

Quercus agrifolia|*Toxicodendron diversilobum*|Grass

The *Quercus agrifolia/Toxicodendron diversilobum/*Grass Association is an upland woodland community found on lower to middle slopes in sandy loam soils, generally in drier areas above drainages. Coast live oak (*Quercus agrifolia*) is the dominant in the tree canopy and poison-oak (*Toxicodendron diversilobum*) is subdominant in the shrub canopy. A diverse array of native and nonnative herbaceous species occur in the understory. Other subdominant shrubs often include upland species such as elderberry (*Sambucus nigra* subsp. *caerulea*) and coyote bush (*Baccharis pilularis*).

We mapped this association in the northeastern portion of the Preserve south of State Route (SR) 78 and in the north to south-trending oak-lined drainage (Figure B-3) where it comprises 11.5 acres (1.24%) of the vegetation onsite. Coast live oak and California sycamore (*Platanus racemosa*) are present in this stand. The shrub canopy is open and includes poison-oak, chaparral honeysuckle (*Lonicera subspicata* var. *denudata*), skunkbush (*Rhus aromatica*), and scattered California buckwheat (*Eriogonum fasciculatum*). Nonnative grasses such as ripgut brome (*Bromus diandrus*)

dominate the herbaceous understory, but nonnative forbs including Italian thistle (*Carduus pycnocephalus*) and milk thistle (*Silybum marianum*) are also common. Native herbaceous species include tree clover (*Trifolium ciliolatum*) and narrow leaved miner's lettuce (*Claytonia parviflora* subsp. *parviflora*) (Sproul et al. 2011).

*Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum/*Grass

The *Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum/*Grass Association is an upland woodland community found on lower to middle slopes in sandy loam soils, generally slightly above drainages. Engelmann oak (*Quercus engelmannii*) and coast live oak are codominants in the tree canopy. Coastal sage scrub shrubs often occur within this association, but their combined cover is generally less than that of poison-oak. Other subdominant shrubs often include upland species such as elderberry. The herbaceous understory may include a high percentage of nonnative grasses (Sproul et al. 2011).

We mapped this association primarily in the northeastern portion of the Preserve south of SR-78 and in the north to south-trending oak-lined drainage (Figure B-3) where it comprises 26.5 acres (2.86%) of the vegetation onsite. Coast live oak and Engelmann oak are present in this stand. The shrub canopy is open and includes scattered California sagebrush (*Artemisia californica*), California buckwheat, and poison-oak. Nonnative grasses dominate the herbaceous understory. Native herbaceous species include California golden violet (*Viola pedunculata*), tree clover, and narrow leaved miner's lettuce.

Quercus engelmannii-Salvia apiana

The *Quercus engelmannii-Salvia apiana* Association is an upland woodland community found on middle slopes in sandy and silty loams. Engelmann oak is the dominant species with white sage (*Salvia apiana*) present diagnostically. Subdominant shrubs often present include chamise (*Adenostoma fasciculatum*), black sage (*Salvia mellifera*), California sagebrush, and laurel sumac (*Malosma laurina*). The herbaceous layer is high in diversity and cover (Sproul et al. 2011).

We mapped a small amount of this association in the northeastern portion of the Preserve south of SR-78 (Figure B-3) where it comprises 1.1 acres (0.12%) of the vegetation onsite. Engelmann oaks are the dominant tree and California buckwheat is the dominant shrub occurring in a mostly closed canopy. White sage is diagnostically present and other shrubs such as chamise and California sagebrush occur in this association on the Preserve.

Table B-4. Vegetation Alliances and Associations on the Montecito Ranch Preserve

Group[1,2]	Alliance or Semi-Natural Stand[1,2,3]	Association or Semi-Natural Stand Type[1,2,3]	Acres
Soft-leaved, Drought-Deciduous Shrublands	*Artemisia californica-Eriogonum fasciculatum*	*Artemisia californica-Eriogonum fasciculatum-Malosma laurina* (ARCA-ERFA-MALA)	178.9
	Artemisia californica	*Artemisia californica-Mimulus aurantiacus* (ARCA-MIAU)	14.0
	Artemisia californica-Salvia mellifera	*Artemisia californica-Salvia mellifera* (ARCA-SAME)	32.3
	Eriogonum fasciculatum	*Eriogonum fasciculatum* (ERFA)	41.0
		Eriogonum fasciculatum-Salvia apiana (ERFA-SAAP)	30.3
	Salvia apiana	*Salvia apiana* Provisional (SAAP Provisional)	2.5
		Salvia apiana-Artemisia californica (SAAP-ARCA)	40.0
	Salvia mellifera	*Salvia mellifera-Eriogonum fasciculatum* (SAME-ERFA)	1.8
Herbaceous Vegetation	*Distichlis spicata*	*Distichlis spicata*-Annual Grasses (DISP-AG)	0.3
	Nassella pulchra	*Nassella pulchra* (NAPU)	1.1
	Avena (*barbata, fatua*) Semi-Natural Stands[3]	*Avena* (*barbata, fatua*) Semi-Natural Stands[3] (AVE [BA, FA] SNS)	0.8
	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands[3]	Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stands (MCNAPG SNS)	235.2
	Corethrogyne filaginifolia Provisional	*Corethrogyne filaginifolia* (COFI)	1.6
	Deinandra fasciculata Provisional	*Deinandra fasciculata* (DEFA)	3.7
Sclerophyllous, Evergreen Shrublands	*Ceanothus tomentosus*	*Ceanothus tomentosus* (CETO)	10.9
	Adenostoma fasciculatum	*Adenostoma fasciculatum-(Eriogonum fasciculatum, Artemisia californica, Salvia mellifera*) (ADFA-[ERFA, ARCA, SAME])	33.8
		Adenostoma fasciculatum-Ceanothus tomentosus (ADFA-CETO)	100.8

Group[1,2]	Alliance or Semi-Natural Stand[1,2,3]	Association or Semi-Natural Stand Type[1,2,3]	Acres
		Adenostoma fasciculatum-Lotus scoparius (ADFA-LOSC)	0.8
	Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor* (ADFA-XYBI)	5.3
		Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus tomentosus (ADFA-XYBI-CETO)	84.5
Riparian Forest	*Salix gooddingii*	*Salix gooddingii*	3.2
Upland Forests & Woodlands	*Quercus agrifolia*	*Quercus agrifolia*|*Toxicodendron diversilobum*|Grass (QUAG|TODI|Grass)	11.5
	Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia*|*Toxicodendron diversilobum*|Grass (QUEN-QUAG|TODI|Grass)	27.0
		Quercus engelmannii|*Salvia apiana* (QUEN-SAAP)	1.1
	Eucalyptus (*globulus, camaldulensis*) Semi-Natural Stands[3]	*Eucalyptus* (*globulus, camaldulensis*) Semi-Natural Stands[3] (EUC [GL, CA] SNS)	42.4
---[4]	Vernal Pools[4]	---[4] (VP)	0.5
Other[5]	Developed Areas	Urban/Developed	21.5
Total Acres			926.8[6]

[1] San Diego Vegetation Classification System for Western San Diego County (Sproul et al. 2011).
[2] Classification level reflects hierarchy used at national, state, and local levels, i.e., National Vegetation Classification (FGDC 2008), Manual of California Vegetation (MCV) (Sawyer et al. 2009), and San Diego Vegetation Classification System for Western San Diego County (Sproul et al. 2011).
[3] Nonnative species dominate Semi-Natural Stands and Stand Types.
[4] Vernal pools are not included in the San Diego Vegetation Classification System for Western San Diego County; thus we do not provide a group or association. We include vernal pools under the 'Alliance or Semi-natural Stand' column for inclusion in total Preserve acreage.
[5] Other = developed or landscaped areas; not included in San Diego Vegetation Classification, such as the ranch house and surrounding areas, roads, and trails.
[6] Total vegetation acres do not sum to 955 (total Preserve acreage) due to differences between surveyed parcel boundaries and spatial boundaries and number rounding.

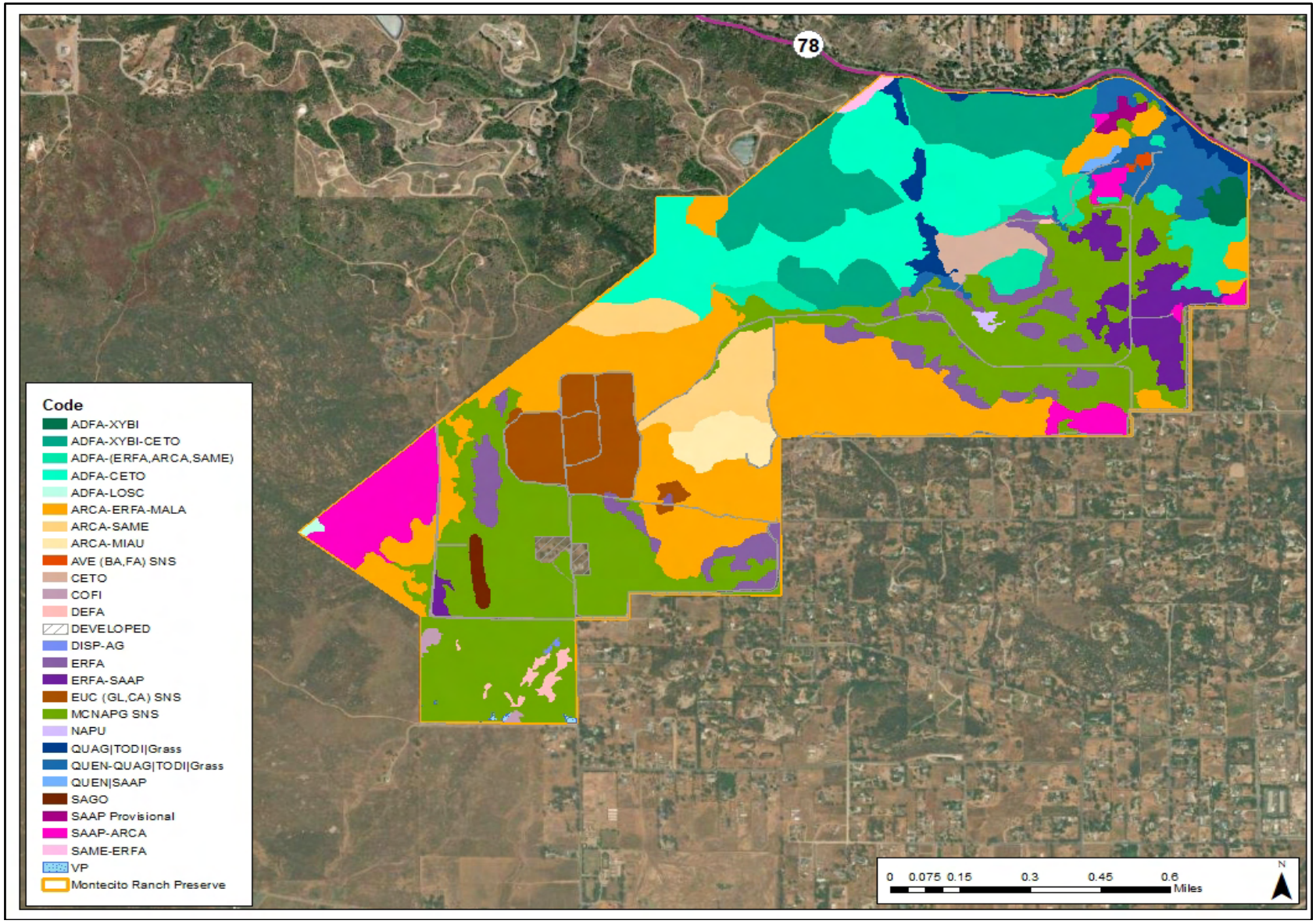

Figure B-3. Vegetation on the Montecito Ranch Preserve

Salix gooddingii

The *Salix gooddingii* Association is dominated by Goodding's black willow (*Salix gooddingii*) in the tree canopy with other riparian trees including Fremont's cottonwood (*Populus fremontii*), red willow (*S. laevigata*), and arroyo willow (*S. lasiolepis*) as subdominant trees. The shrub and herbaceous layers are open to continuous and include shrubs such as mulefat (*Baccharis salicifolia*) and coyote bush. In southern California, the *Salix gooddingii* Alliance occurs along riparian corridors at low elevations (Sproul et al. 2011).

We mapped this association in a created wetland located northeast of Montecito Way and southwest of the Preserve ranch house (Figure B-3) where it occupies 3.2 acres (0.34% of the Preserve). Goodding's black willow is the dominant tree with arroyo willow as a subdominant tree. Sandbar willow (*Salix exigua*), mulefat, and arrowweed (*Pluchea sericea*) are subdominant shrubs occurring in an open canopy. Nonnative grasses including rabbit-foot grass (*Polypogon monspeliensis*) and rattail sixweeks grass (*Festuca myuros*) comprise the understory in dry years. During wet years, the area ponds and holds water for several months.

Eucalyptus (*globulus, camaldulensis*) Semi-Natural Stand

Eucalyptus (*Eucalyptus* spp.) is a nonnative tree imported to San Diego County from Australia in the 1880s, primarily as a source of wood for railroad ties. Today, a number of eucalyptus species are found in naturalized, self-perpetuating stands throughout the County. Some of these species invade riparian habitat where they displace native species and/or create conditions that are not conducive to germination and growth of those natives. In this semi-natural stand type, eucalyptus species must account for at least 50% of the relative tree cover (Sproul et al. 2011). Two species of eucalyptus form the semi-natural stands in western San Diego County, including blue gum (*Eucalyptus globulus*) and river red gum (*E. camaldulensis*). Species of eucalyptus dominate this stand mostly excluding all other vegetation from the understory (Sproul et al. 2011).

We mapped two eucalyptus stands on the Preserve including a very large stand located north of the Preserve ranch house (Figure B-3). Both stands are dominated by species of eucalyptus. These stands occupy approximately 42.4 acres (4.57%) of onsite vegetation. This stand type typically excludes all understory vegetation; however, the stands on the Preserve support many mature coastal sage scrub shrubs including lemonade berry (*Rhus integrifolia*), California sagebrush,

California buckwheat, and black sage indicating that these areas historically supported native shrublands. Native and nonnative herbaceous species including soft-chess brome (*Bromus hordeaceus*), red brome (*B. rubens*), Mediterranean brome (*B. madritensis*), filaree (*Erodium* spp.), cryptantha (*Cryptantha* spp.), canchalagua (*Zeltnera venusta*), and wine-cup clarkia (*Clarkia purpurea* subsp. *quadrinulvera*) occur in openings between shrubs.

3.1.2 Sclerophyllous, Evergreen Shrublands

Adenostoma fasciculatum-(Eriogonum fasciculatum, Artemisia californica, Salvia mellifera)

The *Adenostoma fasciculatum–*(*Eriogonum fasciculatum, Artemisia californica, Salvia mellifera*) Association is a chaparral community with a continuous to open canopy. It is typically found in loamy soils on slopes, and may represent a stable community or an early successional, post-disturbance stage of other shrub communities. Chamise is the dominant shrub; subdominant shrubs may include scrub or chaparral species such as California sagebrush, California buckwheat, black sage, Torrey's scrub oak (*Quercus xacutidens*), Ramona lilac (*Ceanothus tomentosus*), and Eastwood manzanita (*Arctostaphylos glandulosa*), among others. The understory includes a diverse mix of native and nonnative grasses and herbs (Sproul et al. 2011).

The *Adenostoma fasciculatum–*(*Eriogonum fasciculatum, Artemisia californica, Salvia mellifera*) Association occurs in several locations in the north and central portions of the Preserve (Figure B-3). Sugarbush (*Rhus ovata*), yellow bush penstemon (*Keckiella antirrhinoides var. antirrhinoides*), Torrey's scrub oak, California buckwheat, black sage, and California sagebrush are sparse. Herbaceous species include sacapellote (*Acourtia microcephala*) and ladies' tobacco (*Pseudognaphalium californicum*). This association comprises 33.8 acres or 3.64% of the total onsite vegetation.

Adenostoma fasciculatum-Ceanothus tomentosus

The *Adenostoma fasciculatum-Ceanothus tomentosus* Assocation is dominated by a mostly continuous cover of chamise and Ramona lilac. Other dominant shrubs include laurel sumac, scrub oaks (*Quercus* spp.), manzanitas (*Arctostaphylos* spp.), sugar bush, and lilac species (*Ceanothus* spp.). Herbaceous cover and diversity are low excecpt following fire. The assocation typically occurs in sandy loams and loamy sands on south-facing slopes and hilltops (Sproul et al. 2011).

This association is the dominant chaparral assocation occuring in the northern portion of the Preserve (Figure B-3) comprising 100.8 acres or 10.88% of the total vegetation onsite. Cover of Torrey's scrub oak, mission manzanita (*Xylococcus bicolor*), bushrue (*Cneoridium dumosum*),

sugar bush, and yellow-bush penstemon is sparse. Native herbs are diverse and include wild cucumber (*Marah macrocarpa*), ropevine (*Clematis pauciflora*), rattlesnake weed (*Daucus pusillus*), California peony (*Paeonia californica*), common chickweed (*Stellaria media*), and minute flowered cryptantha (*Cryptantha micromeris*).

Adenostoma fasciculatum-Lotus scoparius

The *Adenostoma fasciculatum-Lotus scoparius* Assocation is dominated by a mostly open cover of chamise and deerweed (*Acmispon glaber* [*Lotus scoparius*]). Other co-occuring species found in low densities may include laurel sumac, California sagebrush, peak rush-rose (*Crocanthemum scoparium*), broom matchweed (*Gutierrezia sarothrae*), phacelia (*Phacelia* spp.), and bindweed (*Calystegia macrostegia*). This assocation occurs in sandy loams and loamy sands on slopes and toward hilltops and is a transitional stage to other chaparrals, usually resulting from fire or other disturbances (Sproul et al. 2011).

Less than one acre of the the *Adenostoma fasciculatum-Lotus scoparius* Assocation occurs in the far western corner of the Preserve (Figure B-3) comprising approximately 0.09% of the onsite vegetation. Chamise is dominant and deerweed is codominant with laurel sumac, California sagebrush, and California buckwheat as subdominant species. The herbeacous layer includes both native and nonnative species including common cryptantha (*Cryptantha intermedia*), filaree (*Erodium cicutarium*, *E. botrys*), tocalote (*Centaurea melitensis*), and rattail fescue.

Adenostoma fasciculatum-Xylococcus bicolor

The *Adenostoma fasciculatum-Xylococcus bicolor* Assocation is dominated by a mostly continuous cover of chamise and mission manzanita. The assocation occurs on primarily north-facing slopes in sandy loam soils. Associated shrubs include laurel sumac, sugarbush, black sage, bushrue, lilac species, chaparral yucca (*Hesperoyucca whipplei*), and scrub oaks. Many subshrub and herbaceous species occur in the openings of this assocation (Sproul et al. 2011).

This assocation is located in the northern portion of the Preserve on a northeastern facing slope (Figure B-3) comprising approximately 5.3 acres and <1% of onsite vegetation. Subdominant shrubs include yellow bush penstemon, California sagebrush, and prickly-pear (*Opuntia* spp.), among others.

Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus tomentosus

The *Adenostoma fasciculatum–Xylococcus bicolor–Ceanothus tomentosus* Association is a chaparral community with a continuous to open canopy. It occurs most often in sandy loam soils on ridgelines and slopes. The three named species occur as codominant species. Other shrubs may be codominant, as well, such as laurel sumac, chaparral whitethorn (*Ceanothus leucodermis*), toyon (*Heteromeles arbutifolia*), chaparral yucca, and black sage. The herb cover is diverse in openings and after disturbance events such as fire (Sproul et al. 2011).

The *Adenostoma fasciculatum–Xylococcus bicolor–Ceanothus tomentosus* Association is the second most dominant chaparral association onsite occurring on ridgelines and slopes in the northern portion of the Preserve (Figure B-3). Percent cover of the three codominant species varies throughout the Preserve, with chamise and mission manzanita dominating in some areas and Ramona lilac in others. Subdominant shrubs onsite include yellow bush penstemon, Torrey's scrub oak, California sagebrush, laurel sumac, sugar bush, chaparral yucca, and bushrue. Native herbs are diverse and include narrow-leaf bedstraw (*Galium angustifolium* subsp. *angustifolium*), rattlesnake weed, common chickweed, minute flowered cryptantha, and many others. This association comprises 84.5 acres or nearly 9.12% of the total vegetation onsite.

Ceanothus tomentosus

The *Ceanothus tomentosus* Association is dominated by Ramona lilac with relatively low cover of associated shrubs including scrub oak (*Quercus berberidifolia*), Torrey's scrub oak, San Diego mountain mahogany (*Cercocarpus minutiflorus*), chaparral whitethorn, and poison-oak, among others. Herbaceous cover is sparse, but diverse, increasing in diversity following fire. This association typically occurs in loamy soils on slopes (Sproul et al. 2011).

This association is dominated by Ramona lilac and occurs in the central portion of the Preserve, on north-facing slopes (Figure B-3) comprising 10.9 acres or ~1% of the total vegetation onsite. Other subdominant shrubs include hairy-leaf redberry (*Rhamnus pilosa*) and San Diego mountain-mahogany.

3.1.3 Soft-leaved, Drought-Deciduous Shrublands

Artemisia californica–Eriogonum fasciculatum–Malosma laurina Association

The *Artemisia californica–Eriogonum fasciculatum–Malosma laurina* Association is a scrub habitat that typically occurs on southern, southwestern, or southeastern exposures in sandy loam soils. The three dominant species can vary in cover, but typically comprise a relatively open shrub canopy. A number of subdominant shrubs may be present including lemonade berry, white sage, spiny redberry (*Rhamnus crocea*), and chaparral yucca, among others. This association can be either a stable community or an early transitional community as a result of fire or other disturbance (Sproul et al. 2011).

The *A. californica–E. fasciculatum–M. laurina* association is the most common scrub association on the Preserve, comprising 178.9 acres (19.31%) of the total vegetative cover. This association dominates slopes in the western and central parts of the Preserve (Figure B-3). The three dominant species account for the majority of the cover. Aside from the three dominants, we recorded the

following species: white sage, broom baccharis (*Baccharis sarothroides*), deerweed, bushrue, sawtooth goldenbush (*Hazardia squarrosa* var. *grindelioides*), and chaparral yucca. Native herbaceous species include chaparral odora (*Porophyllum gracile*), bushmallow (*Malacothamnus fasciculatus*), wishbone bush (*Mirabilis laevis* var. *crassifolia*), golden yarrow (*Eriophyllum confertiflorum* var. *confertiflorum*), common melic (*Melica imperfecta*), and fringed spineflower (*Chorizanthe fimbriata* var. *fimbriata*). Nonnative herbaceous species include tocalote, bromes (*Bromus madritensis*; *B. rubens*), slender wild oat (*Avena barbata*), and filaree, among others.

Artemisia californica-Mimulus aurantiacus Association

California sage and bush monkeyflower are codominant with a relatively open canopy. Other soft-leaved, drought deciduous shrubs including lemonade berry, California encelia, laurel sumac, California buckwheat, white sage, and others occur as subdominant species in this association. This assocation occurs primarily mid-slope on northeast and northwest facing aspects in sandy loam soils (Sproul et al. 2011).

This assocation is located in the central portion of the Preserve on a north-facing slope (Figure B-3) comprising approximately 14 acres and 1.51% of onsite vegetation. Subdominant shrubs include white sage, California buckwheat, laurel sumac, and black sage, among others. Native herbaceous species include common melic, climbing snapdragon (*Antirrhinum kelloggi*), and granny's hairnet (*Pterostegia drymarioides*). Nonnative herbaceous species cover is low, but includes tocalote and bromes, among others.

Artemisia californica-Salvia mellifera Association

California sage and black sage are codominant with a relatively open canopy. Subdominant shrubs include California encelia, laurel sumac, California buckwheat, and poison-oak, among others. This association occurs on all slope aspects, but more commonly on northern aspects, often mid-slope in sandy loam soils (Sproul et al. 2011).

This assocation is located in the central portion of the Preserve on south- and north-facing slopes (Figure B-3) comprising approximately 32.3 acres and 3.48% of onsite vegetation. Subdominant shrubs include white sage, California buckwheat, broom baccharis, and laurel sumac. Native herbaceous species include tall melic (*Melica frutescens)*, chaparral odora, broom matchweed, small-seed sandmat (*Euphorbia polycarpa*), and wishbone bush. Nonnative herbaceous species cover is low, but includes tocalote and bromes, among others

Eriogonum fasciculatum Association

The *Eriogonum fasciculatum* Association occurs on lower slopes in loam soils. California buckwheat is the dominant or codominant species in an open shrub canopy. Common subdominant shrub species include laurel sumac, bushrue, deerweed, broom baccharis, white sage, and San Diego County viguiera (*Bahiopsis laciniata*). The herb cover is typically diverse and may include

nonnative grasses and forbs. In some locations, this association may be transitional and eventually succeed to other shrub associations (Sproul et al. 2011).

We mapped this association throughout the Preserve where it comprises 41 acres and 4.40% of the total vegetative cover. This association resulted from previous agricultural practices that disturbed mature scrub vegetation in the southwestern and northeastern portions of the Preserve (Figure B-3). California buckwheat and other native shrubs, to a lesser extent, recovered in these areas or are still in a process of recovery. This association is close in species composition to the *Artemisia californica–Eriogonum fasciculatum–Malosma laurina* Association, but is noteworthy in the higher percentage of buckwheat relative to California sagebrush.

Eriogonum fasciculatum-Salvia apiana Association

California buckwheat and white sage are codominant in an open shrub canopy with California sagebrush, laurel sumac, chaparral yucca, yellow bush penstemon, and other species as subdominant shrubs. The openings support a diverse array of species including California bee plant (*Scrophularia californica*), purple needlegrass (*Stipa pulchra*), everlasting (*Pseudognaphalium* spp.), and California sand-aster (*Corethrogyne filaginifolia* var. *filaginifolia*). This association occurs on all slope aspects and most topographic positions primarily in sandy clay loams (Sproul et al. 2011).

California buckwheat and white sage are codominant on several small hilltops in the eastern portion of the Preserve (Figure B-3). Assocatied shrub diversity is very low relative to other similar onsite shrubland associations. Large openings devoid of shrubs and dominated by a low cover of nonnative and native herbaceous species occur in this association on the Preserve, possibly indicating that the vegetation may be in a process of recovery post-disturbance. This assocation comprises 30.3 acres or 3% of total onsite vegetation.

Salvia apiana Provisional Association

White sage is the domianant species in an open shrub canopy with sawtooth goldenbush, chaparral yucca, redberry, laurel sumac, California buckwheat, chamise and California sagebrush as the subdominant species. The well-developed herb layer is diverse and generally occurs in canopy openings. This association can occur in mature stable shrub communities or as an early transitional stage to other shrublands following disturbance or fire. The *Salvia apiana* Provisional Association occurs on all aspects, primarily mid-slope on sandy loams, clay loams, and clay (Sproul et al. 2011).

White sage dominates the shrub layer where this association occurs in the far northeastern portion of the Preserve where it comprises 2.5 acres and <1% of total onsite vegetation (Figure B-3). Subdominant shrubs include California sagebrush, California buckwheat, and poison-oak. The

herbaceous layer is dominated by nonnative grasses, but native herbs including rattlesnake weed, ladies' tobacco, and everlasting nest-straw (*Stylocline gnaphaloides*) occur as well.

Salvia apiana-Artemisia californica Association

White sage and California sagebrush dominate the open shrub canopy with sawtooth goldenbush, chaparral yucca, redberry, laurel sumac, and California buckwheat occuring as associated subdominant shrub species. Openings within the shrubland generally support a diverse and well-developed cover of native and nonnative herbs. This assocation can occur in mature stable shrub communities or as an early transitional stage to other shrublands following disturbance or fire. The *Salvia apiana-Artemisia californica* Association occurs mostly on northern aspects and primarily mid-slope on sandy, medium, silty, and clay loams (Sproul et al. 2011).

White sage and California sagebrush are codominant on two north facing slopes in the western and eastern portions of the Preserve (Figure B-3). Shrubs including monkeyflower, laurel sumac, poison-oak, and yellow bush penstemon are common subdominant species. Openings are generally small in size and support nonnative grasses and native forbs including common bedstraw (*Galium aparine*), blue dicks (*Dipterostemon capitatus* subsp. *capitatus*), pygmyweed (*Crassula connata*), and granny's hairnet. This assocation comprises 40 acres or 4% of total onsite vegetation.

Salvia mellifera-Eriogonum fasciculatum Association

Black sage and California buckwheat share dominance in this open shrubland community. Associated species include coyotebush, California sagebrush, laurel sumac, coast cholla (*Cylindropuntia littoralis*), and lemonade berry. Openings within shrubs support a high cover of herbaceous species. This assocation mostly occurs on top and in the middle of south facing slopes on various soil textures (Sproul et al. 2011).

This assocation occurs on a south-facing slope along the northwestern Preserve boundary adjacent to SR-78 where it comprises 1.8 acres or <1% of total onsite vegetation (Figure B-3). California buckwheat and black sage are the dominant shrubs with sugarbush, chamise, and deerweed occuring as associated species. Herb cover is low and primarily consists of nonnative grasses and forbs; however, chia (*Salvia columbariae*), small-seed sandmat (*Euphorbia polycarpa*), and fringed spineflower grow in undisturbed openings.

3.1.4 Upland Herbaceous Vegetation

Avena (*barbata, fatua*) Semi-Natural Stands

Disturbed areas dominated by species of oat (*Avena* spp.) comprise this stand, which typically occurs in waste places, rangelands, openings and type-converted scrub habitats located in Cismontane California. Species of oat dominant or codominant the herbaceous layer and shrubs

and emergent trees may be present. This stand can be found on all slope aspects topographically positioned toward the middle or bottom in sandy loams and loamy sands (Sprout et al. 2011).

Corethrogyne filaginifolia Provisional

California sand-aster is codominant to subdominant in open and stable areas adjacent to dry margins of intact native shrublands. Shrub and herb diversity is high and can include species of tarplant (*Deinandra* spp.), filaree, sand spurry (*Spergularia* spp.), lotus (*Acmispon* spp.), and others. This association occurs on northeast, northwest, and southwest slopes toward the bottom on sandy loam soils (Sprout et al. 2011).

The *Corethrogyne filaginifolia* Provisional association occurs adjacent to a vernal pool and on a slightly elevated hill in the southern portion of the Preserve where it comprises 1.6 acre (<1%) of the total vegetative cover (Figure B-3). California sand-aster is subdominant in the herbaceous layer with doveweed (*Croton setiger*) and filaree as the dominant species. Additional associated herbaceous species include fascicled tarplant (*Deinandra fasciculata*), vinegar weed (*Trichostema lanceolatum*), black mustard (*Brassica nigra*), red brome, and blue-eyed grass (*Sisyrinchium bellum*).

Deinandra fasciculata Association

Fascicled tarplant can be a codominant or conspicuous species in the herbaceous layer within a complex mosaic of shrublands with grassland and vernal pool associations. Disturbed stands of fascicled tarplant are easily replaced by nonnative grasses and forbs, and associated shrubs and herbs are highly diverse depending on the level of disturbance and adjacent vegetation associations. This association occurs on all slope aspects and most topographic positions in many soil types (Sproul et al. 2011).

The *Deinandra fasciculata* Association occurs primarily in low-lying vernal areas surrounded by, or adjacent to nonnative grasslands in the southern portion of the Preserve and one location in the northeast where it comprises 3.7 acre (<1%) of the total vegetative cover (Figure B-3). Fascicled tarplant is codominant to conspicuous with nonnative bromes (*Bromus madritensis, B. rubens, B. hordeaceus*), oat, and filaree as the dominant herbaceous species. Native herbs include winecup clarkia, ragweed (*Ambrosia psilostachya*), and doveweed.

Distichlis spicata-Annual Grasses

Saltgrass (*Distichlis spicata*) is dominant in the herbaceous canopy with nonnative grasses occurring as subdominant species. Native herbaceous species include ragweed, creeping wild rye (*Leymus triticoides*), purple needlegrass, and California sand-aster, among others. Inland locations include associated shrubs such as goldenbush (*Isocoma menziesii*), California buckwheat, and

coyotebush. The *Distichlis spicata* Association occurs on all aspects, but most commonly on southeastern slopes in middle to bottom topographic positions (Sproul et al. 2011).

The *Distichlis spicata*-Annual Grasses Association occurs in the southern portion of the Preserve where it comprises 0.3-acre (<1%) of the total vegetative cover (Figure B-3). Saltgrass is the dominant species and nonnative bromes, oat, and filaree occur as subdominant species.

Nassella pulchra Association

Purple needlegrass is codominant to sparse in the herbaceous layer of grasslands, grassland-shrubland complexes, or the Engelmann oak woodlands. Native forbs may include species of tarplant, soap plant (*Chlorogalum* spp.), gumplant (*Grindelia* spp.), brodiaea (*Brodiaea* spp.), winecup clarkia, blue dicks, and blue-eyed grass, among others. Nonnative subdominant annual species include bromes, tocalote, and broadleaf plants. The *Nassella pulchra* Association occurs primarily on northeast to northwest facing slope aspects in sandy loam soils (Sproul et al. 2011).

We mapped this association in the large grassland located in the north-central portion of the Preserve where it comprises 1.1 acres (<1%) of the total vegetative cover (Figure B-3). Native species recorded in this association include woolly-fruited lomatium (*Lomatium dasycarpum*), winecup clarkia, johnny jump-up, doveweed, saltgrass, vinegar weed, sharp-toothed sanicle (*Sanicula arguta*), blue-eyed grass, and southern checkerbloom (*Sidalcea sparsifolia*). Nonnative species include bromes, rattail sixweeks grass, tocalote, and filaree.

Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stand

The Mediterranean California Naturalized Annual and Perennial Grassland Semi-Natural Stand is a Group level classification, because it is not possible to place this assemblage in an alliance or association. We use this classification for vegetation dominated by nonnative grasses and forbs, where none of the species in a named alliance or association is clearly dominant or codominant. In other words, this is a mixed assemblage of nonnative herbaceous species. It often occurs in ruderal areas with a history of repeated soil disturbance (Sproul et al. 2011).

We mapped this stand throughout the Preserve, but primarily in the southern, central, and eastern portions (Figure B-3). It totals 235.3 acres (25%) of the vegetative cover. The southern grasslands are dominated by nonnative, annual grasses including bromes, oat, and barley (*Hordeum* spp.) and nonnative forbs including filaree, tocalote, and black mustard. Native species include ragweed, fascicled tarplant, doveweed, vinegar weed, and saltgrass. The central and eastern grasslands are

dominated by nonnative bromes, filaree, black mustard, and spring vetch (*Vicia sativa*). Native species recorded include fascicled tarplant, doveweed, charming centaury, and winecup clarkia.

3.1.5 Other Mapping Categories

Vernal Pools

The SDVC does not include vernal pools; however, we mapped basins that may function as vernal pools in 2019 and subsequently included these basins in the vegetation mapping effort. We mapped six potential vernal pools (0.5-acre or <1% of onsite vegetation), all occurring in the southern-most portion of the Preserve (Figure B-3).

All pools supported at least one vernal pool indicator species (Table B-5), four pools had three or more indicator species, and one pool supported San Diego fairy shrimp. The presence of vernal indicator plant species is only one factor used to identify a vernal pool. Further investigations into species cover, hydrology, hydroperiod, soils, and other factors are needed to definitively determine whether all mapped basins are functioning vernal pools.

Table B-5. Plant species detected in potential vernal pool basins in 2019

Species[1]	Wetland Status[2]	VP Indicator[3]	Basin[4]					
			1	2	3	4	5	6
Anthemis cotula	FACU			X				
Centromadia parryi subsp. *australis*	FACW		X	X	X		X	
Crassula aquatica	OBL	P	X	X	X			X
Croton setiger	UPL					X		X
Deinandra fasciculata	FACU						X	
Downingia cuspidata	OBL	P						X
Eleocharis macrostachya	OBL	C		X	X			X
Epilobium campestre[5]	OBL			X	X			X
Erodium cicutarium	UPL					X		
Festuca perennis	FAC	C	X	X		X	X	
Heliotropium curassavicum var. *oculatum*	FACU			X				
Hordeum murinum subsp. *glaucum*	FACU		X			X	X	
Juncus bufonius	FACW	C	X	X	X	X	X	X
Lythrum hyssopifolia	OBL	P	X		X	X	X	X
Plagiobothrys undulatus	OBL	P		X	X			X
Polygonum argyrocoleon	FAC		X		X			X
Polypogon monspeliensis	FACW	C	X					
Psilocarphus brevissimus	FACW	P	X	X	X		X	X
Rumex crispus	FAC						X	

Species[1]	Wetland Status[2]	VP Indicator[3]	Basin[4]					
			1	2	3	4	5	6
Spergularia rubra	FAC		X				X	
Veronica peregrina subsp. *xalapensis*	FAC	C	X	X			X	X

[1] Plant species nomenclature per Rebman and Simpson 2014.

[2] Wetland status is primarily per U.S. Army Corps of Engineers 2016 National Wetland Plant List for Arid Regions of the West (Lichvar et al. 2016), and Calflora 2019. Wetland status definitions:

OBL = Obligate Wetland (almost always occurs in wetlands)
FACW = Facultative Wetland. Usually occur in wetlands, but may occur in non-wetlands
FAC = Facultative (occur in wetlands and non-wetlands)
FACU = Facultative Upland (usually occur in non-wetlands, but may occur in wetlands)
UPL = Obligate Upland (almost never occur in wetlands)

[3] Per Bauder 1993: P = species occurs primarily in vernal pools in San Diego County; C = species common in vernal pools in San Diego County, but not restricted to pools.

[4] We numbered basins from east to west.

[5] Formerly *Epilobium pygmaeum.*

Urban/Developed Areas

Urban and developed areas include dirt roads, trails, and the building envelope (i.e., ranch house, barn, and landscaped and disturbed areas) (Figure B-3). The urban and developed areas are mostly devoid of native vegetation and either barren (i.e., dirt access roads) or support landscape and/or ruderal plant species, but still possess attributes suitable for wildlife usage (e.g., foraging and burrowing habitat and nesting sites). Approximately 21.5 acres or 2.32% of the Preserve fall into the urban/developed category.

3.2 Management Strategic Plan (MSP) Species

We identified twenty (20) MSP species on the Preserve through current or previous surveys efforts and an additional fourteen (14) MSP species with the potential to occur within the Preserve, based on previous studies, literature review, and data searches (Table B-6) (Figures B-4 and B-5). Other rare and sensitive plants and animals occur on the Preserve; however, we only discuss *MSP species detected on the Preserve* or species assumed to occur on the Preserve based on communication with species experts (i.e., pallid bat [*Antrozous pallidus*], Townsend's big-eared bat [*Plecotus townsendii pallescens*]) according to these management categories (SDMMP and TNC 2017):

- **SL** Species at risk of loss from Management Strategic Planning Area (MSPA)
- **SO** Species with significant occurrences at risk of loss from MSPA
- **SS** Species stable but still requires species-specific management to persist in MSPA
- **VF** Species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management
- **VG** Species not specifically managed for, but may benefit from vegetation management for VF species

Some of the species described below may require species-specific management (SL, SO, SS) or management of vegetation characteristics (VF). Refer to Artemis 2020, Helix 2010, and REC 2008a for additional information on other rare animals and plants detected on the Preserve during previous survey efforts.

3.2.1 MSP Plants

Southern tarplant. Southern tarplant is a California Native Plant Society (CNPS) List 1B.1 species (rare or endangered in California and elsewhere; seriously endangered in California). It is not federally or state listed as endangered or threatened, but is covered under the proposed North County Multiple Species Conservation Plan (NCMSCP). There are three known occurrences in San Diego County including San Dieguito Lagoon Preserve, San Dieguito River Valley, and Ramona Grasslands Preserve. REC biologists mapped the species in 2001 estimating approximately 2,340 individuals (REC 2008b). In 2019, CBI mapped the species, in and near the vernal pools in the southern part of the Preserve. Its distribution was more extensive than in 2001, which may reflect the optimal climatic conditions in 2019. CBI estimated an overall population size of 9,500 individuals (CBI 2019). CBI detected an additional ten plants in grassland habitat located in the southern portion of the Preserve and another five plants in the southeastern portion of the Preserve just north of Sonora Way in 2021 (Figure B-4).

Engelmann oak. Engelmann oak is a CNPS list 4.2 species (limited distribution in California) and covered under the San Diego Multiple Habitat Conservation Program (MHCP) and proposed NCMSCP. The species is one of the rarest oaks in San Diego County; distributed across inland valleys and foothills from the Lyon's Valley area north to the De Luz area and into Riverside County. The species has been mapped throughout the oak woodlands in the eastern portions of the Preserve and sporadically in the coastal sage scrub and oak riparian forest habitats along Clevenger Canyon (Artemis 2020). REC counted approximately 290 Engelmann oaks on the property in 2001 (REC 2008b). CBI mapped individual trees and recorded approximately 28 acres of Engelmann oak woodland during the 2020 and 2021 rapid assessment surveys (Figure B-4). Large populations are located north of the Preserve on Rancho Guejito and to the east on Mesa Grande and Santa Ysabel. Engelmann oaks are white oaks and thus resistant to goldspotted oak borer *(Agrilus auroguttatus)* (GSOB), but are susceptible to oak pit scale (*Asterolecanium* sp).

Table B-6. Detected and Potentially-occurring Management Strategic Plan (MSP) Species on the Montecito Ranch Preserve

Species	NCCP[1]	MSP Category[2]	Habitat[3]	Potential for Occurrence[4]	Source[5]
Plants					
Acanthomintha ilicifolia (San Diego thornmint)	MSCP, MHCP, NCP	SO	CHP, CSS, GL; clay, gabbro soils	Low	3, 7
Atriplex coulteri (Coulter's saltbush)	NCP	VF	CBS, CD, CSS, GL; alkaline, clay, sand	Moderate	3, 7
Atriplex parishii (Parish's brittlescale)	NCP	VF	CBS, CD, CHP, CSS, GL; playas, sand	Moderate	3, 7
Ceanothus cyaneus (Lakeside ceanothus)	MSCP	VF	CCCF, CHP, CSS	Moderate	3
Centromadia parryi ssp. australis (Southern tarplant)	NCP	VF	GL, M, S, VP	Detected	3, 4, 6
Navarretia fossalis (Spreading navarretia)	MSCP, MHCP, NCP	VF	CS, M, S, GL, VP; playas	Low	3, 7
Quercus engelmannii (Engelmann oak)	MHCP, NCP	VF	CHP, CmWld, RP, GL	Detected	1, 5, 6
Invertebrates					
Branchinecta sandiegonensis (San Diego fairy shrimp)	MSCP, NCP	SL	D, RR, VP	Detected	2
Euphyes vestris harbisoni (Harbison's dun skipper)	MHCP	SL	OW/RW	Detected	5
Streptocephalus woottoni (Riverside fairy shrimp)	MSCP, MHCP, NCP	SL	P, VP	Moderate	7
Amphibians					
Anaxyrus californicus (Arroyo toad)	MSCP, NCP	SO	R, CHP, CSS, OW, OW/RW , GL	Moderate	1
Spea hammondii (Western spadefoot toad)	MHCP, NCP	VF	CHP, CSS, GL, possibly OW, VP	Detected	3
Reptiles					
Aspidoscelis hyperythra beldingi (Belding's orange-throated whiptail)	MSCP, MHCP, NCP	VG	CHP, CSS	Detected	6, 12

Species	NCCP[1]	MSP Category[2]	Habitat[3]	Potential for Occurrence[4]	Source[5]
Crotalus ruber (Red diamond rattlesnake)	NCP	VG	CHP, CSS	Detected	3, 5
Phrynosoma blainvillii (Blainville's horned lizard)	MSCP, NCP	VF	CHP, CSS	Detected	3, 6
Thamnophis hammondii (Two-striped garter snake)	NCP	VG	OW, CHP, CSS; near water sources	Detected	3, 6
Birds					
Accipiter cooperi (Cooper's hawk)	MSCP, MHCP	VG	OW (nesting); entire property (foraging)	Detected	1
Ammodramus savannarum perpallidus (Grasshopper sparrow)	NCP	VF	GL	High	7
Aquila chrysaetos canadensis (Golden eagle)	MSCP, MHCP, NCP	SO	CHP, CSS, GL (foraging)	Detected	3, 9
Artemisiospiza belli belli (Bell's sparrow)	MHCP, NCP	VF	CHP, CSS	Detected	1, 3, 5
Athene cunicularia hypugaea (Western burrowing owl)	MSCP, NCP	SL	GL, rodent burrows	Moderate	3
Buteo regalis (Ferruginous hawk)	MSCP	VG	GL	Detected	10
Circus cyaneus (Northern harrier)	MSCP, NCP	SO	CSS (open), GL (foraging)	Detected	1, 6
Haliaeetus leucocephalus (Bald eagle)		VG		Detected	11
Polioptila californica californica (Coastal California gnatcatcher)	MSCP, MHCP, NCP	VF	CSS	Detected	1, 3, 6
Sialia mexicana (Western bluebird)	MSCP, MHCP	VG	OW/GL	Detected	1
Mammals					
Antrozous pallidus (Pallid bat)	NCP	SL	CmWld, CSS, GL; outcrops, cliffs, mines, buildings, bridges	High	7

Species	NCCP[1]	MSP Category[2]	Habitat[3]	Potential for Occurrence[4]	Source[5]
Chaetodipus fallax fallax (Northwestern San Diego pocket mouse)	MHCP	VG	Sparse or open CHP, CSS, GL; sandy soils	Detected	8
Dipodomys stephensi (Stephens' kangaroo rat)	MHCP, NCP	SO	Sparse or open CSS, GL, DH; sandy soils	Detected	3, 6
Lepus californicus bennettii (San Diego black-tailed jackrabbit)	MHCP, NCP	VF	CHP (open), CSS (open), GL	Detected	1, 3, 6
Odocoileus hemionus fuliginata (Southern mule deer)	MSCP, MHCP	SS	OW, CHP, CSS, GL	Detected	1
Plecotus townsendii pallescens (Townsend's big-eared bat)	NCP	SO	OW/RW (foraging); caves (roosting), open surface water, buildings	High	7
Puma concolor (Mountain lion)	MSCP, MHCP, NCP	SL	Riparian corridors and adjacent uplands	High	7
Taxidea taxus (American badger)	MSCP, NCP	SL	CHP (open), CSS (open), GL	High	1, 3

[1] NCCP = Natural Community Conservation Plan: MSCP = San Diego Multiple Species Conservation Program, MHCP = San Diego Multiple Habitat Conservation Program, NCP = Proposed North County Program.

[2] Management Strategic Plan (MSP) management category: SL = species at risk of loss from Management Strategic Plan Area (MSPA); SO = species with significant occurrences at risk of loss from MSPA; SS = species stable but still requires species-specific management to persist in MSPA; VF = species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management; VG = species not specifically managed for, but may benefit from vegetation management for VF species. Note that VG species are included in this table but are not a MSP management priority.

[3] Habitat: CBS = coastal bluff scrub, CD = coastal dunes, CCCF = closed-cone coniferous forests, CHP = chaparral, CmWld = cismontane woodland, CSS = coastal sage scrub; GL = grassland, D = ditches, DH = disturbed habitat with low plant cover, M = marshes, OW = oak woodland, P = ponds, R = riparian, RR = road ruts, RW = riparian woodland, S = swamps, OW/RW = Oak/riparian woodland, OW/GL = oak woodland/grassland, VP = vernal pools.

[4] Detected = species detected onsite; High = species has a high potential for occurrence due to suitable habitat and/or known occurrence in the vicinity, Moderate = species has a moderate potential for occurrence due to suitable habitat, Low = species has a low potential for occurrence due to lack of suitable habitat.

[5] Source: 1 = Artemis Environmental Services, Inc. 2020. Baseline report for Montecito Ranch. San Diego, California. Prepared for Endangered Habitats Conservancy; 2 = Asmus, J. 2019. Report of fairy shrimp survey on Montecito Ranch. TE 69046B-0; 3 = California Department of Fish and Wildlife (CDFW). 2020. California Natural Diversity Database (CNDDB). Rarefind Database Program. Version 5.2.14. October; 4 = Conservation Biology Institute (CBI). 2019. Montecito Ranch vernal pool and rare plant assessment. Prepared for Endangered Habitats Conservancy; 5 = Dudek and Associates, Inc. (Dudek). 1997. Revised biological resources report and impact analysis for Montecito Ranch San Diego County, California; 6 = REC Consultants, Inc. (REC). 2008. Montecito Ranch biological technical report, TM5250 Prepared for Montecito Ranch LLC. February; 7 = San Diego Management and Monitoring Program (SDMMP). 2020. Advanced GIS viewer. https://sdmmp.com/gis_viewer.php.; 8 = SJM Biological Consulting (SJM). 2019. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat (*Dipodomys stephensi*) at the Montecito Ranch property, Ramona, California. 9. Beck, M. 2021. San Diego Director, Endangered Habitats League & President, Endangered Habitats Conservancy Personal communication with Jessie Vinje. January. 10. iNaturalist observation. 2018. February. 11. AECOM 2014. Ramona Grasslands Preserve Raptor Surveys Summary Report. Prepared for County of San Diego Department of Parks and Recreation. 12. Wolf, Mary Beth. 2021. United States Fish and Wildlife Biologist. Personal communication with Jessie Vinje. November.

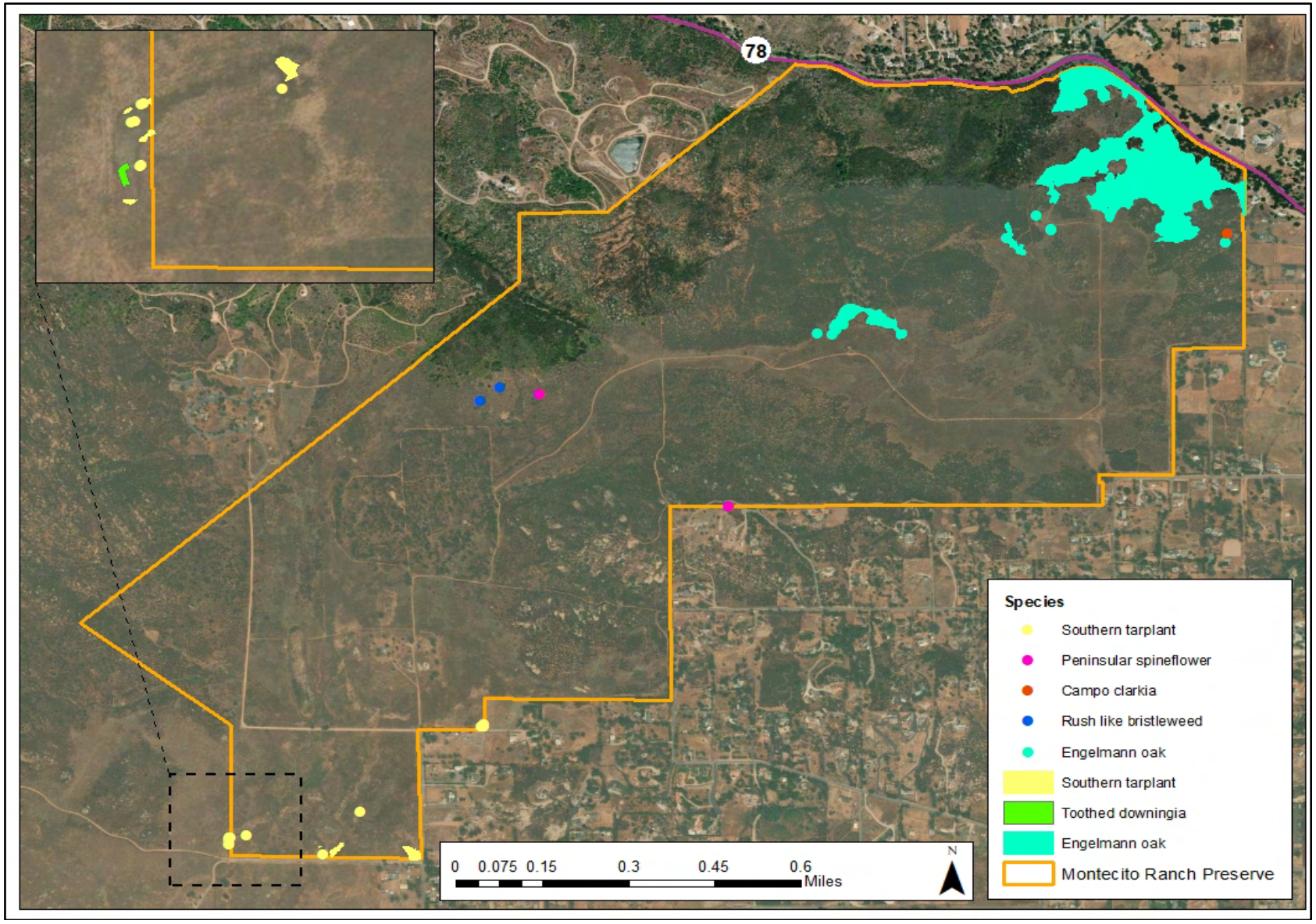

Figure B-4. Rare Plants on the Montecito Ranch Preserve

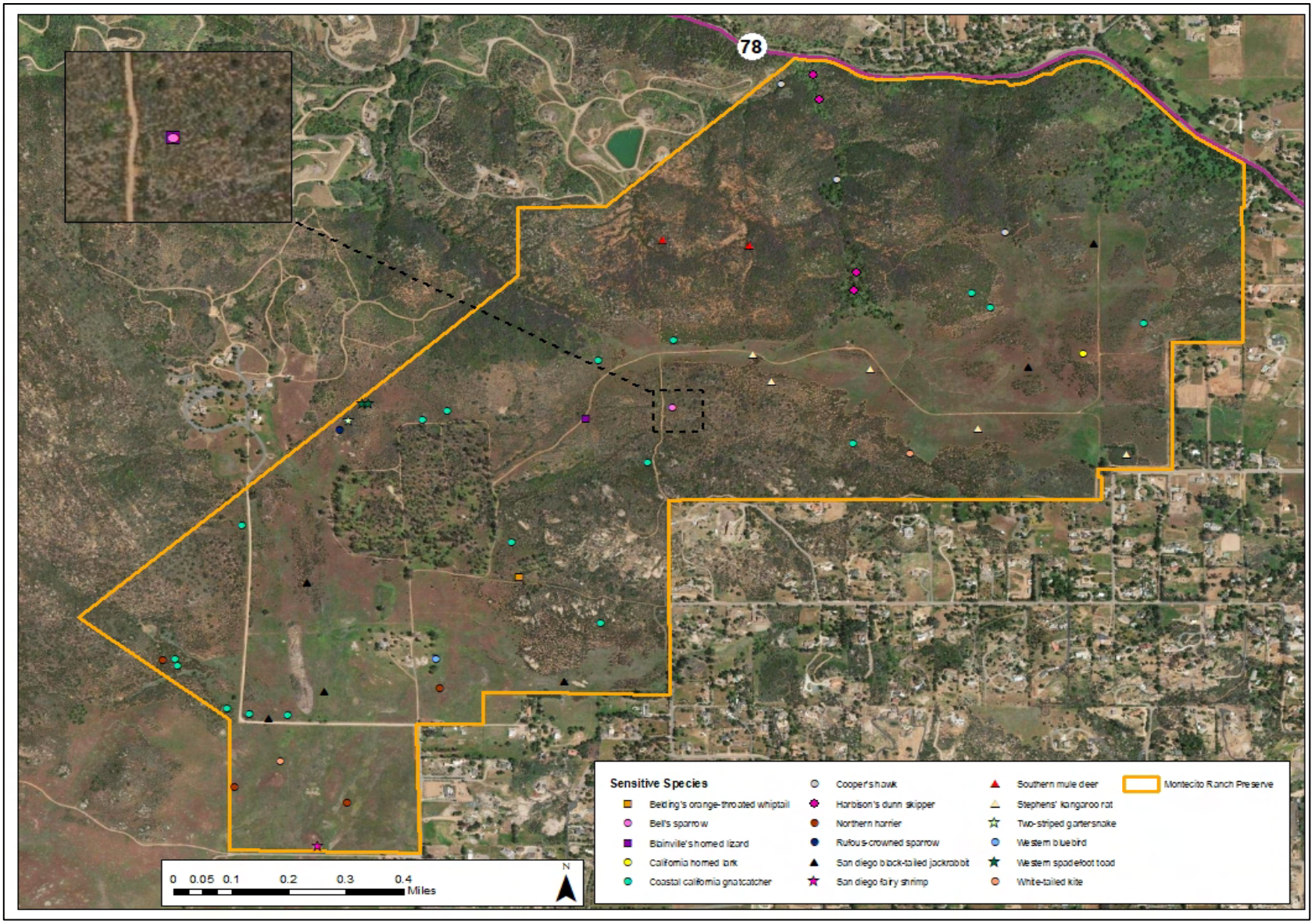

Figure B-5. Rare Animals on the Montecito Ranch Preserve

3.2.2 MSP Animals

San Diego fairy shrimp. San Diego fairy shrimp is a federally endangered species and covered under the MSCP and the proposed NCMSCP. San Diego fairy shrimp is found throughout vernal pools in the Ramona area (CBI 2004, TAIC and EDAW 2005). Preferring cooler temperatures, San Diego fairy shrimp is primarily a coastally distributed species (Hathaway and Simovich 1996); however, the species does occur throughout vernal pools in the Ramona grasslands. The Ramona grassland pools represent the most northern-interior occupied vernal pools in the MSCP. Surveys from the early 2000s failed to locate this species on the Preserve; however, surveys in 2019 did detect this species in one vernal pool located in the southwestern portion of the Preserve (Asmus 2019, REC 2008b) (Figure B-5). A second vernal pool may also support the species based on the presence of larval fairy shrimp (Asmus 2019).

Harbison's dun skipper. Harbison's dun skipper is not currently listed as threatened or endangered but is covered under the MHCP. San Diego sedge (*Carex spissa*) is the host plant for skipper larvae. Dudek & Associates located a substantial population of Harbison's dun skipper in the large riparian woodland located in the north-central portion of the Preserve in 1997 (Figure B-5). REC did not relocate this species during biological surveys conducted in 2001 (REC 2008b) and CBI did not detect San Diego sedge in two of three locations in the riparian woodland where Dudek & Associates located skipper in 1997. The closest known Harbison's dun skipper populations are in Boden Canyon to the north. Researchers located low numbers of skippers at Lake Hodges and Boden Canyon in 2017 (Marshalek 2020). Wildfires have likely caused local extirpations of this taxon, including the San Pasqual Academy site to the west (MSP Strategic Conservation Roadmap Vol 2D). The 2007 Witch fire burned through the population location on the Preserve, as well as Boden Canyon to the north. This fire and subsequent erosion may have killed or washed away San Diego sedge from the drainage that originally supported it.

Pallid bat. Pallid bat is a California Species of Special Concern. Pallid bats have a limited distribution on the western slopes of San Diego County because grassland, a primary foraging habitat, is very limited in the county. A local bat biologist is very concerned about pallid bats since the species has suffered a range contraction and probable decline in southern California (Stokes pers. comm.). Pallid bats occur at the Ramona Grasslands and likely forage on the Preserve due to close proximity with the Ramona Grasslands (Stokes pers. comm.).

Western spadefoot toad. Western spadefoot toad is a California Department of Fish and Wildlife (CDFW) Species of Special Concern and covered under the MHCP and proposed NCMSCP. It uses ephemeral aquatic habitats such as vernal pools for breeding and spends much of its time estivating in upland burrows. Western spadefoot has been documented across San Diego County, including a number of records from vernal pools in the Ramona Grasslands Preserve. Biologists observed an unknown number of spadefoot toads in 1998 on the western boundary of the Preserve in disturbed coastal sage scrub (CDFW 2020) (Figure B-5). Vernal pools on the property have not

been surveyed for western spadefoot since surveys in the early 2000s; however, the Navy identified potential spadefoot tadpoles in one Preserve vernal pool during fairy shrimp surveys.

Belding's orange-throated whiptail. Belding's orange-throated whiptail is a CDFW Watch List species and covered under the MSCP, MHCP, and the NCMSCP. USFWS staff observed this species on the Preserve in 2021 east of the eucalyptus grove (Figure B-5).

Red diamond rattlesnake. Red-diamond rattlesnake is a CDFW Species of Special Concern and a covered species under the proposed NCMSCP. Its distribution is poorly known but biologists have documented it from the San Diego Zoo Safari Park (Rochester 2001) and the Preserve in 1997 (REC 2008b). Biologists did not locate the species during 2020 or 2021 surveys.

Blainville's horned lizard. Blaineville's horned lizard is a CDFW species of special concern and a covered species under the MSCP and proposed NCMSCP. The species is threatened by loss of habitat and invasion of habitat by Argentine ants (*Linepithema humile*), which displace native ants that comprise the horned lizard's diet. The species is distributed across San Diego County and records exist from the Ramona Grasslands Preserve to the west and Boden Canyon to the north. REC detected two Blaineville's horned lizard in coastal sage scrub habitat during 2001 surveys (REC 2008b) and EHC observed one individual in 2021 (Manzuk 2021) (Figure B-5).

Two-striped garter snake. Two-stiped garter snake is a CDFW Species of Concern and covered under the proposed NCMSCP. It is a riparian species that hunts in aquatic habitats and has been documented along drainages in many parts of San Diego County, including Santa Ysabel Creek at the mouth of Boden Canyon. REC biologists observed the species in 2001 in coastal sage scrub habitat on the Preserve (REC 2008b) (Figure B-5).

Cooper's hawk. Cooper's hawk is not federally or state-listed, but is a CDFW Watch List bird and covered under the MSCP. The species prefers mature oak and riparian woodlands; however, Cooper's hawk is widely distributed in San Diego County and has adapted well to suburban areas with mature trees (Unitt 2012). Biologists observed Cooper's hawk on the Preserve during 2020 surveys and the 2021 CBI rapid assessments (Artemis 2020) (Figure B-5).

Bald eagle. Bald eagle is federally protected under the Bald Eagle Protection Act and is a California Fully Protected Species. It is considered a rare winter visitor to San Diego County, generally associated with reservoirs such as Lake Henshaw (Unitt 2012). A pair of bald eagles has nested in eucalyptus trees near the Ramona Airport and used the Ramona Grasslands, including Montecito Ranch, year-round (AECOM 2014). While bald eagles are thought to rely on fish from reservoirs and coastal lagoons, AECOM documented them foraging on ground squirrels in the Ramona Grasslands (AECOM 2014).

Bell's sage sparrow. Bell's sage sparrow is not federally or state listed, but is a CDFW Watch List bird and covered under the proposed NCMSCP. Bell's sage sparrow is resident to central San Diego County where it uses open chaparral and sage scrub habitats and is now largely absent from

highly developed coastal areas (Unitt 2012). Artemis observed several individuals in the central portion of the Preserve during 2020 field surveys and biologists also observed the species in 1997 (Artemis 2020, REC 2008b) (Figure B-5).

Ferruginous hawk. Ferruginous hawk is not federally or state listed, but is covered under the MSCP. Ferruginous hawk is an uncommon winter visitor to San Diego County, using open grassland habitats generally in interior areas (Unitt 2012). The largest numbers of individuals in the County are typically found in the Warner Valley-Lake Cuyamaca area, and Ramona Grasslands Preserve area. An iNaturalist observer photographed a ferruginous hawk flying over the Preserve in 2018. Ferruginous hawk observations also occur in the Ramona Grasslands (iNaturalist 2018).

Northern harrier. Northern harrier is not federally or state-listed, but is covered under the MSCP and the proposed NCMSCP. While known to breed in San Diego County, it is more abundant in winter and is still generally uncommon (Unitt 2012). The San Diego Bird Atlas Project documented moderate numbers (0.10-0.25 birds per hour) in the Ramona Grassland Preserve area (Unitt 2012). Artemis and CBI biologists observed foraging individuals in the south and southwestern portions of the Preserve during 2020 and 2021 field surveys and rapid assessments (Artemis 2020), in addition to earlier detections by REC (2008b) (Figure B-5). Northern harriers use moderate to dense grassland and wetland vegetation for nesting and foraging (Dechant et al. 2002).

Golden Eagle. Golden eagle is listed as a fully protected species in California and covered under the MSCP, MHCP, and the proposed NCMSCP. Michael Beck observed one golden eagle perched on a fence post on Montecito Ranch in the early 2000's (Beck pers. comm.). AECOM documented year-round golden eagle use of the Ramona Grasslands Preserve, and while only a limited portion of Montecito Ranch was included in that study, golden eagles were documented using Montecito Ranch (AECOM 2014). United States Geological Survey has tracked golden eagles using biotelemetry data and determined that several golden eagles have flown over or very near to Montecito Ranch (Tracey et al. 2017). Montecito Ranch occurs in Management Unit (MU) 5 and there are two active nesting territories in this MU; both on private property (SDMMP and TNC 2017). The foraging territories for the eagles in these two territories likely overlap with Montecito Ranch.

Coastal California gnatcatcher. Coastal California gnatcatcher is federally threatened, a CDFW species of special concern, and covered under the MHCP, MSCP and the proposed NCMSCP. The species is distributed throughout coastal sage scrub habitat in coastal San Diego County. There are a number of records from the Ramona Grasslands Preserve and habitat surrounding Ramona (e.g., San Pasqual Valley, Boden Canyon, Mt Gower, Lake Poway). Biologists observed several individuals and pairs throughout the Preserve during 2020 field surveys and REC observed four family groups and two pair during 2001 surveys (Artemis 2020, REC 2008b). CBI observed several individuals and pairs during 2020 and 2021 rapid assessment surveys (Figure B-5).

Western bluebird. Western bluebird is covered under the MHCP and MSCP. The species nests in tree cavities in oak woodlands in interior San Diego County (Unitt 2012). Western bluebird will make use of nonnative trees and structures that provide cavities and appears to be expanding into previous unoccupied urban and suburban areas (Unitt 2012). During 2020 field surveys biologists observed one individual within the eucalyptus tree near the Montecito Ranch house (Artemis 2020) (Figure B-5).

Northwestern San Diego pocket mouse. Northwestern San Diego pocket mouse is a CDFW species of special concern and covered under the MHCP. Although its distribution in San Diego County is not well-documented, it occurs in arid coastal and desert border areas where it utilizes coastal sage scrub, chaparral, sagebrush, and grassland habitats. Several pocket mice were trapped and observed during a 2018 Stephens' kangaroo rat survey (SJM Consultants 2019).

Stephens' kangaroo rat. Stephens' kangaroo rat is currently listed as federally endangered and state threatened; however, United States Fish and Wildlife Service (USFWS) proposed to down-list the species to threatened on August 19, 2020. The southernmost known population occurs in the Ramona Grasslands. In 2015 Steve Montgomery trapped SKR on the Ramona Grasslands Preserve approximately 100 yards from the southwestern corner of Montecito Ranch and in 2018 he conducted surveys on Montecito Ranch for SKR (SJM Consulting 2015, SJM Biological Consultants 2019). Dr. Philip Behrends surveyed the Preserve for Stephens' kangaroo rat in 1998 and identified six Stephens' kangaroo rats in the eastern portion of the Preserve based on morphological measurements (Dudek 1998) (Figure B-5). O'Farrell Biological Consulting and SJM Consulting resurveyed the Preserve in 2001, 2007, and 2018, respectively, but did not relocate the species (REC 2008b, SJM Consulting 2019, Artemis Environmental 2020). In 2001, California State University, San Bernardino conducted genetic analysis on six kangaroo rats from the Preserve and identified these rats as Dulzura kangaroo rats (*Dipodomys simulans*). The distribution of Stephens' kangaroo rat is extremely limited in the Ramona Grasslands and the species exhibits an "uncharacteristic lack of colonizing surrounding areas that are suitable, "particularly west of Rangeland Road" based on studies conducted by Dr. O'Farrell (REC 2008b). Dr. O'Farrell concluded Preserve habitat was marginal at best, surrounded by inappropriate habitat for the species, and that Stephens' kangaroo rat was never present on Montecito Ranch (REC 2008b). However, other Stephens' kangaroo rat experts (Dr. Wayne Spencer and Steve Montgomery) have reviewed Behrend's field notes and believe that Dr. Philip Behrends did indeed trap Stephens' kangaroo rat on the Preserve in 1998. Extensive agriculture cultivation and discing of all potential Stephens' kangaroo rat habitat on the property following Behrend's 1998 surveys may have extirpated the species from the Preserve, and removal of livestock and changes in grassland habitat quality may have prevented their recolonization.

Townsend's big-eared bat. Townsend's big-eared bat is a California Species of Special Concern. It is widely distributed in western North America and uses a wide range of habitats across a broad elevational range. Populations are known from across San Diego County, including the Ramona

Grasslands and even though this species has a broader distribution in San Diego County, their populations are small (Stokes pers. comm.). It is a colonial species, with maternity colonies forming, often in mines in San Diego County, between March and June. The species roosts in boulders and large rock outcroppings and uses winter hibernacula and likely occurs on the Preserve based on foraging and roosting habitat (Stokes pers. comm.).

San Diego black-tailed jackrabbit. San Diego black-tailed jackrabbit is a CDFW species of special concern and covered under the MHCP and proposed NCMSCP. The species requires short grass and open scrub habitats. San Diego black-tailed jackrabbit ranges throughout San Diego County but its distribution is poorly documented. For example, the SDMMP database does not include records of San Diego black-tailed jackrabbit in MU 5; however, biologists have observed individuals during all survey events conducted between 1997 and 2021 (Artemis 2020, REC 2008b). CBI observed several individuals in the southern portion of the Preserve during the 2020 and 2021 rapid assessment surveys (Figure B-5). Recent concerns over the detection of Rabbit Hemorrhagic Disease Virus Type 2 in San Diego County and its effects on jackrabbits prompted EHC to implement best management practices (i.e., 10% bleach and water solution applied to shoes and vehicle tires) before entering the Preserve.

Southern mule deer. Southern mule deer are covered under the MHCP and MSCP. Recent genetic studies identified two major genetic groups in north San Diego County: Central Coast (Penasquitos/Miramar – Carlsbad) and the rest of the County northward into the Santa Ana Mountains, with mixing identified between the populations (Bohanak and Mitelberg 2014, Mitelberg et al. 2020). There are no genetic samples from the Ramona Grasslands Preserve area, but the area is expected to support primarily the interior and north-coastal San Diego genotype. Biologists observed the highest concentrations of mule deer scat and tracks in the north, northwestern, and western portions of the Preserve during the 2020 field surveys (Artemis 2020) and 2021 rapid assessments conducted by CBI (Figure B-5). Movement through Clevenger Canyon and Bandy Canyon to San Pasqual Valley and across State Route 78 to Boden Canyon is likely, but movement to the south is difficult due to extensive residential development.

3.3 General Plant and Wildlife Species

Although we did not conduct comprehensive plant or animal surveys on the Preserve, we did record species during the rapid assessment and vernal pool survey efforts and those species observed by EHC staff. Rapid assessment surveys occurred during a drought year, primarily in fall and winter, thus species sightings are much lower than expected. Nonetheless, these sightings form the basis of preliminary species lists (Appendix B.1, B.2). We expect that land managers, biologists, and researchers will add to these lists over time. Previous survey efforts produced additional species lists (i.e., Artemis 2010, Helix 2010, REC 2008b); however, we have not verified presence of all species included on those lists, thus we exclude them from Appendix B.1 and B.2.

3.4 Invasive Plants

We mapped 31 invasive or ornamental plants within the Preserve during rapid assessment surveys (Table B-7, Figure B-6, B-7): 7 'high priority' species, 14 'other priority' species, and 10 'lower priority and ornamental' species. Figure B-8 includes photographs of several 'other' and 'lower' priority species on the Preserve.

Rapid assessment surveys focused on invasive species recognized as threats at the state- and regional levels (Cal-IPC 2006, CBI et al. 2012), although we did search for EDRR species identified as a concern in the county after IPSP development. High priority species are included in the IPSP and are a high priority for management in the region. Other priority species are listed by the California Invasive Plant Council (Cal-IPC) as invasive or potentially invasive. We mapped other (low priority) plants where they potentially impact MSP species and habitats or pose a risk to Preserve infrastructure or other resources. Refer to Appendix B-3 for attribute data for IPSP species and other invasive species. Appendix B.1 lists all nonnative, invasive or ornamental species documented on the Preserve during rapid assessment surveys; Table B-8 provides a Watch List for EDRR and additional invasive plants that would be a concern if detected on the Preserve.

3.5 Invasive Animals

We did not survey specifically for invasive animal species. Argentine ants (*Linepithema humile*) occur throughout urban San Diego County, and conserved lands bordering urban areas and riparian corridors are at greatest risk of infestation (SDMMP and TNC 2017). The EHC land manager observed wild turkeys (*Meleagris gallopavo)* onsite in the southern grassland. Coast live oak trees are susceptible to several types of oak borers, including GSOB, while California sycamores and coast live oaks are susceptible to Kuroshio shot hole borer (*Euwallacea* sp.) (KSHB) + Fusarium dieback. The Preserve lies within the Zone of Influence in San Diego County for the GSOB (Cal Fire 2016). The nearest reported detections of the KSHB were from trees located in eastern Escondido (UCANR 2016a). Engelmann oaks on the Preserve are susceptible to oak pit scale. EHC staff have monitored selected coast live and Engelmann oaks, willow, and California sycamore trees within the Preserve for GSOB, KSHB, and oak pit scale and to date, have not detected their presence.

3.6 Preserve Stewardship Issues

We identified and mapped management issues in the following stewardship categories during rapid assessment surveys: altered hydrology, access control, erosion, dumping/trash, edge effects, invasive animals, and one uncategorized issue (i.e., 'other') (Figure B-9).

Altered hydrology occurs in the far western corner of the Preserve where an old earthen reservoir and small concrete dam modify the flow. A well is located on the Preserve, but its location is unknown. Access control issues include downed and damaged barbed wire, damaged boundary fencing, and locations where signage should display Preserve information and fencing and gates installed and fencing repaired to prevent unauthorized entry. We mapped erosion along roads and in drainages. Trash is scattered throughout the site, and includes items such as downed and rusted barbed wire fence, PVC pipe, corrugated steel, a steel table, landscape clippings, and farming equipment and materials. We used criteria in Table B-9 to prioritize trash for removal. Edge effects include vandalism, unauthorized clearing, and fuel breaks. Figures B-10 through B-12 depict representative photographs of stewardship issues; Appendix B.4 lists all attributes for stewardship issues.

3.7 Connectivity

Conservation of Montecito Ranch will expand the Ramona Grasslands core area and augment the northern coastal sage scrub buffer (CBI 2004) within MSCP Core L. However, the Ramona Grasslands are largely isolated from other grasslands in the region (e.g., Rancho Guejito in Core D), except through other non-grassland habitat connections. Onsite sage scrub, chaparral and oak woodland are well-connected to similar habitats in the San Pasqual Valley in the western portion of Core L and the block of habitat surrounding Boden Canyon to the north via Bandy Canyon and Clevenger Canyon in Core D. SR-78 may pose a crossing obstacle for some species including southern mule deer and mountain lion since most of the northern Preserve boundary consists of steep cut slopes preventing safe highway crossings.

Connectivity from the Ramona Grasslands Preserve and the Preserve to Mt. Woodson/Blue Sky Ranch Ecological Preserve to the southwest in Core D is likely compromised by rural residential and agricultural development. Small oak lined drainages may facilitate movement of some species from the Ramona Grasslands Preserve through rural residential development into conserved lands to the southwest. The Preserve provides high quality habitat for resident wildlife species, as well as species with small home territories that extend beyond Preserve boundaries. The onsite road and trail network fragments habitat patches to some degree, but does not appear to restrict internal movement for most wildlife species.

Table B-7. Invasive Plant Species on the Montecito Ranch Preserve

Scientific Name[1]	Common Name[1]	Invasive Plant Ranking[2]	
		IPSP	Cal-IPC
IPSP Priority Species[3]			
Management Level 3[4]			
Arundo donax	Giant reed	Very High	High
Cynara cardunculus	Artichoke thistle	Very High	Moderate
Lepidium latifolium	Perennial pepperweed	Very High	High
Oncosiphon pilulifer	Stinknet	Medium	High
Management Level 4[4]			
Dittrichia graveolens	Stinkwort	High	Moderate – Alert
Foeniculum vulgare	Fennel	Very High	Moderate
Silybum marianum	Milk thistle	High	Limited
Other Priority Invasive Species[5]			
Ailanthus altissima	Tree-of-heaven	---	Moderate
Anthemis cotula	Mayweed chamomile	---	
Asphodelus fistulosus	Onion weed	---	Moderate
Brassica tournefortii	Sahara mustard	---	High
Carduus pycnocephalus	Italian thistle	---	Moderate
Cirsium vulgare	Bull thistle	---	Moderate
Nicotiana glauca	Tree tobacco	---	Moderate
Olea europaea	Olive	---	Limited
Phoenix canariensis	Canary Island Palm	---	Limited
Ricinus communis	Castor bean	---	Limited
Schinus molle	Peruvian pepper tree	---	Limited
Stipa miliacea var. *miliacea*	Smilo grass	---	Limited
Tamarix aphylla	Athel	---	Limited
Tamarix sp.[6]	Salt cedar	---	High[6]
Lower Priority Species			
Brahea sp.	Palm	---	---
Calocedrus decurrens	Western incense cedar	---	---

Scientific Name[1]	Common Name[1]	Invasive Plant Ranking[2]	
		IPSP	Cal-IPC
Catalpa speciosa	Western catalpa	---	---
Eucalyptus sp.	Eucalyptus	---	---
Juglans sp.	Walnut	---	---
Opuntia fiscus-indica	Prickly pear	---	---
Opuntia robusta	Wheel cactus	---	---
Parkinsonia sp.	Palo verde	---	---
Pinus sp.	Pine	---	---
Washingtonia filifera	California palm	---	---

[1] Species nomenclature generally follows Rebman and Simpson 2014.
[2] Invasive Plant Ranking:
IPSP = San Diego Invasive Plant Strategic Plan; rankings indicate regional management priority based on regional (versus Cal-IPC) Plant Assessment Form (PAF) score and management feasibility (CBI et al. 2012).
Cal-IPC: California Invasive Plant Council; rankings indicate statewide priority based on Cal-IPC PAF score (Cal-IPC 2006): **High** = Severe ecological impacts, **Moderate** = Substantial and apparent—but generally not severe—ecological impacts, **Limited** = Invasive but ecological impact minor statewide or not enough information to justify a higher score; species may be locally persistent and problematic.
[3] IPSP species = priority invasive species for mapping during rapid assessment field surveys.
[4] Management Levels per regional Invasive Plant Strategic Plan (IPSP) (CBI et al. 2012): **Management Level 3** – Containment: eradication with coordinated programs by management unit or watershed. **Management Level 4** – Directed Management: control within reserve or sub-management unit to benefit NCCP resources.
[5] Other invasive species = invasive species not included in the IPSP but recognized as invasive or potentially invasive by Cal-IPC.
[6] We have not identified the species of *tamarisk*. Cal-IPC rankings for *T. chinensis*, *T. gallica*, *T. parviflora*, and *T. ramosissima* are all high.

Table B-8. Invasive Plant Watch List

Scientific Name	Common Name
Early Detection Rapid Response Species[1]	
Acroptilon repens	Russian knapweed
Aegilops triuncialis	Barb goatgrass
Ageratina adenophora	Eupatory
Agrostis avenacea	Pacific bentgrass
Carrichtera annua	Ward's weed
Carthamus creticus	Smooth distaff thistle
Centaurea solstitialis	Yellow starthistle
Centaurea stoebe ssp. *micranthos*	Spotted knapweed

Scientific Name	Common Name
Chrysanthemoides monilifera	Boneseed
Elymus caput-medusae	Medusahead
Enchylaena tomentosa	Ruby saltbush
Euphorbia terracina	Carnationweed
Euphorbia virgata	Leafy spurge
Genista monosperma	Bridal broom
Genista monspessulana	French broom
Hypericum canariense	Canary Island St. John's wort
Limonium duriusculum	European sea lavender
Limonium ramosissimum	Algerian sea lavender
Lythrum salicaria	Purple loosestrife
Myoporum acuminatum	Strichnine bush
Oncosiphon piluliferum	Stinknet
Parthenium hysterophorus	Santa Maria feverfew
Pentameris airoides subsp. *airoides*	False hair-grass
Senecio quadridentatus	Cotton burnweed
Sesbania punicea	Rattlebox
Spartium junceum	Spanish broom
Volutaria tubuliflora	Volutaria knapweed
Additional Invasive Species[2]	
Cortaderia selloana	Pampasgrass
Cytisus scoparius	Scotch broom
Ehrharta calycina	Purple veldtgrass
Ehrharta longiflora	Long-flowered veldtgrass
Emex spinosa	Devil's thorn
Melinis repens	Natal grass

[1] Per Giessow 2019; includes primarily species that are active EDRR targets.
[2] Includes widely distributed invasive species that have some potential to occur on the Montecito Ranch Preserve.

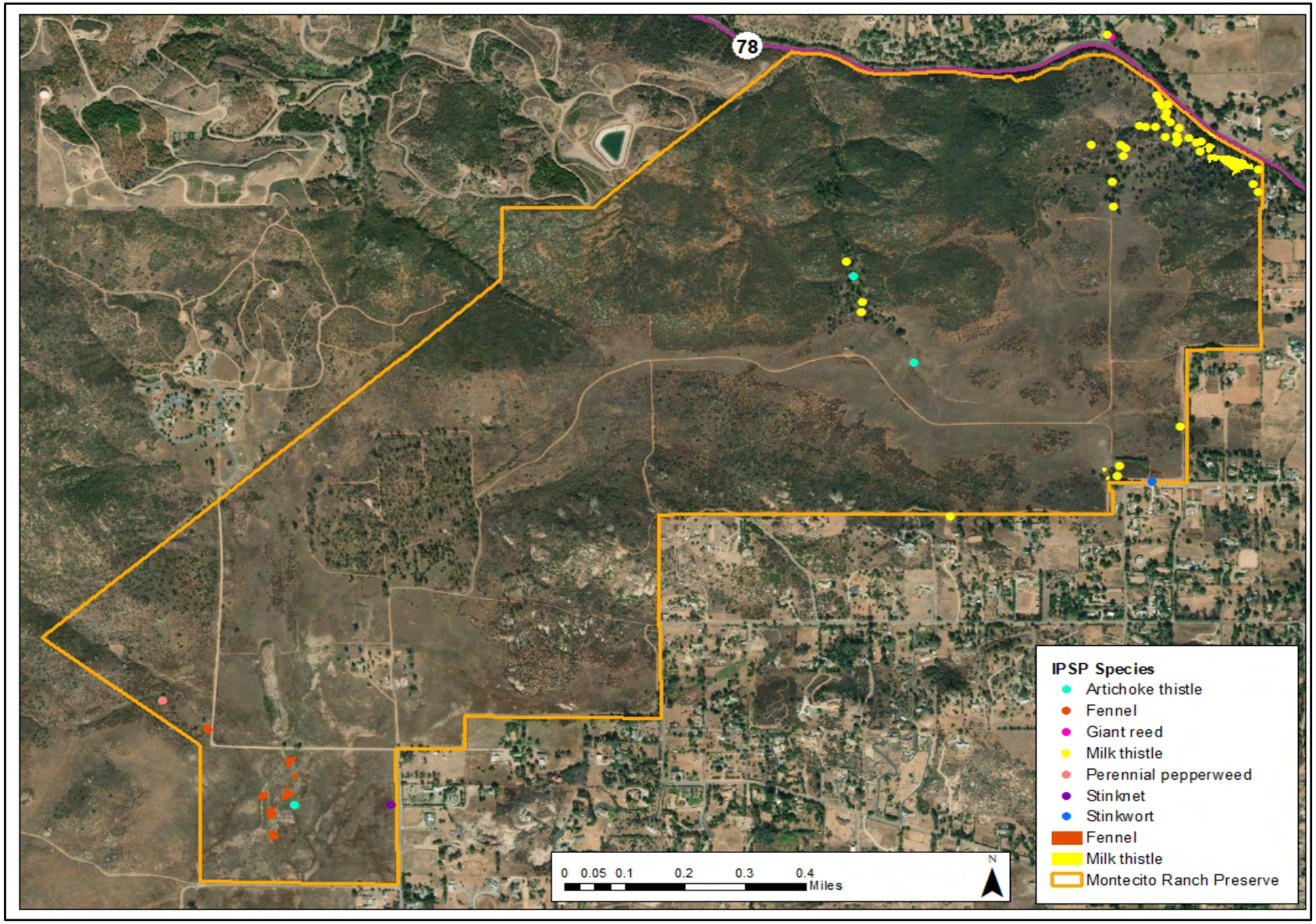

Figure B-6. IPSP Plants on the Montecito Ranch Preserve

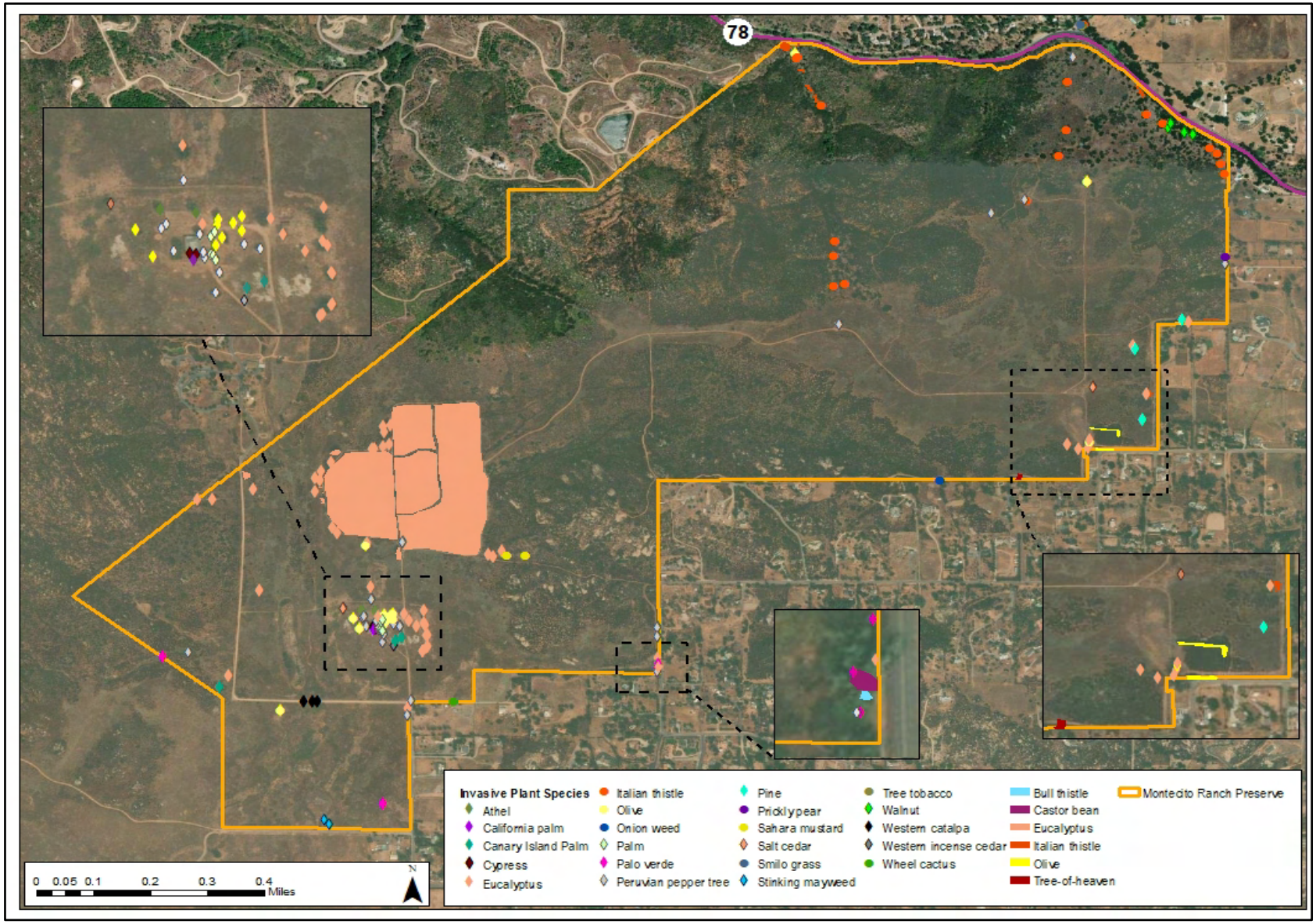

Figure B-7. Other Invasive Plants on the Montecito Ranch Preserve

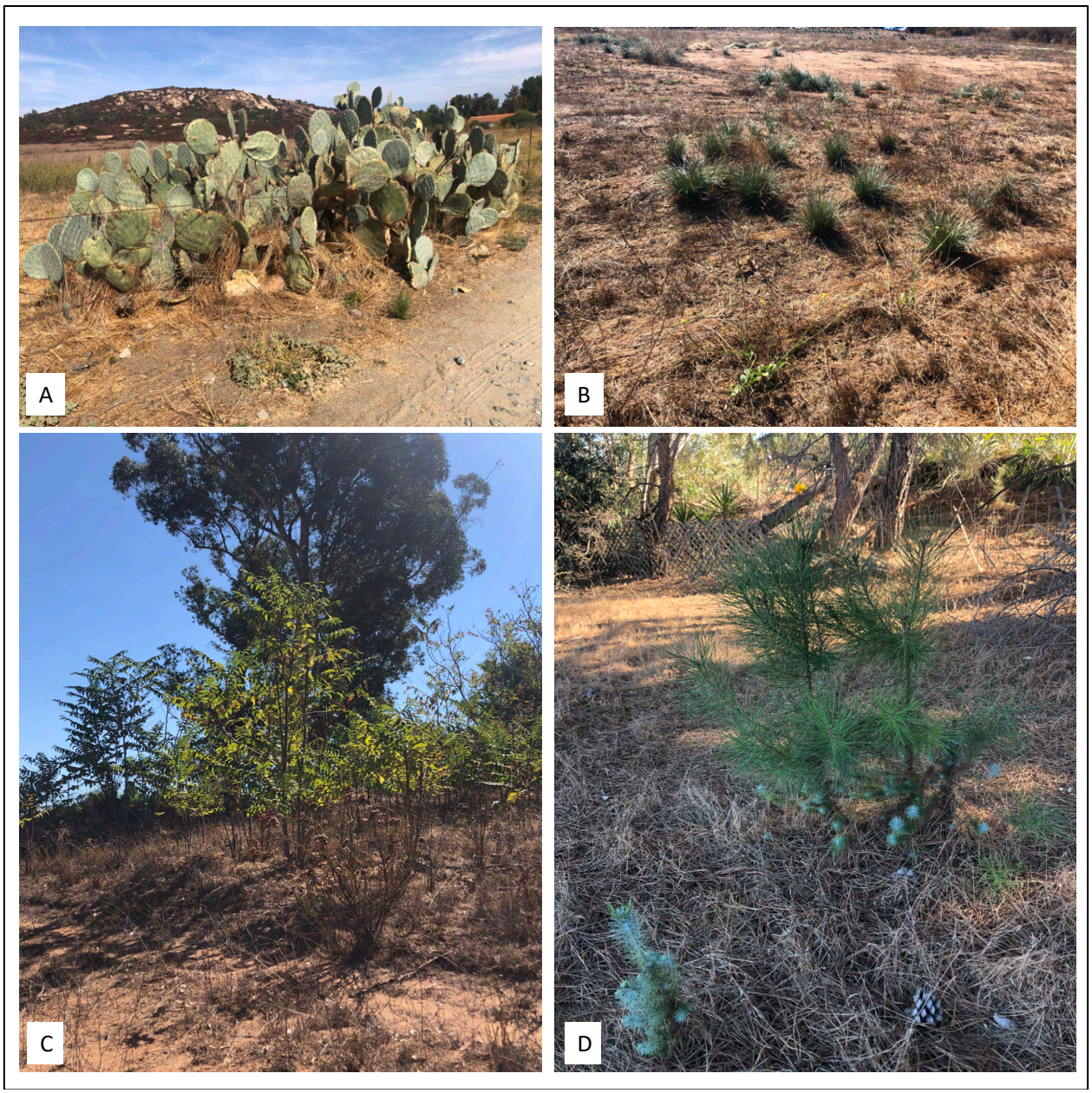

Figure B-8. Photographs of Invasive Plants on the Montecito Ranch Preserve. **A**. wheel cactus (*Opuntia robusta*), **B**. onion weed (*Asphodelus fistulosus*), **C**. Tree-of-Heaven (*Ailanthus altissima*), **D**. pine (*Pinus* sp.).

Table B-9. Trash Removal Priority Levels

Priority Level	Description	Removal Priority
1	May contain hazardous components, function as a potential fire hazard, provide a breeding ground or nest sites for pests, or otherwise threaten wildlife. Examples: tires, large appliances, automobile parts (e.g., batteries, engines), plastics in or near wetlands or drainages, asbestos, electrical wiring, loose barbed wire or other fencing wire.	Highest priority for removal
2	May degrade habitat, function as an 'attractive nuisance' (e.g., old furniture), and have a slow decomposition rate, but is not expected to contain hazardous components. Examples: asphalt, plumbing fixtures, roofing shingles, plastics away from wetlands or drainages, concrete, bricks, glass, tin or aluminum cans or old car parts (not containing Priority Level 1 components).	Remove as funding and resources allow
3	May provide (temporary) habitat for some wildlife species and have a faster decomposition rate than Priority 2 debris; not expected to contain hazardous components. Examples: wood piles, soil, landscape waste (note that if landscape waste is not removed, it may require control measures to stop the spread of invasive propagules).	Remove on a case-by-case basis

3.8 Primary Threats and Stressors

We identified threats to Montecito Ranch based on 2020 and 2021 field surveys, previous Preserve investigations and reports, and known site history. We summarize threats and stressors *typically managed at the preserve-level below* and in Table B-10, along with current management status. Regional threats and stressors (e.g., altered fire regime, climate change, connectivity, nitrogen deposition, light pollution, urban runoff) are addressed in the MSP (SDMMP 2013, SDMMP and TNC 2017). Appendix B-5 lists all threats considered in the assessment process.

Altered Hydrology/Erosion. The Preserve lies in the headwaters of Clevenger Canyon and Santa Maria Creek; thus, offsite land uses generally do not affect its hydrology. Preserve slopes are well vegetated with no obvious erosion problems; however, we noted erosion in and along dirt access roads, drainages, and in the oak woodland (Figure B-9, Figure B-10). In some cases, native vegetation is being affected through loss of soil, shrubs, and undercutting of oak trees.

A small, earthen reservoir (altered hydrology) (Figure B-9), historical well (location unknown), and the removal of native vegetation and associated increase in impermeable surfaces at the

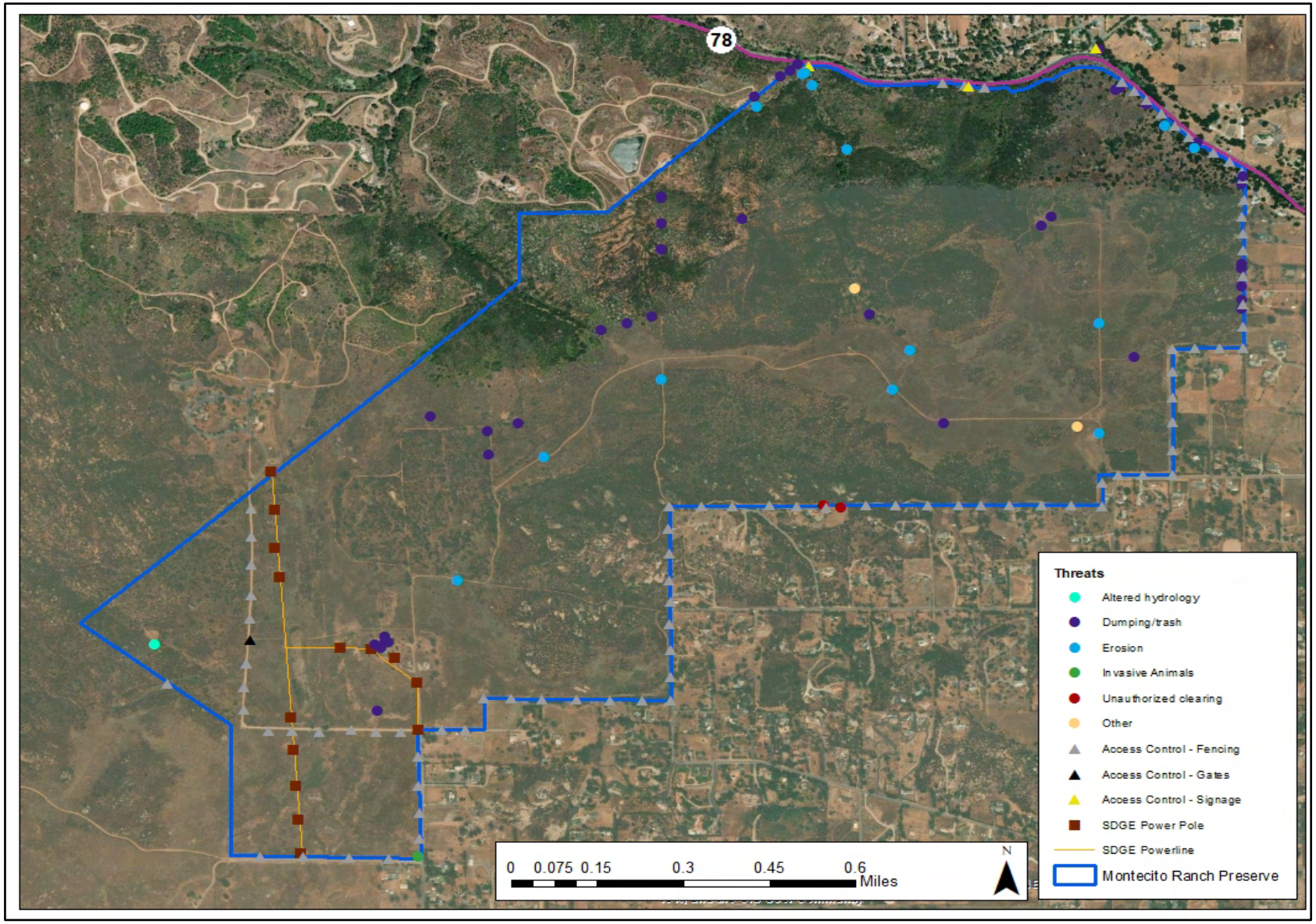

Figure B-9. Stewardship Threats on the Montecito Ranch Preserve

Figure B-10. Erosion on the Montecito Ranch Preserve. **A**. Erosion (gully) on road edge. **B**. and **C**. Erosion in drainage paralleling SR-78. **D**. Erosion in road associated with culvert.

ranch house have altered groundwater and drainage to Santa Maria Creek in the southern portion of the Preserve; however, we do not consider these modifications significant stressors.

Human Use of Preserve. Authorized or unauthorized human uses can adversely affect biological resources.

Monitoring, Management, and Maintenance Activities. Personnel involved in monitoring, managing, and maintaining resources or facilities may unintentionally introduce nonnative species, physically disturb sensitive species or habitats by trampling or vehicle use, or disturb wildlife.

Recreational Use/Unauthorized Trails. Unauthorized users of the Preserve may introduce invasive species, disturb or trample sensitive species and cultural resources, disturb or poach wildlife, and increase risk of fires. We have noted adjacent land-owners walking on Preserve access routes, and we identified locations where a gate and signs are needed and fence installed or repaired to control unauthorized access (Figure B-9). Unauthorized recreational use (e.g., unleashed dogs, off-highway vehicles, mountain and electric bikes) is a high priority threat and installation of new fence or repair of existing fence is recommended for most of the external Preserve boundary (Figure B-9) where unauthorized public access is probable (i.e., interface between the Preserve, public roads, and private residences

Table B-10. Primary Threats and Stressors on the Montecito Ranch Preserve

Threats and Stressors	Priority Level[1]
Altered Fire Regime	
Frequent Fires	Moderate
Fuel Modification[2]	High
Altered Hydrology/Erosion	High
Genetic Consequences	Unknown
Human Use of Preserves	
Management, Monitoring, & Maintenance Activities	Low
Recreational Use/Unauthorized Trails	High
Road Maintenance	Low
Utilities (power lines, transmission towers)	High
Past Agricultural Activities	High
Past Mining Activities	Low
Invasive Animal Species	
Argentine Ants	Low
Goldspotted Oak Borer, Oak Pit Scale	Low
Kuroshio Shot Hole Borer + Fusarium Dieback	Low
Wild Turkeys	High
Invasive Plant Species	
Management Level 3	High
Management Level 4	High

Threats and Stressors	Priority Level[1]
Other Invasive Species	Moderate
Urban Development	
Dumping/Trash	High
Edge Effects[3]	High

[1] Priority Level for Identified Threats/Stressors considers current information and may change over time. **Low** = threat is potential (versus observed) and/or measures are currently in place to minimize impacts; **Moderate** = some threat to species or habitats from past events that may warrant monitoring or restoration if additional events occur; **High** = observed, current threat or stressor that warrants management actions, **Unknown** = potential threat identified, but biological information not yet available to determine if threat adversely affects species in question.

[2] Vegetation removal and associated soil disturbance can increase fine fuels (including nonnative species) and thatch accumulation thus increasing fire ignition sources. As such, fuel modification is included under Altered Fire Regime per the MSP Roadmap (SDMMP and TNC 2017).

[3] Edge effects can include encroachment, unauthorized vegetation clearing (including fuel modification), horticultural plantings, and barriers to species movement and dispersal.

Road Maintenance. This is a potential threat where it removes native vegetation or impacts MSP and USMC focal species. A number of road easements exist on the edges of the Preserve adjacent to residential areas and public roads. SDG&E maintains the roads associated with the overhead powerlines and poles (Figure B-9). Refer to Artemis 2020 for easement descriptions and detailed locations. We also noted rills, gullies, and erosion on access routes during the rapid assessments (Figure B-9). All maintenance activities conducted by EHC will be restricted to the few existing access routes and roads. EHC will coordinate with adjacent landowners on any proposed road easement activities that could affect the Preserve.

Utilities. Several active pole line, underground conduit, and ingress and egress utility easements exist on the Preserve. Refer to Artemis 2020 for easement descriptions and detailed locations. SDG&E currently services two active overhead power lines and associated poles (Figure B-9). The north-south easement is approximately 3,915 ft long and 12 ft wide, while the east-west easement is 840 ft long and 10 ft wide. SDG&E recently changed the power poles from wood to steel and restored native habitat around these poles post-construction. Additional pole lines, underground conduits, and ingress and egress utility easements exist on the Preserve, but their current status is unknown. Refer to Artemis 2020 for easement descriptions and detailed locations.

Past Agricultural Activities. The Preserve has a long history of active agricultural uses, although there are none currently. While the nature and extent of agriculture is unclear, historical photos from the early 20th century show extensive fruit tree orchards over much of the western portion of the Preserve. Livestock grazing occurred historically, and previous land owners disked most of the level terrain and potentially applied rodenticides in the early 2000s. The existing perimeter fence is in disrepair in many locations (Figure B-9) and would require repair and maintenance to support livestock grazing.

Past Mining Activities. We located one exploratory mining pit on the Preserve; however datasets and records do not depict or list any historic mineral claims. The cultural resources

report lists two quarries, but does not discuss them further (Heritage Resources 2008). We do not consider the pit a threat to wildlife since it is shallow and filled with rocks.

Invasive Animal Species. The SDMMP is developing an invasive animal management plan to provide clear steps for managing these species. Species that pose the greatest threat to biological resources are summarized below.

Argentine Ants. Argentine ants occur throughout urban San Diego County, and conserved lands bordering urban areas and riparian corridors are at greatest risk of infestation (SDMMP and TNC 2017). Argentine ants are swarming ants that can result in almost complete loss of the native ant community, which includes both solitary foragers and swarming ants. Ant specialists such as the Blaineville's horned lizard rely on solitary foraging ants for food, and do poorly or do not persist in Argentine ant-invaded regions. Argentine ants are common predators in riparian habitat and may prey on Harbison's dun skipper larvae (Marschalek and Deutschman 2017). Argentine ants are also known to opportunistically depredate nests of ground- and shrub-nesting birds (e.g., Bell's sparrow, coastal California gnatcatcher). Other groups, such as spiders, shrews, and other invertebrates, decline or become absent in the presence of Argentine ants. Thus, Argentine ants are a primary risk to biodiversity and ecological integrity of southern California reserves. In eastern San Diego County, Argentine ants are more restricted to riparian or artificially wetted areas due to their moisture needs.

Although we did not survey for Argentine ants, we expect them predominantly along Preserve boundaries that border residential areas and wet or moist habitats (i.e., wetlands, vernal pools), rather than in more xeric, shrub-dominated areas.

Goldspotted Oak Borer. GSOB is an invasive beetle that attacks mature coast live oaks, resulting in tree damage and mortality, as well as loss of wildlife foraging and nesting habitat, increased fuel for fires, and possibly, gaps for invasive plant establishment. While it occurs in Engelmann oaks, it does not appear to adversely affect that species (UCANR 2016a). The Preserve lies within the GSOB zone of infestation (Cal Fire 2016), and the owner of Green Tree Forest Service indicated that GSOB is present in the Ramona area (Manzuk pers. comm.). EHC staff have monitored select coast live oaks within the Preserve for GSOB and to date, have not detected it

Kuroshio Shot Hole Borer + Fusarium Dieback. The KSHB beetle tunnels into host trees and shrubs and deposits its associated fungi that causes fusarium dieback, a disease that kills many native and nonnative tree and shrub species (Dimson et al. 2014). California sycamore willows, and coast live oak are suitable host trees. The nearest reported detections of KSHB were from trees located in eastern Escondido (UCANR 2016b). EHC staff have monitored select coast live oaks, California sycamore and willow within the Preserve for KSHB and to date, have not detected it.

Oak Pit Scale. Oak pit scale insects attack many deciduous and evergreen oak species in California (Geisel and Perry 2013). Pit scales cause twig dieback by sucking juices from twigs and severe infestations can delay leafing out of deciduous oaks. Ongoing heavy infestations can kill young oak trees. In San Diego county, pit scale is known to attach Engelmann oaks; however, pruning isolated areas of infestation can temporarily eliminate pit scale from oak trees and treatment of Engelmann oaks with insecticides is effective at preventing tree mortality if detected early (Geisel and Perry 2013; Manzuk pers.comm.). EHC staff have monitored select Engelmann oak trees within the Preserve for oak pit scale and to date, have not detected it.

Wild Turkeys. Turkeys prey on small animals and can adversely impact rare plant species. Wild turkeys have been documented on the Preserve (Figure B-9) and are now common in the Ramona area. At this time, we do not consider turkeys a significant stressor to MSP resources; however, it is unclear what level of impact these nonnative predators have on native species populations. Monitoring their presence on the Preserve is warranted.

Invasive Plant Species. Nonnative, invasive plants pose one of the greatest threats to the biological integrity of natural lands because of their ability to displace native species, degrade wildlife habitat, and alter ecosystem processes (e.g., Huenneke et al. 1990, Vitousek 1990, D'Antonio and Vitousek 1992, Wilcove et al. 1998, Cox 1999, Evans et al. 2001, Ehrenfeld 2003, Belnap et al. 2005).

We mapped 31 invasive or ornamental plants within the Preserve during rapid assessment surveys (Table B-6, Figure B-6, B-7): 7 'high priority' species, 14 'other priority' species, and 10 'lower priority and ornamental' species. Figure B-8 includes photographs of several 'other' and 'lower' priority species on the Preserve. See the previous discussion on invasive plants for additional information.

Urban Development. Dumping trash and edge effects are potential threats to Montecito Ranch (Figure B-11 and B-12). The previous owners of the property left numerous trash piles and other debris (e.g., a trailer, corrugated steel, culverts and pipes, and old fencing) scattered across the property (Figure B-12). Some of this trash is considered a high threat to Preserve resources. Appropriate access control (i.e., fencing, signs) and land manager presence will prevent future unauthorized dumping and recreational access. Down and damaged sections of fences and gates (Figure B-11 and B-12) need repair, signage, and posting of Preserve rules to deter trespassing and illegal dumping.

Edge effects can include encroachment, unauthorized vegetation clearing, horticultural plantings, and barriers to species movement and dispersal. Land-owners adjacent to the Preserve have cut and removed fence in three locations and removed vegetation for fuel and fire risk reduction along the southeastern boundary (Figure B-11). They also graded the road on the Preserve adjacent to their property. In other cases, nonnative trees and shrubs are growing onto the Preserve from adjacent private property.

The impact of roads, particularly on wildlife mortality, is a regional issue and beyond preserve-level management. Locally, SR-78 may be a potentially significant source of edge effects at Montecito Ranch and merits monitoring. Internal Preserve roads and trails are not considered significant barriers to movement.

Figure B-11. Edge Effects, Vandalism, and Other Stewardship Issues on the Montecito Ranch Preserve. **A**. Vandalized (cut) boundary fence. **B**. Capped well. **C**. Illegal vegetation clearing. **D**. Disposal of landscape waste onto the Preserve.

Figure B-12. Trash and Altered Hydrology on the Montecito Ranch Preserve. **A**. Wooden structure and landscape waste **B**. Steel table. **C**. Damaged barbed wire fence. **D**. Concrete dam associated with earthen reservoir.

References

AECOM. 2014. Ramona Grasslands Preserve Raptor Surveys Summary Report. Prepared for County of San Diego Department of Parks and Recreation. December.

Artemis Environmental. 2020. Baseline Report for Montecito Ranch, San Diego County, California. March.

Asmus, J. 2019. Report on fairy shrimp survey on Montecito Ranch on 7 Feb 2019. Appendix E in Artemis Environmental. 2020. Baseline report for Montecito Ranch, San Diego County, CA. March.

Bauder, E.T. 1993. Coastal San Diego vernal pool species list. San Diego State University. *In* City of San Diego guidelines for mima mound vernal pool habitat. City of San Diego Planning Department.

Beck, M. 2021. San Diego Director, Endangered Habitats League & President, Endangered Habitats Conservancy. Personal communication with Jessie Vine. January.

Belnap, J., Phillips, S.L., Sherrod, S.K., and A. Moldenke. 2005. Soil biota can change after exotic plant invasions: does this affect ecosystem processes? Ecology 86:3007-3017.

Bohonak, A.J. and A. Mitelberg. 2014. Social structure and genetic connectivity in the southern mule deer: implications for management. Final report prepared for California Department of Fish and Wildlife, April 16.

Calflora. 2019. The Calflora database. *Centromadia parryi* ssp. *australis*. Berkeley, California. https://www.calflora.org/. Accessed August 15.

California Department of Fish and Wildlife (CDFW). 2020. California Natural Diversity Database (CNDDB). Rarefind Database Program. Version 5.2.14. October.

California Department of Forestry and Fire Protection (Cal Fire). 2016. Goldspotted oak borer zone of infestation map. http://ucanr.edu/sites/gsobinfo/files/232575.pdf.

California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory. Cal-IPC publication 2006-02. California Invasive Plant Council, Berkeley, CA. https://www.cal-ipc.org.

Conservation Biology Institute (CBI). 2004. Framework management and monitoring plan: Ramona Grasslands Open Space Preserve, San Diego County, CA. Prepared for The Nature Conservancy. August.

Conservation Biology Institute (CBI). 2019. Montecito Ranch vernal pool and rare plant assessment. Prepared for Endangered Habitats Conservancy.

Conservation Biology Institute (CBI), Dendra, Inc., and California Invasive Plant Council (Cal-IPC). 2012. Management priorities for invasive non-native plants: a strategy for regional implementation, San Diego County, California. Prepared for San Diego Association of Governments (SANDAG), contract no. 5001322. 83 pp.

Cox, G.W. 1999. Alien species in North America and Hawaii: impacts on natural ecosystems. Island Press, Washington, DC. 400 pp.

D'Antonio, C.M., and P.M. Vitousek. 1992. Biological invasions by exotic grasses, the grass/fire cycle, and global change. Annual Review of Ecology and Systematics 23:63-87.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, and B.R. Euliss. 2002. Effects of management practices on grassland birds: northern harrier.

Dudek & Associates. 1998. Stephens' kangaroo rat assessment for Montecito Ranch, San Diego County, California. June.

Ehrenfeld, J.G. 2003. Effects of exotic plant invasions on soil nutrient cycling processes. Ecosystems 6(6):503-523.

Evans, R.D., Rimer, R., Sperry, L., and J. Belnap. 2001. Exotic plant invasion alters nitrogen dynamics in an arid grassland. Ecological Applications 11:1301-1310.

Federal Geographic Data Committee (FGDC). 2008. National vegetation classification standard, version 2. FGDC-STD-005-2008. Federal Geographic Data Committee, FGDC Secretariat, U.S. Geological Survey, Reston, VA.

Geisel, P. M. and M. L. Flint. 2013. Oak pit scale. Integrated pest management for home gardeners and landscape professionals. Pest Notes: publication 7470. University of California Agriculture and Natural Resources Statewide Integrated Pest Management Program

Giessow, J. 2019. Invasive non-native plant early detection and rapid response (EDRR) targets in western San Diego County. Version 2019-7-25.

Hathaway, S.A. and M.A. Simovich. 1996. Factors affecting the distribution and co-occurrence of two Southern Californian Anostracans (*Brachiopoda*), *Branchinecta sandiegonensis* and *Streptocephalus woottoni*. Journal of Crustacean Biology 16(4):669-677.
Marschalek, D. 2020. Hermes copper & Harbison's dun skipper: Where are we and where are we going? A presentation to the San Diego Multiple Species Conservation Program (MSCP).

Helix Environmental Planning, Inc. (Helix). 2010. Final environmental impact report, Montecito Ranch. Prepared for Montecito Ranch LLC. 1052 pp.

Huenneke, L.F., Hamburg, S.P., Koide, R., Mooney, H.A., and P.M. Vitousek. 1990. Effects of soil resources on plant invasions and community structure in Californian serpentine grassland. Ecology 71:478-491.

iNaturalist observation. 2018. Ferruginous hawk. February.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. Arid West 2016 regional wetland plant list. U.S. Army Corps of Engineers. Phytoneuron 2016-30:1-17.

Manzuk, C. 2021. Land Manager, Endangered Habitats Conservancy. Personal communication with Jessie Vine. January.

Marschalek, D., and D. Deutschman. 2017. San Diego County Harbison's dun skipper (*Euphyes vestris harbisoni*) habitat conservation and management plan. San Diego State University. Prepared for San Diego Association of Governments, San Diego, CA.

Marschalek, D. 2020. Hermes copper & Harbison's dun skipper: Where are we and where are we going? A presentation to the San Diego Multiple Species Conservation Program (MSCP).

Mitelberg, A. J.G. Smith and A.G. Vandergast. 2019. DNA Fingerprinting of Southern Mule Deer (*Odocoileus hemionus fuliginatus*) in north San Diego County, California (2018-2019): U.S. Geological Survey Open File Report 2019-1138. https://doi.org/10.3133/ofr20191138.

Rebman, J.P. and M.G. Simpson. 2014. Checklist of the vascular plants of San Diego County, 5th edition. San Diego Natural History Museum. 156 pp.

REC Consultants, Inc. 2008a. Montecito Ranch conceptual revegetation plan, TM 5250. Prepared for Montecito Ranch LLC. 34 pp.

REC Consultants, Inc. 2008b. Montecito Ranch biological technical report, TM 5250. Prepared for Montecito Ranch LLC. 85 pp. + appendices.

Rochester, C., S. Hathaway, C. Brown, K. Pease, and R. Fisher. 2001. Herpetofaunal monitoring in MSCP Region of San Diego. Prepared for City of San Diego. March.

San Diego Association of Governments (SANDAG). 2015. Conserved lands dataset. SANDAG regional information services - GIS. http://gis1.sandag.org/sdgis/rest/services/Land/Conserved_Land/MapServer/.

San Diego Management and Monitoring Program (SDMMP). 2011. Connectivity monitoring strategic plan for the San Diego preserve system. Prepared for the San Diego Environmental Mitigation Program Working Group. January 11.

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), version 08.27.2013.

San Diego Management and Monitoring Program (SDMMP). 2020. Advanced GIS viewer. https://sdmmp.com/gis_viewer.php.

San Diego Management and Monitoring Program and The Nature Conservancy (SDMMP and TNC). 2017. Management and monitoring strategic plan for conserved lands in western San Diego County: a strategic habitat conservation roadmap. 3 volumes. Prepared for the San Diego Association of Governments. San Diego.

Sawyer, J.O., Keeler-Wolf, T., and J.M. Evens. 2009. A manual of California vegetation. Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

SJM Biological Consultants (SJM). 2015. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat for a proposed staging area at the Ramona Grasslands Preserve. Letter report to Jennifer Price, Land Use/Environmental Planner for the County of San Diego Department of Parks and Recreation. January 11.

SJM Biological Consulting (SJM). 2019. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat (*Dipodomys stephensi*) at the Montecito Ranch property, Ramona, California.

Spencer, W.D., D. DiPietro, H. Romsos, D. Shier, and R. Chock. 2021. Stephens' Kangaroo Rat Rangewide Management and Monitoring Plan. Unpublished report prepared by the Conservation Biology Institute for Bureau of Land Management and Riverside County Habitat Conservation Agency. March 2021.

Sproul, F., Keeler-Wolf, T., Gordon-Reedy, P., Dunn, J., Klein, A., and K. Harper. 2011. Vegetation classification manual for western San Diego County. First edition. Prepared for San Diego Association of Governments, San Diego, CA. February.

Stokes, D. 2021. Biologist, San Diego Natural History Museum. Personal communication with Jessie Vinje. March.

TAIC and EDAW. 2005. Ramona vernal pool conservation study, Ramona, CA. Prepared for County of San Diego, CA. January.

Tracey, J.A., Madden, M.C., Sebes, J.B., Bloom, P.H., Katzner, T.E., and Fisher, R.N., 2017, Biotelemetery data for golden eagles (*Aquila chrysaetos*) captured in coastal southern California, February 2016–February 2017: U.S. Geological Survey Data Series 1051, 35 p., https://doi.org/10.3133/ds1051.

Unitt, P. 2012. The birds of San Diego County. San Diego County bird atlas and bird atlas list. http://sdplantatlas.org/BirdAtlas/BirdPages.aspx. Accessed February 2016, February 2019.

University of California, Agriculture and Natural Resources. 2016a. PSHB/FD distribution map. http://ucanr.maps.arcgis.com/apps/Viewer/index.html?appid=3446e311c5bd434eabae98937f085c80.

University of California, Agriculture and Natural Resources (UCANR). 2016b. Goldspotted oak borer. http://ucanr.edu/sites/gosbinfo/.

Vitousek, P.M. 1990. Biological invasions and ecosystem processes: towards an integration of population biology and ecosystem studies. Oikos 57:7-13.

Wilcove, D.S., Rothstein, D., Dubow, J., Phillips, A., and E. Losos. 1998. Quantifying threats to imperiled species in the United States. BioScience 48:607-615.

Appendix B.1

List of Plant Species

List of Plant Species[1]

FERNS AND FERN ALLIES	
Dryopteridaceae	**Wood Fern Family**
Dryopteris arguta	Coastal wood fern
Marsileaceae	**Marsilea Family**
Marsilea vestita subsp. *vestita*	Hairy waterclover
Pteridaceae	**Brake Family**
Adiantum jordani	California maidenhair
Myriopteris clevelandii	Cleveland's lip fern
Myriopteris newberryi	California cotton fern
Pellaea mucronata var. *mucronata*	Bird's foot cliff brake
Pentagramma triangularis subsp. *triangularis*	California goldback fern
Selaginellaceae	**Spike-moss Family**
Selaginella bigelovii	Bigelow's spike-moss
CONIFERS	
Pinaceae	**Pine Family**
Pinus sp.	Pine
FLOWERING PLANTS - DICOTS	
Adoxaceae	**Adoxa Family**
Sambucus nigra subsp. *caerulea*	Blue elderberry
Anacardiaceae	**Sumac or Cashew Family**
Malosma laurina	Laurel sumac
Rhus aromatica var. *aromatica*	Skunkbrush
Rhus ovata	Sugar bush
*Schinus molle**	Peruvian pepper tree
Toxicodendron diversilobum	Western poison-oak
Apiaceae (Umbelliferae)	**Carrot Family**
Daucus pusillus	Rattlesnake weed
*Foeniculum vulgare**	Sweet fennel
Lomatium dasycarpum subsp. *dasycarpum*	Woolly-fruit lomatium
Sanicula arguta	Sharp-tooth sanicle

Apocynaceae	**Dogbane Family**
Asclepias californica	California milkweed
Asteraceae (Compositae)	**Sunflower Family**
Acourtia microcephala	Sacapellote
Ambrosia psilostachya	Western ragweed
*Anthemis cotula**	Mayweed
Artemisia californica	California sagebrush
Baccharis pilularis	Coyote brush
Baccharis salicifolia subsp. *salicifolia*	Mule-fat
Baccharis sarothroides	Broom baccharis
Brickellia californica	California brickellbush
Carduus pycnocephalus subsp. *pycnocephalus**	Italian thistle
*Carduus tenuiflorus**	Slender thistle
*Centaurea melitensis**	Tocalote
Centromadia parryi subsp. *australis*	Southern tarplant
Chaenactis glabriuscula var. *glabriuscula*	Yellow pincushion
*Cirsium vulgare**	Bull thistle
Corethrogyne filaginifolia var. *filaginifolia*	California sand-aster
*Cynara cardunculus**	Artichoke thistle, cardoon
Deinandra fasciculata	Fascicled tarweed
*Dittrichia graveolens**	Stinkwort
Eriophyllum confertiflorum var. *confertiflorum*	Long-stem golden-yarrow
Gutierrezia sarothrae	Broom matchweed
Hazardia squarrosa var. *grindelioides*	Sawtooth goldenbush
*Hedypnois rhagadioloides**	Crete hedypnois
Heterotheca grandiflora	Telegraph weed
*Hypochaeris glabra**	Smooth cat's ear
Isocoma menziesii	Goldenbush
*Lactuca serriola**	Prickly lettuce
*Logfia gallica**	Narrow-leaf cotton rose
*Oncosiphon piluliferum**	Stinknet

Osmadenia tenella	Osmadenia
Pluchea sericea	Arrow weed
Porophyllum gracile	Odora
Pseudognaphalium californicum	California everlasting
Psilocarphus brevissimus var. *brevissimus*	Dwarf woolly-marbles
*Silybum marianum**	Milk thistle
Stylocline gnaphaloides	Everlasting nest-straw
Uropappus lindleyi	Silver puffs
Xanthisma junceum‡	Rush chaparral-star
Xanthium strumarium	Cocklebur
Bignoniaceae	**Trumpet-Creeper Family**
*Catalpa speciosa**	Southern catalpa
Boraginaceae	**Borage Family**
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	Common eucrypta
Heliotropium curassavicum var. *oculatum*	Salt heliotrope
Johnstonella micromeres	Minute-flower johnstonella
Pectocarya linearis subsp. *ferocula*	Slender combseed
Phacelia parryi	Parry's phacelia
Phacelia ramosissima	Branching phacelia
Plagiobothrys undulatus	Wavy-stemmed
Brassicaceae	**Mustard Family**
*Brassica nigra**	Black mustard
*Brassica tournefortii**	Sahara mustard
*Hirschfeldia incana**	Short-pod mustard
*Lepidium latifolium**	Perennial pepperweed
*Sisymbrium officinale**	Hedge mustard
Cactaceae	**Cactus Family**
*Opuntia robusta**	Nopal tapon
Opuntia oricola	Chaparral prickly-pear
Campanulaceae	**Bellflower Family**
Downingia cuspidata	Toothed downingia

Caprifoliaceae	**Honeysuckle Family**
Lonicera subspicata var. *denudata*	Johnston's honeysuckle
Caryophyllaceae	**Pink Family**
*Silene gallica**	Common catchfly
*Spergularia rubra**	Red sand-spurrey
*Stellaria pallida**	Pale starwort
Chenopodiaceae	**Goosefoot Family**
*Salsola tragus**	Russian-thistle
Cistaceae	**Rock-rose Family**
Crocanthemum scoparium var. *scoparium*	Peak rush-rose
Convolvulaceae	**Morning-glory Family**
Calystegia macrostegia subsp. *tenuifolia*	San Diego morning-glory
Cuscuta californica	Chaparral dodder
Crassulaceae	**Stonecrop Family**
Crassula connata	Pygmyweed
Dudleya pulverulenta	Chalk dudleya
Cucurbitaceae	**Gourd Family**
Marah macrocarpa	Wild-cucumber
Ericaceae	**Heath Family**
Xylococcus bicolor	Mission manzanita
Euphorbiaceae	**Spurge Family**
Croton setiger	Doveweed
Euphorbia polycarpa	Small-seed sandmat
*Ricinus communis**	Castor bean
Fabaceae (Leguminosae)	**Legume Family**
Acmispon americanus var. *americanus*	Spanish-clover
Acmispon argophyllus var. *argophyllus*	Silver-leaf lotus
Acmispon glaber var. *brevialatus*	Short-wing deerweed
Acmispon micranthus	Grab lotus
Acmispon strigosus	Strigose lotus
Lupinus bicolor	Miniature lupine

Lupinus hirsutissimus	Stinging lupine
*Medicago polymorpha**	California burclover
Parkinsonia sp.*	Palo verde
Trifolium gracilentum	Pin-point clover
*Trifolium hirtum**	Rose clover
Vicia villosa subsp. *varia*	Hairy vetch
Fagaceae	**Oak Family**
Quercus x*acutidens*	Torrey's scrub oak
Quercus agrifolia var. *oxyadenia*	Coast live oak
Quercus engelmannii‡	Engelmann's oak
Gentianaceae	**Gentian Family**
Zeltnera venusta	Canchalaugua
Geranaceae	**Geranium Family**
*Erodium brachycarpum**	Short-beak filaree
*Erodium cicutarium**	Red-stem filaree
*Erodium moschatum**	White-stem filaree
Geranium carolinianum	Carolina geranium
Grossulariaceae	**Gooseberry Family**
Ribes indecorum	White-flower currant
Lamiaceae (Labiatae)	**Mint Family**
*Marrubium vulgare**	Horehound
Salvia apiana	White sage
Salvia columbariae	Chia
Salvia mellifera	Black sage
Trichostema lanceolatum	Vinegar weed
Lythraceae	**Loosestrife Family**
*Lythrum hyssopifolia**	Grass poly
Malvaceae	**Mallow Family**
Malacothamnus fasciculatus var. *fasciculatus*	Chaparral bushmallow
Sidalcea sparsifolia	Checker-bloom
Myrsinaceae	**Myrsine Family**

Lysimachia arvensis	Scarlet pimpernel
Myrtaceae	**Myrtle Family**
*Eucalyptus sp.**	Eucalyptus
Nyctaginaceae	**Four O'Clock Family**
Mirabilis laevis var. *crassifolia*	Coastal wishbone plant
Oleaceae	**Olive Family**
*Olea europaea**	Olive
Onagraceae	**Evening-primrose Family**
Camissoniopsis bistorta	California sun cup
Clarkia purpurea ssp. quadrivulnera	Four-spot clarkia
Epilobium campestre	Smooth boisduvalia
Epilobium canum subsp. *canum*	California fuchsia
Epilobium ciliatum subsp. *ciliatum*	Willow herb
Orobanchaceae	**Broom-rape Family**
Castilleja densiflora subsp. *gracilis*	Parish's owl's-clover
Paeoniaceae	**Peony Family**
Paeonia californica	California peony
Papaveraceae	**Poppy Family**
Dendromecon rigida	Bush poppy
Plantaginaceae	**Plantain Family**
Antirrhinum kelloggii	Climbing snapdragon
Collinsia heterophylla subsp. *heterophylla*	Chinese houses
Keckiella antirrhinoides var. antirrhinoides	Yellow bush penstemon
Veronica peregrina subsp. *xalapensis*	Purslane speedwell
Platanaceae	**Plane Tree Family**
Platanus racemosa	Western sycamore
Polygonaceae	**Buckwheat Family**
Chorizanthe fimbriata var. *fimbriata*	Fringed spineflower
Chorizanthe procumbens	Prostrate spineflower
Eriogonum fasciculatum var. *foliolosum*	Inland California buckwheat
Pterostegia drymarioides	Granny's hairnet

*Rumex crispus**	Curly dock
Ranunculaceae	**Buttercup Family**
Clematis pauciflora	Ropevine clematis
Thalictrum fendleri var. polycarpum	Smooth-leaf meadow-rue
Rhamnaceae	**Buckthorn Family**
Ceanothus crassifolius var. *crassifolius*	Thick-leaf ceanothus
Ceanothus tomentosus	Ramona-lilac
Rhamnus pilosa	Hairy-leaf redberry
Rosaceae	**Rose Family**
Adenostoma fasciculatum	Chamise
Cercocarpus minutiflorus	San Diego mountain-mahogany
Heteromeles arbutifolia	Toyon
Rosa californica	California rose
Rubiaceae	**Madder or Coffee Family**
Galium angustifolium ssp. *angustifolium*	Narrow-leaf bedstraw
Galium aparine	Common bedstraw
Rutaceae	**Rue or Citrus Family**
Cneoridium dumosum	Bush-rue
Salicaceae	**Willow Family**
Populus fremontii subsp. *fremontii*	Western cottonwood
Salix exigua var. *exigua*	Narrow-leaf willow
Salix gooddingii	Goodding's black willow
Scrophulariaceae	**Figwort Family**
Scrophularia californica	California bee plant
Simaroubaceae	**Quassia or Simarouba Family**
*Ailanthus altissima**	Tree-of-Heaven
Solanaceae	**Nightshade Family**
*Nicotiana glauca**	Tree tobacco
Tamaricaceae	**Tamarisk Family**
Tamarix sp.*	Saltcedar

*Tamarix aphylla**	Athel
Violaceae	**Violet Family**
Viola pedunculata	Johnny jump-up
Vitaceae	**Grape Family**
Vitis girdiana	Southern California wild grape
FLOWERING PLANTS - MONOCOTS	
Agavaceae	**Agave Family**
Chlorogalum parviflorum	Small-flower soap-plant/amole
Hesperoyucca whipplei	Chaparral candle
*Phoenix canariensis**	Canary Island date palm
Cyperaceae	**Sedge Family**
Eleocharis macrostachya	Pale spike-rush
Iridaceae	**Iris Family**
Sisyrinchium bellum	Blue-eyed-grass
Juncaceae	**Rush Family**
Juncus bufonius var. *bufonius*	Toad rush
Liliaceae	**Lily Family**
Calochortus splendens	Splendid Mariposa lily
Poaceae (Gramineae)	**Grass Family**
Agrostis pallens	Seashore bent grass
*Avena barbata**	Slender wild oat
*Avena fatua**	Wild oat
*Bromus diandrus**	Ripgut grass
*Bromus hordeaceus**	Soft chess
*Bromus rubens**	Foxtail chess, red brome
*Crypsis schoenoides**	Swamp prickle grass
Distichlis spicata	Salt grass
Elymus condensatus	Giant wild-rye
*Festuca myuros**	Rat-tail fescue
*Festuca perennis**	Perennial rye grass
Hordeum murinum ssp. *glaucum**	Glaucous barley

*Lamarckia aurea**	Golden-top
Melica frutescens	Tall melic
Melica imperfecta	Coast range melic
Muhlenbergia microsperma	Little-seed muhly
Muhlenbergia rigens	Deergrass
*Polypogon monspeliensis**	Annual beard grass
Stipa coronata	Giant stipa
Stipa lepida	Foothill needle grass
Stipa miliaceae var. *miliacea**	Smilo grass
Stipa pulchra	Purple needle grass
Themidaceae	**Brodiaea Family**
Dipterostemon capitatus subsp. *capitatus*	Blue dicks

[1] Nomenclature follows Rebman and Simpson 2014 and Jepson Eflora 2021

* = Invasive species, ‡ = Sensitive species.

Appendix B.2

List of Animal Species

List of Animal Species

INVERTEBRATES

Branchinectidae	
Branchinecta sandiegonensis	San Diego fairy shrimp
Nymphalidae	**Brushfoots**
Junonia coenia	Common buckeye
Trogidae	**Hide Beetles**
Trox sp.	Hide beetle
Formicidae	**Ants**
Pogonomyrmex californicus	California harvester ant
Apidae	**Carpenter, Bumble, & Honey Bees**
Apis mellifera	European honeybee

VERTEBRATES

REPTILES

Phrynosomatidae	**Phrynosomatid Lizards**
Phrynosoma blainvillei	Blainville's horned lizard
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	Side-blotched lizard
Teiidae	**Whiptail Lizards**
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail
Colubridae	**Collubrid Snakes**
Masticophis lateralis lateralis	California striped racer
Pituophis catenifer annectens	San Diego gopher snake
Viperidae	**Vipers**
Crotalus sp.	Rattlesnake (skin only)

BIRDS

Cathartidae	**New World Vultures**
Cathartes aura	Turkey vulture
Accipitridae	**Hawks**
Elanus leucurus	Black-shouldered kite
Circus cyaneus	Northern harrier

Accipiter cooperi	Cooper's hawk
Buteo jamaicensis	Red-tailed hawk
Falconidae	**Falcons**
Falco sparverius	American kestrel
Odontophoridae	**Quails**
Callipepla californica	California quail
Phasianidae	**Pheasants, Partridges, & Turkeys**
Meleagris gallopavo	Wild turkey
Columbidae	**Pigeons & Doves**
Zenaida macroura	Mourning dove
Cuculidae	**Cuckoos**
Geococcyx californianus	Greater roadrunner
Tytonidae	**Barn Owls**
Tyto alba	Barn owl
Bubo virginianus	Great horned owl
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Picidae	**Woodpeckers**
Picoides nuttallii	Nuttall's woodpecker
Tyrannidae	**Tyrant Flycatchers**
Sayornis saya	Say's phoebe
Tyrannus vociferans	Cassin's kingbird
Corvidae	**Jays & Crows**
Aphelocoma californica	Western scrub jay
Corvus corax	Common raven
Troglodytidae	**Wrens**
Thryomanes bewickii	Bewick's wren
Sylviidae	**Old World Flycatchers**
Polioptila californica californica	Coastal California gnatcatcher
Timillidae	**Babblers**
Chamaea fasciata	Wrentit

Mimidae	**Thrashers**
Mimus polyglottus	Northern mockingbird
Toxostoma redivivum	California thrasher
Emberizidae	**Towhees & American Sparrows**
Pipilo maculatus	Spotted towhee
Pipilo crissalis	California towhee
Melospiza melodia	Song sparrow
Fringillidae	**Finches**
Carpodacus mexicanus	House finch
Carduelis psaltria	Lesser goldfinch
Icteridae	**New World Blackbirds**
Sturnella neglecta	Western meadowlark

MAMMALS

Leporidae	**Hares & Rabbits**
Lepus californicus bennettii	San Diego black-tailed jackrabbit
Sylvilagus audubonii	Desert cottontail
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta's pocket gopher
Muridae	**Mice, Rats, & Voles**
Neotoma fuscipes	Dusky-footed woodrat
Sciuridae	**Squirrels**
Otospermophilus beecheyi	California ground squirrel
Canidae	**Dogs**
Canis latrans	Coyote
Cervidae	**Deer & Elk**
Odocoileus hemionus fuliginata	Southern mule deer

Appendix B.3

Invasive Plant Attribute Data

Invasive Plant Attribute Data

Table B.3-1. Invasive Plant Attribute Data.

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
10/20/20	*Ailanthus altissima*	AIAL_01	N/A	60	0.07	60 plants	JV	CBI
11/11/20	*Arundo donax*	ARDO_01	0	0	N/A	Patch	JV	CBI
10/20/20	*Asphodelus fistulosus*	ASFI_01	5	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_01	1	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_02	1	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_03	1	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_04	0	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_05	1	0	N/A		JV	CBI
2/23/21	*Brahea* sp.	BRSP_06	1	0	N/A		JV	CBI
11/11/20	*Brassica tournefortii*	BRTO_01	1	0	N/A		JV	CBI
11/11/20	*Brassica tournefortii*	BRTO_02	0	50	N/A		JV	CBI
2/23/21	*Calocedrus decurrens*	CADE_01	1	0	N/A		JV	CBI
10/20/20	*Carduus pycnocephalus*	CAPY_01	0	100	N/A		JV	CBI
10/20/20	*Carduus pycnocephalus*	CAPY_02	0	500	N/A		JV	CBI
10/27/20	*Carduus pycnocephalus*	CAPY_03	0	100	N/A		JV	CBI
10/27/20	*Carduus pycnocephalus*	CAPY_04	500	0	N/A		JV	CBI
10/27/20	*Carduus pycnocephalus*	CAPY_05	0	500	N/A		JV	CBI
10/27/20	*Carduus pycnocephalus*	CAPY_06	0	100	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_07	0	25	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_08	0	50	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_09	0	10	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
11/10/20	*Carduus pycnocephalus*	CAPY_10	0	200	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_11	0	100	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_12	0	100	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_13	0	200	N/A		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_14	0	50	N/A		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_15	0	1000	N/A		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_16	1000	0	N/A		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_17	0	0	N/A	Patch	JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_18	0	100	N/A		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_19	0	20	N/A		SS	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_20	0	25	N/A		SS	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_21	0	200	N/A		SS	CBI
10/27/20	*Carduus pycnocephalus*	CAPY_22	N/A	1000	0.04		JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_23	N/A	3000	0.1		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_24	N/A	500	0.04		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_25	N/A	N/A	0.02	Patch	JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_26	N/A	N/A	0.04	Large patch.	JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_27	N/A	N/A	0.06		JV	CBI
11/11/20	*Carduus pycnocephalus*	CAPY_28	N/A	N/A	0.05		JV	CBI
2/23/21	*Carduus pycnocephalus*	CAPY_29	N/A	N/A	0.16	Large patch.	JV	CBI
11/10/20	*Carduus pycnocephalus*	CAPY_30	N/A	2000	0.68		JV	CBI
10/23/20	*Catalpa speciosa*	CASP_01	1	0	N/A		JV	CBI
10/23/20	*Catalpa speciosa*	CASP_02	1	0	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
10/23/20	*Catalpa speciosa*	CASP_03	1	0	N/A		JV	CBI
11/11/20	*Cirsium vulgare*	CIVU_01	N/A	1000	0		JV	CBI
10/23/20	*Cynara cardunculus*	CYCA_01	1	0	N/A		JV	CBI
10/27/20	*Cynara cardunculus*	CYCA_02	0	100	N/A		JV	CBI
11/11/20	*Cynara cardunculus*	CYCA_03	1	0	N/A		JV	CBI
2/23/21	*Cypress* sp.	CYSP_01	1	0	N/A		JV	CBI
2/23/21	*Cypress* sp.	CYSP_02	1	0	N/A		JV	CBI
11/11/20	*Dittrichia graveolens*	DIGR_01	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_01	2	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_02	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_03	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_04	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_05	3	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_06	3	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_07	2	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_08	4	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_09	3	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_10	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_11	1	0	N/A		JV	CBI
10/27/20	*Eucalyptus* sp.	EUSP_12	1	0	N/A		JV	CBI
10/27/20	*Eucalyptus* sp.	EUSP_13	0	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_14	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_15	2	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_16	1	0	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
11/11/20	*Eucalyptus* sp.	EUSP_17	6	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_18	11	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_19	12	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_20	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_21	2	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_22	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_23	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_24	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_25	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_26	2	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_27	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_28	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_29	2	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_30	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_31	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_32	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_33	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_34	1	0	N/A		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_35	3	0	N/A	Saplings.	JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_36	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_37	5	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_38	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_39	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_40	1	0	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
2/23/21	*Eucalyptus* sp.	EUSP_41	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_42	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_43	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_44	3	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_45	5	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_46	2	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_47	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_48	1	0	N/A		JV	CBI
2/23/21	*Eucalyptus* sp.	EUSP_49	1	0	N/A		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_50	35	N/A	0.11		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_51	20	N/A	0.01		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_52	15	N/A	0.01		JV	CBI
10/23/20	*Eucalyptus* sp.	EUSP_53	26	N/A	0.03		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_54	3	N/A	0.08		JV	CBI
11/11/20	*Eucalyptus* sp.	EUSP_55	5	N/A	0.12		JV	CBI
2/17/21	*Eucalyptus* sp.	EUSP_56	N/A	200	11.63	Large eucalyptus stand. 100's of trees.	JV	CBI
2/17/21	*Eucalyptus* sp.	EUSP_57	N/A	100	5.17	Large eucalyptus stand.	JV	CBI
2/17/21	*Eucalyptus* sp.	EUSP_58	N/A	100	4.05	Large eucalyptus stand.	JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
2/17/21	*Eucalyptus* sp.	EUSP_59	N/A	200	17.81	100's of trees.	JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_01	1	0	N/A		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_02	1	0	N/A		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_03	N/A	500	0.1		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_04	25	N/A	0.03		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_05	N/A	250	0.13		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_06	N/A	500	0.15		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_07	N/A	75	0.09		JV	CBI
10/23/20	*Foeniculum vulgare*	FOVU_08	N/A	70	0.08		JV	CBI
11/10/20	*Juglans* sp.	JUSP_01	1	0	N/A		JV	CBI
11/10/20	*Juglans* sp.	JUSP_02	0	0	N/A		JV	CBI
11/10/20	*Juglans* sp.	JUSP_03	0	0	N/A		JV	CBI
11/10/20	*Juglans* sp.	JUSP_04	0	0	N/A		JV	CBI
10/23/20	*Lepidium latifolium*	LELA_01	2	0	N/A		JV	CBI
11/11/20	*Nicotiana glauca*	NIGL_01	5	0	N/A		JV	CBI
11/11/20	*Nicotiana glauca*	NIGL_02	1	0	N/A		JV	CBI
10/23/20	*Olea europaea*	OLEU_01	3	0	N/A		JV	CBI
11/10/20	*Olea europaea*	OLEU_02	1	0	N/A		JV	CBI
11/11/20	*Olea europaea*	OLEU_03	1	0	N/A		JV	CBI
11/11/20	*Olea europaea*	OLEU_04	1	0	N/A		JV	CBI
11/11/20	*Olea europaea*	OLEU_05	1	0	N/A		JV	CBI
2/10/21	*Olea europaea*	OLEU_06	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_07	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_08	1	0	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
2/23/21	*Olea europaea*	OLEU_09	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_10	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_11	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_12	2	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_13	1	0	N/A		JV	CBI
2/23/21	*Olea europaea*	OLEU_14	1	0	N/A		JV	CBI
11/11/20	*Olea europaea*	OLEU_15	11	N/A	0.09		JV	CBI
11/11/20	*Olea europaea*	OLEU_16	20	N/A	0.15		JV	CBI
10/23/20	*Oncosiphon piluliferum*	ONPI_01	1	0	N/A		JV	CBI
2/23/21	*Opuntia ficus-indica.*	OPFI_01	0	0	N/A	Many.	JV	CBI
10/23/20	*Opuntia robusta*	OPRO_01	0	0	N/A	Two patches.	JV	CBI
10/23/20	*Parkinsonia* sp.	PASP_01	1	0	N/A		JV	CBI
11/11/20	*Parkinsonia* sp.	PASP_02	3	0	N/A		JV	CBI
11/11/20	*Parkinsonia* sp.	PASP_03	1	0	N/A		JV	CBI
11/11/20	*Parkinsonia* sp.	PASP_04	1	0	N/A		JV	CBI
2/10/21	*Parkinsonia* sp.	PASP_05	1	0	N/A		JV	CBI
10/23/20	*Phoenix canariensis*	PHCA_01	1	0	N/A		JV	CBI
2/23/21	*Phoenix canariensis*	PHCA_02	1	0	N/A		JV	CBI
2/23/21	*Phoenix canariensis*	PHCA_03	1	0	N/A		JV	CBI
10/27/20	*Pinus* sp.	PISP_01	8	0	N/A	Seedlings.	JV	CBI
10/27/20	*Pinus* sp.	PISP_02	1	0	N/A		JV	CBI
11/11/20	*Pinus* sp.	PISP_03	1	0	N/A		JV	CBI
11/11/20	*Ricinus communis*	RICO_01	N/A	100	0.01		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
10/20/20	*Schinus molle*	SCMO_01	1	0	N/A		JV	CBI
10/20/20	*Schinus molle*	SCMO_02	1	0	N/A		JV	CBI
10/23/20	*Schinus molle*	SCMO_03	1	0	N/A		JV	CBI
10/23/20	*Schinus molle*	SCMO_04	1	0	N/A		JV	CBI
11/10/20	*Schinus molle*	SCMO_05	1	0	N/A		JV	CBI
11/10/20	*Schinus molle*	SCMO_06	1	0	N/A		JV	CBI
11/11/20	*Schinus molle*	SCMO_07	1	0	N/A		JV	CBI
11/11/20	*Schinus molle*	SCMO_08	1	0	N/A		JV	CBI
11/11/20	*Schinus molle*	SCMO_09	0	4	N/A		JV	CBI
11/11/20	*Schinus molle*	SCMO_10	1	0	N/A		JV	CBI
11/11/20	*Schinus molle*	SCMO_11	1	0	N/A		JV	CBI
2/10/21	*Schinus molle*	SCMO_12	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_13	1	0	N/A	Branches from adjacent neighbor laying on preserve	JV	CBI
2/23/21	*Schinus molle*	SCMO_14	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_15	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_16	4	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_17	2	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_18	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_19	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_20	1	0	N/A		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
2/23/21	*Schinus molle*	SCMO_21	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_22	1	0	N/A		JV	CBI
2/23/21	*Schinus molle*	SCMO_23	1	0	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_01	0	50	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_02	0	50	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_03	0	25	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_04	0	10	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_05	0	15	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_06	0	100	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_07	0	10	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_08	0	10	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_09	0	10	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_10	0	5	N/A		JV	CBI
10/27/20	*Silybum marianum*	SIMA_11	1	0	N/A		JV	CBI
10/27/20	*Silybum marianum*	SIMA_12	1	0	N/A		JV	CBI
10/27/20	*Silybum marianum*	SIMA_13	1	0	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_14	0	50	N/A		SS	CBI
11/10/20	*Silybum marianum*	SIMA_15	0	12	N/A		SS	CBI
11/10/20	*Silybum marianum*	SIMA_16	0	25	N/A		SS	CBI
11/10/20	*Silybum marianum*	SIMA_17	0	20	N/A		SS	CBI
11/10/20	*Silybum marianum*	SIMA_18	0	1	N/A	*Carduus* also present.	SS	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
11/10/20	*Silybum marianum*	SIMA_19	3	0	N/A	Carduus also present.	SS	CBI
11/10/20	*Silybum marianum*	SIMA_20	0	100	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_21	0	5	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_22	1	0	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_23	0	30	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_24	0	100	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_25	0	10	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_26	0	5	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_27	15	0	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_28	0	50	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_29	0	30	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_30	10	0	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_31	0	50	N/A		JV	CBI
11/10/20	*Silybum marianum*	SIMA_32	0	200	N/A		JV	CBI
11/11/20	*Silybum marianum*	SIMA_33	10	0	N/A		JV	CBI
11/11/20	*Silybum marianum*	SIMA_34	2	0	N/A		JV	CBI
11/11/20	*Silybum marianum*	SIMA_35	1	0	N/A		JV	CBI
11/11/20	*Silybum marianum*	SIMA_36	0	20	N/A		JV	CBI
10/20/20	*Silybum marianum*	SIMA_37	N/A	1000	0.1		JV	CBI
11/10/20	*Silybum marianum*	SIMA_38	N/A	2000	0.68		JV	CBI
11/10/20	*Silybum marianum*	SIMA_39	N/A	N/A	0.02	Large patch.	JV	CBI
11/11/20	*Silybum marianum*	SIMA_40	N/A	30	0.02		JV	CBI

Survey Date	Species	Occurrence ID	Number of Plants (Exact)	Number of Plants (Estimate)	Area (acres)	Notes	Observer	Affiliation
11/11/20	*Silybum marianum*	SIMA_41	N/A	75	0.01		JV	CBI
11/11/20	*Stipa miliacea*	STMI_01	1	0	N/A		JV	CBI
2/10/21	*Tamarix aphylla*	TAAP_01	1	0	N/A		JV	CBI
2/23/21	*Tamarix aphylla*	TAAP_02	1	0	N/A		JV	CBI
10/20/20	*Tamarix* sp.	TASP_01	1	0	N/A		JV	CBI
2/10/21	*Tamarix* sp.	TASP_02	1	0	N/A		JV	CBI
2/23/21	*Washingtonia filifera*	WAFI_01	2	0	N/A		JV	CBI

Appendix B.4

Stewardship (Threats) Attribute Data

Stewardship (Threats) Attribute Data

Table B.4-1. Stewardship (Threats) Attribute Data.

Survey Date	Type of Threat	Occurrence ID	Trash Priority	Notes	Observer	Affiliation
10/23/20	Altered hydrology	AH_01	0	Concrete dam.	JV	CBI
10/20/20	Dumping/trash	TR_01	3	Wood from old livestock structure.	JV	CBI
10/20/20	Dumping/trash	TR_02	2	Corrugated drain pipe.	JV	CBI
10/23/20	Dumping/trash	TR_03	2	PVC pipe.	JV	CBI
10/27/20	Dumping/trash	TR_04	3	Wood pile.	JV	CBI
10/27/20	Dumping/trash	TR_05	1	Downed barbed wire fence. Old. Remove.	JV	CBI
10/27/20	Dumping/trash	TR_06	1	Old barbed wire fence. Remove.	JV	CBI
10/27/20	Dumping/trash	TR_07	1	Barbed wire fence. Old.	JV	CBI
10/27/20	Dumping/trash	TR_08	1	Old barbed wire fence. Cut and down in some places	JV	CBI
10/27/20	Dumping/trash	TR_09	1	Downed barbed wire fence. Remove.	JV	CBI
11/10/20	Dumping/trash	TR_10	3	Old wooden platform.	JV	CBI
11/10/20	Dumping/trash	TR_11	2	Steel table.	JV	CBI
11/10/20	Dumping/trash	TR_12	2	Corrugated steel.	JV	CBI
11/10/20	Dumping/trash	TR_13	1	Broken barbed wire fence. Remove.	JV	CBI
11/10/20	Dumping/trash	TR_14	1	Broken barbed wire. Old. Remove.	JV	CBI
11/10/20	Dumping/trash	TR_15	1	Old barbed wire. Remove.	JV	CBI
11/10/20	Dumping/trash	TR_16	1	Old barbed wire. Remove.	JV	CBI
11/11/20	Dumping/trash	TR_17	2	Old trailer with wood and metal. Old carpet, fence	JV	CBI
11/11/20	Dumping/trash	TR_18	1	Tire.	JV	CBI
10/27/20	Dumping/trash	TR_19	1	Old fencing. Remove.	JV	CBI
10/27/20	Dumping/trash	TR_20	1	Old barbed wire fence.	JV	CBI
10/27/20	Dumping/trash	TR_21	1	Old barbed wire fence.	JV	CBI

Survey Date	Type of Threat	Occurrence ID	Trash Priority	Notes	Observer	Affiliation
10/27/20	Dumping/trash	TR_22	1	Old barbed wire fence.	JV	CBI
10/27/20	Dumping/trash	TR_23	1	Barbed wire fence. Remove.	JV	CBI
10/27/20	Dumping/trash	TR_24	1	Barbed wire fence. Remove.	JV	CBI
2/23/21	Dumping/trash	TR_25	1	Old barbed wire.	JV	CBI
2/23/21	Dumping/trash	TR_26	1	Old smooth wire.	JV	CBI
2/23/21	Dumping/trash	TR_27	2	Old plastic bucket.	JV	CBI
2/23/21	Dumping/trash	TR_28	2	Old, melted PVC pipe.	JV	CBI
2/23/21	Dumping/trash	TR_29	1	Old barbed wire in several locations here.	JV	CBI
2/23/21	Dumping/trash	TR_30	1	Old barbed wire.	JV	CBI
2/23/21	Dumping/trash	TR_31	3	Yard waste (eucalyptus leaves, branches).	JV	CBI
2/23/21	Dumping/trash	TR_32	3	Yard waste.	JV	CBI
2/23/21	Dumping/trash	TR_33	3	Yard waste and dirt.	JV	CBI
2/23/21	Dumping/trash	TR_34	2	Plastic tub.	JV	CBI
2/23/21	Dumping/trash	TR_35	1	Old barbed wire.	JV	CBI
2/23/21	Dumping/trash	TR_36	2	Old hammock.	JV	CBI
2/23/21	Dumping/trash	TR_37	2	Old wood farming and shed materials	JV	CBI
2/23/21	Dumping/trash	TR_38	1	Old fence for a garden. Wooden posts and other mis	JV	CBI
2/23/21	Dumping/trash	TR_39	1	Old wooden playhouse. TV inside.	JV	CBI
2/23/21	Dumping/trash	TR_40	2	Old doghouse.	JV	CBI
10/20/20	Erosion	ER_01	0	Fix erosion around culvert.	JV	CBI
11/10/20	Erosion	ER_02	0	Erosion associated with drainage.	JV	CBI
11/10/20	Erosion	ER_03	0	Erosion.	JV	CBI
11/11/20	Erosion	ER_04	0	Gully in road.	JV	CBI
11/11/20	Erosion	ER_05	0	Bank erosion.	JV	CBI
11/11/20	Erosion	ER_06	0	Rills in road.	JV	CBI

Survey Date	Type of Threat	Occurrence ID	Trash Priority	Notes	Observer	Affiliation
11/11/20	Erosion	ER_07	0	Road gully.	JV	CBI
11/11/20	Erosion	ER_08	0	Rill in road.	JV	CBI
11/11/20	Erosion	ER_09	0	Bank erosion.	JV	CBI
11/11/20	Erosion	ER_10	0	Bank erosion.	JV	CBI
2/23/21	Erosion	ER_11	0	Gully erosion.	JV	CBI
2/23/21	Erosion	ER_12	0	Gully erosion.	JV	CBI
2/23/21	Erosion	ER_13	0	Associated with a drainage.	JV	CBI
2/23/21	Erosion	ER_14	0	Gully along roadside.	JV	CBI
10/20/20	Fencing	FE_01	0	Fix fence to prevent trespassing.	JV	CBI
10/20/20	Fencing	FE_02	0	Fence cut by private landowner. Repair.	JV	CBI
10/23/20	Fencing	FE_03	0	Fencing needed here.	JV	CBI
11/10/20	Fencing	FE_04	0	Broken/cut chain link. Repair.	JV	CBI
11/10/20	Fencing	FE_05	0	Broken chain link. Need to repair/replace.	JV	CBI
11/10/20	Fencing	FE_06	0	Cut chain link. Repair or contact adj. land owner.	JV	CBI
11/11/20	Fencing	FE_07	0	Repair fence.	JV	CBI
11/11/20	Fencing	FE_08	0	Fence needed. Illegal parking here.	JV	CBI
10/23/20	Fencing	FE_09	0	Downed fencing. Repair.	JV	CBI
10/23/20	Fencing	FE_10	0	Downed fence. Repair.	JV	CBI
10/23/20	Fencing	FE_11	0	Downed fencing. Repair.	JV	CBI
10/20/20	Gates	GA_01	0	Gate needed here.	JV	CBI
10/23/20	Gates	GA_02	0	Old gate located here. Repair.	JV	CBI
10/27/20	Gates	GA_03	0	Old gate. Repair.	JV	CBI
10/23/20	Invasive Animals	IA_01	0	Wild turkeys, observed by EHC.	JV	CBI
10/20/20	Other	Other_01	0	Concrete pad. A possible old well head.	JV	CBI
10/27/20	Other	Other_02	0	Concrete pad, capped well?	JV	CBI
11/11/20	Signage	SI_01	0	Need signs.	JV	CBI

Survey Date	Type of Threat	Occurrence ID	Trash Priority	Notes	Observer	Affiliation
11/11/20	Signage	SI_02	0	Signs needed. Illegal parking area.	JV	CBI
10/20/20	Unauthorized clearing	UC_01	0	Fuel break along whole boundary - illegal.	JV	CBI
10/20/20	Unauthorized clearing	UC_02	0	Fuel break.	JV	CBI

Appendix B.5

Threats Worksheet

Threats Worksheet

Table B.5-1. Threats Worksheet

Main Threat	Threat Subcategory	Evidence
Agriculture	Crops/Orchards	Crops planted and harvested (orchards and dryland farming).
	Grazing (current)	No evidence.
	Grazing (historic)	Grazing in grasslands and possibly other portions of the Preserve.
	Logging	No evidence.
Altered Fire Regime	Frequent Fires	Three fires between 1911 and 2007.
	Fire Suppression	No evidence.
	Fuel Modification	Vegetation clearing on the Preserve by adjacent homeowner.
Altered Hydrology	Flood Control	No evidence.
	Groundwater Pumping	A historic well is located on the Preserve (location unknown).
	Hydrological Alteration	Earthen reservoir and dam located west of ranch house; impervious surfaces around ranch house from removing vegetation and compacting soil.
	Inundation	No evidence.
	Water Diversion	Earthen reservoir and dam located west of ranch house.
	Waterway Channelization	Earthen reservoir and dam located west of ranch house.
Border Patrol Activities	Vehicle Impacts	No evidence.
Competition	Native Species	No evidence.
Climate Change	---	Regional impact; not addressed at preserve-level.
Energy	Pipelines	No evidence.

Main Threat	Threat Subcategory	Evidence
	Powerlines	Transmission towers and lines, spur roads.
	Substations	No facilities.
	Wind Facilities	No facilities or structures.
Erosion	Roads and trails	Evident on roads and in drainages.
Genetics Consequences (MSP Species)	Small Population(s)	No evidence.
	Isolated Population(s)	No evidence.
	Hybridization	No evidence.
Herbivory and Predation	---	No evidence.
Horticultural Collecting	---	No evidence
Human Use of Preserve	Dumping/Trash	Mapped during reconnaissance surveys.
	Illegal Encampments	No evidence.
	Management, Monitoring, & Maintenance Activities	Management, monitoring and maintenance activities occur on a regular basis.
	Off-road Vehicles	No evidence.
	Recreation	Hikers observed.
	Shooting	No evidence.
	Trail Use	Trails evident; hikers observed.
	Trampling	No evidence.
Invasive Animal Species	Aquatic Species	Not detected within Preserve.
	Argentine Ants	No evidence, but likely threat.
	Brown-headed Cowbird	No recent evidence, but historically observed.
	Feral Pigs	Not detected within Preserve.
	Goldspotted Oak Borer	GSOB: The Preserve lies within the GSOB zone of infestation and GSOB is present in the Ramona area.

Main Threat	Threat Subcategory	Evidence
	Polyphagous/Kuroshio Shot-hole Borer, Oak Pit Scale	Reported from trees located in eastern Escondido. Oak Pit Scale: No evidence, but likely threat.
	Oak Pit Scale	Not detected within Preserve.
	Turkeys	Observed on the Preserve (southern grassland area).
Invasive Plant Species	Level 1 Invasive Plants	No evidence.
	Level 2 Invasive Plants	No evidence.
	Level 3 Invasive Plants	Mapped during 2020-2021 invasive plant surveys.
	Level 4 Invasive Plants	Mapped during 2020-2021 invasive plant surveys.
	Level 5 Invasive Plants	No evidence.
	Uncategorized Species	Mapped during 2020-2021 invasive plant surveys.
Loss of Connectivity	Roads	State-route 78.
	Development	Rural residential development adjacent to Preserve to east, south and west.
Military Activities	Training Activities	No military activities on Preserve.
	Vehicle Impacts	No military activities on Preserve.
Mining	Gravel	No evidence.
	Sand	No evidence.
	Other	Exploratory mining pit located on the Preserve, but not considered a threat.
Parasitism and Disease	(Specify if Detected)	No evidence.
Pesticides, Rodenticides, and Herbicides	Rodenticides	Reports of historical rodenticide application to control small mammals.
Roads	Construction	No new construction (historical only).

Main Threat	Threat Subcategory	Evidence
	Maintenance	Several roads maintained by SDG&E to service powerlines.
	Widening	No evidence.
Urban Development	Artificial Lighting	Possible along southern and eastern boundaries of Preserve; however, rural residential. Possible from ranch house lighting.
	Edge Effects	Vegetation clearing, dumping, encroachment, Argentine ants.
	Nitrogen Deposition	Regional impact; moderately high per nitrogen deposition model (Tonnesen et al. 2002).
	Pollution	Regional impact; unknown but inferred to be moderately high based on nitrogen deposition levels.

Appendix C. History of Stephens' Kangaroo Rat (*Dipodomys stephensi*) on the Montecito Ranch Preserve

History of Stephens' Kangaroo Rat (*Dipodomys stephensi)* on the Montecito Ranch Preserve

1.0 Introduction

Stephens' kangaroo rat (*Dipodomys stephensi*, SKR) is a federally listed (endangered) and state listed (threatened) mammal distributed in parts of western Riverside and northern San Diego counties. The California Department of Fish and Wildlife (CDFW) listed the species as threatened in 1971 and the United States Fish and Wildlife Service (USFWS) listed the species as endangered in 1988. The USFWS proposed to down-list SKR to threatened on August 19, 2020. Prior to the late 1990s, its known distribution in San Diego County was limited to Marine Corps Base Camp Pendleton, Seal Beach Naval Weapons Station Fallbrook Annex, Lake Henshaw, and Rancho Guejito. Wayne Spencer and Steve Montgomery documented SKR in the Ramona Grasslands in 1997 (Ogden 1998).

The Montecito Ranch Preserve (Preserve) is in the northern portion of the Ramona Grasslands and supports habitat considered suitable for SKR; however, SKR biologists have reached varying conclusions regarding the species' occupation of the Preserve. We provide background information on SKR and describe the various SKR surveys, results, and conclusions for the Preserve in this document.

2.0 Background

SKR is a nocturnal, burrowing, seed-eating rodent restricted to grassland and open coastal sage scrub habitats. General natural history features and habitat requirements of SKR are well known (O'Farrell 1987, 1990). Habitats occupied by SKR typically occur on level to gently sloping terrain, although biologists have occasionally found the species on relatively steep slopes (e.g. Montgomery 1990; M.J. O'Farrell, pers. comm.). Preferred soils are loamy and low in clay and rock content, which allows for easy burrowing. SKR typically occupy disturbed annual grasslands characterized by a relatively sparse cover of both shrubs and herbaceous vegetation. Although biologists have occasionally detected resident SKR in relatively dense stands of sage scrub in Riverside County (S.J. Montgomery, pers. observ.), such occurrences are exceptions to the rule. The species is capable of occupying small patches of favorable habitat amidst otherwise unsuitable (e.g. dense grassy, denser shrub) habitats. SKR readily use narrow strips of open habitat such as dirt roads and trails to move between larger blocks of suitable habitat separated by generally unsuitable habitats (S.J. Montgomery, pers. observ; Montgomery et al. 2006; O'Farrell 1990; Price and Kelly 1992). Populations of SKR can rapidly colonize or abandon sites in response to changes in habitat conditions (e.g., natural or human-caused decreases or increases in herbaceous vegetation cover) (Dudek 1998).

A high ratio of forbs to nonnative annual grasses is indicative of high quality SKR habitat (O'Farrell and Uptain 1987). Well-occupied SKR habitat commonly exhibits an abundance of bare ground during much of the year. Spring and early summer produce forb (e.g. *Erodium* sp.) growth that often temporarily reduces the amount of bare ground; however, hot summer weather then typically causes forb desiccation and disarticulation, once again revealing high amounts of bare ground. In contrast, nonnative grasses such as rip-gut brome (*Bromus diandrus*) and other bromes (*B. madritensis, B. rubens*) form dense layers of thatch after senescing. This thatch persists and increases over time reducing forb and bare ground cover eventually leading to unsuitable conditions for SKR.

3.0 Historical Surveys

Phil Behrends conducted the first SKR survey on the Preserve in March 1998 (Dudek 1998). He initially noted signs of kangaroo rats in the western and eastern grasslands and in disturbed coastal sage scrub habitats, and implemented live-trapping in areas he considered potentially suitable for SKR. He then later successfully trapped kangaroo rats in the grassland located in the eastern portion of the Preserve. He collected anatomical measurements on captured kangaroo rats (e.g., ear and skull measurements) leading him to confirm the presence of SKR on the Preserve; albeit occupation was low (Dudek 1998).

Dr. Behrends did not detect any other kangaroo rat species during his surveys, but he did trap San Diego and California pocket mice (*Chaetodipus fallax, C. californicus*), deer mice (*Peromyscus maniculatus*), and California mice (*Peromyscus californicus*). Behrends reported that 1998 was an El Niño rainfall year and some areas of the Preserve that supported kangaroo rat sign during his initial habitat assessment were overgrown with dense grass and forbs later in the season when he conducted trapping. He also noted the presence of cattle grazing, which can help maintain suitable habitat conditions for SKR.

Michael O'Farrell resurveyed the Preserve for SKR in 2001 (O'Farrell Biological Consulting 2001). He detected kangaroo rat sign in the eastern grasslands, like Behrends, and noted that the owner was dryland farming the southwest grasslands thus reducing the likelihood of kangaroo rat presence in that area. He trapped in the eastern grasslands but only captured Dulzura kangaroo rats (*Dipodomys simulans,* DKR), and noted that California ground squirrel (*Otospermophilus beecheyi*) and pocket gopher (*Thomomys bottae*) sign was low. O'Farrell sent tissue samples from the trapped kangaroo rats to Anthony Metcalf (California State University San Bernardino) for genetic analysis, who confirmed the identification of DKR (REC Consultants 2008). While disagreeing with Behrends' original identification of SKR, O'Farrell found no compelling reason for SKR absence; however, he noted low abundances of other small mammals possibly resulting from large-scale agriculture discing or the possible application of rodenticides (Beck pers. comm., Wynn pers. comm.).

O'Farrell resurveyed the Preserve again in 2007 and found the same general conditions as in 2001. He captured a single DKR and stated that he doubted that SKR ever occupied the Preserve (REC Consultants 2008). O'Farrell also expressed skepticism about the functionality of SKR habitat connectivity from the Ramona Grasslands to the Preserve and noted that potential SKR habitat on the Preserve was marginal and surrounded by inappropriate habitat. Interestingly, his 2001 report stated that SKR habitat conditions in the eastern grassland were high quality, in contrast to his characterization of SKR habitat in his 2007 report.

O'Farrell concluded that SKR in the Ramona Grasslands were limited in their distribution and exhibited an "uncharacteristic lack" of colonizing of surrounding apparently suitable unoccupied habitats (e.g., west of Rangeland Road). Similarly, S. Montgomery (personal observation) had noted a similar inexplicable absence of SKR in some apparently suitable habitats during various field visits to the Ramona Grasslands prior to 2018.

4.0 Recent Surveys

In 2015 Steve Montgomery trapped SKR on the Ramona Grasslands Preserve approximately 100 yards from the southwestern corner of Montecito Ranch and in 2018 he conducted surveys on Montecito Ranch for SKR (SJM Consulting 2015, SJM Biological Consultants 2019). During the 2018 surveys, Montgomery set traps in the eastern and southwestern grassland areas in locations exhibiting clear kangaroo rat sign, including several of the same locations cited by Behrends. Montgomery focused his 4-night trapping effort on the dirt road that traverses the eastern grassland that is mostly distant from significant shrub cover. He also trapped in open mostly grassland habitats in the southwestern part of the property. He captured numerous DKR in all trapping locations, as well as low numbers of other small mammals, but no SKR. He captured far higher numbers of DKR than Behrends, but fewer species of rodents than reported by Behrends despite Behrends' more limited (2-night) survey effort (Dudek 1998). Interestingly, Behrends reported two species typically associated with more shrubby habitat types (*Peromyscus californicus, Chaetodipus californicus*), neither of which were captured by Montgomery or O'Farrell, suggesting that he may have trapped closer to shrub cover than either Montgomery or O'Farrell. Montgomery stated that removing cattle (grazing), and the potential application of rodenticides, could have resulted in the eventual extirpation of SKR from the Preserve.

5.0 Summary and Conclusions

The history of SKR occupation on the Preserve is unclear, but it appears that SKR likely existed there historically. Previous agricultural land use practices (e.g., removal of cattle, discing, potential rodenticide application) and changing habitat conditions may have caused their decline and eventual absence from the Preserve. Two SKR experts (Wayne Spencer, Steve Montgomery) support Behrends' original identification of SKR and believe that historical Preserve conditions were suitable for SKR (Montgomery pers. comm., Spencer pers. comm.). O'Farrell, also an SKR expert, disagreed with Behrends' assessment and only confirmed the presence of DKR in 2001

using genetic analyses. Steve Montgomery then ultimately only captured DKR in the grassland habitat exhibiting the highest potential for SKR.

Montecito Ranch has a long history of human land uses, including intensive agriculture and livestock grazing that have potentially affected SKR and its habitat. Much of the western portion of the Preserve supported orchards in the early 20th century. Portions of the Preserve were disced or cultivated in contemporary times but it is unclear when these activities occurred or if Preserve owners implemented other land-disturbing activities. Aerial photographs (May 2002; Google Earth) of the Preserve depict large-scale discing of nearly all level and gently sloping terrain, while aerial photos from 1994 and 1996 show no signs of cultivation or discing. O'Farrell reported active dryland farming of the western half of the Preserve during his September 2001 surveys (O'Farrell 2001). Behrends' stated that nonnative grassland/pastureland existed in the flatter portions of the Preserve where cattle grazing and other disturbances had altered the natural vegetation. He also stated that the Preserve supported a small herd of cattle that maintained the pasture-like quality of the grasslands.

O'Farrell's 2001 survey presumably occurred before the 2002 discing and he did not survey the southwestern grasslands because it was dryland farmed. However, he did not mention the presence of extensive discing in his subsequent 2007 report, suggesting that the vegetation had recovered to more normal conditions by that time. Montgomery's 2018 survey occurred well after the 2002 discing, following many years of nonnative grass and forb thatch accumulation that presumably resulted from the removal of livestock.

Both O'Farrell and Montgomery captured numerous DKR and no SKR, but Behrends reported a slightly higher number of non-kangaroo rat rodent species than either O'Farrell or Montgomery. DKR is typically associated with shrub-dominated habitats (SJM Biological Consultants 2019). However, O'Farrell and Montgomery captured DKR in more open herbaceous-dominated habitats that are typically occupied by SKR, possibly in response to the absence of SKR and/or habitat modifications associated with recent land use practices.

Montgomery conducted a more recent site visit in November 2020 and found that habitat conditions on the Preserve consisted of denser herbaceous cover in all grassland/pastureland areas, with less kangaroo rat sign than observed during his 2018 survey. The increase in herbaceous vegetation cover likely resulted from the absence of recent regular human land use practices. In 2018, a property manager occupied the Preserve house located in the southwest part of the property. He controlled vegetation cover in some areas primarily in the southeastern part of the Preserve near the existing house and outbuildings by regularly maintaining it with mechanical equipment, grazing with horses, and regularly driving the dirt roads. The absence of such effects in the intervening years apparently has resulted in or contributed to the more "overgrown" herbaceous vegetation conditions.

Existing spatial point data from the USFWS Carlsbad Fish and Wildlife Office includes various SKR points in the western and eastern portions of the Preserve. Review of the various SKR study reports for the Preserve confirm that all of these points were recorded by Phil Behrends in 1998. However, Behrends captured only SKR in the eastern part of the Preserve, and the various points in the western part of the Preserve were locations where he observed kangaroo rat sign but did not capture kangaroo rats. Behrends must have assumed that these westerly sign locations were occupied by SKR, based upon his capture of only SKR in the eastern part of the Preserve. Furthermore, the lack of DKR captures on the Preserve likely influenced his assumption. The absence of SKR and the capture of only DKR in subsequent trapping studies by O'Farrell (2001, 2007) and Montgomery (2019), including some of the same locations trapped by Behrends, indicated that the kangaroo rat signs reported in the western part of the Preserve by Behrends could have been those of DKR. Thus, his assumption of the occurrence of SKR in the western part of the Preserve was invalid. We recommend the reassignment of the SKR points in the western part of the Preserve as potential SKR capture locations instead of positive capture locations for this species.

Literature Cited

Beck, Michael. 2020. San Diego Director, Endangered Habitats League and President, Endangered Habitats Conservancy. Personal communication with Jessie Vinje. November.

Dudek and Associates. 1998. Stephens' kangaroo rat assessment for Montecito Ranch, San Diego County, California. Prepared for Caprock Three, LLC. June 5.

Montgomery, S. 2020. Biologist. ECORP Consulting, Inc. Personal communication with Jessie Vinje. November.

Montgomery, S.J., D.J. Grout, A. Davenport, R. Knight and SJM Biological Consultants. 2006. Stephens' kangaroo rat monitoring program, and results of monitoring sessions between March 2002 and Fall 2004, at Naval Weapons Station Seal Beach, Detachment Fallbrook (NWSSB/DF). Fallbrook, California. Prepared for Conservation Program Manager, NWSSB/DF. Fallbrook, CA.

Montgomery, S.J. 1990. Trapping and habitat mapping survey for Stephens' kangaroo rats on the 235-acre Norco Hills Specific Plan, Tentative Tract 25779. Prepared for Windward Development Co. Newport Beach, California.

Ogden Environmental and Energy Services. 1998. Stephens' kangaroo rat study for the Ramona Airport expansion project, Ramona, California. Prepared for KEA Environmental and County of San Diego Department of Public works.

O'Farrell, MJ. 2001. Stephens' kangaroo rat survey results. Biological technical report and resource management plan for the Montecito Ranch draft environmental impact report. August.

O'Farrell, M.J. 1990. Stephens' kangaroo rat: natural history, distribution, and current status. Pp 78-84, In P.J. Brant and J. Remington (eds.), Memoirs of the Natural History Foundation of Orange County; Vol. 3, Publ. By Nat. Hist. Found. Of Orange County.

O'Farrell, M.J. and C.E. Uptain. 1989. Assessment of population and habitat status of the Stephens' kangaroo rat (*Dipodomys stephensi*). Calif. Dept. Fish and Game, Non-game Bird and Mammal Section Report (July 1989).

O'Farrell, M.J. and C.E. Uptain.1987. Distribution and aspects of the natural history of Stephens' kangaroo rat (*Dipodomys stephensi*) on the Warner Ranch, San Diego County, California. The Wasmann Journal. 45:34-48.

Price, M. V. and P. Kelly. 1992. Monthly and lifetime movement distances of Stephens' kangaroo rat (*Dipodomys stephensi Merriami*). Final Report, Submitted to Riverside County Habitat Conservation Agency. January 15.

Price, M.V. and P.R. Endo. 1989. Estimating the distribution and abundance of a cryptic species, *Dipodomys stephensi* (Rodentia: Heteromyidae), and implications for management. Conserv. Biol. 3:293-301.

REC Consultants. 2008. Biological technical report and resource management plan for the Montecito Ranch draft environmental impact report. August.

SJM Biological Consultants (SJM). 2015. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat for a proposed staging area at the Ramona Grasslands Preserve. Letter report to Jennifer Price, Land Use/Environmental Planner for the County of San Diego Department of Parks and Recreation. January 11.

SJM Biological Consultants. 2019. Results of a habitat assessment and trapping survey for Stephens' kangaroo rat (*Dipodomys stephensi*) at the Montecito Ranch property, Ramona, California. Prepared for Endangered Habitats Conservancy. February.

Spencer, W. 2020. Biologist, Conservation Biology Institute. Personal communication with Jessie Vinje and Steve Montgomery. November.

Spencer, W, S. J. Montgomery, P. R. Behrends, and D. M. Shier. 2018. Stephens' kangaroo rat (*Dipodomys stephensi*). In: Tremor, S., D. Stokes, W. Spencer, J. Diffendorfer, and S. Chivers (Eds.). San Diego County Mammal Atlas. Sunbelt Publications.

Wynn, Susan. 2020. Fish and Wildlife Biologist. United States Fish and Wildlife Service. Personal communication with Jessie Vinje. November.

Appendix D. Example of Vernal Pool Monitoring Form

Example of Vernal Pool Monitoring Form

Example City of San Diego Vernal Pool Habitat Conservation Plan Monitoring Form

Monitor Name & Affiliation:	*Date:*
Complex ID:	*Complex Name:*
Pool ID:	*Additional Staff:*
Land Owner/Manager:	

I. QUALITATIVE MONITORING

Mark all categories that apply and specify type of disturbance

☐ Fencing/Sign _____ ☐ Trespass _____ ☐ Invasive Species _____

☐ Edge effects _____ ☐ Topographic Disturbance _____ ☐ Inundation _____

☐ Fire _____ ☐ Other _____

Notes: (describe impact in more detail including % of pool and/or complex affected)

Complex Disturbance Category (see back of form for description of categories)

☐ None/Minimal ☐ Light to Moderate ☐ Moderate to Substantial

☐ Substantial (restoration potential) ☐ Substantial (low restoration potential) ☐ Severe

Habitat Condition (see back for description)

☐ Very Good - Excellent ☐ Fair to Good ☐ Poor ☐ Very Poor

Pool Inundation - Note evidence of pool ponding and any observations of problems with ponding (i.e., hydrological disturbance)

II. MANAGEMENT RECOMMENDATIONS

☐ Fencing/Sign _____ ☐ Trespass _____ ☐ Invasive Species _____

☐ Edge effects _____ ☐ Topographic Disturbance _____ ☐ Inundation _____

☐ Fire _____ ☐ Other _____

Management Level ☐ Level 1 ☐ Level 2 ☐ Level 3

Timing of Management Action ☐ Immediate (contact Preserve Manager) ☐ Other timeframe (indicate)

III. QUANTITATIVE MONITORING

Monitoring Level ☐ Level 1 ☐ Level 2 ☐ Level 3

Flora Species Observations

(check cover class for each species, add additional native and nonnative species as necessary)

Species	<1%	1-5%	5-10%	10-25%	25-50%	50-75%	75-100%	Species	<1%	1-5%	5-10%	10-25%	25-50%	50-75%	75-100%
PONU															
POAB															
NAFO															
ERAR															
ORCA															

Fauna Species Observations

	Observed in Pool	Collected	# Males Collected	Est. Population (1's, 10's, 100's, 1,000's)	Permitted/Qualified Staff
Brachinecta sp.	☐	☐			
Streptocephalus woottoni	☐	☐			

V. SITE PHOTO MONITORING ☐ Check if photos were taken

Location [State Plane (ft)]	Direction (facing)	Height	Camera Angle	Photo #	File location/s

VI. OTHER NOTES/COMMENTS

Continue on back if needed.

Modified Trudgen & Keighery Vegetation Condition Scale

Very Good-Excellent	80-100% Native Flora Composition Vegetation Structure intact or nearly so Cover /abundance of weeds < 5% No or minimal signs of disturbance
Fair to Good	50-80% Native Flora Composition Vegetation structure modified or somewhat modified Cover/abundance of weeds 5-20% any number of individuals Possible minor signs of disturbance
Poor	20-50% Native Flora Composition Vegetation structure modified Cover/abundance of weeds 20-60% any number of individuals Disturbance incidence high
Very Poor	0-20% Native Flora Composition Vegetation Structure disappeared Cover/abundance of weeds 60-80% any number of individuals Disturbance incidence very high

Disturbance Categories and Descriptions (Bauder et al. 2009)

1 **Minimal disturbance/no disturbance**
- no known disturbance
- light past grazing or brushing
- ungraded tracks or trails

2 **Light to moderate disturbance --not recent, self-recovered or restorable**
- brushing, blading, disking, cultivation and/or vehicles (not recent)
- grazing
- trash/dumping
- fire
- sediment deposition

3 **Moderate to substantial disturbance --restorable or has been restored; some potential for self-recovery**
- disking, blading and/or plowing (cultivation)- may or may not be recent
- sediment deposition
- vehicle damage
- landscape altered by roads, culverts, and/or loss of mounds

4 **Substantial disturbance--restoration potential, but extensive restoration efforts needed**
- on-going grazing, frequent fires and/or recent blading/brushing
- extensive vehicle damage
- landscape altered by roads, culverts, and/or loss of mounds
- past extensive blading, bulldozing, plowing (cultivation) or grading

5 **Substantial disturbance--developed or restoration potential low**
- blading, grading, trenching or filling
- extensive development with hard surfaces, roads, culverts
- severe or ongoing disturbance (brushing, blading, disking, grading, bulldozing, irrigation, cultivation, vehicles)

6 **Severe disturbance—surrounding landscape dominated by development, restoration potential minimal to none**
- deep blading, extensive trenching or ripping
- native soil profile no longer evident
- artificial landscape dominates, either hard surface or cultivated turf and landscaping
- few or no vestiges of the natural topography