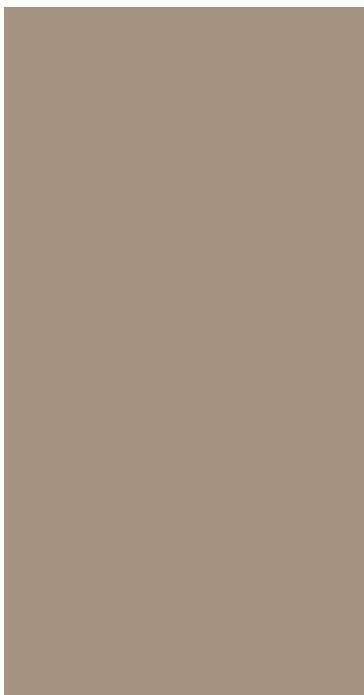
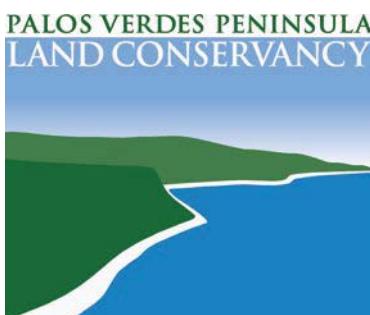


Palos Verdes Peninsula **Land Conservancy**



January -- December 2019

PALOS VERDES NATURE PRESERVE ANNUAL REPORT



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**RANCHO PALOS VERDES
NATURAL COMMUNITY CONSERVATION
PLAN/ HABITAT CONSERVATION PLAN**

November 2020

2019 ANNUAL REPORT

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1.0 INTRODUCTION

The 2019 Palos Verdes Nature Preserve Annual Report for the Rancho Palos Verdes Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) fulfills annual submittal requirements by the Palos Verdes Peninsula Land Conservancy (PVPLC) for the Palos Verdes Nature Preserve (Preserve). Additionally this report details stewardship activities, research, funding, and community involvement in the Preserve during the period January 1 through December 31, 2019. This report also includes annual submittal requirements of the City of Rancho Palos Verdes including habitat tracking and updates on Covered Projects and Activities permitted under the NCCP/HCP.

PVPLC is the designated Habitat Manager for the Palos Verdes Nature Preserve for the City of Rancho Palos Verdes. The Preserve encompasses approximately 1,400 acres and is located on the southern side of the Palos Verdes Peninsula in the City of Rancho Palos Verdes, California. The Preserve was formed under the RPV NCCP/HCP (adopted by City Council in October 2018) to “maximize benefits to wildlife and vegetation communities while accommodating appropriate economic development within the City and region pursuant to the requirements of the NCCP/HCP Act and Section 10(a) of the ESA (URS 2004a).” As a primary component of the NCCP/HCP, a Preserve design was proposed to conserve regionally important habitat areas and provide habitat linkages in order to benefit sensitive plants and wildlife. PVPLC manages the habitat in the Preserve per the requirements of the NCCP/HCP as well as other Preserve management duties further detailed in a management agreement with the City.

The primary focus of management for the Preserve is to maintain or restore habitat for the covered plant and animal species listed in the NCCP/HCP. A Habitat Management Plan was adopted in 2007 that outlines the restoration of five acres per year for a total of 15 acres over a three-year period. This plan also outlined the methodology for removal of exotic plant species, a predator control plan, and the monitoring of covered plant and animal species. PVPLC seeks additional funding when possible, to perform restoration on more than the minimum five acres per year required in the NCCP/HCP. Several opportunities of this nature occurred during the reporting period that enabled PVPLC to implement additional restoration as detailed below. Additionally, PVPLC executes several trail projects and habitat protection and enhancement measures with the aid of staff, volunteers and additional funding sources.

PVPLC also facilitates scientific research through community science programs and academic research in the Preserve. Volunteers greatly support the implementation of management strategies for the Preserve by assisting in monitoring the properties, wildlife, and habitat as well as help restore habitat and maintain trails. Collaborating with regional high schools and colleges allows for scientific research that expands our understanding of the Preserve.

Annual Submittals (Included in This Report)

1. Restoration Plans for the NCCP/HCP and Other Projects
2. NCCP/HCP Restoration Monitoring Report
3. Targeted Exotic Removal Program for Plants (TERPP) Report
4. Trail Maintenance Activities and Project List
5. Volunteer Involvement and Support
6. Community Science and Education Programs
7. City Projects and Tracking of Habitat Impacts

Site Description

The Preserve is located on the southern side of the Palos Verdes Peninsula in the City of Rancho Palos Verdes, California (Figure 1). The approximately 1,400-acre Preserve has been divided into twelve subareas referred to as Reserves.

The topography of the Preserve is diverse, ranging from relatively flat lowland areas above steep coastal bluffs in the south, to very steep slopes, ridgelines and gullies on the slopes to the north. Elevations range from approximately sea level along the coastal edges of Vicente Bluffs, Abalone Cove, and Ocean Trails to approximately 1,300 feet above mean sea level at the northern most parcel, vista del Norte. Adjacent land uses include single-family residences on most sides, open space associated with neutral lands on the Peninsula, the Pacific Ocean to the south and west, and the Los Verdes and Trump National golf courses near the western and eastern ends of the Preserve area.

Figure 1. Map of the Palos Verdes Nature Preserve with associated Reserves locations.

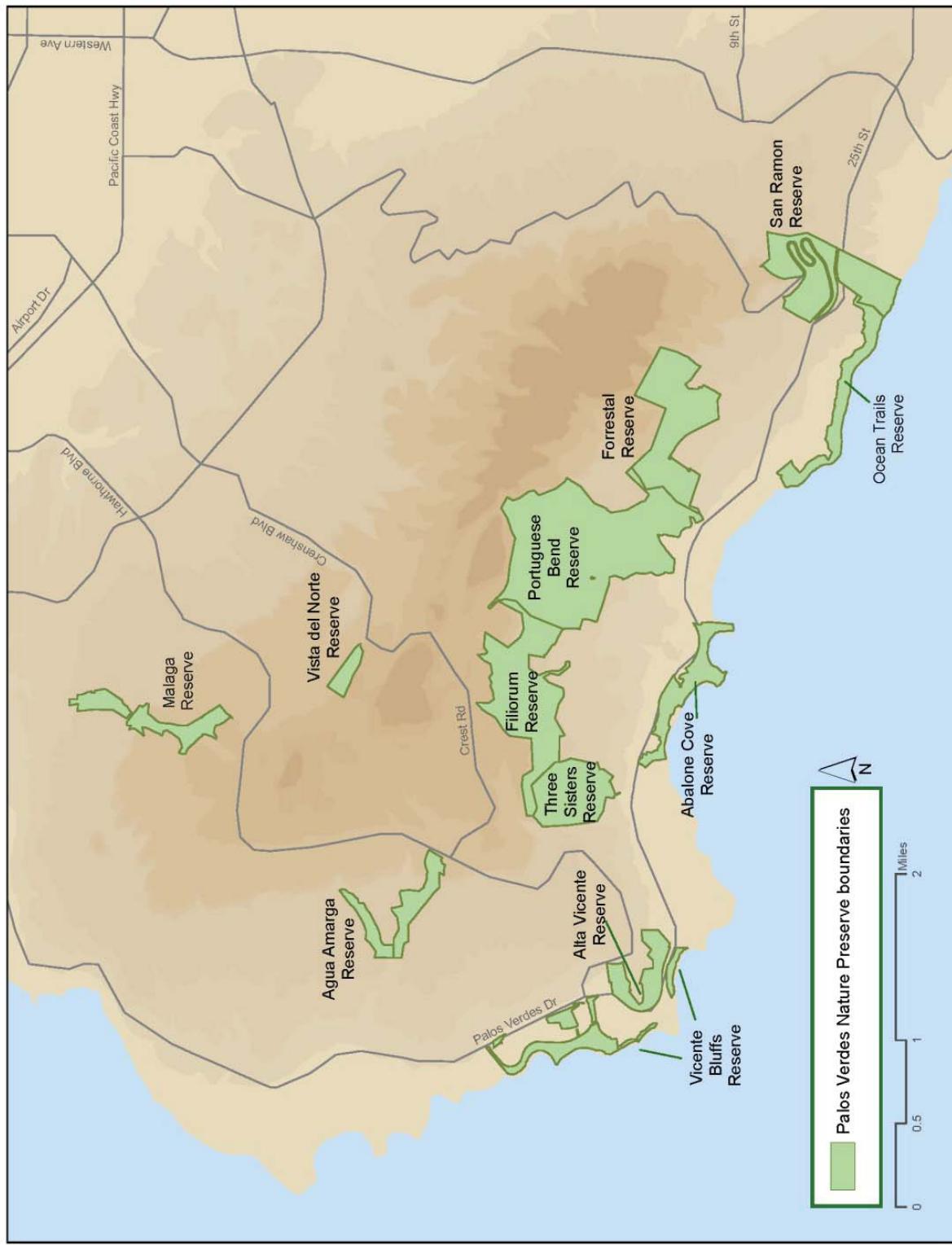


Table I
Reserve Names of the Palos Verdes Nature Preserve. See Figure I for locations.

Abalone Cove Reserve	Ocean Trails Reserve*
Agua Amarga Reserve	Portuguese Bend Reserve
Alta Vicente Reserve	San Ramon Reserve
Filiorum Reserve	Three Sisters Reserve
Forrestal Reserve	Vicente Bluffs Reserve
Malaga Reserve**	Vista del Norte Reserve

* Not managed by PVPLC, but managed under Habitat Conservation Plan
** Will be added to the Preserve when NCCP/HCP is adopted

2.0 HABITAT RESTORATION PLAN

The initial Preserve Habitat Management Plan (PHMP) for the Draft NCCP/HCP was created in 2007. A component of the PHMP was the Habitat Restoration Plan for five acres per year for a total of 15 acres over the first three-year period. This plan was completed in April 2007 and concluded that Alta Vicente Reserve in the Preserve ranked the highest in terms of site suitability for an immediate restoration project. The Habitat Restoration Plan for Alta Vicente Reserve outlines appropriate habitat revegetation locations and methodology to adequately comply with the Preserve Management requirements of the Rancho Palos Verdes NCCP/HCP. The Habitat Restoration Plan for Alta Vicente Reserve provides guidelines for the establishment of coastal sage scrub (CSS), coastal cactus scrub (CCS), and PVB butterfly habitat on a total of 15 acres during 3 consecutive years at the Alta Vicente Reserve. However, since a fire occurred at Portuguese Bend Reserve in August 2009, plans were adapted to focus immediate habitat restoration at Portuguese Bend, and only Phase 1 and 2 (10 acres) were implemented at Alta Vicente. The Restoration Plan for Portuguese Bend covers habitat restoration and monitoring of 25 acres over five years (2010 to 2015). The following provides a brief description of work done to fulfill the NCCP/HCP during the reporting period. Table 2 provides the implementation schedule for Phase 1 through 5 at Portuguese Bend.

In 2015, PVPLC developed new habitat restoration plans to execute the final phases of the restoration at Alta Vicente, and these plans were included in the 2015 Comprehensive Report. Phase 3 was initiated in 2016 and Phase 4 initiated in 2017, with the installation of drip irrigation and coastal sage scrub vegetation species. Table 3 provides the implementation schedule for Phase 3 and 4 at Alta

Vicente. In 2016, the Habitat Restoration Plan for the Abalone Cove Ecological Reserve was developed to continue with restoration at Abalone Cove Reserve. The plan includes three phases with site preparation of the first phase beginning in 2019. Table 4 provides the implementation schedule for Abalone Cove.

2.1 PORTUGUESE BEND RESERVE RESTORATION

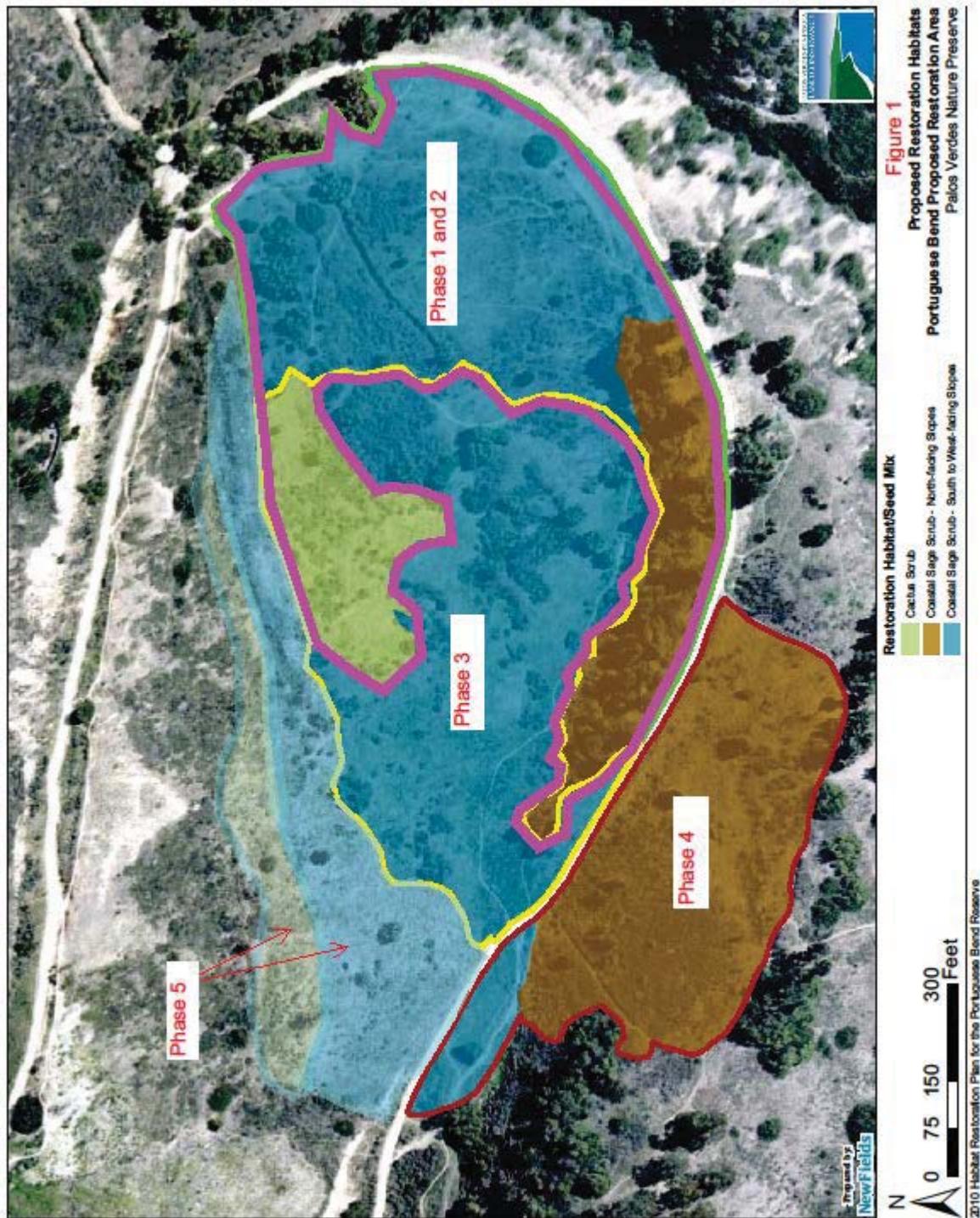
The habitat restoration plan for Portuguese Bend is to complete 25 acres in five phases (Table 2, Figure 2). Site preparation at Portuguese Bend began in February 2010. Field staff weeded (hand/herbicide) the burn area in 2010. In February 2011, goats were deployed to clear vegetation. Due to the high density of weeds, an additional year of weeding was implemented, and plants were installed on ten acres in fall 2012 (Phase 1 and Phase 2).

PVPLC implemented “grow and kill” prior to plant installation, and improve seed and plant survival after planting. Phases 1, 2 and 3 were irrigated with overhead sprinklers. Drip irrigation was installed for Phases 4 in fall 2014 and for Phase 5 in fall 2015, coinciding with the plant installation for those phases. Weed control is implemented in all phases for five years minimum after they are initiated.

Table 2
Restoration Project Schedule for Portuguese Bend Reserve Phases 1, 2, 3, 4 and 5, based on the Portuguese Bend Reserve Habitat Restoration Plan.

	Task	Date
PHASE 1 and PHASE 2	Begin site preparation, weed removal	Fall 2010
	Install irrigation	Winter 2012
	Final site preparation: weed and thatch removal	Fall 2012
	Installation: Seeding and planting	Fall 2012-Early Winter 2013
	Maintenance weeding	Winter 2013-Spring 2014
	Fill-in planting, as needed	Fall 2013-Fall 2014
	5-year biological monitoring and maintenance	Spring 2013-Spring 2017
	Phase one and two completion	2017, end of Year 5
PHASE 3	Site preparation, weed removal	Fall 2012-Fall 2013
	Final site preparation: weed and thatch removal	Fall 2013
	Installation: Seeding and planting	Fall 2013-Early Winter 2014
	Maintenance weeding	Winter 2014-Spring 2015
	Remedial seeding, as needed	Fall 2014-Fall 2015
	5-year biological monitoring and maintenance	Spring 2014-Spring 2018
	Phase three completion	2018, end of Year 5
PHASE 4	Site preparation, weed removal	Fall 2013-Fall 2014
	Final site preparation: weed and thatch removal	Fall 2014
	Installation: Seeding and planting	Fall 2014-Early Winter 2015
	Maintenance weeding	Winter 2015-Spring 2016
	Remedial seeding, as needed	Fall 2015-Fall 2016
	5-year biological monitoring and maintenance	Spring 2015-Spring 2019
	Phase 4 completion	2019, end of Year 5
PHASE 5	Site preparation, weed removal	Fall 2014-Fall 2015
	Final site preparation: weed and thatch removal	Fall 2015
	Installation: Seeding and planting	Fall 2015-Early Winter 2016
	Maintenance weeding	Winter 2016-Spring 2017
	Remedial seeding, as needed	Fall 2016-Fall 2017
	5-year biological monitoring and maintenance	Spring 2016-Spring 2020
	Phase 5 completion	2020, end of Year 5

Figure 2. Map of restoration areas at Portuguese Bend Reserve.



2.2 ALTA VICENTE RESERVE RESTORATION

The habitat restoration conducted at the Alta Vicente Reserve consists of four phases, with one phase initiated each year. The first five-acre phase of restoration (Phase 1) began with site preparation during the fall of 2007 and 2008 to minimize weeds after planting (as per the timeline in the Alta Vicente Restoration Plan, Table 2). Phase 1 plants were installed and hydroseeded during the winter of 2009/2010. Site preparation for Phase 2 began in fall 2008. In December 2010, staff removed *Acacia cyclops* and completed planting and seeding in the Phase 2 area. Staff weeded and maintained Phase 1 and 2. Additional container plants were installed from 2012 to 2017 to fill in areas with low native plant cover.

Phase 3 (Figure 3) was initiated in fall 2016 with the installation of drip irrigation system and container plants throughout the 5 acre area. Year 1 monitoring began in spring 2018. Preparation for Phase 4 planting began in summer 2017 with site clearing using goats and drip irrigation system installation. Phase 4 planting began in winter 2017 and extended through early 2018, Year 1 monitoring began in spring 2019.

Table 3
Restoration Project Schedule for Alta Vicente Reserve, based on the Alta Vicente Reserve Habitat Restoration Plan.

	Task	Date
PHASE 3	Begin site preparation, weed removal	Fall 2016
	Install irrigation	Fall 2016
	Planting Container Stock	Fall and Early Winter 2016
	Seed application	Fall and Early Winter 2017
	Monitoring and Maintenance	Begin after planting, Winter 2016
	5-year biological monitoring and maintenance	Spring 2018-Spring 2022
PHASE 4	Begin site preparation, weed removal	Summer 2017
	Install irrigation	Fall 2017
	Planting Container Stock	Fall and Early Winter 2017
	Seed application	Fall and Early Winter 2017
	Monitoring and Maintenance	Began after planting, Winter 2017
	5-year biological monitoring and maintenance	Spring 2019-Spring 2023

Figure 3. Map of Phase 3 and 4 Restoration Area at Alta Vicente Reserve



2.3 ABALONE COVE RESTORATION

The habitat restoration project at Abalone Cove Reserve will restore 15.3 total acres of mixed coastal scrub (Table 4, Figure 4). The project began in 2019, by introducing goats to graze the Phase I area to reduce the cover of invasive plants and prepare the site for the upcoming habitat planting effort set to occur in 2020. At the end of 2019, PVPLC crews also began to remove non-native woody shrubs such as acacia.

Table 4
Restoration Project Schedule for Abalone Cove Reserve, based on the Abalone Cove Reserve Habitat Restoration Plan.

	Task	Date
PHASE 1	Site clearing	Fall 2019
	Installation of supplemental watering system	Spring 2020
	Invasive weed species control and grow-kill cycles	Fall 2019 – Summer 2020
	Planting container stock	Spring 2020
	Seed application	Fall 2020
	Monitoring and maintenance	To begin upon successful installation of plants
PHASE 2	Site clearing	Spring 2020
	Installation of supplemental watering system	Summer 2020
	Invasive weed species control and grow-kill cycles	Spring 2020 – Fall 2020
	Planting container stock	Fall 2020
	Seed application	Fall 2020
	Monitoring and maintenance	To begin upon successful installation of plants
PHASE 3	Site clearing	Spring 2021
	Installation of supplemental watering system	Summer 2021
	Invasive weed species control and grow-kill cycles	Spring 2021 – Fall 2021
	Planting container stock	Fall 2021
	Seed application	Fall 2021
	Monitoring and maintenance	To begin upon successful installation of plants

Figure 4. Map of restoration areas at Abalone Cove Reserve



3.0 ADDITIONAL RESTORATION ACTIVITIES IN 2019

PVPLC seeks additional funding, to perform restoration on more than the minimum five acres per year required in the NCCP/HCP. Several opportunities occurred during the reporting period. Figure 5 provides a site map for all restoration projects active in 2019, including the restoration at Alta Vicente, Portuguese Bend and Abalone Cove Reserves that fulfills the requirements of the NCCP/HCP Habitat Restoration Plan. A complete summary of all restoration work completed in the Preserve, along with maps of restoration sites, can be found in Appendix C.

3.1 ABALONE COVE

In 2015, illegal grading took place in the Abalone Cove Reserve. The city took action working closely with the US Fish and Wildlife Service to create a mitigation plan for the area. Project planning and design began and in 2019, site preparation started with the removal of non-native species. Irrigation installation and planting is scheduled for 2020 followed by site maintenance and monitoring.

3.2 AGUA AMARGA

In 2012, an additional mitigation project (D&M Eight LTD) funded the planting of 147 riparian plants at Lunada Canyon. The plants were installed in January 2014 and irrigated with a drip irrigation system. Severe rains in 2014 caused torrential stream flows that removed some of the installed plants. PVPLC installed replacement plants and monitored the site's recovery in 2015, 2016, 2017, and 2018. The final report was submitted in 2019.

3.3 VICENTE BLUFFS

In June 2008, a grant agreement was signed with the State Coastal Conservancy to provide habitat restoration at Vicente Bluffs Reserve. PVPLC restored three acres of coastal bluff scrub and El Segundo blue butterfly habitat by removing acacia, pampas grass and ice plant, and installing container plants with coastal bluff scrub and El Segundo blue butterfly host plants. PVPLC added plants to this site in 2013, 2014 and 2015 to fulfill the grant goals. Since then, volunteers have continued the effort to plant host plants and remove weeds through 2019 in order to expand habitat area for the El Segundo blue butterfly.

3.4 PORTUGUESE BEND

In 2012, PVPLC received funding from the Habitat Conservation Fund to create trail-side habitat consisting of coastal sage scrub and cactus scrub to close unauthorized trails. The closeout of this grant occurred in 2018. PVPLC continues to monitor the completed work and maintain closures on unauthorized trails.

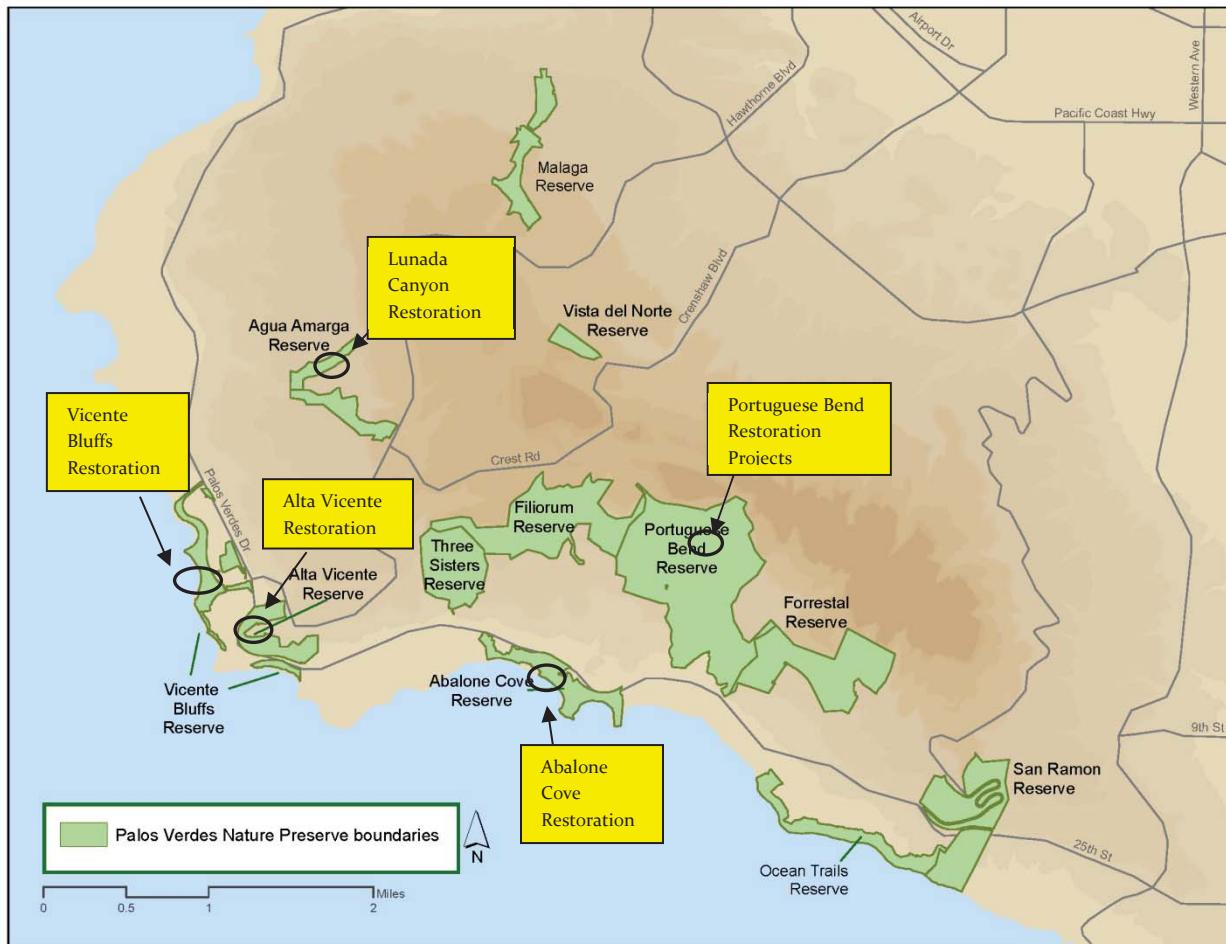


Figure 5. Site map for active 2019 restoration projects in the Palos Verdes Nature Preserve.

3.5 FUEL LOAD REDUCTION PROJECT

In the summer of 2019, PVPLC proposed a fuel load reduction project to the city of RPV which consisted of the removal of 23 acres of Acacia (*Acacia cyclops*) shrubs and 15 acres of non-native mustard. This approved project occurred in three locations in the Portuguese Bend Reserve near Portuguese Canyon and in the southern area of the preserve near Narcissa drive. Large Acacia shrubs were cut, chipped and taken offsite where possible. PVPLC is monitoring the areas of Acacia removal to treat any regrowth and to remove any seedlings. Goats were used in the San Ramon Reserve to reduce the large stands of non-native brush along the San Ramon Trail. The full details of the Acacia removal and fuel load reduction project can be found in the Targeted Exotic Removal Program for Plants (section 6.0)

4.0 MONITORING

4.1 HABITAT RESTORATION MONITORING

PVPLC's stewardship staff conducted surveys at the restoration sites throughout the Preserve including quantitative vegetation transects, qualitative vegetation assessments and photo point monitoring. Vegetation transect surveys were conducted using standardized methods (line intercept and CNPS Rapid Vegetation Assessment) that provide data on the cover of native and non-native plants in the habitat in order to evaluate success against criteria as determined in the habitat restoration plans. Quantitative point-intercept transect surveys are conducted in Year 3 and Year 5 after planting, whereas qualitative rapid vegetation assessments are conducted in Years 1, 2 and 4. In 2019, restoration monitoring was conducted at Alta Vicente and Portuguese Bend Reserves. Detailed monitoring reports are in Appendix A.

At Alta Vicente, the plants in all phases of the restoration area are healthy and growing. The cactus scrub has met success criteria. The coastal sage scrub has achieved success criteria of 50% native plant cover (63% qualitatively observed). Over the years, PVPLC has adapted its approach to restoration and resulting low percent cover by increasing plant density and utilizing drip irrigation instead of overhead sprinklers in subsequent restoration projects. The Palos Verdes blue butterfly habitat has not met the success criteria (>10%), due to low numbers of host plants along the transects (8% and 9% quantitatively). In 2020 staff will focus on controlling weeds on a regular basis to decrease competition and increase bare ground for seed germination. Targeted soil disturbance will also occur to stimulate early successional host plant species germination. PVPLC will continue to observe and control weeds in Phase 1 and Phase 2 to observe the rate of restoration and monitor butterfly habitat transects, but will stop monitoring CSS habitat transects since they are beyond Year 8 of restoration and are meeting qualitative measurements. Phase 3 was monitored for its Year 2 analysis in 2019. Using qualitative methods (CNPS Rapid Vegetation Assessment Method) coastal sage scrub and wildflower habitats were found to already be approaching Year 3 goals with native cover above 50% in coastal sage scrub and over 25% in wildflower restored areas.

At Portuguese Bend, Phase 1 and 2 were installed the same year (2012), to allow for an additional year of weed control at the site prior to planting. Therefore, they both represent Year 7 after plant installation for the 2019 monitoring. Plants were healthy, and recruitment from seed was observed at the site, however several transects within coastal sage scrub habitat (north and south facing) of Phase 1 and 2 continued to struggle to meet success criteria. This is due to now-discontinued restoration methods of overhead irrigation and sparse planting arrays. After not meeting success criteria after the qualitative monitoring, transects PB1, PB2 and PB3 will be monitored again in 2020. PVPLC will plant and remove non-native species in less dense areas to aid in native plant percent cover in these areas in 2020. The cactus scrub restoration in Phase 1 and 2 had already met success criteria in 2018. In Phase 3, native plant cover achieved quantitative success criteria

achieving Year 5 standards in 2018. In Phase 4 (Year 5) quantitative and qualitative measurements describe this transect as meeting criteria for both native and non-native plant cover in 2018. Transect PB7 (Phase 4) will be removed from future monitoring activities. The cactus scrub habitat transect, PB9 (Phase 5) restoration was evaluated against success criteria in 2019 and was surveyed using both quantitative (point intercept) and qualitative (CNPS Rapid Vegetation Assessment) methods. Quantitative measurements describe this transect as meeting criteria for both native and non-native plant cover in Year 4 monitoring, however qualitative measurements describe this transect as not passing due to the total native plants (33%) and cactus species (4%) not meeting success criteria. The transect PB9 will be monitored in 2020 (Year 5) using quantitative and qualitative methods. PVPLC conducted infill planting in cactus scrub areas in 2019 in order to meet year 5 success criteria in 2020 (Year 5).

4.2 COVERED SPECIES MONITORING

The NCCP/HCP requires surveys for covered species on the Preserve every three years. The Comprehensive Management and Monitoring Report for 2016-2018 contains the latest report on the status of covered plant species, California gnatcatcher, and cactus wren. The surveys for El Segundo blue butterfly were conducted in 2019 for the 2019-2021 comprehensive report period and the report can be found in Appendix E.

The draft NCCP/HCP includes a total of six covered plant species. They are aphanisma (*Aphanisma blitoides*), south coast salt scale (*Atriplex pacifica*), Catalina crossosoma (*Crossosoma californicum*), island green dudleya (*Dudleya virens* ssp. *insularis*), Santa Catalina Island desert thorn (*Lycium brevipes* var. *hassei*) and woolly seablitz (*Suaeda taxifolia*). Surveys for covered plant species will be triggered by precipitation that totals at least 9.75 inches (75% of the annual average), or the last year of the comprehensive reporting period. The survey for covered plants was conducted in 2019 due to adequate precipitation levels. The Covered Plant species report will be available in the 2019-2021 cumulative report. California gnatcatcher and cactus wren surveys last took place in 2018, and will likely be monitored in 2021 for the 2019-2021 comprehensive report period.

4.3 MONITORING CITY PROJECTS

PVPLC provided monitoring and consultation for two projects in 2019 – the storm drain renovation/removal project at Abalone Cove and the Burma Road grading project. A table of habitat impacts is shown in Appendix J. City staff and PVPLC worked on updating a Preserve Project Form for any projects occurring within the preserve. The form includes a comprehensive summary of the NCCP/HCP covered species regulations and minimization measures for covered projects and activities.

In the spring of 2019, PVPLC was contacted to assist with vegetation clearing for the assessment of the storm drain renovation/removal project at Abalone Cove. PVPLC worked with city staff to conduct a bird survey and to give guidance to city contractors on any nesting activity or

covered species in the area. The project was completed in late summer and PVPLC staff verified that no impacts to habitat had occurred.

In the summer of 2019, a project to “blade” Burma Road to mitigate erosion issues from the previous season’s rains was brought to PVPLC staffs attention. Site visits were conducted and minimization measures were recommended for the project. Once the project was completed, staff visited the site and found that side casting was present and some vegetation had been pruned to provide access for equipment. PVPLC staff worked closely with the city to recommend side casted material be used for other projects and to check on the health of damaged plants, which was minimal and did not cause any impacts. PVPLC staff is working closely with Public Works to implement measures on Burma and other trail tributaries, so that erosion issues are limited and “blading” is no longer needed in the future.

5.0 UTILITY AND CONTRACTOR ACCESS

Protocols are currently in place to ensure that utilities and contractors accessing the Preserve follow guidelines to implement minimization measures and remain on permitted trails to avoid damaging the habitat. PVPLC is collaborating with the City to create more effective protocols and outreach techniques. For example, a Preserve Project Form helps communicate all aspects of contractor, City, and PVPLC projects that are planned to take place in the preserve. Additionally, a Preserve Access Protocol will be developed after adoption of the NCCP/HCP to address where authorized vehicles may travel in the Preserve. The City also hosts an annual Utility Meeting to receive updates on upcoming projects throughout the City and provide reminders for protocols to follow while conducting work in the Preserve.

6.0 TARGETED EXOTIC REMOVAL PROGRAM FOR PLANTS

The Targeted Exotic Removal Program for Plants (TERPP) is an element of the Preserve Habitat Management Plan for the NCCP/HCP that requires the annual removal of exotic plant species of twenty individual populations or five acres in the Preserve. The TERPP provides a protocol for ranking the degree of threat to native vegetation, the feasibility of eradication, and the invasiveness of each exotic species found in the Preserve. Populations of exotic plant species are then targeted for removal based on the results of the ranking outcome.

In 2019, PVPLC met the objectives for the TERPP program by treating approximately 38 acres of *Acacia cyclops* (Coastal Wattle) at Portuguese Bend. PVPLC also treated 7 populations of invasive species throughout the preserve, 6 of which were the highly invasive *Euphorbia terracina*. *Acacia* and *Euphorbia* seeds can persist in the soil for an indefinite amount of years, and treatment needs to be repeated for several years to successfully control these species on the Preserve. *Acacia* and *Euphorbia* are very serious invasive species, and their expansion in the Preserve must be controlled. Therefore, many of the TERPP sites are the same as in the previous years.

7.0 FUEL MODIFICATION

Fuel modification is the clearing or thinning of vegetation in areas that occur immediately adjacent to residential structures and roads as mandated by County Department of Agriculture Weights and Measures. As land owner, the City is responsible for brush clearance within the Preserve (with the exception of Lunada Canyon owned by PVPLC), to provide an appropriate level of fire protection, emphasizing the protection of public safety in the urban-wildlife interface areas while minimizing environmental impacts of fire suppression and control. PVPLC has collaborated with RPV to develop clear protocols to ensure that all Best Management Practices associated with fuel modification activities are consistently followed.

In 2019, RPV staff continued to successfully collaborate with PVPLC to ensure that bird surveys were completed prior to fuel modification activities and sensitive habitat areas were avoided. Stewardship Associate Biologist, Austin Parker, worked with RPV to establish clear nesting bird survey and reporting protocols. All sites that had observed nesting birds within the Fuel Modification Zone or within an NCCP/HCP determined buffer area (300ft for nesting birds and 500ft for nesting California gnatcatchers and cactus wrens), were postponed until after the bird breeding season (February 15th – August 31st). During the bird surveys, any natural resource concerns, including animal dens or rare plants, were flagged and the city was notified in each report. Maps of each site with GPS coordinates of any concerns were provided in each report.

The 20-acre Lunada Canyon property located within the larger Agua Amarga Reserve is owned by PVPLC, which maintains brush clearance requirements. All of these requirements were met in May and June 2019. No other fuel modification areas within the Preserve fall under the responsibility of PVPLC.

8.0 COMMUNITY SCIENCE AND EDUCATION

The Preserve is an ideal setting for an outdoor laboratory, because it provides scientists and students with access to a variety of habitat types and wildlife. Student research topics are often chosen to answer questions informing improved restoration practices and to better understand the local ecology. Community Science volunteer programs assist the PVPLC with annual monitoring of the presence and abundance of cactus wren and mesopredators (coyote, grey fox and red fox) as part of the NCCP/HCP Predator Control program. A report of 2019 research projects and community science monitoring programs is located in Appendix E.

9.0 TRAIL MANAGEMENT AND MONITORING

9.1 PRESERVE TRAILS PLAN

The Preserve Trails Plan is a part of the City's Public Use Master Plan (PUMP), which is a NCCP/HCP-covered activity, and must follow certain avoidance measures and guidelines to protect covered species. The RPV City Council approved the latest version updates of PUMP in March 2013 after the designation of trails in Filiorum Reserve. A revision to the PUMP is required in order to adopt trail alignment and user designations for Malaga Reserve, and incorporate other changes including the Preserve Access Protocol and other minor trail amendments. It is anticipated that the PUMP may be revised in 2020 with public input and City Council approval.

9.2 TRAIL MANAGEMENT

PVPLC continues to update trail maps, print and place map brochures at major trailheads, and post them on PVPLC's website. Recently, QR codes were installed at brochure boxes to provide a quick link to the maps on a personal device. PVPLC regularly refreshes carsonite signs and decals in the Preserve to better delineate trails. A full-time PVPLC field operations technician focuses on unauthorized trail closure, trail delineation and graffiti removal. With the help of the Volunteer Trail Watch, a weekly report is submitted to staff, where tasks are prioritized and addressed on the preserve. The following represent the accomplishments in 2019 for trail management:

Area Closed Signs Installed	1 sign
Decals Replaced	67 decals
Graffiti Removed	7 locations
New/Repaired Carsonite Markers	16 markers
Trail Maintenance Projects	184 projects
Spur Trail Closures (New/Old)	25 closures
Brush Trimming/Weed Clearance	94 projects
Trail Crew Events (Maintenance Projects)	12 events
Rapid Response Volunteer Days	70 events

With support of grants from Habitat Conservation Fund, PVPLC worked with the City of Rancho Palos Verdes to design a master plan for Preserve signage to include designs for primary trailhead markers, interpretive panels and regulatory signage. The signage plan was approved by City Council in July 2016. In 2017, the Los Angeles County Regional Parks and Open Space District provided funds to implement the new Preserve signs at Alta Vicente Reserve and HCF funded signs at Portuguese Bend Reserve and Agua Amarga Reserve. In 2018, signage was installed at Vicente Bluffs, Vista del Norte and San Ramon Reserves and in 2019, signage was installed at Filiorum, Forrestal and Three Sisters Reserves. The remaining Reserve signs are planned to be installed in 2020.

9.3 UNAUTHORIZED TRAIL CLOSURES

Implementing the Preserve Trails Plan involves closing many social trails that were previously in use and are no longer authorized in the PUMP. PVPLC's priorities are to close newly created unauthorized trails before they become established and damage habitat. PVPLC has also developed techniques to reduce trail widening, particularly at trail intersections. Maintaining closures of unauthorized trails is intensive work, which requires continuously reinforcing and replacing trail closures when signage, branches, and plants are removed. Rapid Response Team volunteers assist in maintaining closures by reclosing sections on a regular basis. Additionally, the Volunteer Trail Watch assists with some of these tasks when they encounter them.

In 2019, focal areas were Filiorum (Gary's Gulch Trail, Kelvin Canyon Trail); Portuguese Bend (Burma Rd Trail and Paintbrush trail); Forrestal (Flying Mane, Conqueror Trail and Exultant Trail); and Abalone Cove Reserve (Smuggler's Trail, Cave Trail, and Olmsted Trail); and Alta Vicente Reserve (Alta Vicente Trail and Prickly Pear Trail); San Ramon Reserve (Switchback trail); Three Sisters Reserve (Barkentine trail and Three Sisters trail). (Appendix G).

9.4 TRAIL REPAIR



The PVPLC volunteer Trail Crew assists in much of the trail work on the Preserve. A complete summary of the PVPLC Volunteer Trail Crew Program's accomplishments can be found in the Volunteer Involvement section of the report (Appendix F). PVPLC staff or RPV staff including Open Space Management, Recreation and Parks, and Public Works personnel were also involved in trail enhancements. Trail projects that may be completed in the future, based on funding, are listed in Appendix H.

9.5 TRAIL MONITORING

PVPLC stewardship staff and volunteers from the Volunteer Trail Watch (VTW) Program conducted trail patrols to educate trail users and to report maintenance and safety issues to City and PVPLC staff during the reporting period. The mission of the Palos Verdes Nature Preserve Volunteer Trail Watch Program is to serve as eyes and ears of the City and the Palos Verdes Peninsula Land Conservancy with a view to 1) protect the natural resources of the Palos Verdes Nature Preserve, including the flora and fauna as well as the geology, topography and scenic landscape, and 2) enhance the safety of, and promote an enjoyable experience for all Preserve visitors. Volunteers educate the public about Preserve rules and etiquette; and enter observations of infractions into a web portal (i.e. dogs off leash, off-trail activity, user on non-designated trail, etc.) to allow enforcement personnel and Preserve managers to track time and location of these activities. In 2019, volunteers dedicated 4333.94 hours to the program through training and field implementation activities, and reporting observations through the web portal for record keeping. The VTW also meets every quarter to provide additional training and information to share with Preserve visitors. Additional details of the VTW program are described in detail in the Volunteer Annual Report section of the report (Appendix F).

The City of RPV grants permission for night hikes in the Preserve. A listing of night hikes is found in Appendix K.

In 2018, PVPLC was awarded a California Department of Fish and Wildlife Local Assistance (LAG) Grant. The grant supports the implementation of the Trail Baseline Monitoring Program required by the NCCP/HCP to monitor and manage trail widening impacts to habitat. The initial tasks of the grant were started in 2019 and are expected to be completed by the end of 2020.

10.0 VOLUNTEER INVOLVEMENT

PVPLC is a non-profit organization that relies heavily on the support of community involvement to perform many of the tasks necessary to manage the Preserve. In 2019, volunteers contributed over 27,105 hours of service (an increase of 7,720 hours from 2018, an 8.7% increase) totaling \$854,078.55 of in-kind service in support of conservation, restoration, education and management of the Palos Verdes Nature Preserve. The 2019 Volunteer Annual Report detailing the volunteer programs is located in Appendix F.

11.0 ABILITY TO ACCOMPLISH RESOURCE MANAGEMENT GOALS

PVPLC, City staff and Wildlife Agency representatives successfully achieved the adoption of the final Draft NCCP/HCP in 2019. The subsequent permits will be issued from the State and Federal wildlife agencies in order to give take authorization to the City to conduct projects in the NCCP/HCP area and Preserve.

PVPLC has been successful at completing restoration under the NCCP/HCP, monitoring NCCP/HCP covered species, and meeting the goals for targeted invasive plant removal. With the start of the Abalone Cove Restoration project at the end of 2019 and the continued maintenance of the previous restoration projects, more contiguous high quality habitat will be available throughout the Preserve. PVPLC recommends the assessment of a new restoration project site in 2020 so that planning and funding can begin. PVPLC also recommends the evaluation of areas where more Acacia can be removed to enhance native habitats in order to support the natural recovery of covered species.

Concerns about habitat management in the future include the ability to successfully close unauthorized trails and to prevent new trails from being created. Closing unauthorized trails is time consuming and expensive because of continuous vandalism, drought, and increasing use of the Preserve. PVPLC is taking information collected by staff and the VTW to coordinate with City of RPV staff, the Lomita Sheriffs assigned to patrol the Preserve and incoming city rangers to help determine which areas need more enforcement and maintenance attention.

12.0 FUNDING NEEDS

PVPLC would benefit from continued funding to control highly invasive species on the Preserve and continually battle back against unauthorized and widening trails that damage habitat. PVPLC continues to apply for funding from federal, state and private sources to increase the amount of acreage restored for the species listed under the plan.

13.0 PALOS VERDES PENINSULA LAND CONSERVANCY BOARD AND STAFF

2019 Board Officers

Allen Franz, President
Carolynn Petru, Exec. Vice President
Diana Bailey, Secretary
Rick Wallace, Treasurer

2019 Board of Directors

Bill Ailor, President Emeritus
Bob Ford
Amy Friend
Bill Glantz
Randy Harwood
Cassie Jones
Rob Kautz
Dave Pilon
David Snow

2019 Staff (as of December 2019)**Executive Director**

Adrienne Mohan

Office Administration

Jill Wittman, Administrative Assistant

Land Stewardship

Cristian Sarabia, Conservation Director
Johnny Perez, Stewardship Manager
Austin Parker, Stewardship Associate
Brittany Goldsmith, Volunteer Program Manager
Megan Wolff, Volunteer Coordinator
Alejandro Lemus, Field Operations Technician
Hugo Morales, Stewardship Technician Lead
Humberto Calderon, Stewardship Technician
Neli Gonzalez, Nursery Technician Lead

Education Program

Connie Smith, Education Director
Holly Gray, Education Program Manager
Alexandra Kovary-Turnsek, Nature Center Manager
Neil Uelman, Naturalist

Development

Susan Wilcox, Director of Development
Louise Olfarnes, Manager of Marketing Communications
Laura Lohnes, Development Associate

APPENDIX A

2019 RESTORATION MONITORING

REPORT

In 2019 vegetation surveys were conducted at restoration sites within currently-managed NCCP/HCP restoration projects located at Alta Vicente and Portuguese Bend Reserves to quantify establishment of native plant habitat through measurements of estimated percent cover of native and non-native plants, litter, and bare ground. These data are used to evaluate the success of restoration based on the goals determined in each site-specific restoration plan.

1.0 ALTA VICENTE SURVEY METHODS

Restored habitat areas were surveyed through qualitative and photographic vegetative assessment techniques along 50m permanent transect lines (location of transects: Appendix A1 and A2, Figure 1 and Figure 2) within three habitat types (coastal sage scrub, cactus scrub, and Palos Verdes blue butterfly habitat). Transects were surveyed in April 2019 by PVPLC Stewardship Associate Josh Weinik. Success criteria was assessed using qualitative methodology (CNPS Rapid Vegetation Assessment Method) in monitoring Years 1 and Year 2 and with quantitative methodology (point-intercept method) in Years 3 and 5. Photopoints were collected in all monitoring years. Areas that had not achieved success by Year 5 according to criteria, were assessed using qualitative methods to determine overall plant health for the restored area. Qualitative measurements of percent cover for native, non-native, species-specific, and bare/litter categories were collected through use of an adapted form of the CNPS Rapid Vegetation Assessment Method. Quantitative measurements of percent cover and plant size (height and width) were collected using the point-intercept method on a 50m transect to evaluate restoration success based on set criteria for Year 3 and Year 5 after planting. Photopoints were taken at both ends of permanent monitoring transects to aid in the assessment of plant health and establishment. Transects not meeting success criteria by Year 5 (end of required monitoring period) were monitored using qualitative measures to assess plant percent cover and overall recovery of the habitat within a 10-m buffer of the transect.

1.1 ALTA VICENTE PHASE 2 SURVEY RESULTS (YEAR 9)

Cactus Scrub

All Cactus Scrub transects were removed from monitoring activities after achieving success criteria in 2018 or earlier.

PVB Butterfly Habitat

Two monitoring transects (AV2 and AV5) were surveyed within the PVB butterfly habitat of Phase 2 restored areas. AV2 was surveyed within the PVB habitat of Phase 2 restoration following a relocation from Phase 1. Qualitative survey methods (CNPS Rapid Vegetation Assessment Method) found percent cover of native plant species to be 55% with 11% cover by PVB host plants (Table 1). Native plant cover is within the success criteria range for Year 5 goals (Table 8) and also reached host plant minimum cover with an 11% cover of the three host plant species.

At AV5, qualitative survey methods (CNPS Rapid Vegetation Assessment Method) found percent cover by native plant species to be 53% with 9% cover by PVB host plants (Table 1). Qualitative assessments indicate that habitat along AV5 is within success criteria goals for native cover (30-60% in Year 5) and although host plant cover falls below Year 5 goals, the observed increase of 5% is an improvement from 2018 when host plants were estimated at 4%.

Coastal Sage Scrub

One monitoring transect (AV6) was surveyed within the coastal sage scrub of Phase 2 restoration. Qualitative survey methods (CNPS Rapid Vegetation Assessment Method) found percent cover of native plant species to be 63% with the highest cover by *Encelia californica* (26%) and *Artemisia californica* (11%) (Table 1). Qualitative methods describe AV6 as achieving success criteria goals for native plant cover, and will be removed from future monitoring efforts.

1.2 ALTA VICENTE SURVEY RESULTS PHASE 3 (YEAR 2)

Phase 3 restoration in Alta Vicente will not be officially monitored until 2020 (Year 3), however preliminary assessments describe habitat as establishing well and in good health. Using qualitative methods (CNPS Rapid Vegetation Assessment Method) coastal sage scrub and wildflower habitats were found to already be approaching Year 3 goals with native cover above 50% in coastal sage scrub and over 25% in wildflower restored areas.

1.3 ALTA VICENTE CONCLUSIONS AND RECOMMENDATIONS

In 2019, two transects (AV2 and AV6) met success criteria standards, while one transect (AV5) did not. Transect AV6 within coastal sage scrub habitat was successful in meeting performance standards. Perennial species such as *Artemisia californica*, *Encelia californica*, and *Eriogonum fasciculatum* appear to be well established and in good health. Three species of cactus were observed at the site, with highest presence by *Opuntia littoralis*. Increased cactus presence at the site is likely a result of infill planting directed by the 2017 monitoring report and increased detection due to lower non-native plant and *Encelia californica* cover at the transect. The cactus scrub habitat areas in Phase 1 and 2 restoration at Alta Vicente has received additional cactus planting in 2018 in connection with coastal cactus wren recovery efforts at the site. It was recommended that weed control and supplemental watering (during drought conditions) continue at the restoration site to aid 2017 and 2018 planting survival and maintenance of adequate cactus cover at the site. Watering and maintenance of these cactus plantings occurred in 2018 and into early 2019.

Palos Verdes blue butterfly restoration areas made good improvements to meet success criteria standards in 2019, but one (AV5) still failed to meet success criteria. Considerable effort was given to the removal of the invasive plant, crystalline ice plant, in 2016, which was promptly followed by non-native annual grasses colonizing the site. This persistent weed encroachment has required frequent visits from field technicians to reduce weed cover.

Following the observed absence of host plant along PVB transects (AV2, AV5) in 2017 monitoring, infill planting later that year (October) reintroduced PVB host plants to the site. These infill plants comprised the majority of host plants detected in 2018 and 2019 monitoring and produced 11% and 9% cover by host plant species at transects AV2 and AV5 respectively. Restoration work in October 2018 also added additional host plant and drip line irrigation to further promote host plant establishment. These efforts allowed the percent cover to increase to just below the required minimum. It is recommended that weed removal continue and be more frequently implemented at PVB host plant restoration sites than other perennial dominated habitat types. Any infill planting that needs to occur in and around AV5 should be solely PVB and ESB host plant species.

2.0 PORTUGUESE BEND SURVEY METHODS (PHASE 1, 2, 3, 4 AND 5)

Restored habitat areas were surveyed through qualitative, quantitative, and photographic vegetative assessment techniques. Qualitative measurements of percent cover for native, non-native, species-specific, and bare/litter were collected through use of an adapted form of the CNPS Rapid Vegetation Assessment Method across nine transects (PB1 - PB9). Quantitative measurements of percent cover and plant size (height and width) were collected through use of the point-intercept method across two transects in their third or fifth year of establishment (PV7 and PB9). Photopoint documentation of all restored areas continued, and typically included a photograph being taken at the beginning and end of each monitoring transect. Monitoring surveys were conducted on throughout April and May 2019. Locations of monitoring transects and photo points can be found in Appendix A2, Figure 2.

2.1 PORTUGUESE BEND SURVEY RESULTS FOR PHASES 1 AND 2 (YEAR 7)

South-facing Coastal Sage Scrub (CSS)

Two monitoring transects (PB1 and PB2) within the south-facing CSS of Phase 1 and 2 restoration did not meet Year 5 success criteria evaluation in 2017 and were subsequently monitored in 2018 and again in 2019 using qualitative (CNPS Rapid Vegetation Assessment) methods.

At PB1, the presence of 12 native plant species, a total native plant cover of 40%, and a non-native plant cover of 20% were observed (Table 7). Native plant species with the highest percent cover at this transect included *Artemisia californica* (10%), *Heteromeles arbutifolia* (7%), and *Eriogonum fasciculatum* (8%) (Table 7). PB1 did not meet final success criteria for native plant cover in 2019. At the second monitoring transect, PB2, the presence of 16 native plant species, a total native cover of 44%, and non-native cover of 20% were observed (Table 7). Native species with the highest percent cover at this transect included *Artemisia californica* (10%), *Eriogonum*

fasciculatum (12%), and *Encelia californica* (5%) (Table 7). PB2 did not meet final success criteria in 2019. Transects PB1 and PB2 will be monitored using qualitative methods in 2020 to determine site success.

North-facing Coastal Sage Scrub (CSS)

One monitoring transect (PB3) situated within the north-facing CSS of Phase 1 and 2 restoration failed to meet success criteria evaluation in 2017 and was subsequently monitored in 2018 and again in 2019 using qualitative methods (CNPS Rapid Vegetation Assessment).

At PB3, the presence of 14 native plant species, a total native plant cover of 46%, and a non-native plant cover of 25% were observed (Table 7). Native plant species with the highest percent cover at this transect included *Baccharis pilularis* (12%), *Heteromeles arbutifolia* (7%), and *Rhus integrifolia* (5%) (Table 7). PB3 did not meet final success criteria for native plant cover in 2019. Transect PB3 will be monitored using qualitative methods in 2020 to determine site success.

Cactus Scrub

All Cactus Scrub transects situated within cactus scrub of Phase 1 and 2 restoration have met the success criteria and were removed from monitoring activities.

2.2 PORTUGUESE BEND SURVEY RESULTS FOR PHASE 4 (YEAR 5)

North-facing Coastal Sage Scrub (CSS)

At PB7, quantitative methods were used to identify the presence of nine native plant species, a total native plant cover of 64% and non-native plant cover of 0% (Table 4). Native plant species with the highest percent cover at this transect included *Artemisia californica* (32%), *Eriogonum fasciculatum* (14%), and *Encelia californica* (6%) (Table 4). Qualitative methods (CNPS Rapid Vegetation Assessment) were used to identify the presence of 18 native plants, a total native plant cover of 53%, and non-native cover of 20% (Table 7). Native species with the highest percent cover were *Artemisia californica* (19%), *Eriogonum fasciculatum* (10%), and *Salvia leucophylla* (5%) (Table 7). Quantitative and qualitative measurements describe this transect as meeting criteria for both native and non-native plant cover in Year 5 monitoring. The transect PB7 will be removed from future monitoring activities.

2.3 PORTUGUESE BEND SURVEY RESULTS (PHASE 5) YEAR 4

South-facing Coastal Sage Scrub (CSS)

One monitoring transect (PB8) within south-facing CSS of Phase 5 restoration was evaluated against success criteria in 2018 and surveyed using both quantitative (point intercept) and qualitative (CNPS Rapid Vegetation Assessment) methods. Quantitative and qualitative measurements describe this transect as meeting criteria for both native and non-native plant

cover in Year 3 monitoring in 2018. PB8 will be monitored again in 2020 (Year 5) using both quantitative and qualitative methods.

Cactus Scrub

One monitoring transect (PB9) within cactus scrub of Phase 5 restoration was evaluated against success criteria in 2019 and surveyed using both quantitative (point intercept) and qualitative (CNPS Rapid Vegetation Assessment) methods.

At PB9, quantitative methods were used to identify the presence of 14 native plant species, a total native plant cover of 42% and non-native plant cover of 0% (Table 3). Native plant species with the highest percent cover at this transect included *Artemisia californica* (8%), *Encelia californica* (12%), and *Opuntia littoralis* (18%) (Table 3). Qualitative methods (CNPS Rapid Vegetation Assessment) were used to identify the presence of 14 native plants, a total native plant cover of 33%, and non-native cover of 7% (Table 7). Native species with the highest percent cover were *Artemisia californica* (6%), *Eriogonum fasciculatum* (5%), and *Encelia californica* (5%) (Table 7). Quantitative measurements describe this transect as meeting criteria for both native and non-native plant cover in Year 5 monitoring, however qualitative measurements describe this transect as not passing due to the total native plants (33%) and Cactus species (4%) not meeting success criteria. The transect PB9 will be monitored in 2020 (Year 5) using quantitative and qualitative methods.

2.4 PORTUGUESE BEND CONCLUSIONS AND RECOMMENDATIONS

Five transects within restored habitat of Portuguese Bend were evaluated for success criteria in 2019. Of these, two (PB7, PB9) were under quantitative evaluation (Year 3 or Year 5), another four transects (PB1, PB2, and PB3) were qualitatively evaluated after failing to meet Year 5 success criteria in previous years.

Several transects within coastal sage scrub habitat (north and south facing) of Phase 1 and 2 continued to struggle to meet success criteria along with one transect in cactus habitat of Phase 5. Phase 1 and 2 are the earliest phases of the now 25 acres of restoration in Portuguese Bend. Monitoring transects in these areas have not met success criteria measures despite good overall health of the vegetation. As mentioned in the 2017 and 2018 reports, several factors may be preventing transects within these phases from being successful; namely the invasion by the non-native black mustard (*Brassica nigra*) and drought conditions. Despite the immediate effort to clear black mustard from the restoration area, native plants may be slow to recover following the strong mustard influx in 2017 and 2019 that came with the higher than normal average rainfall that occurred in 2017 and 2019. The cactus restoration in Phase 5 also failed to meet criteria in the quantitative methods, but passed using the qualitative methods. This failure is not linked to the success vegetation establishment, rather the misplacement cactus plantings outside of the restoration area. Infill planting of native species, mostly cactus species, occurred in 2018 and early 2019, before the growing season. It is recommended that Phase 1 and 2

continue to receive infill planting of native species to increase native planting density and improve of former design flaws as well as to continue the removal of black mustard from the site. Infill planting may also be recommended for the Phase 5 cactus restoration area, where increases in the presence of cactus is surely needed.

An encouraging sign of the success of most transects within the overall Portuguese Bend restoration is the improved native plant cover during intense drought conditions. Despite the lack of rain, native plants did well in many areas with evergreen perennials such as *Artemisia californica*, *Encelia californica*, *Eriogonum fasciculatum* and *Heteromeles arbutifolia* increasing cover at many sites. The resulting increases may be attributed to the higher than normal rainfall in Early 2019. Also later phases of restoration in Portuguese Bend (Phase 4 and 5) appear to be benefiting from “lessons learned” in earlier phases (Phase 1 and 2). The early phases were planted in lower density and irrigated with overhead sprinklers, and have not achieved success criteria in the timeline required by the Habitat Restoration Plan and NCCP/HCP. PVPLC has since implemented restoration phases with drip irrigation which has reduced plant die off and reduced germination of nonnative weeds, as well as planting in higher density (more plants per acre). Subsequent planting phases have achieved more transects passing or progressing toward achieving success criteria goals. It is recommended that areas with near or qualifying success criteria evaluations continue to receive nonnative plant control to maintain positive native plant growth and establishment.

Table I. Alta Vicente

Percent cover along each 50m transect as observed along 10m swath on each side of the transect.

<i>Species</i>	<i>AV2</i>	<i>AV5</i>	<i>AV6</i>
<i>Acmispon glaber</i>	2	9	
<i>Amsinckia menziesii</i>	3		
<i>Artemisia californica</i>	15	15	11
<i>Astragalus trichopodus</i>	6		3
<i>Brickelia sp.</i>	<1	<1	
<i>Cylindropuntia prolifera</i>		<1	
<i>Elymus condensatus</i>	2		
<i>Encelia californica</i>	1	20	26
<i>Eriogonum cinereum</i>	2	2	
<i>Eriogonum fasciculatum</i>			
<i>Eriogonum parvifolium</i>	3	<1	3
<i>Eschscholzia californica</i>	<1		
<i>Mirabilis californica</i>	2	<1	2
<i>Opuntia littoralis</i>	3		4
<i>Peritoma arborea</i>	2	2	
<i>Rhus integrifolia</i>	3	3	6
<i>Salvia leucophylla</i>	6	2	3
<i>Salvia mellifera</i>	5		5
<i>Solanum douglasii</i>	<1		<1
Total Native Cover	55	53	63
NNAG	7	2	3
NNP	5	5	3
Total Non-native Cover	12	7	6
Bare	22	12	8
Litter	10	28	23
Total Bare and Litter	32	40	31
Total Plant Cover	67	60	69

Sampling dates for Alta Vicente 2019 CNPS Rapid Vegetation Assessment:

AV2, AV5, and AV6: April 2019

Table 2. Portuguese Bend

Number of Plants counted along 50m transects

Species	PB7	PB9
<i>Artemisia californica</i>	12	3
<i>Astragalus tricopodus</i>	1	0
<i>Corethrodyne filaginifolia</i>	2	0
<i>Encelia californica</i>	3	6
<i>Ericameria ericoides</i>	2	0
<i>Eriogonum cinereum</i>	0	2
<i>Eriogonum fasciculatum</i>	7	0
<i>Lupinus succulentus</i>	1	0
<i>Opuntia littoralis</i>	0	9
Total Native Plants	28	20
NNAG	0	0
NNP	0	0
Total Non-native Plants	0	0
Bare	0	1
Litter	18	28
Total Bare and Litter	18	29
Total Plant Cover	32	21

Table 3. Portuguese Bend

Percent cover for each species observed along the 50m transect

Species	PB7	PB9
<i>Artemisia californica</i>	32	8
<i>Astragalus tricopodus</i>	2	0
<i>Corethrodyne filaginifolia</i>	4	0
<i>Encelia californica</i>	6	12
<i>Ericameria ericoides</i>	4	0
<i>Eriogonum cinereum</i>	0	4
<i>Eriogonum fasciculatum</i>	14	0
<i>Lupinus succulentus</i>	2	0
<i>Opuntia littoralis</i>	0	18
Total Native Plants	64	42
NNAG	0	0
NNP	0	0
Total Non-native Plants	0	0
Bare	0	2
Litter	36	56
Total Bare and Litter	36	58
Total Plant Cover	64	42

Sampling dates for Portuguese Bend 2019 point-intercept:

PB4, PB5, and PB8: April 2019

PB9: May 2019

Table 4. Portuguese Bend Qualitative Data

Percent cover along each 50m transect as observed along 10m swath on each side of the transect.

Species	PB1	PB2	PB3	PB7	PB9
<i>Acmispon glaber</i>	1	<1	<1		
<i>Allium angustifolium</i>					
<i>Artemesia californica</i>	10	10	6	19	6
<i>Asclepias fascicularis</i>				<1	
<i>Astragalus trichopodus</i>	2	2	1	2	
<i>Baccharis pilularis</i>			12	1	
<i>Baccharis salicifolia</i>					1
<i>Castilleja exserta</i>				1	
<i>Corethrogynne filaginifolia</i>				2	
<i>Chamaesyce albomarginata</i>		<1			
<i>Dichelostemma capitatum</i>		<1			
<i>Elymus condensatus</i>			1	1	
<i>Encelia californica</i>	2	5	2	2	5
<i>Eriogonum cinereum</i>		1			1
<i>Eriogonum fasciculatum</i>	8	12	1	10	5
<i>Eriogonum parvifolium</i>					2
<i>Ericameria ericoides</i>				<1	
<i>Erigeron canadensis</i>		3	4		
<i>Eschscholzia californica</i>				1	
<i>Heteromeles arbutifolia</i>	7	2	7	2	
<i>Isocoma menziesii</i> var. <i>sedoides</i>	2	1	2	2	2
<i>Lupinus succulentus</i>	1			1	
<i>Malacothrix saxatilis</i>	1			1	1
<i>Marah macrocarpa</i>			2		
<i>Melica imperfecta</i>		2			
<i>Mirabilis californica</i>					2
<i>Opuntia littoralis</i>					4
<i>Phacelia cicutaria</i>					<1
<i>Rhus integrifolia</i>	2	1	5	1	
<i>Salvia leucophylla</i>			1	5	

<i>Salvia mellifera</i>		2			
<i>Salix gooddingii</i>					
<i>Salvia leucophylla</i>	2				3
<i>Salvia mellifera</i>	2				
<i>Sambucus nigra</i> subsp <i>caerulea</i>			2		1
<i>Sisyrinchium bellum</i>		<1			
<i>Solanum douglasii</i>					<1
<i>Stipa pulchra</i>		3		2	
Total Native Cover	40	44	46	53	33
NNAG	5	10	15	10	2
NNP	15	10	10	10	5
Total Non-native Cover	20	20	25	20	7
Bare	6	11	7	5	12
Litter	34	25	26	22	48
Total Bare and Litter	40	36	33	27	60
Total Plant Cover	60	64	71	73	40

Sampling dates for Portuguese Bend 2019 CNPS Rapid Vegetation Assessment:

PB1, PB2, and PB7: May 2019

PB3, PB4, PB5, PB6, PB8, and PB9: April 2019

Table 5. Alta Vicente and Portuguese Bend success criteria measures.

Preserve	Year	Percent Cover of Native Species (%)			Percent Cover of Non-native Species (%)	
		CSS	Cactus Scrub ¹	PVB Habitat ²	CSS	Cactus Scrub
Alta Vicente	Year 1*	10%	10%	10%		
	Year 2*	20%	20%	20%		
	Year 3	>40%	>30%	30%-60% max		
	Year 5	>50%	>40%	30%-60% max		
Portuguese Bend	Year 3	>40% (≥30% perennial)	>30% (≥20% perennial and 5% cactus)			
	Year 5	>50%	>40% (≥ 10% cactus)		<25% (<5% perennials w/ no CAL-IPC List A except NNAG)	<25% (<5% perennials w/ no CAL-IPC List A except NNAG)

* Percentage based on visual estimates.

¹ Percentage coverage of cactus species should be at least 1% for Year 1, 3% for year 2, 5% for Year 3, and 10% for Year 5.

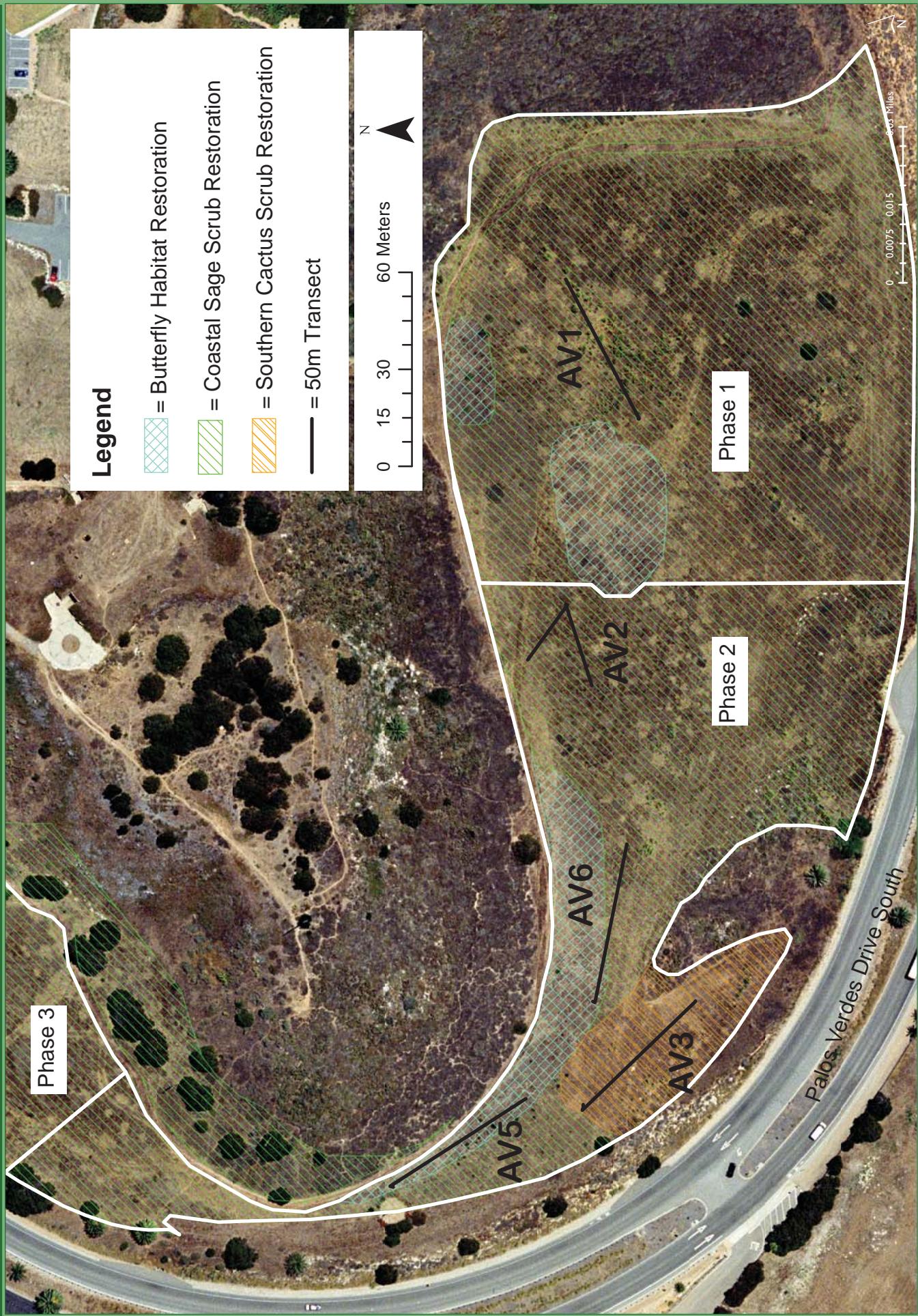
² From Year 3 on, there should be at least 10% coverage from *Acmispon glaber* and/or *Astragalus tricopodus* and the woody shrubs should be maintained at 10-20%.

CAL-IPC = California Invasive Plant Council

NNAG = non-native annual grass

Appendix A1

Alta Vicente Monitoring Transects



Appendix A1 - Alta Vicente Transect Images



AV 2 Beginning



AV2 Middle



AV 2 End



AV 5 Beginning



AV 5 End



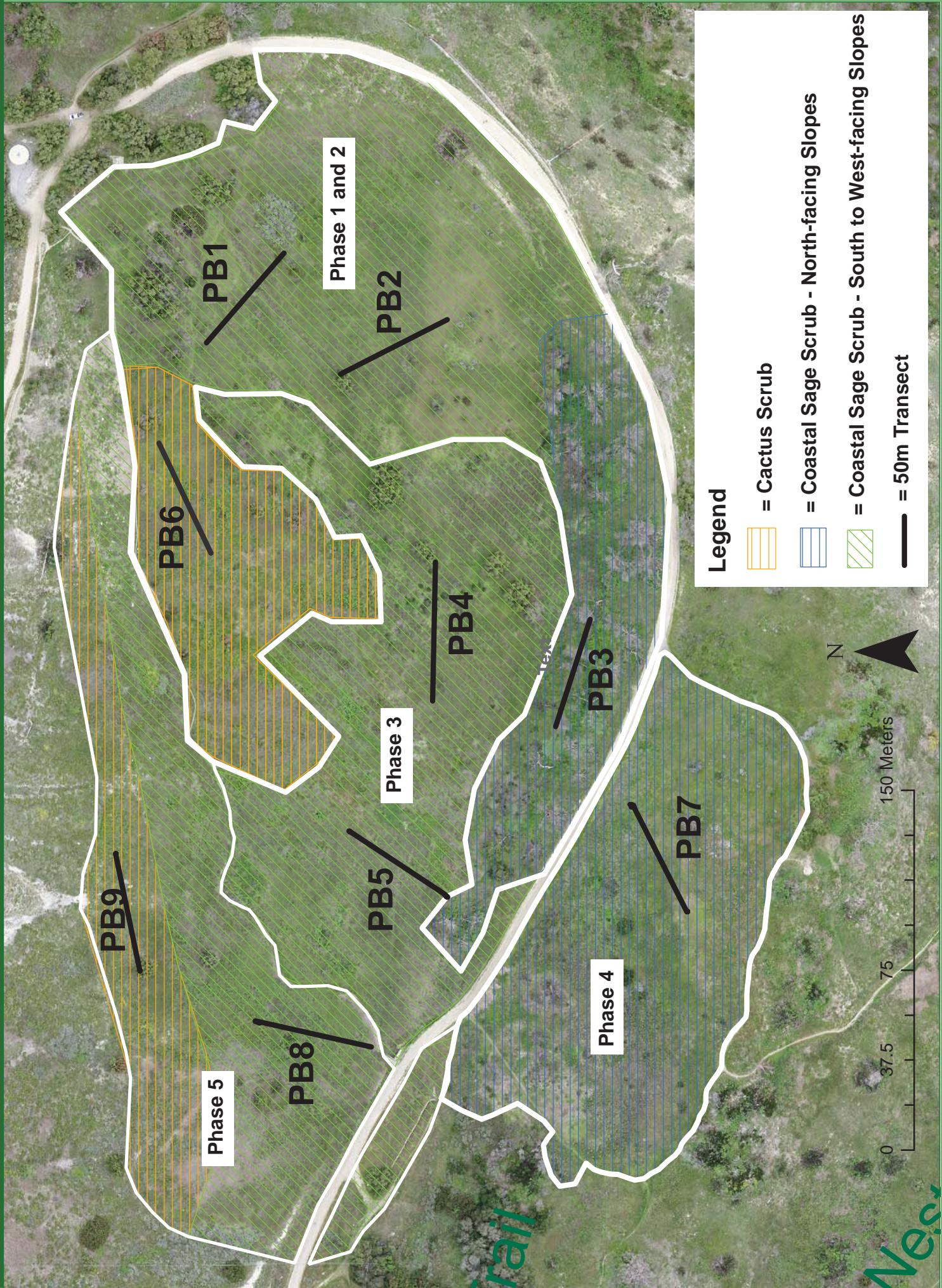
AV 6 Beginning



AV 6 End

Portuguese Bend Reserve

NCCP Restoration Transects



Appendix A2 – Portuguese Bend Transect Images



PB 1 Beginning



PB 1 End



PB 2 Beginning



PB 2 End



PB 3 Beginning



PB 3 End



PB 7 Beginning



PB 7 End



PB 9 Beginning



PB 9 End

APPENDIX B

ABALONE COVE RESTORATION PLAN



Habitat Restoration Plan for the

Abalone Cove Ecological Reserve in the Palos Verdes Nature Preserve



FEBRUARY 2016

PREPARED BY:



**Palos Verdes Peninsula
Land Conservancy**
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**HABITAT RESTORATION PLAN
for the
Abalone Cove Reserve
in the
Palos Verdes Nature Preserve**

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FEBRUARY 2016

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Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

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A	Soil Test Results
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Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

1 INTRODUCTION

This Habitat Restoration Plan (HRP) was prepared for the Abalone Cove Reserve within the Palos Verdes Nature Preserve (PVNP) located in the City of Rancho Palos Verdes, California (Figures 1 and 2). The Abalone Cove Reserve is one of ten ecological reserves within the approximately 1,400-acre PVNP. The PVNP is owned by the City of Rancho Palos Verdes and managed by the Palos Verdes Peninsula Land Conservancy (PVPLC).

This HRP discusses implementing restoration of approximately 3.5 acres of coastal sage scrub, 1.1 acre of cactus scrub, 0.2 acre of mulefat scrub, and the enhancement of approximately 8.3 acres of mixed coastal scrub in a disturbed area of the Abalone Cove Reserve. Portions (approximately 2.2 acres) of the habitat enhancement area were identified for planting additional cactus. The HRP addresses restoration design, planting recommendations, installation procedures, maintenance requirements, monitoring methodology, and performance standards.

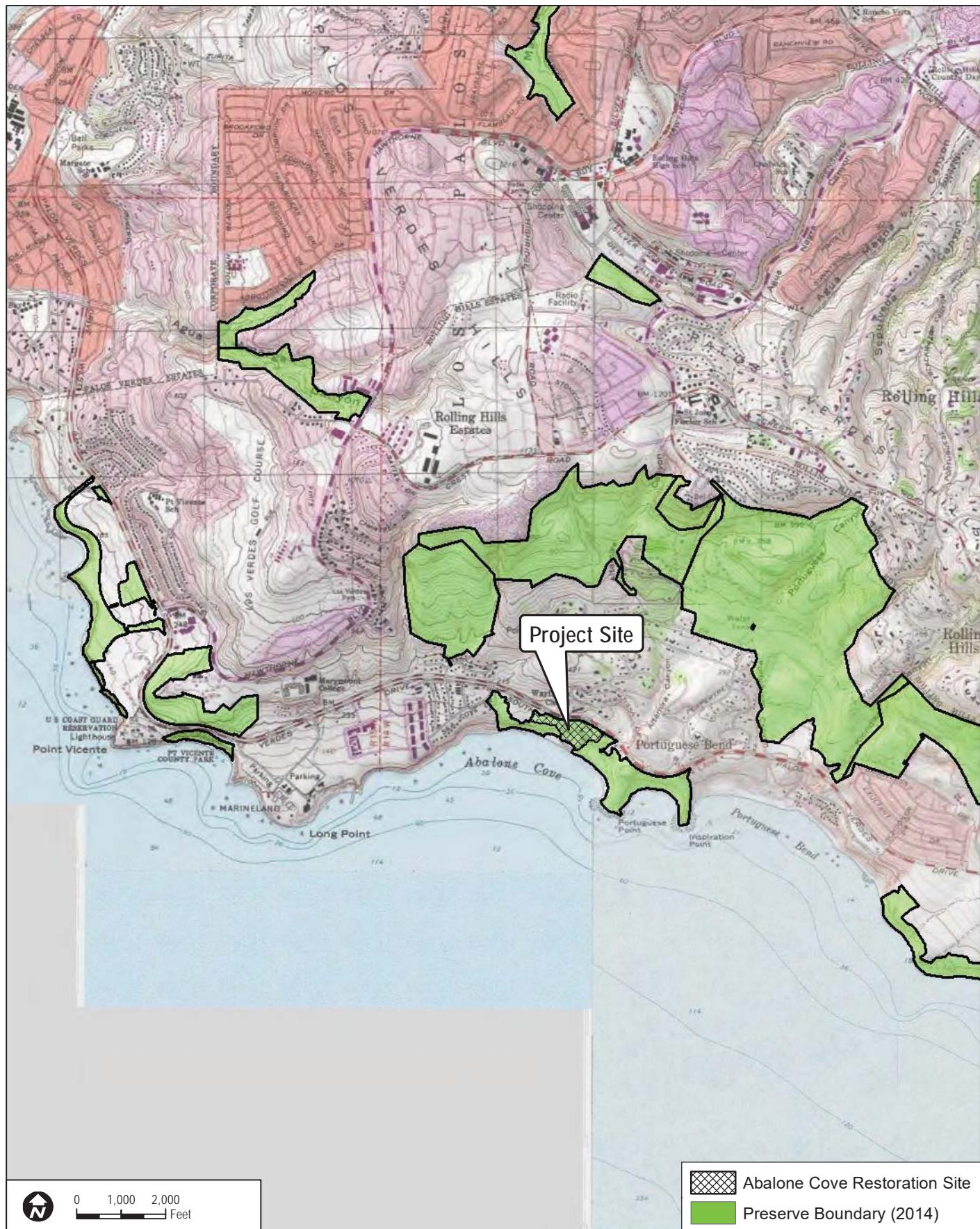
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DUDEK	SOURCE: USGS 7.5-Minute Redondo Beach, San Pedro Series Quadrangles.	FIGURE 2 Vicinity Map
9085	Habitat Restoration Plan for the Abalone Cove Ecological Reserve in the Portuguese Bend Nature Preserve	

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

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Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

2 EXISTING CONDITIONS

2.1 Site Description

The Abalone Cove Reserve is located on the southern portion of the Palos Verdes Peninsula. The entire Abalone Cove Reserve is approximately 64 acres and is located south of Palos Verdes Drive South along the shoreline of the peninsula. There are two promontories, Portuguese and Inspiration Points, which bound the cove within the Abalone Cove Reserve. The proposed restoration area is located upslope from the Portuguese Bend Nursery School (Beach School) in the central part of the reserve.

2.2 Vegetation Communities

Plant communities and land covers within the Abalone Cove Reserve are typical of plant communities found in this region, exhibiting various levels of disturbance, but containing elements of the native plant communities. Vegetation mapping of the reserve was prepared by the PVPLC and the California Native Plant Society (CNPS) (PVPLC and CNPS 2010). According to the vegetation mapping conducted by PVPLC and CNPS, the proposed restoration area consists of California coastal sage scrub, mixed coastal scrub, and non-native grassland, comprised of several subtypes (e.g., alliances and associations). The existing vegetation communities present in the restoration/enhancement area are described below.

2.2.1 Coastal Sage Scrub

The coastal sage scrub on site was mapped by CNPS as *Encelia californica* association, *Encelia californica* alliance, *Encelia californica-Artemesia californica* association, and *Rhus integrifolia* (strongly dominant) association (PVPLC and CNPS 2010). Coastal sage scrub is composed of low, subshrubs approximately 1 meter (3 feet) high, many of which are facultatively drought-deciduous (Holland, 1986). Dominant shrub type varies across this vegetation type, depending on localized factors and levels of disturbance, but often includes California Sagebrush (*Artemesia californica*) and California Brittlebush (*Encelia californica*). In this community the shrub layer primarily forms a continuous canopy, but there are areas with a more open canopy, widely spaced shrubs, and fairly well-developed understory. Within the site non-native species, including black mustard (*Brassica nigra*), Russian thistle (*Salsola tragus*), wild oat (*Avena barbata*, *A. fatua*) and other non-native grasses have invaded the coastal sage scrub community.

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

2.2.2 Mixed Coastal Scrub

The mixed coastal scrub on site was mapped by CNPS as disturbed *Rhus integrifolia* association, and urban trees (PVPLC and CNPS 2010). Though these areas are dominated by lemonadeberry (*Rhus integrifolia*) they are disturbed and contain many non-native shrubs and trees, including coastal wattle (*Acacia cyclops*) spiny holdback (*Caesalpinia spinosa*), and Phoenix palm (*Phoenix canariensis*).

2.2.3 Non-native Grassland

Non-native grassland within the project site was mapped by CNPS as cleared land, and California annual and perennial grassland macrogroup (PVPLC and CNPS 2010). Non-native grassland is typically characterized by dense to sparse cover of weedy, introduced annuals including wild oat, brome grasses (*Bromus diandrus*, *B. madritensis*, *B. hordeaceus*) and black mustard. Annual grassland often occurs in areas where there has been some historic disturbance to the natural community. At the proposed restoration site, non-native grassland is heavily dominated by wild oat, brome grasses, black mustard, fennel, tocalote (*Centaurea melitensis*), and false brome (*Brachypodium distachyon*).

2.3 Geology and Soils

The Palos Verdes Peninsula is primarily an old marine terrace with relatively steep eroded canyons which drain southwesterly into the Pacific Ocean. The underlying geologic material consists of marine sedimentary and basaltic rocks. The area is seismically active, with active Palos Verdes and San Pedro fault zones that have caused the peninsula to uplift relative to the adjacent Los Angeles Basin and the offshore bedrock.

According to the Report and General Soil Map for Los Angeles County (USDA 1969), the soils within the Abalone Cove Reserve are composed of the Altamont-Diablo association (30–50% slopes). Soils of the Altamont-Diablo association occur on gently sloping to rolling foothills throughout the Los Angeles basin as far north as Point Dume. The Altamont-Diablo association is comprised of approximately 60% Altamont soils and 30% Diablo soils. Diablo soils are described to be 22–52 inches deep, are well drained, and have slow subsoil permeability. Altamont soils are described to be 24–36 inches deep, are well drained, and have slow subsoil permeability. They have dark brown, neutral, clay surface layers about 12 inches thick underlain by a brown, calcareous clay subsoil.

The proposed restoration area is primarily a terrace above the coastal bluffs. The terrace appears to have been used for agriculture in the 1950's and 1960's, but has lain fallow for several decades. Three soil samples were collected from the proposed restoration area. The soil samples

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

were collected from three areas proposed for restoration (Figure 3). Each of the soil samples was composed of 3-4 subsamples consisting of the 12-16-inch deep soil profile from each location to create a composite soil sample for analysis. The composite soil samples are representative of the general soil conditions on site within the rooting zone of the target plant species. The soil samples were submitted to Wallace Laboratories for analysis of standard soil constituents, agricultural suitability, texture, and cation exchange capacity. The results of the analysis show that, the soils are clay, with a slow/fair infiltration rate and fair organic matter (Appendix A). The soils on site are slightly alkaline (pH = 7.69-7.76) and the salinity is low (ECe = 0.44-0.72). Major nutrients (nitrogen and phosphorus) are low.

Plant establishment is not expected to be significantly inhibited due to the soil chemistry described above. The soils appear to be suitable for the establishment of the target habitats without soil remediation or extensive soil amendments. However, container plants may struggle to become established and grow healthfully without supplemental watering, and amendments may be necessary if plants are struggling to become established. While the soils on site pose no significant problems to establishment of native habitat, as native soils they have low levels of major nutrients. Native species are adapted to lower nutrient soils, but will benefit from some supplemental nutrient augmentation during planting to initiate establishment (e.g., slow-release fertilizer packet).

2.4 Special-Status Species

Two special-status wildlife species have been documented within or nearby the restoration and enhancement areas. Coastal California gnatcatcher (*Polioptila californica californica*) (CAGN) and the cactus wren (*Campylorhynchus brunneicapillus*) (CAWR) have been observed in the coastal sage scrub enhancement area, as well as on the southern border of the coastal sage scrub restoration area (PVPLC 2012) (Figure 3).

No special-status plant species have been documented within the specific area identified for restoration in the HRP. However, four special-status plant species have been documented nearby, including aphanisma (*Aphanisma blitoides*), south coast saltyscale (*Atriplex pacifica*), woolly seablite (*Suaeda taxifolia*), and sea dahlia (*Coreopsis maritima*) (Dudek and PVPLC 2007; CNPS 2015). In addition to special-status plant species, the host plant seacliff buckwheat (*Eriogonum parvifolium*) for the federally listed, endangered, El Segundo blue butterfly (*Euphilotes battoides allyni*) is known to occur in the vicinity of the proposed restoration areas. Observation of the El Segundo blue butterfly has not been reported at the Abalone Cove Reserve.

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

2.5 Non-Native Invasive Species

Non-native species are abundant within the area identified for restoration, making up the majority of the existing vegetative cover. Non-native species are also common in the area proposed for enhancement. Controlling non-native species during the plant establishment phase will present a significant challenge, and should be prioritized as the most critical aspect of the maintenance program. The most predominant non-native species observed on-site include black mustard, coastal wattle, spiny holdback, Peruvian pepper, Brazilian pepper, and non-native grasses. These species, as well as additional non-native species observed or expected on site, are provided in Table 1 with their associated rating in the California Invasive Plant Council's (Cal-IPC) Inventory of Invasive Plant Species (2015).

Table 1
Non-Native Plant Species and Associated Cal-IPC Ratings

High
<i>Bromus madritensis</i> ssp. <i>madritensis</i> —compact brome
<i>Carpobrotus edulis</i> —hottentot fig
<i>Foeniculum vulgare</i> —fennel
Moderate
<i>Atriplex semibaccata</i> —Australian saltbush
<i>Avena barbata</i> —slender oat
<i>Brassica nigra</i> – black mustard
Moderate
<i>Bromus diandrus</i> —ripgut brome
<i>Centaurea melitensis</i> —Maltese star-thistle
<i>Glebionis coronaria</i> —crowndaisy
<i>Hordeum murinum</i> —mouse barley
<i>Mesembryanthemum crystallinum</i> —common iceplant
<i>Myoporum laetum</i> —myoporum
<i>Pennisetum setaceum</i> —crimson fountaingrass
<i>Euphorbia terracina</i> —Geraldton carnation weed
Limited
<i>Bromus hordeaceus</i> —soft brome
<i>Erodium cicutarium</i> —redstem stork's bill
<i>Marrubium vulgare</i> —horehound
<i>Olea europaea</i> —olive
<i>Phoenix canariensis</i> —phoenix palm
<i>Ricinus communis</i> —castorbean
<i>Salsola tragus</i> —prickly Russian thistle
<i>Schinus molle</i> – Peruvian peppertree
<i>Schinus terebinthifolius</i> —Brazilian peppertree

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

Table 1
Non-Native Plant Species and Associated Cal-IPC Ratings

None
* <i>Acacia cyclops</i> —coastal wattle
<i>Caesalpinia spinosa</i> —spiny holdback
<i>Erigeron bonariensis</i> - asthmaweed
<i>Lactuca serriola</i> – prickly-lettuce
<i>Malva parviflora</i> —cheeseweed mallow
* <i>Melilotus indicus</i> —annual yellow sweetclover
** <i>Pinus</i> sp.—pine
<i>Solanum elaeagnifolium</i> – silverleaf nightshade
<i>Sonchus oleraceus</i> —common sowthistle
* <i>Tropaeolum majus</i> —nasturtium
<i>Yucca gloriosa</i> – Spanish dagger

* Note that while there are several species on the list that do not have a Cal-IPC rating for the state of California, that some of these species can be locally invasive. Species with an asterisk are considered to be moderately invasive within the region and should be aggressively controlled. The Targeted Exotic Removal Program for Plants (TERPP) provides additional target invasive species (PVPLC 2013) that may occur on-site

** Note that some trees taller than 5 feet will be left in place and not removed. Seedlings and young saplings less than 5 feet tall will be removed.

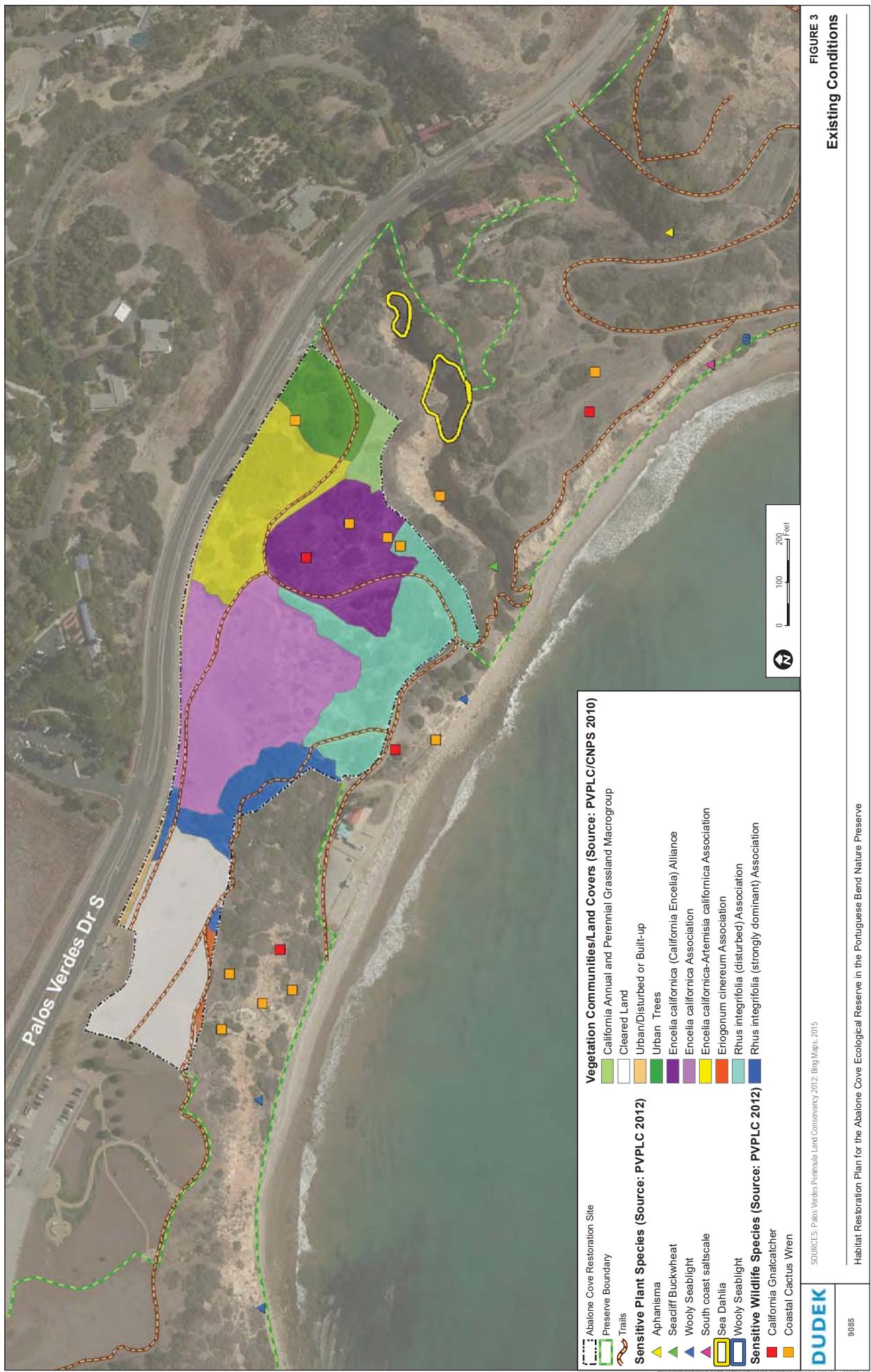
2.6 Additional Considerations

The City of Rancho Palos Verdes has plans for a stabilization project on the walls of the steep, highly eroded canyon on the eastern border of the enhancement area. To allow a buffer for stabilization activities, the enhancement area will leave a buffer of at least 30 feet along the canyon rim, where no enhancement activities will be undertaken.

Additionally, two or more electric utility poles intersect the enhancement area in transit to the Beach School. Restoration and enhancement activities will allow a 15 foot buffer around utility poles, allowing only the management and control of particularly invasive species within these zones (i.e., no planting or seeding).

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3 RESTORATION PROGRAM

This HRP outlines the restoration and enhancement implementation strategy for upland habitat at the Abalone Cove Reserve and proposes to provide for the restoration of approximately 4.8 acres of habitat restoration, and the enhancement of approximately 8.3 acres of mixed coastal scrub. This HRP uses a restoration approach that emphasizes the recovery of the degraded ecosystem through planting and seeding to re-establish or enhance biological functions and services within portions of the Abalone Cove Reserve.

3.1 Restoration Site Goals and Objectives

The disturbed and fragmented habitat existing in the proposed restoration and enhancement locations limit the magnitude of potential wildlife use and provide opportunities for the further spread and establishment of invasive weed species in the area. The planting of native coastal sage scrub, cactus scrub, mulefat scrub, and enhancement of mixed coastal scrub will provide contiguous native habitat that includes a mosaic of shrub cover which will resist the invasion of invasive weed species and provide increased nesting, cover, and foraging opportunities for wildlife. In particular, the overarching goal of the restoration program is to provide habitat for coastal California gnatcatcher and the cactus wren.

The habitat restoration program will focus on the creation of habitat for covered species with the objective of increasing the overall habitat carrying capacity for the target species populations. Coastal scrub restoration is intended to provide improved foraging habitat for resident and migrating wildlife species, and potential nesting and foraging habitat for the coastal California gnatcatcher, and other sensitive wildlife species. Achievement of the performance standards described herein would create suitable habitat for these species. However, occupation of the site by these species is not a requirement for successful project completion.

In addition to these broad goals, the following site-specific objectives for the Abalone Cove Reserve restoration site have been incorporated into this HRP in the interest of minimizing adverse impacts to biological resources:

- Avoid additional or unplanned disturbance to existing native habitats during implementation of the project construction and long-term maintenance activities;
- Prevent any impacts to sensitive plant or wildlife species during implementation of the project construction and long-term maintenance activities;
- Control non-native invasive weed species considered to be highly or moderately invasive on the Cal-IPC Invasive Plant Inventory (2015), and others identified by PVPLC as locally invasive (PVPLC 2013);

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

- Utilize erosion control measures in the form of “Best Management Practices” (BMPs) on the site as conditions necessitate;
- Reintroduce special-status plant species and/or host plants of special-status wildlife species as components of the planting plans where feasible and as appropriate.

3.2 Habitats to be Established or Enhanced

The habitat restoration program consists of site preparation (primarily non-native plant species removal), native planting, seeding, supplemental watering, maintenance, and monitoring. Proposed planting for the target habitat types will focus primarily on the installation of container plants to achieve the project goals. A native seed mix will also be applied as a supplemental measure to increase cover and diversity.

The habitat restoration areas are currently dominated by non-native species. The existing habitat in the restoration areas contains many non-native annual herbs, including black mustard, Russian thistle, and bromes (Figure 4, Photos 1 and 2). Non-native perennials, such as fennel, spiny holdback, Peruvian pepper, and Brazilian pepper also exist within the restoration areas.

Coastal sage scrub habitat will make up the majority of the restored habitat, followed by cactus scrub. Mulefat scrub is planned for approximately 0.2 acre within the restoration area. Each specific habitat type to be restored is described below. It is expected that all planting shall be installed to mimic the natural distribution and vegetation mosaic of adjacent healthy habitats.



Photo 1: Representative view of western restoration area (facing west)

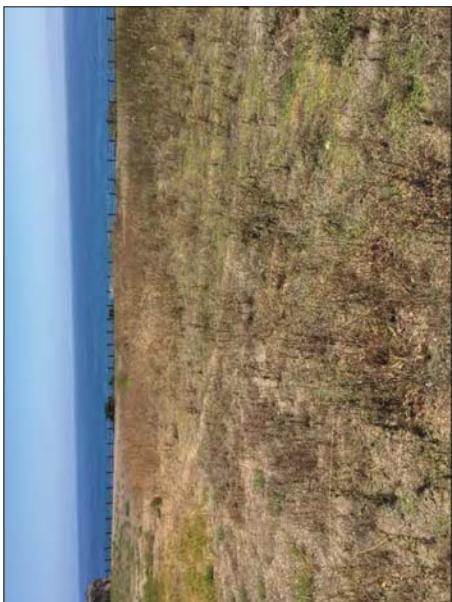


Photo 2: Non-native plants in the western restoration area (black mustard, brome grasses, Russian thistle)



Photo 3: Trail lined by invasive spiny holdback (*Cesalpinia spinosa*)



Photo 4: Invasive perennial weeds in the habitat enhancement zone (Coastal wattle, Brazilian pepper)



Photo 5: Representative view of the eastern restoration area (facing west)



Photo 6: Invasive annual weeds in the restoration site (black mustard, wild oat)

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Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

3.2.1 Coastal Sage Scrub

The restoration strategy for coastal sage scrub habitat on the Abalone Cove Reserve restoration site includes reintroducing regionally appropriate native coastal sage scrub species that are currently present in adjacent native habitats. The plant palette includes a container plant and seed mix composition (Table 2) that has been designed to replicate the native composition of a healthy coastal sage scrub plant community similar to existing coastal sage scrub habitat present on the Abalone Cove Reserve site, and with the specific intent to provide habitat suitable for occupation by coastal California gnatcatcher. The planting palette has thus been designed to contain a composition of shrub species that are dominant in coastal sage scrub habitat occupied by coastal California gnatcatcher (Atwood et al. 1994). On the Palos Verdes Peninsula, the primary coastal sage scrub dominants include California sagebrush, California brittlebush, and coastal buckwheat, with coast goldenbush, lemonadeberry, California buckwheat, sages, bladderpod, coast prickly-pear, and wishbone bush as common constituents.

The plant palette provides a quantity of container plants (perennial species) that is estimated to establish approximately 75% cover for coastal sage scrub, 60% cover for cactus scrub, and 100% for mulefat scrub once the plants reach maturity. The seed mix is provided to address erosion control and enhance species diversity, and will be applied as needed, and as determined necessary by the PVPLC.

Table 2
Proposed Coastal Sage Scrub Planting Palette (Approximately 3.5 Acres)

Botanical Name	Common Name	Container Size	Spacing (on center)	Group Size	Quantity (per acre)	Total # Plants
<i>Container Plants</i>						
<i>Artemesia californica</i>	California sagebrush	D40	5	5	348	1,220
<i>Astragalus trichopodus</i> var. <i>lonchus</i>	Ocean locoweed	D40	3	7	184	645
<i>Baccharis pilularis</i>	Coyote brush	D40	5	3	87	305
<i>Brickellia californica</i>	California bricklebush	D40	5	3	87	305
<i>Corethrodyne filaginifolia</i>	Common sandaster	D40	3	3	24	85
<i>Cylindropuntia prolifera</i>	Coastal cholla	1-gallon	4	5	27	95
<i>Dudleya virens</i>	Bright green dudleya	D40	3	3	24	85
<i>Elymus condensatus</i>	Giant wildrye	D40	6	3	24	85
<i>Encelia californica</i>	California brittlebush	D40	5	5	261	915
<i>Eriogonum cinereum</i>	Coastal buckwheat	D40	5	5	87	305
<i>Eriogonum fasciculatum</i>	California buckwheat	D40	5	5	157	549

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

Table 2
Proposed Coastal Sage Scrub Planting Palette (Approximately 3.5 Acres)

Botanical Name	Common Name	Container Size	Spacing (on center)	Group Size	Quantity (per acre)	Total # Plants
<i>Eriogonum parvifolium</i>	Seacliff buckwheat	D40	5	5	87	305
<i>Eriophyllum confertiflorum</i>	Golden yarrow	D40	3	3	145	508
<i>Isocoma menziesii</i>	Coast goldenbush	D40	5	3	87	305
<i>Mirabilis laevis</i> var. <i>crassifolia</i>	Wishbone bush	D40	4	5	54	191
<i>Opuntia littoralis/oricola</i>	Chaparral prickly-pear	1-gallon	6	3	24	85
<i>Peritoma arborea</i>	Bladderpod	D40	5	5	35	122
<i>Rhus integrifolia</i>	Lemonadeberry	D40	15	1	4	14
<i>Salvia leucophylla</i>	Purple sage	D40	5	5	87	305
<i>Salvia mellifera</i>	Black sage	D40	5	3	87	305
Total Container Plants					1,920	6,734
Seed Mix						
Botanical Name	Common Name	Pure Live Seed	Lbs. Per Acre		Total Lbs.	
<i>Eschscholzia californica</i> var. <i>maritima</i>	California poppy	85	2		7	
<i>Lupinus bicolor</i>	Miniature lupine	90	2		7	
<i>Lupinus succulentus</i>	Arroyo lupine	90	4		14	
<i>Stipa lepida</i>	Foothill needlegrass	65	1		3.5	
<i>Stipa pulchra</i>	Purple needlegrass	75	6		21	
Total Lbs.			15		52.5	

3.2.2 Cactus Scrub

The restoration strategy for cactus scrub is comparable to that described for coastal sage scrub, except that the composition of species was modified to be dominated by prickly-pear cactus (*Opuntia littoralis*, *O. oricola*). The plant palette includes a container plant and seed mix composition (Table 3) that has been designed to replicate the native composition of a healthy cactus scrub plant community similar to existing cactus scrub habitat present on the Abalone Cove Reserve site, and with the specific intent to provide habitat suitable for occupation by cactus wren. In addition to areas identified for cactus scrub restoration, approximately 2.2 acres of the habitat enhancement area were designated for planting additional cactus. These areas were previously documented to support cactus wren and have since been overgrown with non-native trees and shrubs and lemonadeberry

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

Table 3
Proposed Cactus Scrub Planting Palette (1.1 Acres)

Botanical Name	Common Name	Container Size	Spacing (on center)	Group Size	Quantity (per acre)	Total # Plants
<i>Container Plants</i>						
<i>Artemisia californica</i>	California sagebrush	D40	5	5	227	249
<i>Astragalus trichopodus</i> var. <i>lonchus</i>	Ocean locoweed	D40	3	7	111	123
<i>Brickellia californica</i>	California bricklebush	D40	5	3	52	57
<i>Corethrodyne filaginifolia</i>	Common sandaster	D40	3	3	24	27
<i>Cylindropuntia prolifera</i>	Coastal cholla	1-gallon	4	10	272	299
<i>Encelia californica</i>	California brittlebush	D40	5	5	87	96
<i>Eriogonum fasciculatum</i>	California buckwheat	D40	5	3	174	192
<i>Isocoma menziesii</i>	Coast goldenbush	D40	5	3	35	38
<i>Mirabilis laevis</i> var. <i>crassifolia</i>	Wishbone bush	D40	4	5	54	60
<i>Opuntia littoralis/ oricola</i>	Coast prickly-pear	1-gallon	6	30	363	399
<i>Peritoma (=Isomeris) arborea</i>	Bladderpod	D40	6	5	36	40
<i>Rhus integrifolia</i>	Lemonadeberry	D40	15	1	2	2
<i>Salvia mellifera</i>	Black sage	D40	5	3	87	96
Total Container Plants (per acre)					1,524	1,678
<i>Seed Mix</i>						
Botanical Name	Common Name	Pure Live Seed	<i>Lbs. Per Acre</i>		Total Lbs.	
<i>Eschscholzia californica</i> var. <i>maritima</i>	California poppy	74	2		2.2	
<i>Lupinus bicolor</i>	pygmy lupine	78	2		2.2	
<i>Lupinus succulentus</i>	arroyo lupine	81	4		4.4	
<i>Phacelia ramosissima</i>	branching phacelia	80	0.25		0.275	
<i>Stipa lepida</i>	foothill needlegrass	54	1		1.1	
<i>Stipa pulchra</i>	purple needlegrass	42	6		6.6	
Total Lbs. Per Acre					15.25	16.8

3.2.3 Mulefat Scrub

The restoration strategy for mulefat scrub habitat on the Abalone Cove Reserve restoration site includes reintroducing regionally appropriate native mulefat scrub species. A small drainage within the restoration area has been selected as being compatible with mulefat scrub based on the vegetation that currently inhabits the channel and its apparent hydrology. The mulefat scrub restoration area within the Abalone Cove Reserve will contain the native

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

species mulefat (*Baccharis salicifolia*), giant wildrye (*Elymus condensatus*), and blue elderberry (*Sambucus nigra*) as dominant species (Table 4).

Table 4
Proposed Mulefat Scrub Planting Palette (Approximately 0.2 Acre)

Botanical Name	Common Name	Container Size	Spacing (on center)	Group Size	Quantity (per acre)	Total # Plants
<i>Container Plants</i>						
<i>Artemisia dracunculus</i>	Tarragon	D40	4	3	136	27
<i>Baccharis pilularis</i>	Coyote bush	D40	5	3	87	17
<i>Baccharis salicifolia</i>	Mulefat	1-gallon	6	3	605	121
<i>Elymus condensatus</i>	Giant wildrye	D40	5	3	174	35
<i>Isocoma menziesii</i>	Coast goldenbush	D40	5	3	87	17
<i>Muhlenbergia rigens</i>	Deergrass	D40	3	3	242	48
<i>Sambucus nigra</i>	Blue elderberry	1-gallon	8	1	102	20
<i>Verbena lasiostachys</i>	Western vervain	D40	3	3	242	48
Total Container Plants (per acre)					1,675	333
<i>Seed Mix</i>						
Botanical Name	Common Name	Pure Live Seed	Lbs. Per Acre	Total Lbs.		
<i>Ambrosia psilostachya</i>	Western ragweed	8	2	0.4		
<i>Artemisia douglasiana</i>	Mugwort	5	1	0.2		
<i>Eschscholzia californica</i> var. <i>maritima</i>	California poppy	78	2	0.4		
<i>Isocoma menziesii</i>	Coast goldenbush	80	1	0.2		
<i>Lupinus succulentus</i>	Arroyo lupine	54	2	0.4		
<i>Stipa pulchra</i>	Purple needlegrass	42	4	0.8		
Total Lbs. Per Acre			12.0	2.4		

3.3 Habitat to be Enhanced

The habitat enhancement program consists of site preparation (primarily non-native plant species removal), maintenance, monitoring, and potential native planting or seeding. The habitat enhancement area is currently dominated by a mix of native and non-native species. Although the enhancement area currently supports native species, including lemonadeberry (*Rhus integrifolia*) and coast brittlebush (*Encelia californica*), a number of non-native perennials, such as coastal wattle, phoenix palm, spiny holdback, Peruvian pepper, and Brazilian pepper are also common.

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Habitat enhancement generally includes control of non-native weed species and reliance on natural succession to fill the gaps left by removal. In the case of the enhancement area in Abalone Cove Reserve it is likely that most locations in the enhancement zone will improve naturally after initial removal of invasive species. However, in locations that a significant area is cleared, in-planting of native species may be necessary. The area north of the access road, nearest to Palos Verdes Drive South in particular may necessitate additional planting after removal activities occur.

The planting palette in Table 2 for coastal sage scrub habitat and Table 3 for cactus scrub provide options for installing supplemental plants in areas that require selective planting to fill in gaps created from invasive species removal. Note that Tables 2 and 3 do not account for the quantity of container plants that will be needed for the enhancement areas, as the acreage of invasive species removal is not known. However, the number of container plants is expected to be relatively low compared to the restoration areas. Selective in-planting shall mimic the natural distribution and vegetation mosaic of adjacent native habitats.

3.4 Revegetation Materials

Plant materials for the restoration planting areas will include container stock and seed of coastal scrub species, as indicated in the plant palettes provided in Tables 2–4. As much as feasible, the container plant materials will be grown from native seed collected on the Palos Verdes Peninsula. The plant nursery will grow the plants primarily in D40 Deepots, with some smaller and larger sizes depending on the species (as indicated in Tables 2–4). Additionally, for the seed mixes, PVPLC will coordinate collection of available seed from the peninsula for application at the restoration site. If some species cannot be grown as container stock at the nursery, or local seed is not available for collection, the planting palettes may be adjusted, or another source may be used for acquiring locally sourced plant materials.

DriWater may also be used to aid plant establishment. DriWater is a time released natural cellulose gum gel that retains moisture which is slowly released into the soil when the gel is broken down by naturally occurring enzymes. The moisture released from the DriWater gel becomes available for uptake by developing plant roots. DriWater can be applied in cardboard cartons or in plastic tubes with gel packs. DriWater can be costly to utilize on large scale restoration projects, and therefore would only be used in special cases where supplemental watering was insufficient to promote plant establishment. DriWater may be most useful within the enhancement area if supplemental watering is infeasible.

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

3.5 Target Functions and Values

The primary functional goal of the restored coastal sage scrub, cactus scrub, and mulefat scrub and the enhanced mixed coastal scrub is to restore vegetation that contains a diversity of native coastal scrub plant species and that provides habitat value for sensitive wildlife species, particularly for coastal California gnatcatcher and cactus wren. Additionally, a secondary consideration is to create contiguous and intact habitat which resists the re-establishment of invasive plant species.

3.6 Time Lapse

The length of time necessary to develop high quality habitat depends on a variety of factors including weather, soil conditions, herbivory protection, weed competition, and maintenance quality. Under optimal conditions, coastal sage scrub, cactus scrub, and mulefat scrub may take approximately three years from the installation of container plants and application of seed to develop the appropriate structure to provide the functions and values needed for habitation of wildlife, including suitable nesting habitat for California gnatcatcher and other scrub species. In an unirrigated setting, and with drought conditions, scrub development may take longer than three years to mature enough to be suitable for nesting. As a hedge against drought, the addition of supplemental watering would increase plant survival, improve establishment, and hasten habitat development. This plan allows for five years of maintenance and monitoring to establish the target habitats.

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

4 IMPLEMENTATION PLAN

4.1 Rationale for Expecting Success

The identified locations for restoration on the Abalone Cove Reserve are directly adjacent to viable and self-sustaining target habitats, indicating appropriate environmental conditions to support the intended habitats. This HRP includes a provision for supplemental watering to promote establishment and survival of native species included in the plant palette. The HRP also includes a 5-year maintenance plan, wherein invasive non-native weeds within the restoration site will be controlled to aid native plant establishment. Additionally, native plant materials will be grown or collected from sources on the Palos Verdes Peninsula, thus preserving genetic integrity and increasing the potential for long-term success.

4.2 Preliminary Schedule

Appropriate timing of planting and seeding will minimize the need for supplemental watering and will increase the survival rate of the installed plants. The best survival rates are achieved when container plants and seed are installed at the onset of the rainy season or soon thereafter (November through February). Planting and seeding at the site should be timed to take advantage of seasonal rainfall patterns and most appropriate growing season temperatures (see Charts 1–2 and Table 5).

Table 5
Preliminary Restoration Project Schedule

Task	Date
Site clearing	Fall prior to first year
Invasive weed species control and grow-kill cycles	Winter and Spring of first year
Installation of supplemental watering system	Summer of first year
Planting container stock	Fall and Early Winter of second year
Seed application	Fall and Early Winter of third year
Monitoring and maintenance	To begin upon successful installation of container plants

Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

Chart 1
Average Monthly Precipitation for the Portuguese Bend Nature Preserve

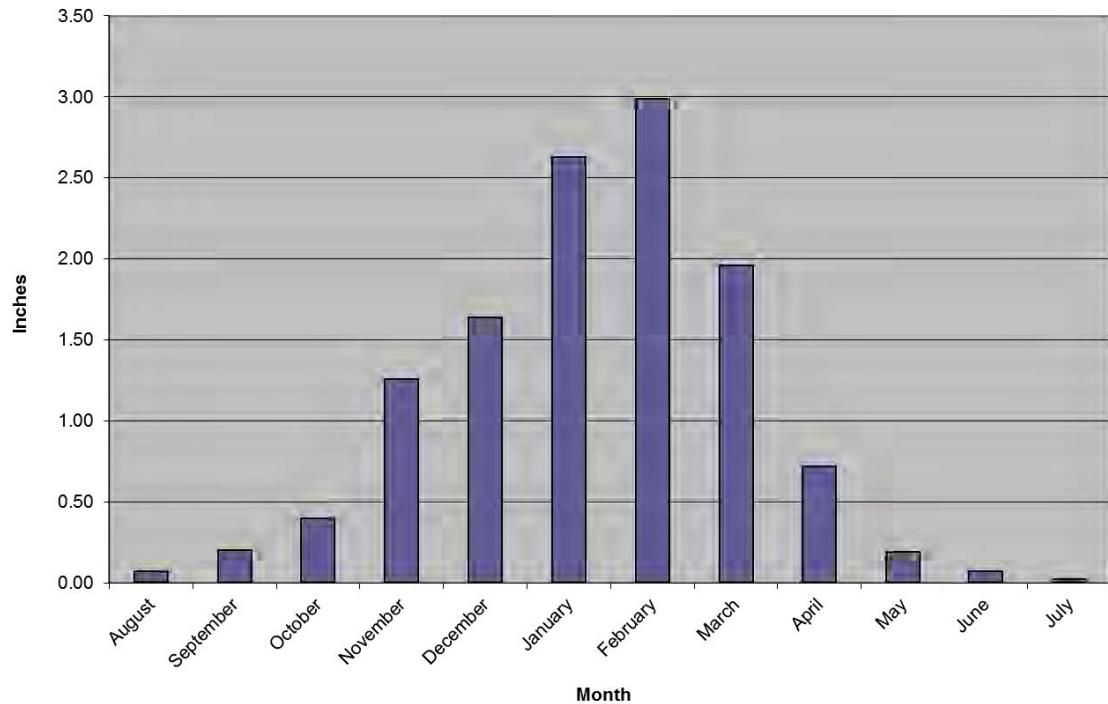
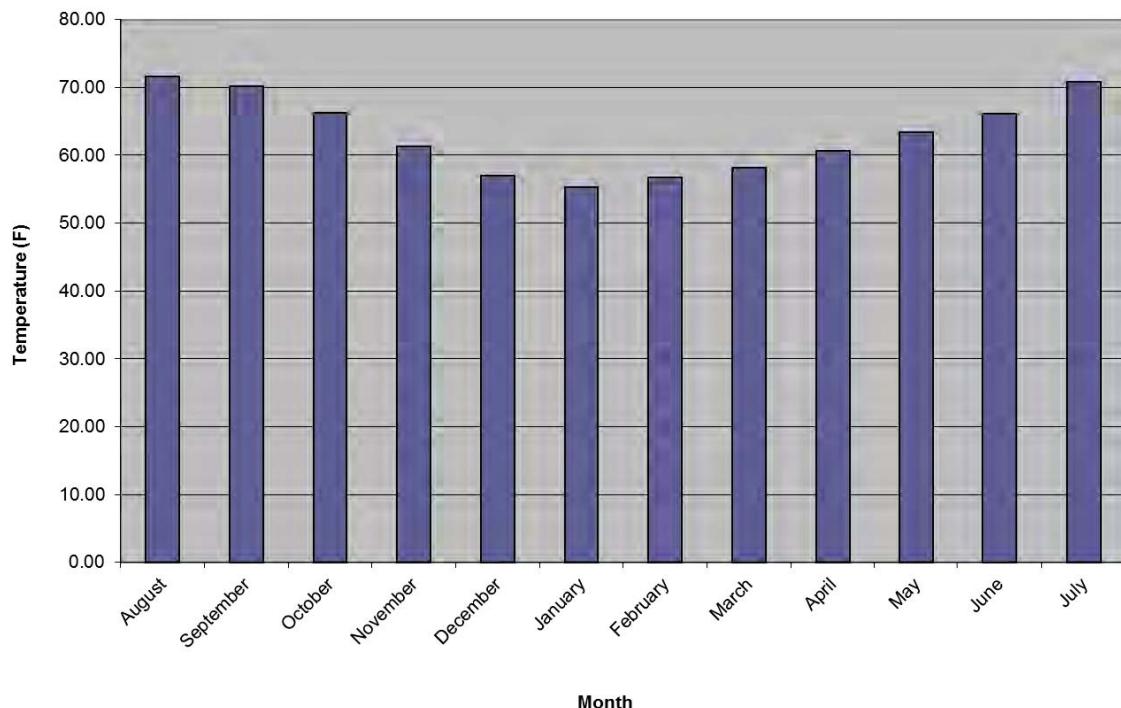


Chart 2
Average Monthly Temperatures for the Portuguese Bend Nature Preserve



Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

4.2.1 Site Preparation

Site preparation includes control of invasive weed species and soil preparation in the restoration areas. If clearing of weeds is planned to be performed during the migratory bird nesting season (February 15–September 15), a nesting bird survey should be conducted by a qualified wildlife biologist within 72 hours prior to vegetation removal in accordance with the Migratory Bird Treaty Act (16 U.S.G. 703-712).

During site preparation, all invasive weed species, particularly non-native annual grasses, black mustard, and fennel, should be killed and removed from the restoration areas. Invasive species control should also include exotic trees and shrubs such as spiny holdback, Peruvian pepper, Brazilian pepper, coastal wattle, pine trees, and palms, as directed by PVPLC staff.

The initial weed control effort will involve a combination of chemical and mechanical treatment. Prior to the installation of native plant materials, “grow and kill” weed removal treatments should be conducted by allowing non-native seedling emergence in the winter and spring. When weeds have begun to grow, and before they begin to develop flowers or flowering structures, a foliar application of an appropriate systemic herbicide should be applied to kill target weeds. If adequate rainfall occurs during this period, multiple grow-kill cycles should be repeated. The restoration ecologist will provide weed control recommendations to the restoration maintenance staff that are specific to the target weed species identified for control. Any use of herbicides shall be in accordance with label instructions, following the recommendations of a licensed Pest Control Advisor, and any application shall be applied under the direction of a state-certified Qualified Applicator.

4.2.2 Supplemental Watering System

The planned method of providing supplemental watering at the proposed restoration area is with a temporary above-ground drip irrigation system. This will help ensure that native container plants and seed installed on site will become adequately established. The supplemental watering system would only be used until the plants are established such that they can survive on their own between periods of rainfall. It is expected that, depending upon the level of plant establishment, the watering system would be removed after two to three years of use. Watering on site will gradually be decreased prior to the removal of the system so the plants can become acclimated to the site’s natural conditions.

The habitat enhancement area may prove infeasible for installation of a temporary watering system. Areas that require planting within the enhancement area will be considered for supplemental watering from a water truck or the use of alternative methods such as DriWater.

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There is a fire hydrant located immediately north of the proposed restoration site along Palos Verdes Drive South that may function as a point of connection for a temporary irrigation system (Figure 5). The irrigation system should be designed by a landscape architect to ensure that the system has adequate water pressure to supply water to all areas of the proposed restoration site. The supplemental watering system would be installed as an above-ground system, so that irrigation equipment may be removed once the system has been decommissioned.

4.2.3 Erosion Control

Where needed, erosion control measures, such as the installation of sandbags, fiber rolls, silt fencing, and/or erosion-control matting may be necessary to control erosion until target vegetation is established. At a minimum, silt fencing should be installed at the toe of slopes that are unvegetated after removing non-native species. Additionally, erosion control materials may be needed at the edge of the coastal bluff, particularly in the locations where surface runoff coalesces and runs off the bluff. No erosion control materials should be used that contain seed from non-native plants. The need and location of erosion control will be determined in the field by the project's restoration ecologist.

4.2.4 Plant Installation

Standard planting procedures will be employed for installing container stock. Planting holes shall be approximately twice the width of the rootball, and as deep. If dry soil conditions exist at the time of plant installation, planting holes will be filled with water and allowed to drain immediately prior to planting. A fertilizer packet with controlled-release fertilizer (e.g., Best Paks 20-10-5) will be placed in the bottom of each hole prior to planting.

4.2.5 Seed Application

Seed will be hand broadcast throughout the restoration site. The seed mix is primarily a supplemental feature to increase diversity and will not occur until the second year of the Restoration Program. The seeding sites should be prepared by removing weedy vegetation to expose the soil surface. The seed should be raked into the soil so there is good seed-soil contact. Seeding should be timed to occur prior to or early in the rainy season.



FIGURE 5
Abalone Cove Restoration Area

**Habitat Restoration Plan for the Abalone
Cove Reserve in the Palos Verdes Nature Preserve**

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Habitat Restoration Plan for the Abalone Cove Reserve in the Palos Verdes Nature Preserve

5 MAINTENANCE PLAN

The purpose of the maintenance plan is to provide guidelines for long-term maintenance of the restoration site during the establishment period. Maintenance activities will be initiated during the weed reduction period (i.e., grow-kill cycles), and will occur at the direction of the project's restoration ecologist on an as-needed basis. The maintenance period will intensify after the installation of the container plants. Maintenance will be necessary until the habitats are fully established, which is estimated to take approximately five years.

Because the goal of this project is to establish a natural system that can support itself with little or no maintenance, the primary focus of the maintenance plan is concentrated in the first few seasons of plant growth following the revegetation effort, when weeds can easily out-compete native plants. The intensity of the maintenance activity is expected to subside each year as the native plants become established, and local competition from non-native plants for resources is minimized through direct removal and treatment of non-native plants.

5.1 Maintenance Activities

Maintenance activities will be primarily related to non-native invasive plant species control. Supplemental watering, supplemental planting, trash removal, and erosion control will also be conducted, as necessary.

- Non-native plant species should be controlled as soon as they begin to establish. Recommended control methods should be tailored to each specific weed species and should include the most effective control measures for the species and time of year. Control methods may include a combination of manual, mechanical, and chemical control.
- Container plants should be watered when natural rainfall is not adequate to sustain the establishing plants. The project's restoration ecologist will be responsible for scheduling the supplemental watering to promote plant establishment. Supplemental watering should be conducted as deep, soaking watering to promote deep rooting.
- Generally, the site will not be fertilized during the maintenance period unless determined necessary by the project's restoration ecologist as a remedial measure to correct soil nutrient deficiencies.
- Deadwood and leaf litter of native vegetation should not be removed. Deadwood and leaf litter provide valuable microhabitats for invertebrates, reptiles, small mammals, and birds. Non-organic trash and debris should be removed from the revegetation areas on a regular basis.

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- Erosion control materials should be maintained in working order until they are deemed no longer necessary by the project's restoration ecologist. Maintenance of erosion control materials may include repairing or replacing dilapidated, damaged, or ineffective materials.

5.2 General Habitat Maintenance Guidelines

5.2.1 Weed Control

Weeds are expected to be the primary pest problem in the restoration area during the first several years of the maintenance period. Weeds should be controlled so they do not prevent the establishment of the native species or invade adjacent areas. A combination of physical removal, mechanical treatments (weed whipping) and appropriate herbicide treatments should be used to control the non-native/invasive plant species. Weeds should be controlled prior to setting seed, and should be removed from the site if they become large enough to block sunlight to developing native plants.

Re-establishment of non-native plants onto the site can be adequately minimized by regular and timely maintenance visits with implementation of effective weed control measures. Weed control will require constant diligence by the maintenance personnel. Invasive plant species, such as those listed in Table 1 should be controlled wherever possible within the restoration area. Mature invasive tree species will be retained at the discretion of the PVPLC though the majority of individuals should be removed to reduce the spread of weed propagules.

Removal of weeds by hand where practicable and effective is the most desirable method of control and should be done around individual plantings and native seedlings to avoid inadvertent damage to the native species. However, several of the invasive species may be more effectively controlled with herbicide due to their tenacious and spreading root systems, their size, or their ability to re-sprout from root fragments. All herbicides shall be used in accordance with label instructions, following the recommendations of a licensed Pest Control Advisor, and any application shall be applied under the direction of a state-certified Qualified Applicator. The project's restoration ecologist should monitor control efforts to ensure that the target weed species are being adequately addressed without impacting the native plants.

The non-native Bagrada bug (*Bagrada hilaris*) has been documented on the Palos Verdes Peninsula, and is known to cause substantial damage to plant species from the mustard family (*Brassicaceae*) (County of Los Angeles 2013; University of California, Riverside 2013). As black mustard is one of the predominant species within the proposed coastal sage scrub restoration area, the Bagrada bug may occur; however, it is expected that the damage

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caused by this insect would be to non-native mustard species, and not native plants. Despite this, if the species becomes problematic as a pest species on the native plants, then the restoration ecologist will evaluate whether or not control measures are necessary. Similarly, if other deleterious pests (e.g., beetles on bladderpod) become problematic enough to cause container plant mortality, the restoration ecologist may recommend measures to minimize pests and promote healthy plant establishment.

5.2.2 Supplemental Watering System

Supplemental watering will be provided for two to three years after planting to help the container plants become established. Supplemental watering will be provided through a drip irrigation system. Supplemental watering would likely be necessary every 3–4 weeks during the dry season, and more frequently immediately after installation if natural rainfall does not provide adequate moisture. If a temporary, on-grade supplemental watering system is installed in the restoration area as described in Section 4.4, it would need to be maintained and repaired as necessary.

The watering system shall be checked regularly to ensure proper operation and adequate coverage of the restoration areas. Problems with the watering system shall be repaired immediately to reduce potential plant mortality or erosion. The frequency and duration of irrigation applications shall be adjusted seasonally in coordination with the project's restoration ecologist to meet habitat needs.

Supplemental watering will be terminated when deemed appropriate by the project's restoration ecologist. All above-ground components of the watering system should be removed from the site at the successful completion of the project. The timing for cessation and removal of the irrigation system shall be determined by the project's restoration ecologist.

5.2.3 Clearing and Trash Removal

Trash consists of all man-made materials, equipment, or debris dumped, thrown, washed into, or left within the restoration area. Pruning or clearing of native vegetation is not anticipated to be necessary within the restoration area, unless extensive growth is causing a maintenance problem for a utility or for an area outside of the restoration area. Any pruning or clearing of native vegetation should be approved by the project's restoration ecologist. Deadwood and leaf litter of native vegetation will be left in place to replenish soil nutrients and organic matter.

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5.3 Schedule of Maintenance Inspections

The project's restoration ecologist will perform quarterly maintenance/monitoring inspections during the scheduled maintenance and monitoring period. Recommendations for maintenance efforts will be based upon these site observation visits. Weed control shall be conducted as needed to ensure adequate control to promote healthy establishment of the target habitat types. It is anticipated that weed control will be necessary on a monthly basis during the winter and early spring when weeds are vigorously growing. Weed control during other times of the year will likely be diminished, but conducted as necessary, and as directed by the project's restoration ecologist.

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6 MONITORING PLAN

Monitoring of the restoration site has a two-fold purpose: (1) To monitor the progress of the Abalone Cove Reserve restoration areas by assessing native habitat establishment relative to the established performance standards; and (2) To direct and monitor the maintenance activities and determine remedial actions in a manner that ensures that appropriate maintenance occurs in a timely manner. The monitoring will be performed by the project's restoration ecologist.

The project's restoration ecologist will be responsible for monitoring activities of all the work crews during preparation of the restoration area including site clearing and soil preparation, weed control, container plant and seed application, and quarterly monitoring for the duration of the 5-year maintenance and monitoring period.

Reports will be prepared annually for the restoration areas after installation is complete. Each report will include qualitative data, photo documentation, and future recommendations for site maintenance as described below.

6.1 Performance Standards

Performance standards have been established for the habitat restoration area based on the guidelines in the draft NCCP and on expected vegetative development relative to undisturbed habitat of the same type (Table 6). The following performance standards apply to the Abalone Cove restoration site:

1. Soil at the site is stable and shows no significant erosion.
2. After five years, non-native plant cover is less than 25% with less than 15% cover of invasive perennial species. After five years, there will be no presence of species on Cal-IPC List A with the possible exception of Cal-IPC List A non-native annual grasses.
3. Native plant cover after three years in the CSS community should be greater than 40% with at least 30% cover from perennial species. At five years, total native cover should be greater than 50% with appropriate species diversity.
4. Native plant cover after three years in the cactus scrub community should be greater than 30% with at least 20% cover from perennial species and 5% cover from cactus species. Native plant cover after five years in the cactus scrub community should be greater than 40% with at least 10% cover from cactus.

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Table 6
Performance Standards

Year	Percent Cover of Native Species (%) [*]			Non-native Cover (for all habitat types)	
	Coastal Sage Scrub	Cactus Scrub	Mulefat Scrub	Invasive Perennial Species Cover	Total Non-native Species Cover
Year 3	>40% (>30% perennial)	>30% (>20% perennial and >5% cacti)	>40%	<15% (0% of Cal-IPC List A)*	<25%
Year 5	>50%	>40% (>10% cacti)	>50%	<15% (0% of Cal-IPC List A)*	<25%

* The NCCP success criteria allow an exception to the requirement for 0% Cal-IPC List A for non-native annual grasses. In other words, Cal-IPC List A grass species would not count toward the 0% criteria, but would count toward the 25% criteria for total non-native species cover.

The Year 3 performance standards will be utilized to assess the annual progress of the restoration area, and are regarded as interim project objectives designed to reach the final Year 5 goals. Fulfillment of these standards will indicate that the restoration area on the project site is progressing toward the habitat type and functions that constitute the long-term goals of the plan. If the restoration efforts fail to meet the performance standards in any year, the project's restoration ecologist may recommend remedial action to be implemented the following year with the intent to enhance the vegetation to a level of conformance with the original standard. These remedial actions may include re-seeding, re-planting, applying soil amendments, additional weed control measures, erosion control, or adjustments to the watering and maintenance practices.

6.2 Monitoring Methods and Schedule

Annual qualitative assessments will be conducted through visual analysis of the restoration area to assess vegetation development, weed presence, and plant establishment. Qualitative monitoring will include reviewing the health and vigor of container plants and seed germination/establishment, assessing survival/mortality, checking for the presence of pests and disease, soil moisture content, and the effectiveness of the supplemental watering, erosion problems, invasion of weeds, and the occurrence of trash and/or vandalism. Representative photographs of the restoration site from stationary photo points will be taken annually.

Permanent vegetation sampling sites will be established within the coastal sage scrub and cactus scrub restoration areas at randomized representative locations. A minimum of one transect will be established for each two acres of restoration area, and at least one transect for each habitat type. The mulefat scrub area is too small to establish quantitative sampling sites and will be evaluated with visual estimates of cover. Transect data will be collected in Years 3 and 5 from the restoration sites in the spring and will be used to determine compliance and achievement of

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the restoration performance standards. Transect data will be collected using the point-intercept method to determine percent target vegetation cover and weed cover. If the restoration project is in compliance with the Year 5 performance standards in an earlier monitoring period, then qualitative assessments may be substituted for the quantitative monitoring until the end of the 5-year restoration program. If the restoration site is performing below the interim performance standards, the project's restoration ecologist will determine if remedial measures are necessary.

Each monitoring visit will be followed by a summary of observations, recommendations, and conclusions. Results from the annual monitoring will be used to evaluate the progress of each habitat toward the ultimate goals of the project, and to recommend appropriate management actions.

6.3 Monitoring Reports

The designated restoration ecologist will monitor and report on the restoration work underway in the Abalone Cove Reserve. The restoration area will be monitored for five years, with reports prepared in Years 1-3 and Year 5. Monitoring reports should provide concise, meaningful summaries of the restoration progress and provide direction and maintenance recommendations for future work.

Annual reports will include the following:

1. A description of the restoration and maintenance activities (e.g., seeding, irrigation, weed control, trash removal) conducted on the site during the previous year including the dates the activities were conducted.
2. A description of existing conditions within the restoration site, including descriptions of vegetation composition, weed species, and erosion problems, if any.
3. Qualitative and quantitative monitoring data related to proposed target goals including a comparative analysis of data over the years the project has been monitored.
4. Recommendations for remedial measures to correct problems or deficiencies, if any.
5. Representative photographs of notable observations on site and from fixed photo viewpoints.

6.4 Project Conclusion

At the end of the 5-year monitoring period, a final report will be prepared by the restoration ecologist for submittal to PVPLC. The final report will summarize the project relative to project goals. Upon completion, the site will be managed along with other reserve lands in the Palos Verdes Nature Preserve by the PVPLC.

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APPENDIX A

Soil Test Results

WALLACE LABS
365 Coral Circle
El Segundo, CA 90245
(310) 615-0116

SOILS REPORT

Print Date July 17, 2015 Receive Date 7/16/15

Location Palos Verdes Peninsula, Job No. 9085
Requester Andy Thomson and Jake Marcon, Dudek

graphic interpretation: * very low, ** low, *** moderate

ammonium bicarbonate/DTPA

extractable - mg/kg soil

Interpretation of data

low medium high

0 - 7 8-15 over 15

0-60 60-120 121-180

0 - 4 4 - 10 over 10

0-0.5 0.6- 1 over 1

0 - 1 1 - 1.5 over 1.5

0-0.2 0.3- 0.5 over 0.5

0-0.2 0.2- 0.5 over 1

Sample ID Number

15-198-07

Sample Description

AC #1

elements

graphic

phosphorus

10.35 ***

potassium

522.13 *****

iron

1.38 *

manganese

2.01 ****

zinc

2.45 ****

copper

6.19 *****

boron

0.18 **

calcium

322.10 ***

magnesium

259.18 *****

sodium

197.35 ***

sulfur

20.84 *

molybdenum

0.08 ***

nickel

2.51 **

aluminum

n d *

arsenic

0.07 *

barium

2.41 *

cadmium

1.46 **

chromium

n d *

cobalt

0.06 *

lead

2.51 **

lithium

0.40 *

mercury

n d *

selenium

n d *

silver

n d *

strontium

0.61 *

tin

n d *

vanadium

1.28 **

Saturation Extract

pH value

7.69 ****

ECe (milli-

mho/cm)

0.72 **

millieq/l

7.76 ****

7.68 ****

0.45 **

0.44 **

millieq/l

millieq/l

calcium

61.1

magnesium

14.3

sodium

43.6

potassium

11.4

cation sum

6.4

chloride

128

nitrate as N

12

phosphorus as P

0.2

toxic over 800

sulfate as S

anion sum

7.6

5.0

5.0

boron as B

0.28 **

SAR

1.3 *

est. gypsum requirement-lbs./1000 sq. ft.

37

relative infiltration rate

slow/fair sand - 19.6%

soil texture

clay silt - 34.3%

lime (calcium carbonate)

slight clay - 46.1%

organic matter

fair

moisture content of soil

14.5% gravel over 2 mm

half saturation percentage

41.3% 8.8%

15-198-08

AC #2

graphic

10.25 ***

318.32 *****

1.45 *

2.01 ****

2.40 ****

5.50 *****

0.23 ***

1.85 **

316.50 ***

20.50 *

212.89 ****

n d *

0.01 **

0.99 *

n d *

0.40 *

n d *

0.40 *

n d *

1.20 **

n d *

APPENDIX C

ALL RESTORATION PROJECTS

APPENDIX C. PALOS VERDES NATURE PRESERVE RESTORATION PROJECTS THROUGH 2019

NCCP/HCP	Funding source	Location	Habitat Type	Acres	Status	Start Date	End Date
Alta Vicente	NCCP	Phase 1	CSS	4.5	completed	2007	2014
Alta Vicente	NCCP	Phase 1	PVB habitat	0.5	completed	2007	2014
Alta Vicente	NCCP	Phase 2	CSS	4	active	2008	2015
Alta Vicente	NCCP	Phase 2	cactus scrub	0.5	active	2008	2015
Alta Vicente	NCCP	Phase 2	PVB habitat	0.5	active	2008	2015
Alta Vicente	NCCP/LA County Grant	Phase 3	CSS	4.5	active	2016	2021
Alta Vicente	NCCP/LA County Grant	Phase 3	wildflowers	0.5	active	2016	2021
Alta Vicente	NCCP/LA County Grant	Phase 4	cactus scrub	1	active	2017	2022
Alta Vicente	NCCP/LA County Grant	Phase 4	PVB habitat	1	active	2017	2022
Alta Vicente	NCCP/LA County Grant	Phase 4	CSS	5	active	2017	2022
Portuguese Bend	NCCP	Phase 1 and 2	CSS	8	active	2010	2017
Portuguese Bend	NCCP	Phase 1 and 2	cactus scrub	2	active	2010	2017
Portuguese Bend	NCCP	Phase 3	CSS	5	active	2012	2018
Portuguese Bend	NCCP	Phase 4	CSS	5	active	2013	2019
Portuguese Bend	NCCP	Phase 5	CSS	4	active	2014	2020
Portuguese Bend	NCCP	Phase 5	cactus scrub	1	active	2014	2020
Abalone Cove	NCCP	Phase 1	CSS	4.8	active	2019	2024
Abalone Cove	NCCP	Phase 2	Mixed CSS	4	active	2020	2025
Abalone Cove	NCCP	Phase 3	Mixed CSS	4.3	active	2021	2026
Additional Projects							
Abalone Cove	Coastal Conservancy, NFWF, SMBRC, USFWS	CSS	CSS, Cactus Scrub, Butterfly habitat	1.5	Active	2020	2025
Abalone Cove	Heritage Castle						
Aguia Amarga	USFWS	CSS	2	completed	2001	2003	
Aguia Amarga	USFWS	riparian	0.5	completed	2004	2005	

	Funding source	Location	Habitat Type	Acres	Status	Start Date	End Date
Agua Amarga	LACSD		riparian	0.25	completed	2011	2016
Agua Amarga	D&M		riparian	0.2	completed	2012	2017
Alta Vicente	PVPLC	Alta Vicente Trail	Cactus Scrub	0.82	Active	2018	ongoing
Filiorum	PVPLC	Pony	Cactus Scrub	3.08	Active	2018	ongoing
Portuguese Bend	El Segundo Mitigation	Ishibashi	CSS and grassland	9.5	completed	2010	2015
Portuguese Bend	HCF grant	Ishibashi	CSS	0.25	completed	2012	2015
Portuguese Bend	HCF grant	Peppertree	CSS	0.5	completed	2012	2015
Portuguese Bend	Local Assistance Grant		cactus scrub	3	completed	2010	2011
Portuguese Bend	PVPLC	Peacock Flats	cactus scrub	0.86	Active	2018	
Three Sisters	LAWA		CSS	13.3	completed	2007	2013
Three Sisters	LAWA		grassland	7.7	completed	2007	2013
Three Sisters/McCarrell's Canyon	Coastal Conservancy		riparian	0.5	completed	2009	2012
Three Sisters/McCarrell's Canyon	Coastal Conservancy	McCarrell Cyn Trl	Cactus Scrub	2	completed	2009	2012
Three Sisters	PVPLC			2.3	active	2018	ongoing
Vicente Bluffs	Coastal Conservancy		coastal scrub	2	completed	2009	2014
Vicente Bluffs	PVPLC	Adpot-a-Plot	ESB habitat	0.1	active	2016	ongoing
TOTAL				115.50			

* NCCP Funding Sources include a combination of sources including the City of Rancho Palos Verdes Management Agreement, community contributions, and grants to name a few.



Restoration Sites (Current and Completed)





APPENDIX D

2019 TARGETED EXOTIC REMOVAL PROGRAM FOR PLANTS (TERPP)

1.0 INTRODUCTION

The Palos Verdes Peninsula Land Conservancy (PVPLC), as manager of the Palos Verdes Nature Preserve (PVNP), conducts strategic weed control activities throughout the year as part of the Targeted Exotic Plant Removal Plan for Plants (TERPP). As directed in the draft Rancho Palos Verdes Natural Communities Conservation Plan/ Habitat Conservation Plan (NCCP/HCP), PVPLC selects five acres or 20 small sites of invasive plants for removal each year. The overall goal of this program is to systematically target invasive species throughout the PVNP to increase the success of native plant growth and create greater habitat opportunities for wildlife.

The TERPP is an element of the NCCP/HCP that includes a specific protocol for ranking exotic species populations and strategically removing those species over time (Appendix D1-D7). The 2019 TERPP Report documents PVPLC's effort over the past year to remove exotic plant species that threaten native vegetation in the PVNP. It details the methods of assessing the threat of individual exotic species to native vegetation, field methods for removal and provides site-specific documentation related to every completed removal site.

2.0 SITE ASSESSMENT

Invasive species control is included in PVPLC's annual conservation planning strategy where Stewardship staff prioritize potential TERPP sites and assess best practice methods for removal. PVPLC staff locate TERPP sites to target for the calendar year, assess the best method for eradication, photo document and map the population/s, and conduct weed removal accordingly.

The PVPLC weighs potential areas for exotic species control based on several criteria:

1. Threat to native vegetation, particularly populations of NCCP/HCP-covered species;
2. Feasibility of eradication, which includes limiting disturbance to native habitat and ease of access, and;
3. Invasiveness of exotic species, using a synthesized rating system drawn from plant invasiveness rankings from both the California Invasive Plant Council (Cal-IPC) and the California Department of Food and Agriculture (CDFA).

Through regular property reviews and viewing fine scale imagery through the Geographic Information System (GIS), ArcGIS, PVPLC plans for invasive species control across the entire Preserve area.

A sample of the TERPP field data collection form is in Appendix D1. The forms provide basic information about the species targeted, including site identification number and property, approximate location, removal methods used, and general comments related to the removal

activities. PVPLC also includes photo documentation: staff photographs the sites before work takes place and after the removal of the individual or population of exotic species. Photo documentation not only confirms completion of the work, but also provides a snapshot of the surrounding environment at the time of the TERPP-related activities. This record helps to create a historical record of the presence of non-native plant species on the sites, which may inform future restoration efforts. Beginning in 2017, PVPLC began using the GIS based application, Survey 123, to track the TERPP sites. Using this application has assisted with efficiency and accuracy in data collection and reporting.

Each TERPP site is tracked via GIS, a tool that aids planning and monitoring efforts. PVPLC has treated 123 individual TERPP sites since 2006. As *Euphorbia terracina* is a high priority invasive and may take multiple treatments to control, these populations are treated in numerous years. In 2019, 7 TERPP sites were treated. These include 6 *Euphorbia terracina* populations as well as 3 Acacia removal sites within Portuguese Bend (Table I). The 3 Acacia removal sites totaled approximately 38 acres.

3.0 FIELD METHODS

PVPLC staff uses best practice, the most effective and least intrusive, methods at all times when conducting TERPP-related activities. High priority areas may occur near rare or endangered biological populations. Care is taken to minimize soil erosion, fire risk, disturbance to surrounding native vegetation and further dispersal of the exotic species. PVPLC utilizes a combination of methods to conduct exotic species removal, generally limited to the following:

- Mechanical removal - staff may use tools with motorized blades to fell larger species;
- Hand removal - staff conduct most removals by hand pulling and/or with small hand tools for pruning and cutting;
- Chemical control - trained staff applies herbicides at the appropriate phase of vegetative growth;
- Growth and seed maturation, and;
- Disposal - City of Rancho Palos Verdes staff coordinate with waste companies to supply green waste and trash containers.

Qualified Licensed Applicator(s) develop all recommendations for chemical pest control and senior staff supervises field staff and contractors in sensitive areas. Additionally, field staff has an integral role in the TERPP and often have crucial, site-specific knowledge related to the sites.

4.0 2019 TREATMENTS

In 2019, PVPLC treated 7 populations of invasive plants across four reserves (Table I, photopoints in Appendix D8) and approximately 38 acres of Acacia. Of the 7 treated

populations, 6 were populations of *Euphorbia terracina* (Geraldton spurge, Euphorbia). Euphorbia grows rapidly in disturbed areas, is a prolific seeder and is rapidly expanding its distribution in southern California. Invaded areas show reduced ecological quality and reduced habitat quality compared to un-invaded areas. Euphorbia shows a broad habitat tolerance in southern California, invading both cool coastal areas and hot, dry, interior areas. Most of the populations of Euphorbia have been treated for several years, in attempts to keep it from spreading further into the Preserve. In addition to Euphorbia treatments, the 2019 TERPP treated approximately 38 acres of *Acacia cyclops* (Coastal Wattle) at Portuguese Bend.

Table I. 2019 TERPP Sites and Treatment Description

Stand ID	Reserve	Name	Stand Size	Number Individuals	Treatment	Percent Treated
AA_EuTe_02	Agua Amarga	<i>Euphorbia terracina</i>	10 – 100 ft ²	10 - 50	Hand pull/Herbicide	75 - 100%
AC_CoVa_01	Abalone Cove	<i>Coronilla valentina</i>	10 – 100 ft ²	100 - 200	Herbicide	75 – 100%
AC_EuTe_01	Abalone Cove	<i>Euphorbia terracina</i>	100 – 300 ft ²	50-100	Hand- pull/Herbicide	75 - 100%
PB_EuTe_04	Portuguese Bend	<i>Euphorbia terracina</i>	10 – 100 ft ²	1-10	Herbicide	75 - 100%
TS_EuTe_01	Three Sisters	<i>Euphorbia terracina</i>	10 -100 ft ²	100-200	Hand pull/Herbicide	75 - 100%
TS_EuTe_02	Three Sisters	<i>Euphorbia terracina</i>	10 – 100 ft ²	10-50	Hand Pull	75 - 100%
TS_EuTe_04	Three Sisters	<i>Euphorbia terracina</i>	300 – 600 ft ²	100 - 200	Hand pull/Herbicide	75 – 100%
PB_AcCy_11	Portuguese Bend	<i>Acacia cyclops</i>	>1000 ft ²	50-100	Tree Removal	75 – 100%
PB_AcCy_12	Portuguese Bend	<i>Acacia cyclops</i>	>1000 ft ²	50-100	Tree Removal	75 – 100%
PB_AcCy_13	Portuguese Bend	<i>Acacia cyclops</i>	>1000 ft ²	50-100	Tree Removal	75 – 100%

5.0 REFERENCES

California Invasive Plant Council 2006. California Invasive Plant Inventory. February. California Invasive Plant Council: Berkley, CA.

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State of California 2007. Department of Food and Agriculture Division of Plant Health & Prevention Services Noxious Weed Ratings. Retrieved September 2007, from: <http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/pdfs/noxiousweed_ratings.pdf>.

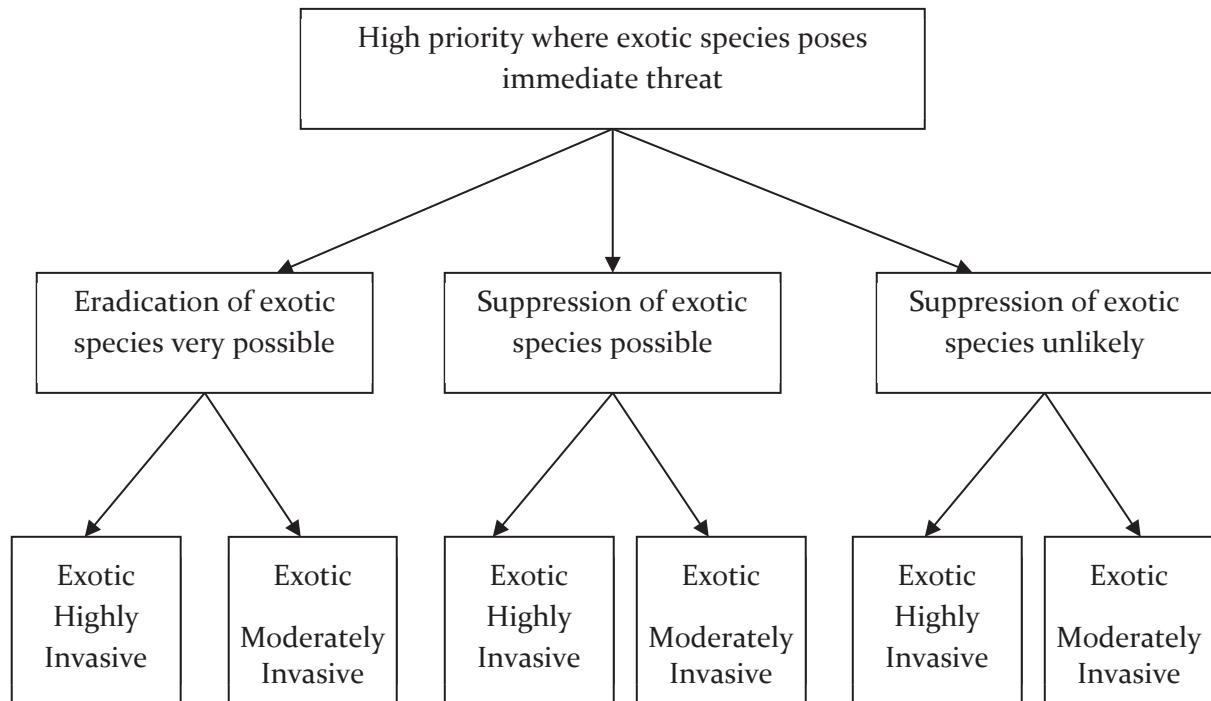
URS 2006. City of Rancho Palos Verdes Draft Natural Community Conservation Plan and Habitat Conservation Plan. June 9.

APPENDIX DI: SAMPLE TERPP FORM

Invasive Weed Mapping Field Datasheet

Rev 3/13

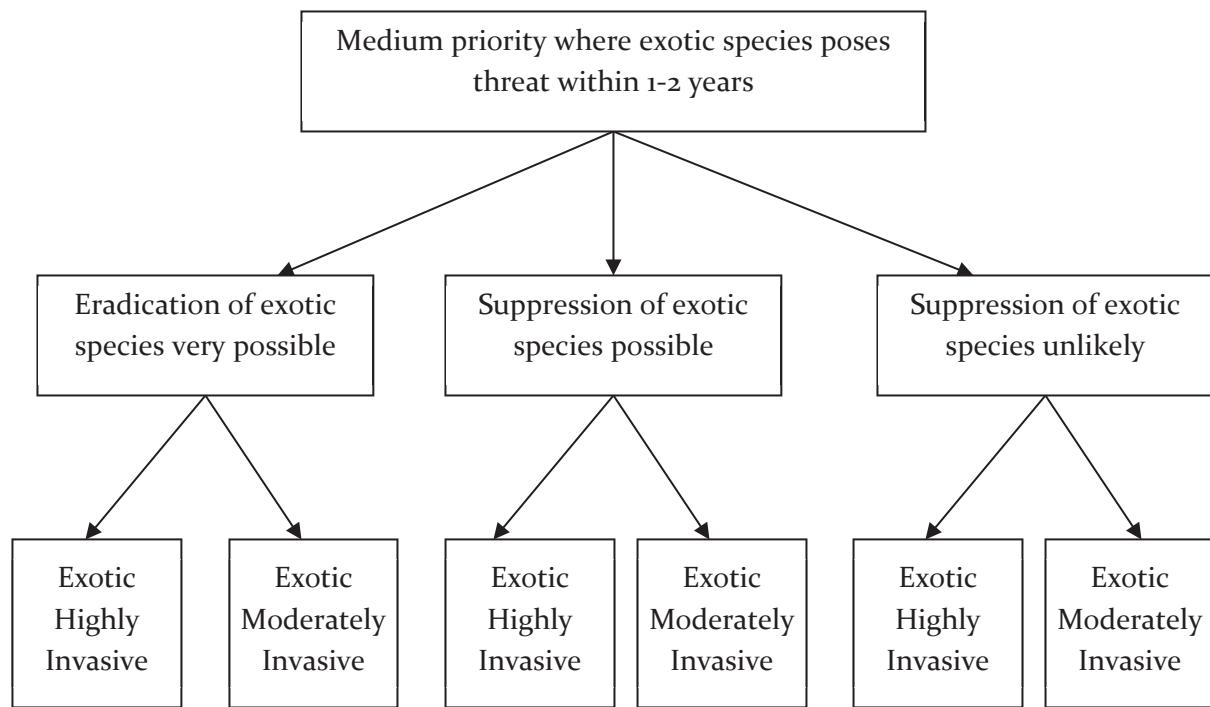
APPENDIX D2: FLOWCHART FOR HIGH PRIORITY THREAT TO NATIVE VEGETATION



Priority Ranking For Control of Exotic Species

1-3= Low priority 4-7= Medium priority 8-10= High priority

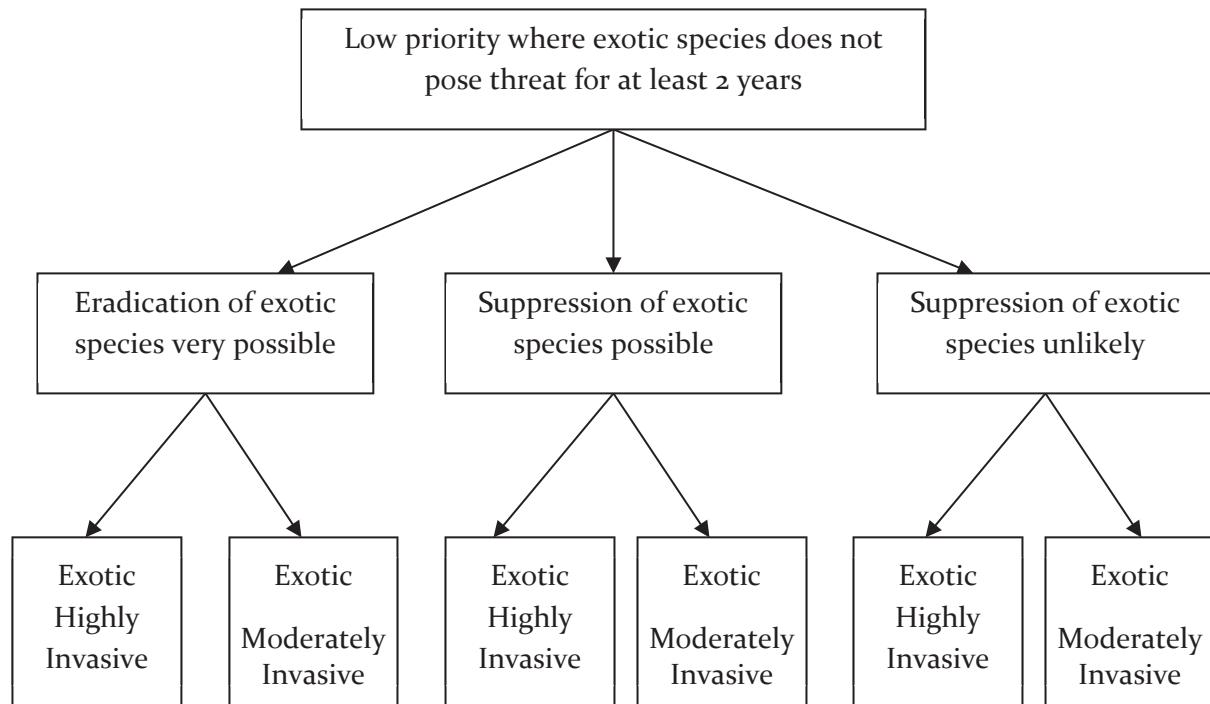
APPENDIX D3: FLOWCHART FOR MEDIUM PRIORITY DEGREE OF THREAT TO NATIVE VEGETATION



Priority Ranking For Control of Exotic Species

1-3= Low priority 4-7= Medium priority 8-10= High priority

APPENDIX D4: FLOWCHART FOR LOW PRIORITY DEGREE OF THREAT TO NATIVE VEGETATION



Priority Ranking For Control of Exotic Species

1-3= Low priority 4-7= Medium priority 8-10= High priority

APPENDIX D5: HIGHLY INVASIVE SPECIES

<u>Genus species</u>	<u>Common name</u>
<i>Aegilops triuncialis</i>	Barbed goatgrass
<i>Alternanthera philoxeroides</i>	Alligatorweed
<i>Ammophila arenaria</i>	European beachgrass
<i>Arundo donax</i>	Giant reed
<i>Brassica tournefortii</i>	Sahara mustard
<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome
<i>Bromus tectorum</i>	Cheatgrass
<i>Carpobrotus edulis</i>	Highway iceplant
<i>Carthamus lanatus</i>	Woolly starthistle
<i>Centaurea solstitialis</i>	Yellow starthistle
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	Spotted knapweed
<i>Cortaderia jubata</i>	Jubatagrass
<i>Cortaderia selloana</i>	Pampasgrass
<i>Cytisus scoparius</i>	Scotch broom
<i>Delairea odorata</i>	Cape-ivy
<i>Egeria densa</i>	Brazilian egeria
<i>Ehrharta calycina</i>	Purple veldtgrass
<i>Eichhornia crassipes</i>	Water hyacinth
<i>Elymus caput-medusae</i>	Medusahead
<i>Euphorbia virgata</i>	Leafy spurge;
<i>Genista monspessulana</i>	French broom

<i>Hedera canariensis</i>	Algerian ivy
<i>Hedera helix</i>	English ivy
<i>Hydrilla verticillata</i>	Hydrilla
<i>Lepidium latifolium</i>	Perennial pepperweed
<i>Limnobium spongia</i>	South American spongeplant
<i>Ludwigia hexapetala</i>	Creeping waterprimrose
<i>Ludwigia peploides</i>	Floating water primrose
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Myriophyllum aquaticum</i>	Parrotfeather
<i>Myriophyllum spicatum</i>	Spike watermilfoil
<i>Onopordum acanthium</i>	Thistle
<i>Rubus armeniacus</i>	Himalayan blackberry
<i>Salvinia molesta</i>	Water fern
<i>Sesbania punicea</i>	Scarlet wisteria
<i>Spartina alterniflora</i> x <i>S. foliosa</i>	Smooth hybrid cordgrass
<i>Spartina densiflora</i>	Dense-flowered cordgrass
<i>Spartium junceum</i>	Spanish broom
<i>Tamarix chinensis</i>	Chinese tamarisk, fivestamen tamarisk
<i>Tamarix gallica</i>	French tamarisk
<i>Tamarix parviflora</i>	Smallflower tamarisk
<i>Tamarix ramosissima</i>	Tamarisk
<i>Ulex europaeus</i>	Common gorse

APPENDIX D6: MODERATELY INVASIVE SPECIES

Genus species

Common Name

<i>Acacia dealbata</i>	Silver wattle
<i>Acroptilon repens</i>	Russian knapweed
<i>Ageratina adenophora</i>	Sticky eupatorium
<i>Ailanthus altissima</i>	Tree-of-heaven
<i>Alhagi maurorum</i>	Camelthorn
<i>Arctotheca calendula</i>	Fertile capeweed
<i>Arctotheca prostrata</i>	Capeweed
<i>Asparagus asparagoides</i>	Bridal creeper
<i>Asphodelus fistulosus</i>	Onion weed
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Avena barbata</i>	Slender oat
<i>Avena fatua</i>	Wild oats
<i>Brachypodium distachyon</i>	Annual false-brome
<i>Brachypodium sylvaticum</i>	False-brome
<i>Brassica nigra</i>	Black mustard
<i>Bromus diandrus</i>	Ripgut brome
<i>Carduus nutans</i>	Musk thistle
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Carpobrotus chilensis</i>	Iceplant
<i>Carrichtera annua</i>	Ward's weed
<i>Centaurea calcitrapa</i>	Purple starthistle

<i>Centaurea diffusa</i>	Diffuse knapweed
<i>Centaurea jacea</i> ssp. <i>pratensis</i>	Meadow knapweed
<i>Centaurea melitensis</i>	Tocalote
<i>Centaurea virgata</i> var. <i>squarrosa</i>	Squarrose knapweed
<i>Chondrilla juncea</i>	Skeleton weed
<i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i>	Boneseed
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium vulgare</i>	Bull thistle
<i>Clematis vitalba</i>	Old man's beard
<i>Colocasia esculenta</i>	Taro root
<i>Conium maculatum</i>	Poison-hemlock
<i>Cotoneaster franchetii</i>	Orange cotoneaster
<i>Cotoneaster lacteus</i>	Milkflower cotoneaster
<i>Cotoneaster pannosus</i>	Silverleaf cotoneaster
<i>Cynara cardunculus</i>	Artichoke thistle
<i>Cynodon dactylon</i>	Bermuda grass
<i>Cynoglossum officinale</i>	Dog bur
<i>Cynosurus echinatus</i>	Hedgehog dogtail
<i>Cytisus striatus</i>	Portuguese broom
<i>Dipsacus fullonum</i>	Common teasel
<i>Dipsacus sativus</i>	Fullers teasel
<i>Dittrichia graveolens</i>	Stinkwort
<i>Ehrharta erecta</i>	Ehrharta

<i>Elaeagnus angustifolia</i>	Russian olive
<i>Emex spinosa</i>	Devil's thorn
<i>Fallopia japonica</i>	Japanese knotweed; Mexican bamboo
<i>Fallopia sachalinensis</i>	Giant knotweed
<i>Festuca arundinacea</i>	Kentucky fescue
<i>Festuca myuros</i>	Rat-tail fescue
<i>Festuca perennis</i>	Italian ryegrass
<i>Ficus carica</i>	Edible fig
<i>Foeniculum vulgare</i>	Fennel
<i>Gazania linearis</i>	Gazania
<i>Genista monosperma</i>	Bridal veil broom
<i>Glyceria declinata</i>	Mannagrass
<i>Halogeton glomeratus</i>	Halogeton
<i>Hirschfeldia incana</i>	Short-pod mustard
<i>Holcus lanatus</i>	Common velvet grass
<i>Hordeum marinum</i>	Mediterranean barley
<i>Hordeum murinum</i>	Foxtail
<i>Hypericum canariense</i>	Canary Island St. Johnswort
<i>Hypochaeris radicata</i>	Rough cat's-ear
<i>Isatis tinctoria</i>	Dyer's woad
<i>Lepidium chalepense</i>	Whiteweek
<i>Lepidium draba</i>	Heart-podded hoary cress
<i>Leucanthemum vulgare</i>	Ox-eye daisy

<i>Limonium duriusculum</i>	European sea lavender
<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	Dalmatian toadflax
<i>Linaria vulgaris</i>	Yellow toadflax
<i>Lythrum hyssopifolium</i>	Hyssop loosestrife
<i>Mentha pulegium</i>	Pennyroyal
<i>Mesembryanthemum crystallinum</i>	Crystalline iceplant
<i>Myoporum laetum</i>	False sandalwood
<i>Nicotiana glauca</i>	Tree tobacco
<i>Oxalis pes-caprae</i>	Bermuda buttercup
<i>Pennisetum setaceum</i>	Purple fountain grass
<i>Phalaris aquatica</i>	Harding grass
<i>Potamogeton crispus</i>	Curly-leaved pondweed
<i>Rumex acetosella</i>	Sheep sorrel
<i>Saccharum ravennae</i>	Ravennagrass
<i>Salsola soda</i>	Glasswort
<i>Schinus terebinthifolius</i>	Brazilian pepper tree
<i>Senecio glomeratus</i>	Australian fireweed
<i>Spartina anglica</i>	English cordgrass
<i>Stipa capensis</i>	Cape ricegrass
<i>Tanacetum vulgare</i>	Common tansy
<i>Torilis arvensis</i>	Hedgeparsley
<i>Triadica sebifera</i>	Chinese tallow tree
<i>Vinca major</i>	Periwinkle

Washingtonia robusta

Mexican fan palm

Zostera japonica

Dwarf eelgrass

APPENDIX D7: WATCH LIST

<u>Scientific Name</u>	<u>Common Name</u>
<i>Acacia baileyana</i>	Cootamundra wattle
<i>Acacia cyclops</i>	Cyclops acacia
<i>Acacia latifolia</i>	Sydney golden wattle
<i>Acacia paradoxa</i>	Kangaroothorn
<i>Acacia pycnantha</i>	Golden wattle
<i>Acacia saligna</i>	Orange wattle
<i>Acaena novae-zelandiae</i>	Biddy-biddy
<i>Aegilops cylindrica</i>	Jointed goatgrass
<i>Alopecurus pratensis</i>	Meadow foxtail
<i>Alyssum corsicum</i>	Yellowtuft
<i>Alyssum murale</i>	Yellowtuft
<i>Ambrosia trifida</i>	Giant ragweed
<i>Araujia sericifera</i>	Bladderflower
<i>Berberis darwinii</i>	Darwin barberry
<i>Berteroa incana</i>	Hoary alyssum
<i>Buddleja davidii</i>	Butterfly bush
<i>Carex pendula</i>	Hanging sedge
<i>Casuarina equisetifolia</i>	Beach sheoak
<i>Catharanthus roseus</i>	Madagascar periwinkle
<i>Cenchrus echinatus</i>	Southern sandbur

<i>Cenchrus longispinus</i>	Mat sandbur
<i>Centaurea diluta</i>	Spotted knapweed
<i>Cestrum parqui</i>	Willow jessamine
<i>Chasmanthe floribunda</i>	African cornflag
<i>Cytisus multiflorus</i>	White Spanish broom
<i>Cytisus proliferus</i>	Tagasaste
<i>Datura inoxia</i>	Pricklyburr
<i>Dipogon lignosus</i>	Okie bean
<i>Dipsacus laciniatus</i>	Cutleaf teasel
<i>Dittrichia viscosa</i>	False yellowhead
<i>Echium plantagineum</i>	Patterson's curse
<i>Eucalyptus cladocalyx</i>	Sugargum
<i>Euphorbia lathyris</i>	Caper spurge
<i>Fallopia bohemica</i>	Bohemian knotweed
<i>Galega officinalis</i>	Professorweed
<i>Genista linifolia</i>	Mediterranean broom
<i>Geranium lucidum</i>	Shining geranium
<i>Grevillea robusta</i>	Silkoak
<i>Gunnera tinctoria</i>	Chilean gunnera
<i>Gypsophila paniculata</i>	Baby's breath
<i>Helianthus tuberosus</i>	Jerusalem artichoke
<i>Heliotropium amplexicaule</i>	Clasping heliotrope
<i>Heracleum mantegazzianum</i>	Giant hogweed

<i>Hyparrhenia hirta</i>	Tambookie grass
<i>Hypericum androsaemum</i>	Sweet-amber
<i>Hypericum grandifolium</i>	Large-leaved hypericum
<i>Ipomoea indica</i>	Blue morningglory
<i>Kniphofia uvaria</i>	Redhot poker
<i>Lantana camara</i>	Lantana
<i>Lathyrus latifolius</i>	Perennial sweet pea
<i>Leptospermum laevigatum</i>	Australian tea tree
<i>Malephora crocea</i>	Coppery mesembryanthemum
<i>Maytenus boaria</i>	Mayten
<i>Myoporum laetum</i>	False sandalwood
<i>Nardus stricta</i>	Matgrass
<i>Nothoscordum gracile</i>	False garlic
<i>Oncosiphon piluliferum</i>	Globe chamomile
<i>Onopordum illyricum</i>	Illyrian thistle
<i>Orobanche aegyptiaca</i>	Egyptian broomrape
<i>Paraserianthes lophantha</i>	Plume acacia
<i>Parthenium hysterophorus</i>	Santa Maria feverfew
<i>Paspalum urvillei</i>	Vasey's grass
<i>Paspalum vaginatum</i>	Seashore paspalum
<i>Passiflora tarminiana</i>	Banana passionfruit
<i>Peganum harmala</i>	African-rue
<i>Pennisetum villosum</i>	Feathertop

<i>Persicaria wallichii</i>	Himalayan knotweed
<i>Pittosporum undulatum</i>	Victorian box
<i>Plecostachys serpyllifolia</i>	Petite-licorice
<i>Polygala myrtifolia</i>	Myrtle-leaf milkwort
<i>Pyrus calleryana</i>	Callery pear
<i>Rhamnus alaternus</i>	Italian buckthorn
<i>Romulea rosea</i> var. <i>australis</i>	Rosy sandcrocus
<i>Rytidosperma caespitosum</i>	Wallabygrass
<i>Salpichroa origanifolia</i>	Lily of the valley vine
<i>Salsola ryanii</i>	Ryan's Russian thistle
<i>Scabiosa atropurpurea</i>	Pincushion flower
<i>Scolymus hispanicus</i>	Goldenthistle
<i>Senecio linearifolius</i>	Fireweed groundsel
<i>Solanum aviculare</i>	New Zealand nightshade
<i>Solanum carolinense</i>	Carolina horsenettle
<i>Sphaerophysa salsula</i>	Alkali swainsonpea
<i>Stipa brachychaeta</i>	Punagrass
<i>Stipa tenuissima</i>	Mexican feathergrass
<i>Thinopyrum junceiforme</i>	Russian wheatgrass
<i>Ventenata dubia</i>	North Africa grass
<i>Verbena bonariensis</i>	Tall vervain
<i>Zygophyllum fabago</i>	Syrian beancaper

APPENDIX D8

2019 TARGETED EXOTIC REMOVAL PROGRAM FOR PLANTS (TERPP) PHOTOS (Before and After)

AA_EuTe_02



AC_CoVa_01



AC_EuTe_01



PB_EuTe_04



TS_EuTe_01



TS_EuTe_02



TS_EuTe_04



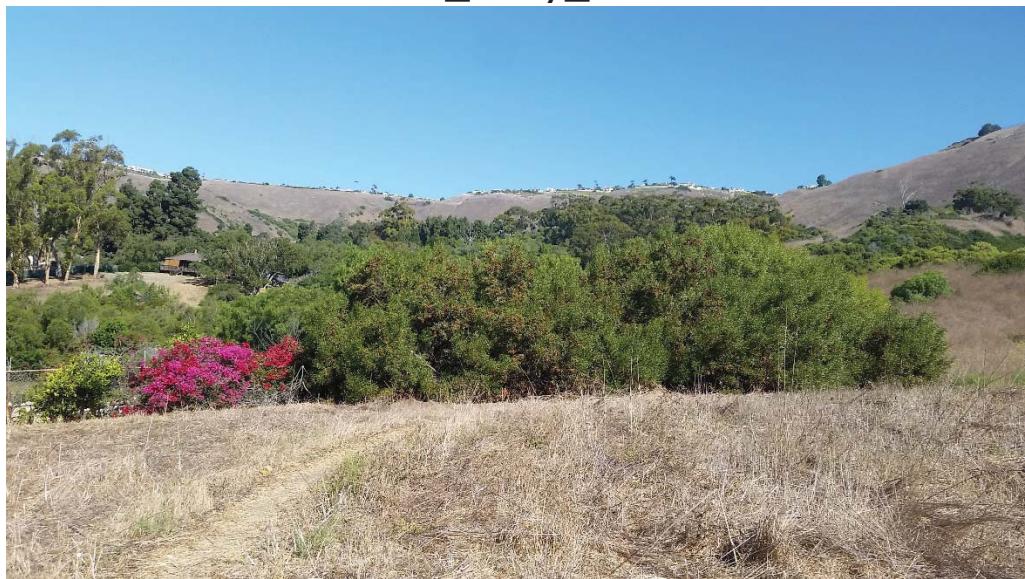
PB_AcCy_11



PB_AcCy_12



PB_AcCy_13



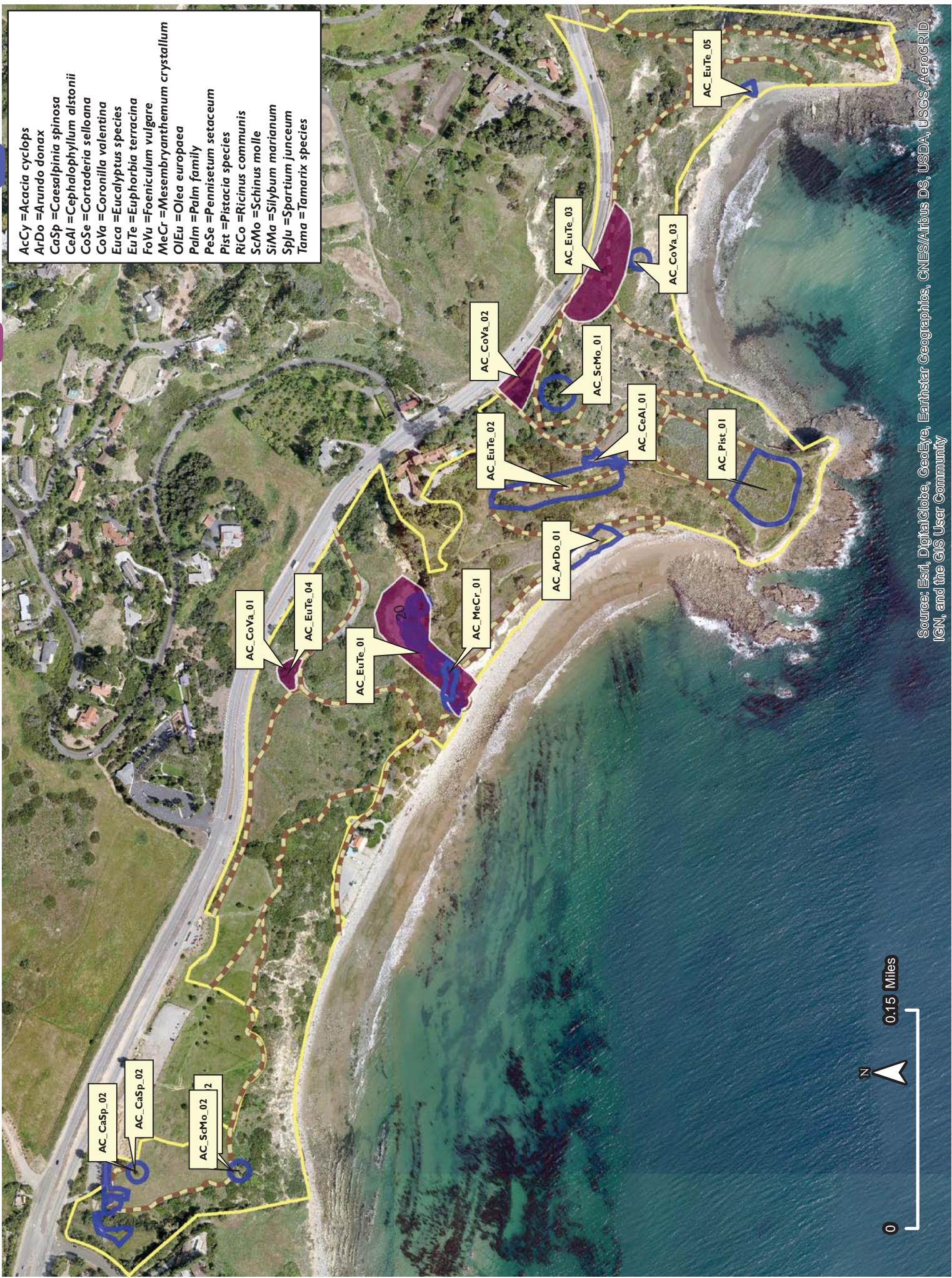
TERPP Sites: AGUA AMARGA

TERPP TERPP Areas



TERPP Sites: ABALONE COVE

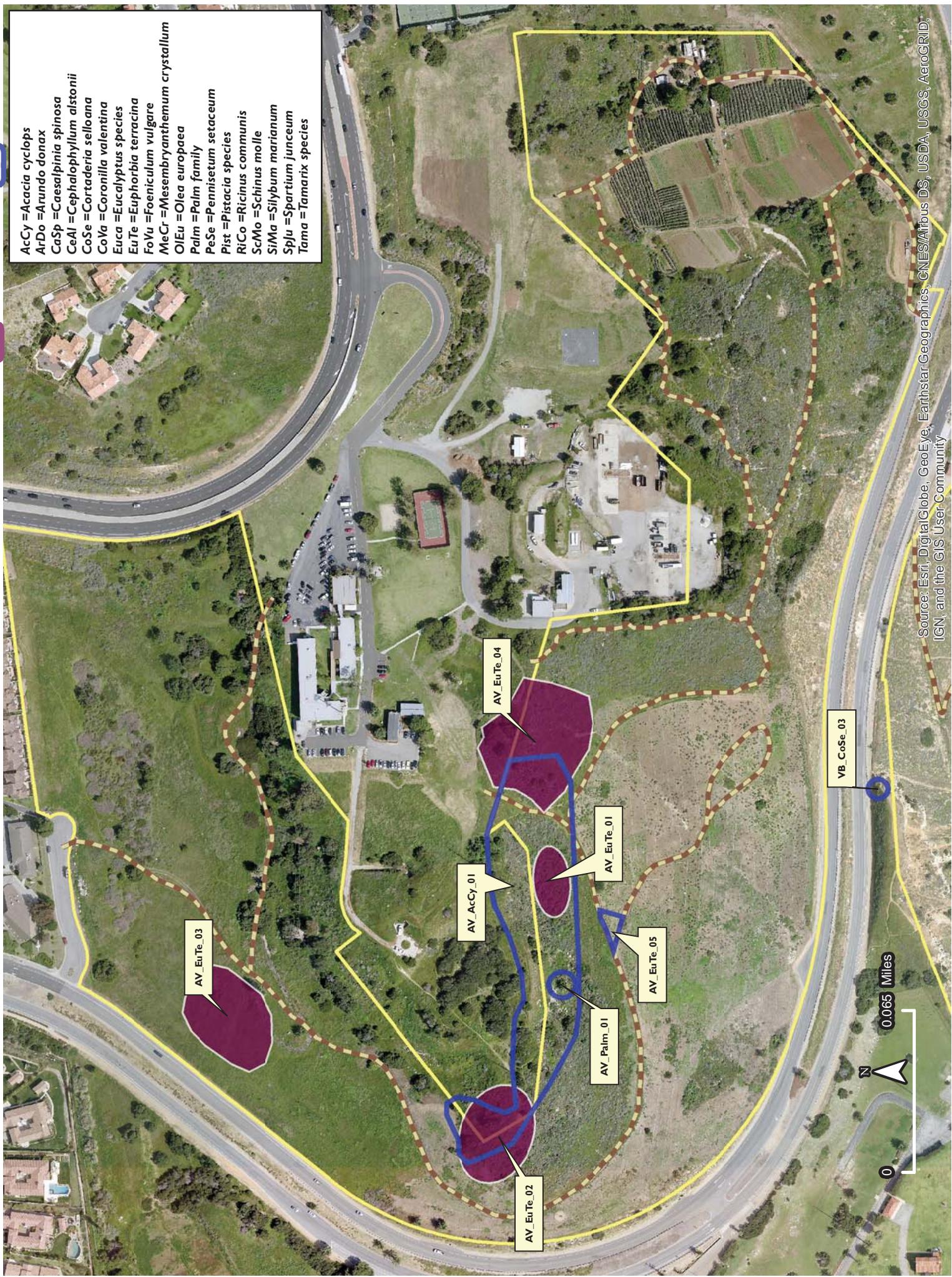
TERPP Areas



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TERPP Sites: ALTA VICENTE

TERPP Areas



TERPP Sites: FILIORUM

TERPP Areas



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TERPP Sites: FORRESTAL

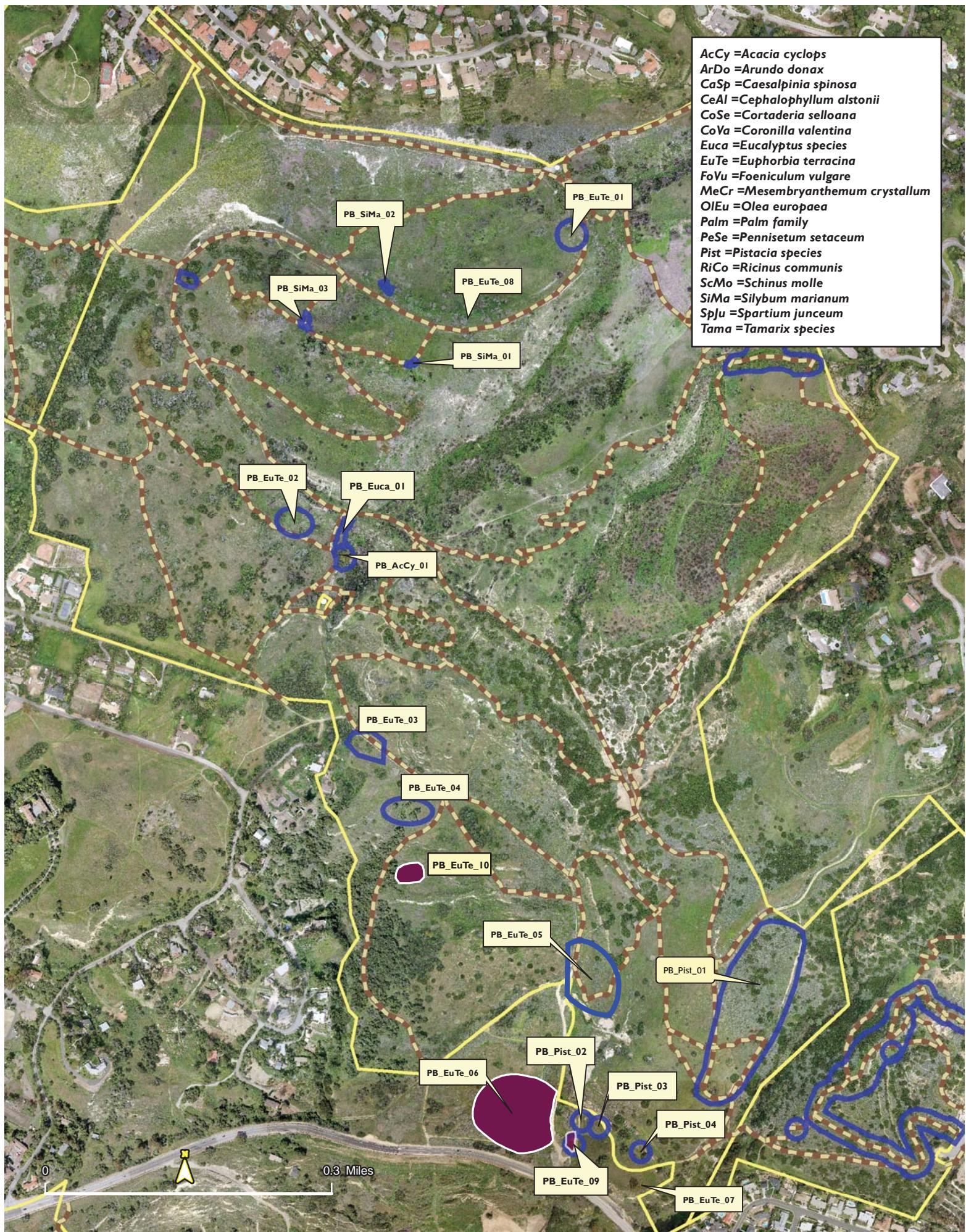
TERPP Areas



TERPP Sites: PORTUGUESE BEND

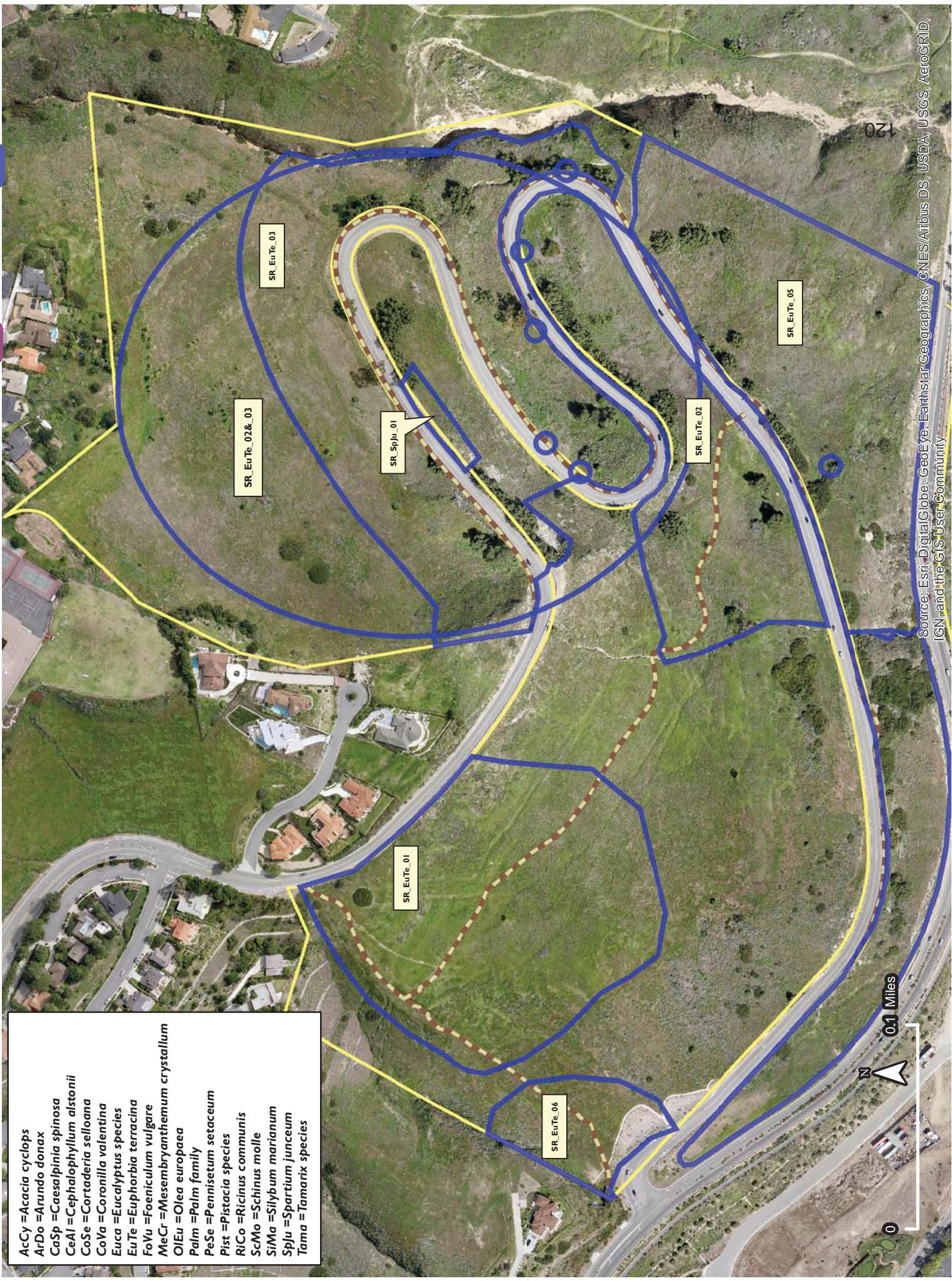
TERPP

TERPP Areas



TERPP Sites: SAN RAMON

TERPP Areas

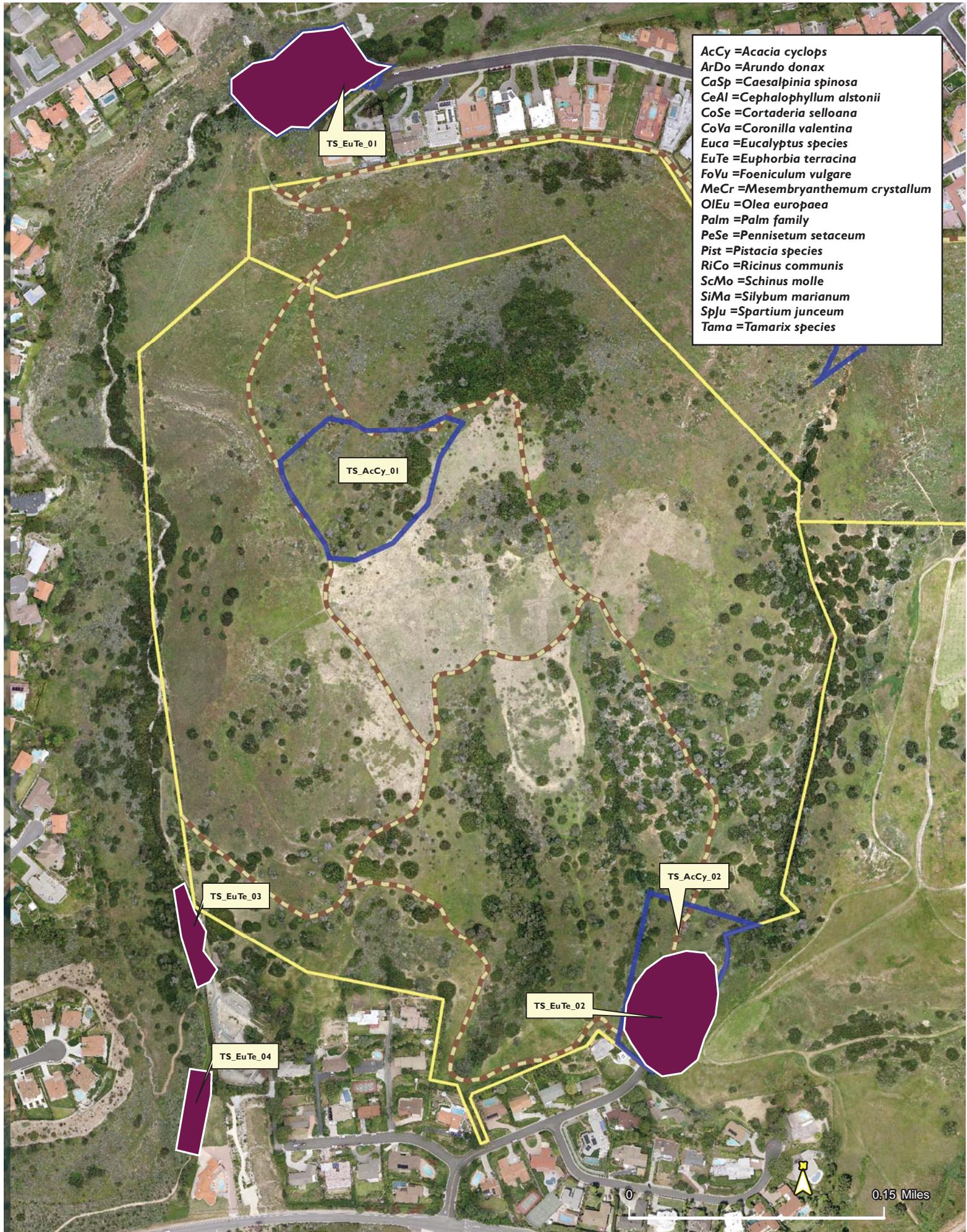


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN and the GIS User Community

TERPP Sites: THREE SISTERS

TERPP

TERPP Areas



TERPP Sites: VICENTE BLUFFS

TERPP

TERPP Areas



TERPP Sites: Acacia Removal at Lower PB



TERPP Sites: Acacia Removal at Upper PB



TERPP Sites: Acacia Removal at Vanderlip/Narcissa Area



APPENDIX E

COMMUNITY SCIENCE AND EDUCATION PROGRAMS

1.0 INTRODUCTION

PVPLC implements an integrated approach to stewardship by involving students and community volunteers in programs that addresses specific conservation issues related to the management of the Palos Verdes Native Preserve. In 2019, high school and university students as well as community members participated in research that not only satisfied their educational and/or personal goals, but also contributed to informing PVPLC land management activities. The Community Science Program, initiated in Fall 2013, has brought volunteers to PVPLC for focused studies in the preserves. Community Science projects completed in 2019 include the Cactus Wren Monitoring Program and the Wildlife Tracking Program.

University professors are crucial for the success of research, as they provide expertise and technical guidance in managing several research projects. Land Conservancy staff provides access to the preserves, local knowledge, as well as technical support to participants.

This report covers the Research and Education Program's activities via the major categories:

- High School Research
- University Researchers
- Community Science Programs

2.0 HIGH SCHOOL RESEARCH

High school and college students are important to PVPLC's field research. By participating in PVPLC's research program with professionals and university researchers, high school students obtain field and analytical skills in the natural science fields. Additionally, students increase their appreciation of nature while expanding their awareness of opportunities that the natural science fields have to offer. As a result, PVPLC students often win honors in science fairs and are able to leverage their experience for gaining entrance into top universities, satisfying course credits, or obtaining paid internships. In 2019, Anne-Sophie Corry of PV High endeavored to study the red fox population in her community of Lunada Bay and compare the abundance of red and grey fox populations within the Agua Amarga Reserve as well as the entire Palos Verdes Nature Preserve.

3.0 UNIVERSITY STUDENTS

College students from local universities participate in research under the umbrella of the Conservancy's Intern and Community Science programs (Table. I). Students participate in activities integral to land management and conservation, which provides the students valuable hands-on experience. PVPLC's stewardship staff conducts a variety of surveys throughout the preserves for assessing habitat quality as well as documenting the progress of our restoration efforts. The Conservancy's Interns participated in vegetation assessment surveys as well as

entered the resulting data into the database. They also developed data tables for reports and conducted the initial stages of the report writing.

In addition to gaining work experience, many students leverage their internships for entrance into a professional job or graduate school. While the Conservancy benefits from their work, the students benefit from experience and training that will benefit them in future careers.

Table 1. 2019 Collegiate research conducted

Student	Project Title	Academic Institution
Justin White	Effects of the Non-Native <i>Schinus molle</i> , <i>Eucalyptus globulus</i> , and <i>Acacia cyclops</i> on Biodiversity in Their Respective Understory in a Coastal Sage Scrub Ecosystem	University of Edinburgh

In 2019 PVPLC commenced research with the California State University Long Beach Department of Geography GIS Master's program cohort. This research has endeavored to create a fire hazard model using remote sensing technology, UAV imagery, and implementing various GIS tools. Mapping acacia throughout the preserve was a component of the project. Any results will be shared in the 2020 annual report.

4.0 COMMUNITY SCIENCE PROGRAMS

Volunteers are important for PVPLC, not only helping with growing plants, habitat restoration, guiding walks, and special events, but also with science research and education. Our volunteers travel from throughout the Peninsula and surrounding areas to help out.

The Community Science program blossomed in 2013 with the initiation of the Cactus Wren Program along with the ongoing Wildlife Tracking Program. The initial Cactus Wren Program resulted in detailed analysis of how the birds utilize mature cactus scrub habitat and newly-restored habitat at Alta Vicente Reserve. In addition, the volunteers were able to obtain detailed documentation of a single pair of cactus wrens as the wrens built a nest, incubated eggs, and successfully fledged three chicks. Monitoring work in 2019 focused on cactus wren occupancy of specific delineated cactus patches within the Palos Verdes Nature Preserve. This information described varying levels of cactus wren occupancy across the Preserve and made possible the inference of breeding activity based on a number of criteria.



Volunteers learn the basics of cactus wren observations before starting the first Community Science Cactus Wren monitoring session.

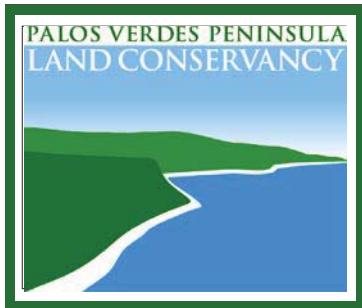
The 2019 Wildlife Tracking Program took place in the fall, beginning with training the volunteers for tracking coyotes, red fox, and gray fox, among many other species in the Preserve. Once volunteers were confident in identifying tracks and scat of a particular species, they individually conducted regular surveys along specific routes. The data were submitted to the Conservancy for use in its management using a new program called Survey123 for ArcGIS allowing for more efficient data analysis and reporting. A map was also created to illustrate the location of scat or track observations. Motion-sensor cameras were integrated in the Wildlife Tracking Program and captured both images and video of wild canid species. High quality images and videos allowed for the potential identification of individual coyotes providing insight into coyote population dynamics and movement throughout the Preserve.

Coastal Cactus Wren

(*Campylorhynchus brunneicapillus*)

Community Science Monitoring

2019



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Report by: Austin Parker.

Surveyed by PVPLC Community Science Volunteers: Ben Smith, Brandon Zvanut, Donna McLaughlin, Evi Meyer, Gary Scimeca, James Rassler, Jess Morton, Joan Krause, Rod Jensen, Lowell R Wedemeyer, Michael Bell, Willow Eichler, Ann Dalkey, Dana Blasingame, Daniel Loether, Dee Edridge, Lynn Yamaoka, Tania Morris, Alex Kovary, Christine Lloyd, Nancy Fitzhugh, Noel and Cathy Casil, Rebecca Heisey, Helen Tang, Jill Morrow, Kathy Hill, Margarita Labik, Marina Farberov, Matt Covill, Patricia Lyon, Silke von Bueren, Kevin Martinez, Randy Harwood, Chadwick Sprouse

INTRODUCTION

The coastal cactus wren (*Campylorhynchus brunneicapillus*) (CACW) on the Palos Verdes Peninsula is a special status species that lives exclusively in coastal sage scrub habitat areas. They prefer areas of at least one acre in size containing 30% prickly pear cactus (*Opuntia spp.*) and large specimens of coastal cholla (*Cylindropuntia prolifera*). Habitat preferences for nesting are strict, with nesting substrate almost entirely restricted to prickly pear and cholla (Rea and Weaver 1990). Ninety percent of their foraging time is spent on the ground, feeding on insects year-round, and feeding on fruit and plants during cooler months. Adult birds are highly sedentary and tend to return to the same breeding territory each year. In a 1993-1997 study on the Palos Verdes Peninsula, ornithologist Jon Atwood found that 65% of the juveniles dispersed less than one kilometer from their natal territory (Atwood 1998). The wren's natural tendency to stay close to its natal territory and not move great distances underscores the importance of having quality habitat throughout the preserves

Following the formal establishment of the Community Science Cactus Wren Program in 2014, volunteer work focused on assessing how CACW utilize their habitat. The goal was to obtain data that would inform the Conservancy how to better manage cactus habitat for the bird and to build new habitat. Those two years were quite successful in meeting that goal, as we now have a better understanding of how close the wrens stay to their habitat and how much they explore developing habitat (infrequently, unless they are feeding growing chicks and need to expand their forage area).

Despite the ability of previous surveys to identify the CACW behavior relating to dispersal, locating areas of CACW inhabitance has proven challenging. As shown by ornithologist Dan Cooper, who conducted comprehensive triennial cactus wren surveys in 2009, 2012, 2015 and 2018, the numbers of CACW has varied over time, counting the same number of territories in 2009 and 2015 (25) and more counted in 2012 (48) and a precipitous decrease in 2018 (5). (Cooper Ecological Monitoring 2018) Because of the triennial frequency of the surveys, it is difficult to determine whether or not these trends are true or an artifact of sampling.

Participants in the Community Science Cactus Wren Program can help answer the question: Where are cactus wrens found in the preserves year-to-year? To address this question, teams of volunteers regularly hike the trails, noting when CACW are heard and/or seen, beginning in April and continuing through July. This period coincides with the more active period for the wrens when they are nesting and caring for newly fledged chicks. These repeated visits provide data that indicates where birds are likely to be, and the variation of their distribution year-to-year to augment the triennial surveys conducted by the Conservancy's biologist.

The community science cactus wren monitoring program also monitors for the presence of brown-headed cowbirds. Brown-headed cowbirds parasitize nests of other native bird species and have detrimental impacts to native bird breeding, including the coastal cactus wren. Observations of brown-headed cowbirds are recorded and locations are passed on to the wildlife agencies.

METHODS

Study Area:

The study area was within seven reserves (Alta Vicente, Filiorum, Forrestal, Ocean Trails, Portuguese Bend, San Ramon, and Three Sisters) of the Palos Verdes Nature Preserve located in the city of Rancho

Palos Verdes, CA. The reserves surveyed were those which had been documented to support CACW activity or extensive patches of prickly pear (*Opuntia littoralis* and *O. oricola*) and cholla (*Cylindropuntia prolifera*) (Cooper Ecological Monitoring 2013).

Figure 1. Study area within the Palos Verdes Peninsula Nature Preserve.



Data Collection:

Volunteers for the Community Science Program met prior to the start of the monitoring season to learn how to identify CACW in their habitat, how to record field observations, and how to generate and send data electronically on Excel spreadsheets to the Conservancy. Teams were formed for the monitoring season, pairing more experienced volunteers with those having little or no birding experience. The enthusiastic volunteers then took to the field outfitted with binoculars, spotting scopes, and cameras equipped with telephoto lenses.

The volunteers conduct at least two surveys for each month of the survey period (April through July). Volunteers walked their predetermined trail route documenting visual or audial observations of CACW. This information was recorded on field data sheets. Additionally, weather and wind observations were included because the birds' presence is impacted unduly by weather. No surveys were conducted during rainy days and high winds greater than 19 mph (30 km/hr). Surveys were typically conducted during late morning. All electronic field observations were archived in the Conservancy's database, and maps depicting wren inhabitance were archived in PDF format on the Conservancy's server.

Data Analysis:

Collected data were analyzed on the basis of four criteria that describe the level of CACW inhabitance specific to each cactus patches surveyed. These criteria allowed each cactus patch to receive a rating category reflecting the level of CACW inhabitance observed. These ratings assist in the interpretation of

survey data and specifically allow for the inference, in general terms, of potential CACW behavior, habitat quality, and other factors relative to inhabitance. Categorization is also helpful in providing a scale of inhabitance for each cactus patch that can be mapped. Subsequent ratings associated with each patch were mapped using ArcGIS Software which allowed for a color gradient to describe the various inhabitance ratings throughout the surveyed reserves as well as a map depicting the highest rating found within each reserve (Appendix A).

Inhabitance Rating Categories

Categories were developed to assist in the interpretation of survey data and to infer in general terms potential CACW behavior, habitat quality, and other factors related to CACW inhabitance. This categorization is also helpful in providing a scale of inhabitance that can be mapped such that different levels of inhabitance may be compared to each other. Categorical ratings based on four descriptors were extracted from the data:

Inhabitance Descriptors (4):

1) Observation Rate

of visits with a CACW observation / total number of visits

2) Multiple Month Observation

Sighting of a CACW in more than one month of the survey period

3) Multiple CACW Observation

Sighting of multiple CACWs during a single survey or site visit.

4) Nest

Sighting of a nest that appears to have been used by CACW within the survey period.

Inhabitance Rating Categories (5):

RARE

Indicates rare habitation of a cactus patch, which is defined by an observation rate below 25% and a lack of any additional inhabitance descriptor. Rare habitation is expected to include behaviors associated with short term inhabitance such as foraging or dispersal and suggests a lack of nesting. A patch categorized as “rare” may also indicate poor habitat quality or the presence of residence inhibiting factors (i.e. competition, predation, or disturbance).

OCCASIONAL

Indicates occasional habitation of a cactus patch, which is defined as an observation rate below 25% and having one or more additional inhabitance descriptors associated with that patch. Occasional habitation is expected to include behaviors associated with short term inhabitance (i.e. foraging or dispersal) and suggests a lack of nesting. A patch categorized as “occasional” may also indicate poor habitat quality or the presence of residence-inhibiting factors.

PERIODIC

Indicates periodic habitation of a cactus patch, which is described by an observation rate of 26-50% and one or more additional inhabitance descriptors. Periodic habitation is expected to include behaviors

such as repeated visitation for foraging and/or dispersal. This rating could be considered a weak indicator of nesting. A patch categorized as “periodic” may also indicate higher quality habitat and a decrease in residence inhibiting factors in compared to un-ranked or patches ranked patches or those ranked as “rare” or “occasional”.

REGULAR

Indicates regular habitation of a cactus patch, which is defined as an observation rate of 50-75% and at least two additional inhabitance descriptors. A patch categorized as “regular” may indicate CACW nesting, high quality habitat, and a lack of residence-inhibiting factors.

CONSISTENT

Indicates consistent habitation of a cactus patch, which is defined as an observation rate of 75-100% and at least two additional inhabitance descriptors. A patch categorized as “consistent” may be a strong indicator of CACW nesting, high quality habitat, and a lack of residence-inhibiting factors.

RESULTS

Table I. Inhabitance criteria and rating of cactus patches where CACW were observed in 2019.

Reserve	Cactus Patch ID	Total # of Surveys	Surveys w/ CACW Observations	Inhabitance Criteria				Inhabitance Rating
				Observation Rate (%)	Multiple CACW Observation	Multiple Month Observation	CACW Nest	
Alta Vicente	AV2	8	4	50	x	x	x	REGULAR
Alta Vicente	AV3	8	1	12	x			OCCASIONAL
Ocean Trails	OT5	10	1	10				RARE
Ocean Trails	OT7	7	1	14				RARE
Ocean Trails	OT8	7	1	14	x			OCCASIONAL
Ocean Trails	OT10	7	1	14				RARE
Ocean Trails	OT11	7	3	43	x			PERIODIC
Ocean Trails	OT12	7	1	14				RARE
Filiorum	Fi4	9	6	66	x	x	x	REGULAR

Green rows indicate the high likelihood of cactus wren breeding within associated cactus patch.

DISCUSSION

The cactus wren population of the Palos Verdes Nature Preserve have been experiencing a decline in observed territorial breeding behavior with similar declines being expected in their actual population size.

The 2019 breeding season for cactus wren was monitored the Community Science Cactus Wren Monitoring Program coordinated by the Palos Verdes Peninsula Land Conservancy. The cactus wren were found in fewer reserves and in lower abundance within each reserve since monitoring began in 2006. The volunteer program also noted a reduced number of cactus wren breeding territories and overall observations of the species in 2019 as compared to all previous survey years.

The cactus wren was exclusively found in reserves providing the highest quality habitat with large expanses of cactus (*Opuntia littoralis*, *O. oricola*, and *Cylindropuntia prolifera*) and specifically mature cactus plants. These locations, Alta Vicente, Filiorum, and Ocean Trails are considered “core habitat” or locations of central importance to cactus wren breeding in previous years. Species retractions back to core habitat often signals a population under stress. The observed cactus wren absence of previously occupied marginal habitat areas, such as Forrestal, San Ramon, and Portuguese Bend reserves, and exclusive use of core habitat areas may signal the presence of highly stressful conditions under which persistence and successful breeding is difficult.

Several causes of cactus wren decline have been identified as potential and likely drivers of declining regional presence and nesting success of cactus wren. These include: invasion by non-native plant species, heightened predation pressure in urban areas, unfavorable weather conditions (drought, seasonal shifts in rainfall, and cool early spring temperatures), and human disturbance. This program has found evidence to support each of these factors as present in the Preserve. It is expected that these issues are working synergistically creating a complex set of overlapping challenges. 2019 was especially bad for invasive species. With a high rainfall total of 17.62in, black mustard (*Brassica nigra*) and other non-natives overtook and over-topped many of the existing cactus patches. In 2019 the conservancy has worked on opening up the vegetation around core habitat areas and previously inhabited patches to avoid a further decline in population.

To meet or mitigate challenges faced by cactus wren in the preserve, conservancy staff has determined several management activities to improve the viability of the PV cactus wren population.

Recommended activities include:

- Removal of invasive non-native plants from cactus rich areas
- Installation of new cactus plantings
- Creation of foraging habitat (bare ground) surrounding cactus patches
- Possible implementation of nesting boxes

No brown-headed cowbirds were observed in the 2019 season.

LITERATURE CITED

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<http://www.laalmanc.com/weather/we10a.php>

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APPENDIX A

Mapped results of cactus inhabitance per catus patch survyed.

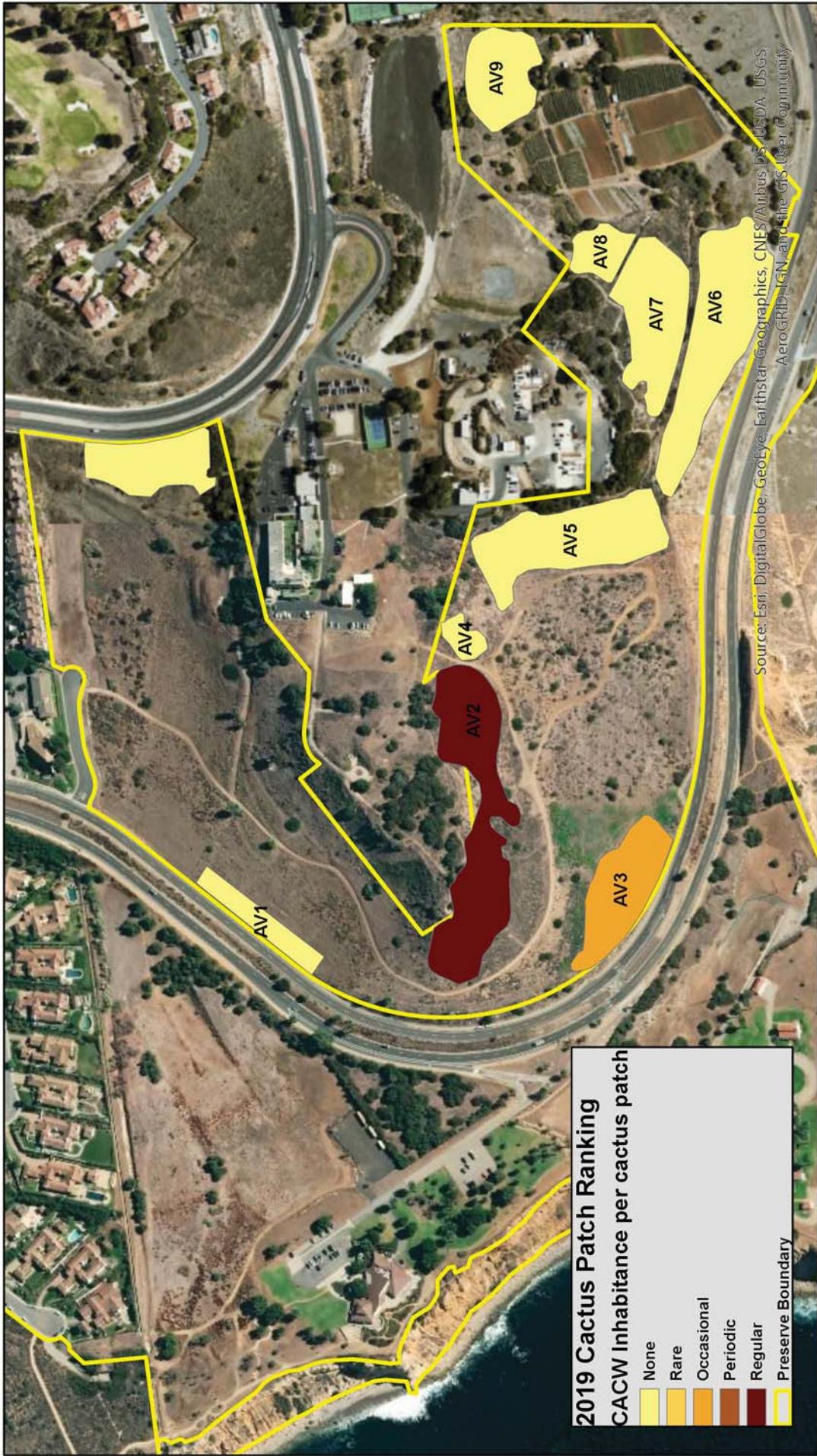


Community Science *Cactus Wren* Monitoring (2019) Abalone Cove Reserve



Community Science *Cactus Wren* Monitoring (2019)

Agua Amarga Reserve



Community Science *Cactus Wren* Monitoring (2019)

Alta Vicente Reserve



Community Science *Cactus Wren* Monitoring (2019)

Forrestal Reserve



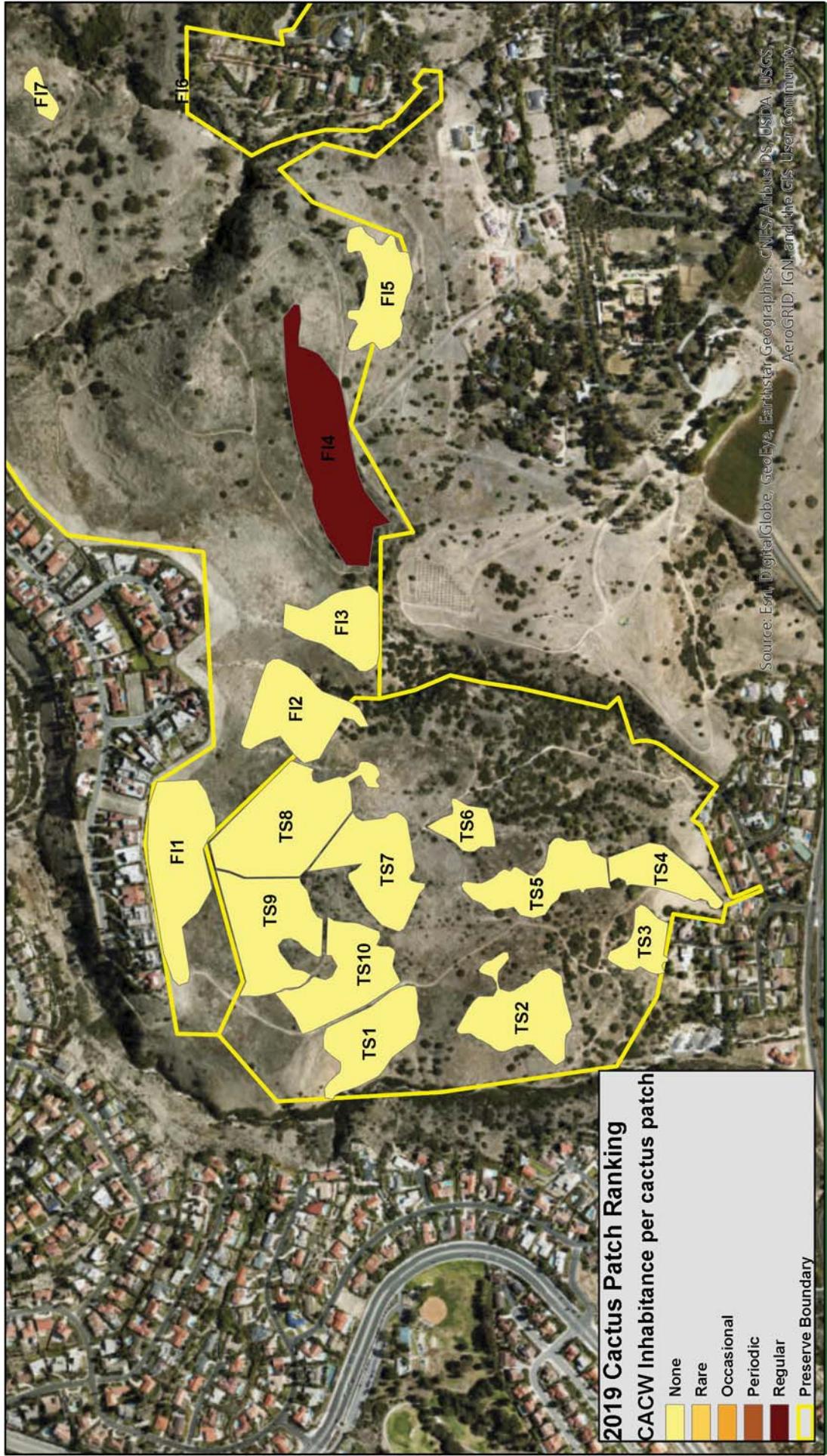
Community Science *Cactus Wren* Monitoring (2019)

Ocean Trails and San Ramon Reserves



Community Science *Cactus Wren* Monitoring (2019)

Portuguese Bend Reserve



Community Science *Cactus Wren* Monitoring (2019)

Three Sisters and Filiorum Reserves

Wildlife Tracking Community Science Monitoring 2019



INTRODUCTION

Top predators are an important ecological component of natural ecosystems. In southern California Coyotes are meso-predators, where they control the population of several tertiary food web members. The regulation of intermediate predators is important to maintaining healthy populations of other wildlife species including protected songbirds such as the California gnatcatcher *Polioptila californica californica* (FT). The Rancho Palos Verdes Natural Communities Conservation Plan describes the need for collecting new biological data on wildlife movements and the importance of monitoring predator presence within the reserve.

The Community Science Wildlife Tracking program is a monitoring project that surveys the Preserve for the presence of coyotes and other species. Volunteer participants walk trail segments in search of tracks or scat which are mapped and photographed. Results of this survey are compiled to create maps of areas used by coyotes and foxes within each reserve. Mapped observations of track and scat work to describe locations of high and low coyote and fox activity. A relative population index can be used to evaluate population trends from year to year. The wildlife camera project was designed to complement the Community Science Wildlife Tracking Program and further investigate findings of the Tracking Program such as areas of exclusion or territorial boundaries.

METHODS

Study Area:

The study area was within 7 reserves (Alta Vicente, Filiorum, Forrestal, Ocean Trails, Portuguese Bend, San Ramon, and Three Sisters) of the Palos Verdes Peninsula Nature Preserve located in the cities of Palos Verdes and Rolling Hills, CA. The reserves surveyed were those which were contiguous and comprise the majority of land managed by the Conservancy.



Figure 1. Wildlife Tracking Study Area Map

Data Collection:

The monitoring is conducted when the animals are most active, November through March by walking along specific trail routes in the preserves. While walking along marked trails, surveyors search for evidence of coyotes, gray fox, and red fox which is usually in the form of scat or track imprints. This year the Land Conservancy started tracking all species observed. Scat is the most frequent observation made, with tracks a distant second. When tracks are found, the length and width of the track is observed and a ruler is placed in the photo of the track or scat.

Training is required for participants to develop the necessary skills for optimal accuracy in identifying scat and tracks. At minimum, initial training requires three 2-3 hour sessions, which are conducted on Saturdays in October. Additionally Community Science participants are encouraged to accompany advanced trackers to enhance their skills. Photographs of observations are an important tool for confirming the accuracy of observations. The Conservancy provides additional support as needed to the wildlife tracking volunteers.

Recorded data are submitted electronically to the Conservancy using a mobile app called Survey123. This app streamlines the data collection and submission process by allowing all volunteers to save observations on their phones, including photos, notes, and geolocation. This data is then downloaded into an Excel sheet and analyzed. The points recorded by each observation are downloaded as a shapefile and mapped and analyzed using ArcGIS Pro.

As volunteers record observations throughout the season, they were able to write in the notes their confidence in the species, if necessary. The Land Conservancy Biologist was able to go and confirm or contest each observation, and ultimately change the data if necessary.

RESULTS

Table I. Number of observations per reserve.

Reserve	Coyote	Fox	Survey Trips
Abalone Cove	15	2	14
Agua Amarga	18	7	12
Alta Vicente	6	5	5
Chandler	56	2	20
Filiorum	195	15	26
Forrestal	148	43	35
George F. Canyon	29	2	15
Ocean Trails	1	5	3
Portuguese Bend	162	15	36
San Ramon	12	8	8
Three Sisters	122	50	14
Vicente Bluffs	18	9	17
Vista Del Norte	3	1	1
White Point	25	5	18

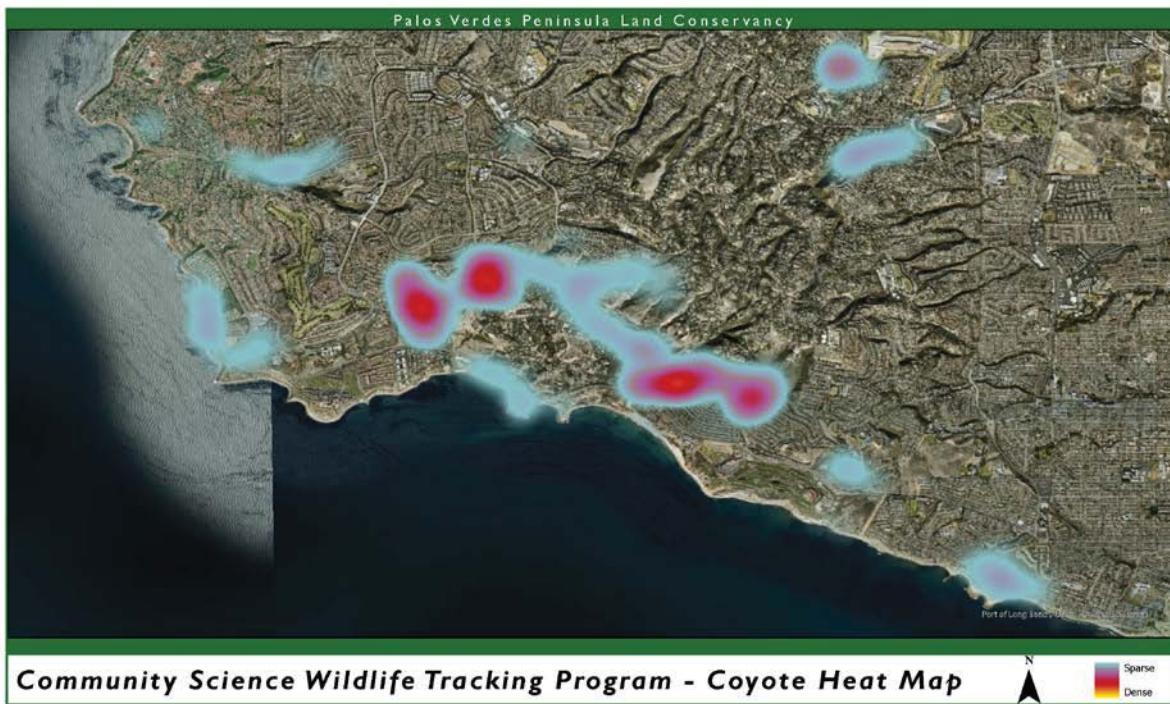


Figure 1. Coyote Observations Heat Map

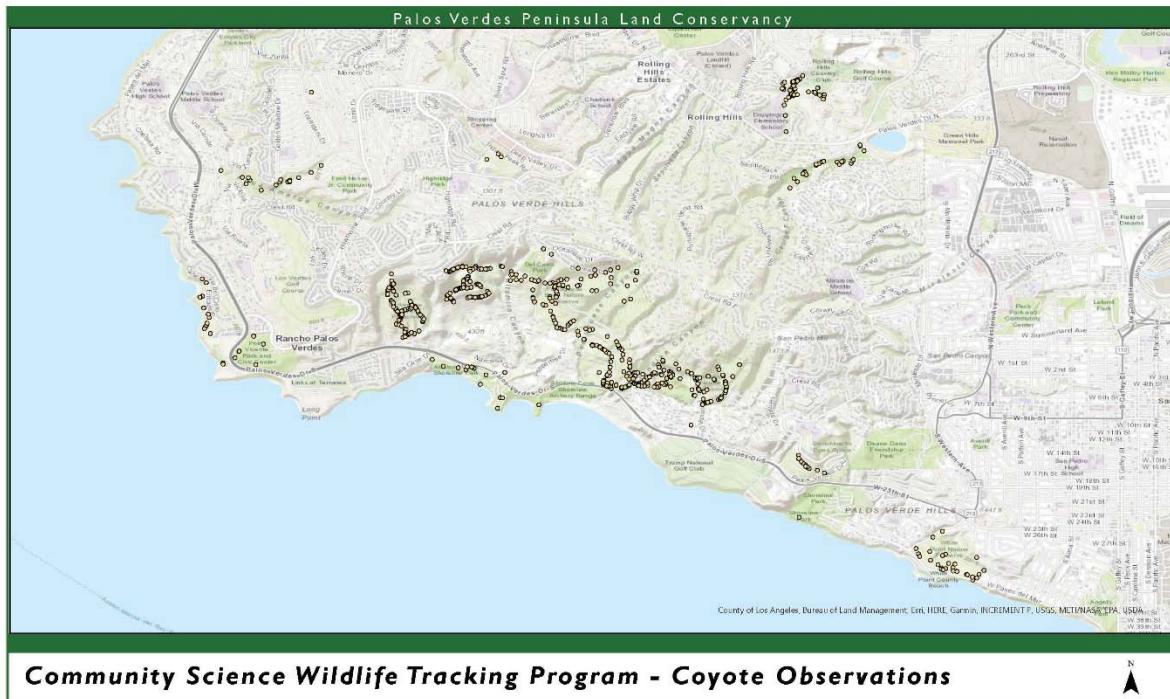


Figure 2. Coyote Observations points Map

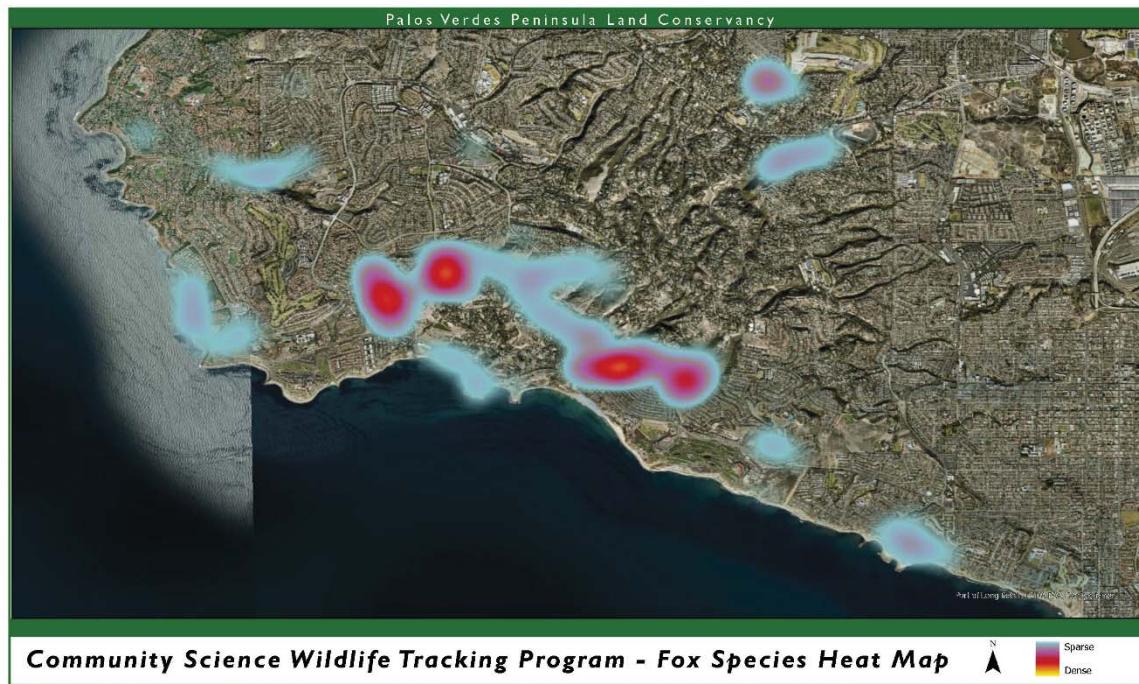


Figure 3. Fox sp. Observations Heat Map

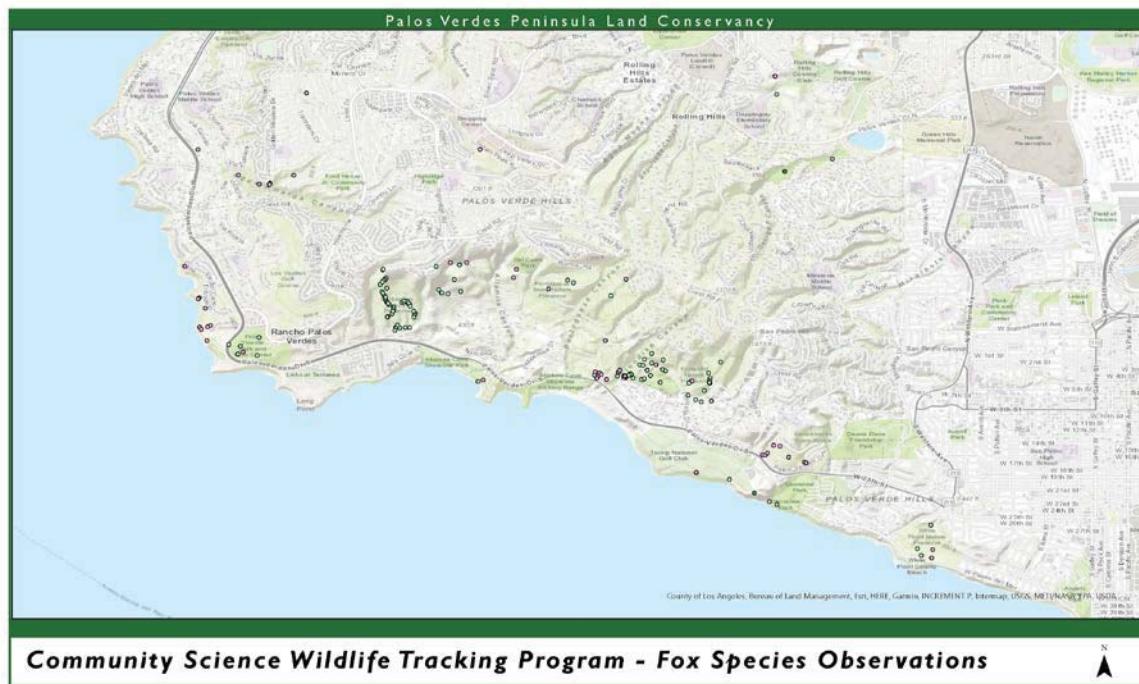


Figure 4. Fox sp. Observations Points Map



Figure 5. Wild Canid. Observations Points Map

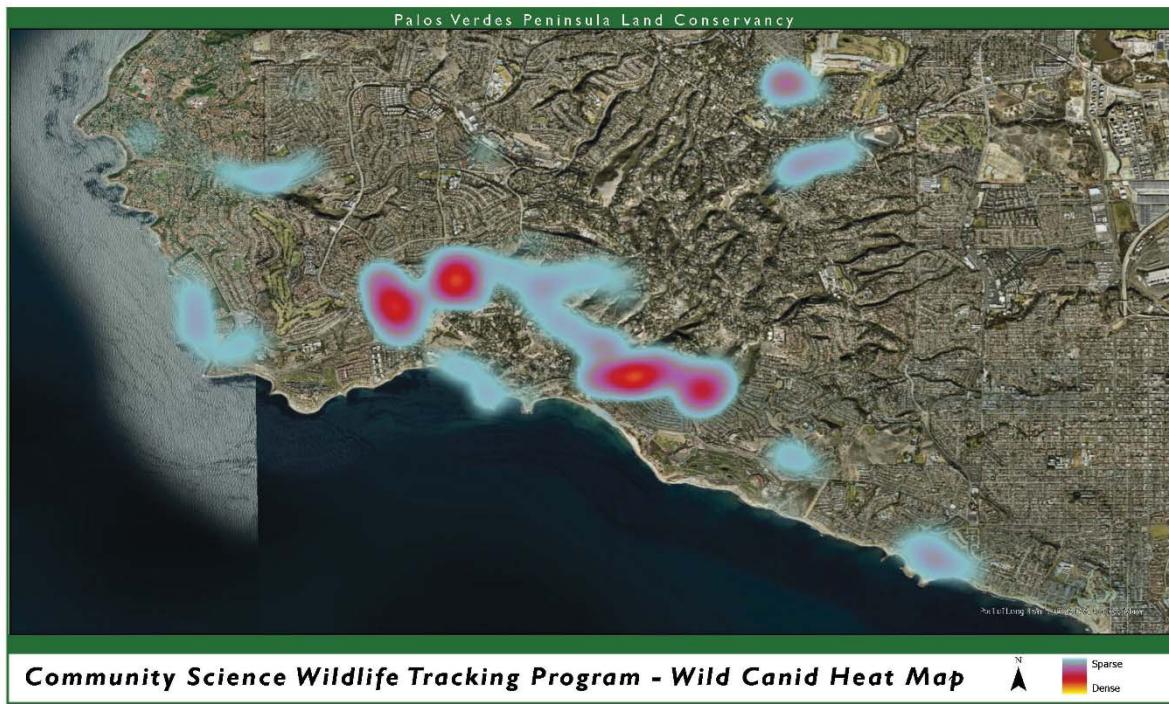


Figure 6. Wild Canid Observations Heat Map

The 2019-20 wildlife tracking survey identified a total of 993 wild canid observations in the survey area. Coyote observations were the most common found with 818 scat and tracks being identified, while the Fox, both species, tracks and scat were totaled at 175. Coyote observations were found across all reserves studied. The maps above, figures 1 and 2, show that the highest frequency of coyote observations were in Filiorum, Forrestal, Portuguese bend and Three Sisters Reserves, with Filiorum and Forrestal the most frequent. Figures 3 and 4 show us that, while much less frequent overall as compared to Coyotes, Fox species observations were most frequent in Filiorum, Forrestal, Portuguese bend and Three Sisters Reserves, with Forrestal and Three Sisters being the most frequent.

Appendix A shows the locations and distribution of all species observed throughout the program.

DISCUSSION

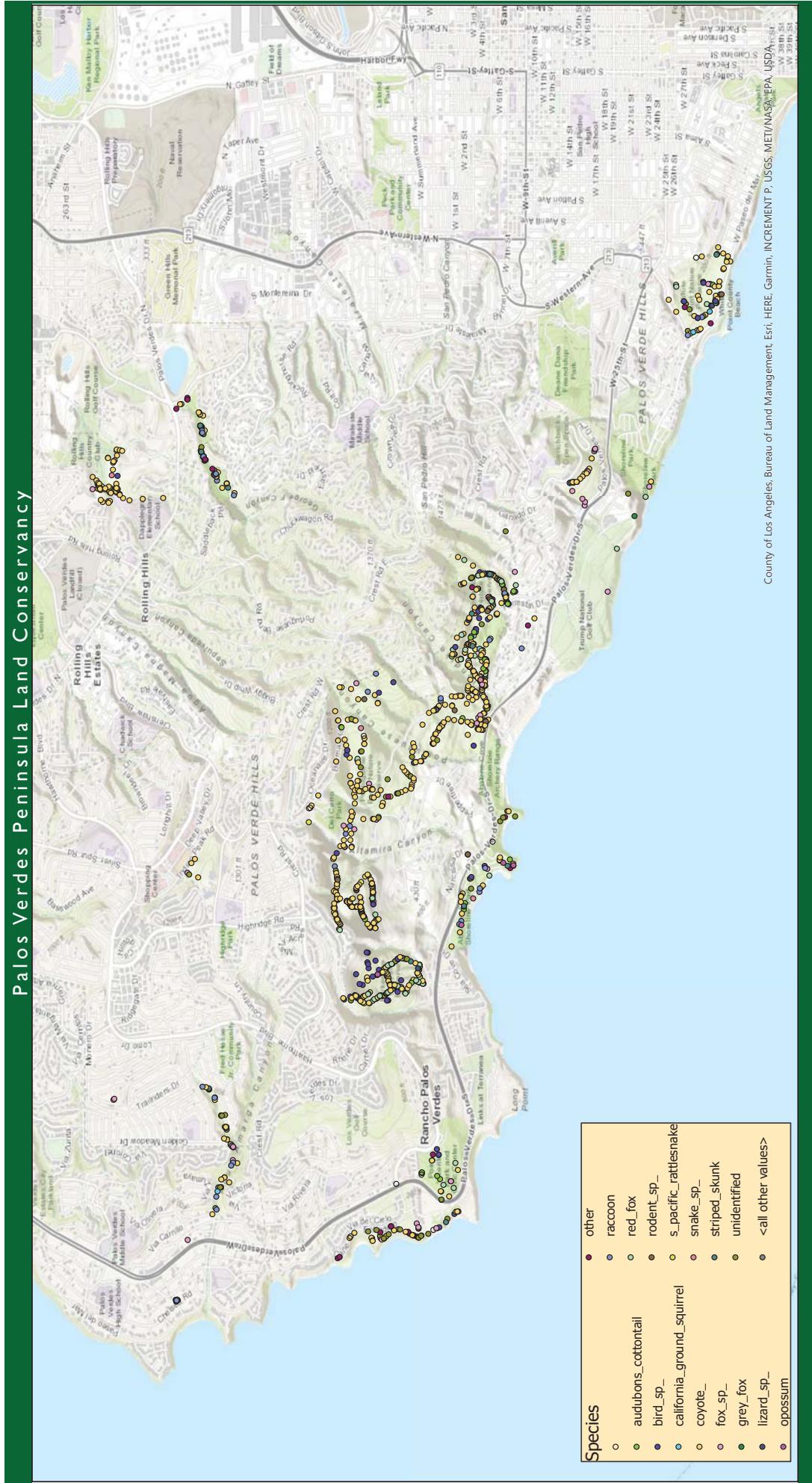
The presence of top predators within wildlife habitats has been documented as crucial to ensuring healthy ecosystem function. In the Palos Verdes Nature Preserve the success of nesting songbirds, namely the federally protected California gnatcatcher and state protected coastal cactus wren, can be positively influenced by the presence of predators through their control of lower predator (i.e.: striped skunk and raccoon) populations. The presence of coyotes is specifically indicated by the Rancho Palos Verdes Natural Community Conservation Plan as an important ecological element necessary for successful nesting conditions. Considering the presence of coyotes in these terms, the broad range of the coyote observed within the Palos Verdes Nature Preserve indicates the existence of an important meso-predator control dynamic.

Further research is suggested for the Grey Fox in the PVNP as well as increasing the observations of other non-canid species. Feral or free roaming cat options will be added to next year's survey to be able to monitor the issue throughout the PVNP.

Appendix A

All Species Point Map

Community Science Wildlife Tracking Program - All Species





MEMORANDUM

To: Palos Verdes Peninsula Land Conservancy
(Austin Parker)

U.S. Fish and Wildlife Service
(Stacey Love)

From: Irena Mendez, PhD

Date: September 30, 2019

Subject: Results of 2019 Surveys for the El Segundo Blue Butterfly at Vicente Bluffs, Alta Vicente and Abalone Cove, Palos Verdes Peninsula, Los Angeles County, CA

Attachment: Exhibits 1 and 2
Field Notes

Executive Summary

This Memorandum documents surveys performed for the El Segundo Blue butterfly (*Euphilotes battoides allyni*) during the 2019 flight season pursuant to U.S. Fish and Wildlife Service (USFWS) Recovery Permit TE218630-2 (Recovery Permit) issued to Irena Mendez. Surveys were conducted at the request of the Palos Verdes Peninsula Land Conservancy (PVPLC) within three reserves of the approximately 1,382-acre Palos Verdes Nature Preserve (PVPLC 2015) located on the Palos Verdes Peninsula: Vicente Bluffs, Alta Vicente, and Abalone Cove.

- Six surveys were conducted between July 19 and August 17, 2019 at 10 survey sites within Vicente Bluffs (five survey sites), Alta Vicente (two survey sites), and Abalone Cove (three survey sites).
- Two new survey sites were established this year: one at Vicente Bluffs one at Alta Vicente.
- 51 ESB butterflies were observed in 2019 in close association with sea-cliff buckwheat (*Eriogonum parvifolium*) the ESB host plant. The 51 butterflies were observed at three of the 10 survey sites with 98 percent of the butterflies observed at two survey sites at Vicente Bluffs. At least one ESB butterfly was observed on each of the six surveys performed.
- No incidental take is authorized by the recovery permit; no incidental take occurred during 2016 surveys.

Introduction

Irena Mendez, PhD conducted distribution surveys for the El Segundo Blue (ESB) butterfly within the Palos Verdes Nature Preserve during the ESB 2019 flight season at the request of the Palos Verdes Peninsula Land Conservancy (PVPLC). Surveys were conducted in support of triennial reporting responsibilities by the PVPLC consistent with requirements set forth in the City of Rancho Palos Verdes Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP).

The PVPLC is a certified 501(c)(3) nonprofit corporation and conservation organization that has been actively working to preserve undeveloped land as open space for historical, educational, ecological, recreational and scenic purposes. Since its founding in 1988, the Conservancy has successfully preserved 1,600 acres of open space on the Palos Verdes Peninsula (PVPLC Website)¹. The City of Ranch Palos Verdes (City) and PVPLC have entered into the Palos Verdes Nature Preserve Management Agreement (Management Agreement) that allows the PVPLC to act as the City's designated NCCP/HCP Preserve Habitat Manager and is the entity responsible for overseeing the day-to-day operations and long-term preserve management activities including management of resources, restoration of habitat, reporting and enforcement of open space restrictions (Rancho Palos Verdes 2018).

The Palos Verdes Nature Preserve consists of 12 reserves along the southern bluffs and marine terraces of the Palos Verdes Peninsula. Three of the 12 reserves support sea-cliff buckwheat, the sole larval food plant for the ESB butterfly: Vicente Bluffs, Alta Vicente, and Abalone Cove. Vicente Bluffs and Abalone Cove are characterized by steep coastal bluffs that characterize the peninsular coastline; the Alta Vicente Reserve consists of marine terrace habitat, one of approximately 13 staircase-like terraces that characterize the Palos Verdes Peninsula (USGS online publication)².

ESB butterfly surveys have previously been conducted in 2014 and 2016 at up to 15 sites within the specified reserves (Dalkey 2016). At most of these sites, habitat for the ESB consists of sea-cliff buckwheat that has been planted as part of on-going habitat restoration efforts by the PVPLC, particularly at Alta Vicente, however, at a few sites, naturally occurring sea-cliff buckwheat individuals can be found on vertical rocky bluffs that face the Pacific Ocean (in Dalkey 2016). Some of the historical survey sites have been eliminated as of this year's survey either because sea-cliff buckwheat is no longer present (Sites 1 and 10) or because their bluff location is unsafe to access (Sites 2, 3, 4/5, and 6 and 7). See Dalkey (2016) for more information about these historical sites.

Project Location

The Palos Verdes Nature Preserve (Nature Preserve) is located in the City of Rancho Palos Verdes on the southern slopes of the Palos Verdes Peninsula in southwestern Los Angeles County. The approximately 1,382-acre Nature Preserve is found on portions of four U.S. Geological Survey

¹ <https://pvplc.org>

² <https://pubs.usgs.gov/of/2004/1050/Geology.htm>

(USGS) 7.5-minute series topographic quadrangles: Redondo Beach, San Pedro, Torrance and Rancho Palos Verdes (PVPLC 2015). The ESB survey sites that are the subject of this report are found on three reserves managed by the PVPLC: Vicente Bluffs, Alta Vicente, and Abalone Cove (**Exhibit 1**, ESB Survey Sites at Vicente Bluffs, and Alta Vicente) (**Exhibit 2**, ESB Survey Sites at Abalone Cove Reserve).

Methods

This section summarizes coordination efforts with the U.S. Fish and Wildlife Service (USFWS), establishment via a Geographic Positioning System (GPS) and photo-documentation of the ten survey sites, as well as survey methods employed for counting ESB butterfly individuals during the 2019 flight season.

Agency Coordination

The USFWS was notified on July 11, 2019 that sites within the Palos Verdes Nature Preserve would be evaluated for the presence of sea-cliff buckwheat and any ESB butterflies observed recorded. The USFWS was notified again on August 7, 2019 of the intent to extend the survey window into mid-August due to the presence of ESB individuals despite the late start date for the surveys along the peninsula (ESB butterflies were observed in mid-June further north at the Ballona Wetlands Ecological Preserve)³. A request was also made to the USFWS to allow Austin Parker, staff scientist with the PVPLC to be present during the surveys to gain experience to support his own Recovery Permit application to the USFWS. During each survey, Austin Parker was under the direct on-site supervision of Irena Mendez consistent with permit conditions; with on-site supervision being defined as “an unauthorized person conducting activities within 3 meters (9.8 feet) of an authorized individual.”

GPS Documentation of Survey Sites

To further document ESB survey sites, GPS data was collected for 10 ESB survey sites that include survey sites established in previous ESB survey efforts (Dalkey 2016). Of the 10 sites documented, 2 are newly established survey sites due to the presence of sea-cliff buckwheat. One is at the interpretive garden at Vicente Bluffs (Site 17) and the other is at restored habitat at Alta Vicente (Site 18). Geographic coordinates were documented on July 19, 2019 by PVPLC Biologist Austin Parker and Irena Mendez as follows:

A total of five sites were recorded at Vicente Bluffs. Three survey sites were recorded at Vicente Bluffs proper; two of which were previously established survey sites (Dalkey 2016): Sites 14, and 15. Site 17 is a newly recorded survey site. Two additional survey sites were recorded at the Pelican Cove extension of Vicente Bluffs, these were previously established survey sites (Dalkey 2016): Sites 11 and 12.

³ Email correspondence with Patrick Tyrell of the Ballona Wetlands Ecological Reserve on June 19, 2019.

Two survey sites were recorded at Alta Vicente, one of which was a previously established survey site (Dalkey 2106): Site 16. Site 18 is a newly recorded survey site.

Three survey sites were recorded at Abalone Cove, all of which were previously established survey sites (Dalkey 2016): Sites 8, 9 and 13.

Survey Method

Surveys were conducted using point count observations walking by the clusters of sea-cliff buckwheat closely observing each plant for the presence of ESB butterflies. The surveyors approached the vegetation with care to not disturb ESB butterflies that could be present. A sex determination was made when the top side of the wings were visible; when not visible, the butterfly was recorded as undetermined. Weather conditions recorded included air temperatures, wind and cloud cover to ensure that no site survey was performed with rain or drizzle, air temperatures less than 65 degrees Fahrenheit and winds of less than 5 miles per hour. All surveys were performed between approximately 9:00am and 4:00pm local time consistent with special terms and condition specified in the Recovery Permit. Six surveys were performed.

Results

This section provides a description of the survey sites; photo-documentation at established photo stations, weather conditions/survey personnel and numbers of ESB individuals observed at each survey site. Tables 1 through 3 summarize the description of survey sites at each of the three reserves: Vicente Bluffs, Alta Vicente, and Abalone Cove. Photo-documentation at established photographic stations serve to compare each site with photographs taken in previous years.

Almost all of the ESB butterflies (98 percent) were observed at Vicente Bluffs (Sites 14 and 17). Only one ESB butterfly was observed at Alta Vicente. No ESB butterflies were observed at the Pelican Cove extension of Vicente Bluffs or at Abalone Cove, consistent with observations made by Dalkey (2016).

ESB butterflies were observed on all six surveys:

- ◆ 43 percent (22 butterflies) were observed on the first survey day (July 17)
- ◆ 29 percent (15 butterflies) observed on the second survey date (July 23)
- ◆ 16 percent (8 butterflies) on the third survey (July 31)
- ◆ 8 percent (4 butterflies) on the fourth survey date (August 7)
- ◆ 2 percent (1 butterfly) on the fifth survey date (August 11)
- ◆ 2 percent (1 butterfly) on the sixth survey date (August 17)

Table 4 documents the weather conditions and survey personnel and Table 5 provides the numbers of ESB butterflies observed at each survey site for each of the six surveys performed. Surveys were discontinued at sites where no ESB butterflies were observed in two or more weeks of consecutive surveys: Sites 11, 12 at Pelican Cove; and Sites 8, 9 and 13 at Abalone Cove. Although no ESB butterflies were observed at Alta Vicente after the first survey on July 17, surveys never-the-less continued for an additional three consecutive weeks before ceasing due to the high quality of the habitat. High quality habitat is defined as abundant sea-cliff buckwheat planted in clusters with significant numbers of flowers.

Table 4
Summary of 2019 ESB Survey Data

Survey Date	Weather Conditions and Time	Survey Personnel
7/19/2019	11:05am: 75 °F, 0% cloud cover; light air 3:50pm: 70 °F, 40% cloud cover; light air	Irena Mendez & Austin Parker
7/23/2019	1:45pm: 82 °F, 5% cloud cover; light air 4:18pm: 82 °F, 5% cloud cover; light air	Irena Mendez & Austin Parker
7/31/2019	9:30am: 71 °F, 100% cloud cover; light air 12:43pm: 80 °F, 100% cloud cover; light air	Irena Mendez & Austin Parker
8/07/2019	9:30am: 68 °F, 100% cloud cover, light air to light breeze 11:10 am: 73 °F, 40% cloud cover; light-gentle breeze	Irena Mendez & Austin Parker
8/11/2019	12:07pm: 75 °F; 0% cloud cover; light air to light breeze 1:10pm: 80 °F, 80% cloud cover; light air to gentle breeze	Irena Mendez & Austin Parker
8/17/2019	12:30pm: 70 °F; 5% cloud cover; light air to light breeze 1:30pm: 70 °F, 5% cloud cover; light air	Irena Mendez

Table 5
Results of 2019 ESB Butterfly Surveys

Date (2019)	19-Jul			23-Jul			31-Jul			7-Aug			11-Aug			17-Aug		
Vicente Bluffs																		
Survey Site #	M	F	U	M	F	U	M	F	U	M	F	U	M	F	U	M	F	U
11	0	0	0	0	0	0	0	0	0	*	*	*	*	*	*	*	*	*
12	0	0	0	0	0	0	0	0	0	*	*	*	*	*	*	*	*	*
14	5	0	2	3	4	0	0	1	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	8	5	1	5	3	0	2	2	3	1	2	1	0	0	1	1	0	0
Alta Vicente																		
16	1	0	0	0	0	0	0	0	0	0	0	0	*	*	*	*	*	*
18	0	0	0	0	0	0	0	0	0	0	0	0	*	*	*	*	*	*
Abalone Cove																		
8	0	0	0	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*
9	0	0	0	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*
13	0	0	0	0	0	0	*	*	*	*	*	*	*	*	*	*	*	*
TOTAL	14	5	3	8	7	0	2	3	3	1	2	1	0	0	1	1	0	0
M = male ESB																		
F = female ESB																		
U = undetermined																		
* = no survey																		

Recommendations

At the Palos Verdes Peninsula, the ESB flight season begins in late May/early June with noted variability in the blooming period for sea-cliff buckwheat (Dalkey 2016). Based on this, it is recommended that the survey period extend from June through August to capture the peak in the flight season at each survey site. Due to the diverse habitats with a range of habitat quality and variability in host plant blooming, understanding the peak in the flight season for each survey site could prove useful to inform management strategies for maximum efficiency such as:

- ◆ Prioritization of sites for restoration
- ◆ Timing and methods for weed abatement
- ◆ Informing planting schemes; as well as to gauge the success of current day strategies.

References

Dalkey, Ann. 2016 (October 26). El Segundo Blue Butterfly (*Euphilotes battoides allynii*) Survey Results for the Palos Verdes Nature Preserve 2016. Prepared for the Palos Verdes Peninsula Land Conservancy, Rolling Hills Estates, CA. 19 p.

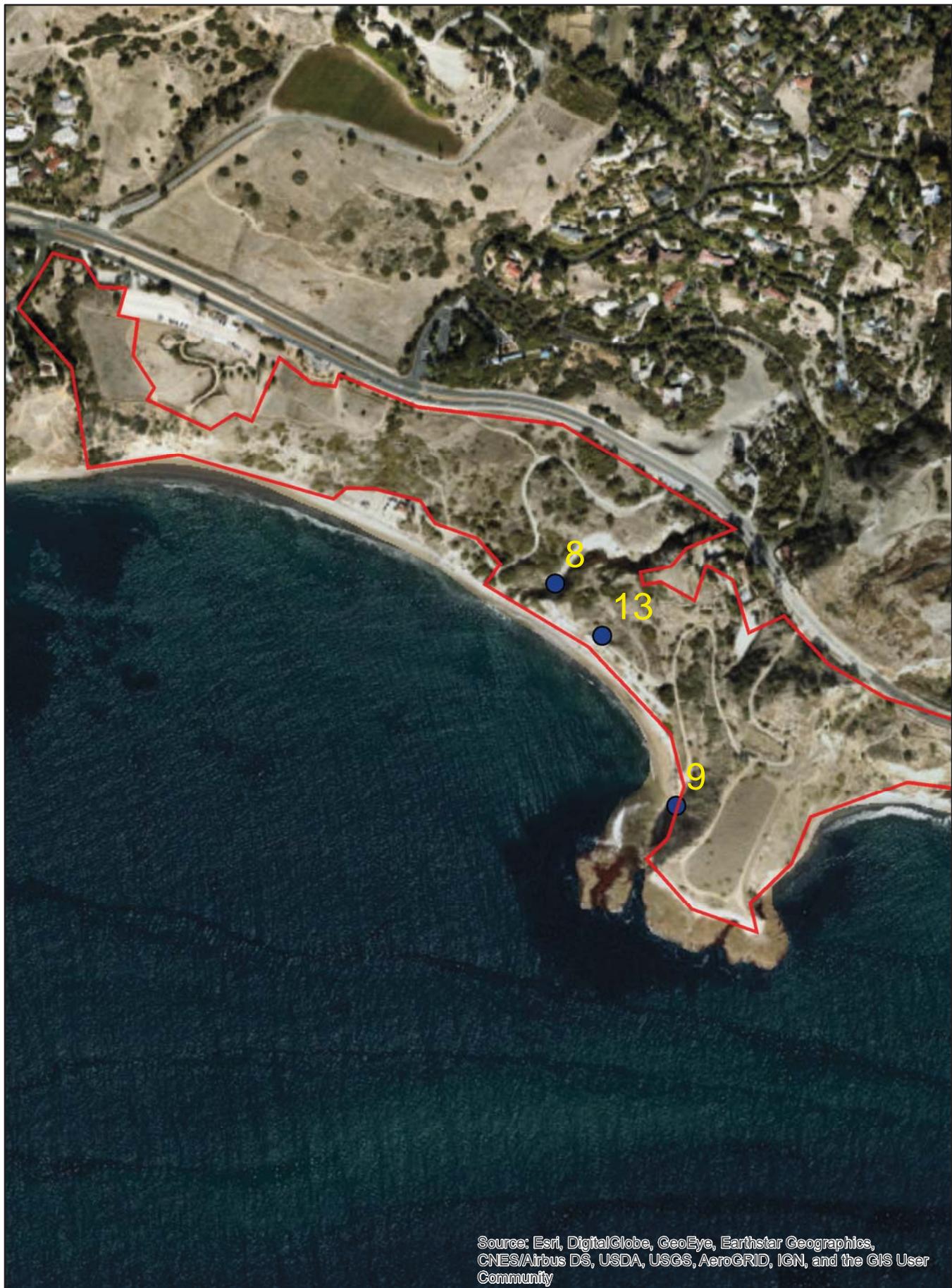
Palos Verdes Peninsula Land Conservancy (PVPLC). 2015. Comprehensive Management and Monitoring Report 2013-2015 and 2015 Annual Report for the Rancho Palos Verdes Draft Natural Communities Conservation Plan and Habitat Conservation Plan. PVPLC, Rolling Hills Estates, CA. 537 p.

Rancho Palos Verdes. 2018 (March). Final Draft Natural Communities Conservation Plan/Habitat Conservation Plan. 109 p.

Exhibit 1, ESB Survey Sites at Vicente Bluffs and Alta Vicente Reserves



Exhibit 2, ESB Survey Sites at Abalone Cove Reserve



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



FIELD NOTES Page 1 of 5

Observer Name:

Irena Mendez / in Austin Parker under supervision

Job Number:	200	Survey Date:	July 19, 2019
Project Name:	2019 ESB Survey for PVPCL	Start/End Time:	11:05 am - 3:50 pm Survey #1
Client:	Palos Verdes Peninsula Land Conservancy	Project Location (include County/USGS Quad Sheet):	Palos Verdes Peninsula: Vicente Bluffs Alta Vicente and Abalone Cove Reserves. Portion of R. Beach Torrance / San Pedro / Rancho Palos Verdes tops
Participating Personnel (Name/Affiliation):	Austin Parker w/ PVPCL		
Survey Purpose:	Distribution surveys for ESB during 2019 Flight season		

Starting Weather Conditions:

Temp (F):	% Cloud Cover:	Wind (Beaufort*):	Temp (F):	% Cloud Cover	Wind (Beaufort*):
75°F	0%	1-2	70°F	40%	1-2

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Establishment of survey sites:

sites 2,3,4/5 (combined in 2016) and 6 and 7 will be eliminated due to unsafe site access along steep and eroded bluff face.

sites 1 + 10 did not have any buckwheat in previous surveys as per Ann Dalkay. Site 1 is dominated by Crystalline plant, mustard and star thistle.

Site 11 - Austin used collector app to get GPS point for site center. This is Ann's plot restored with buckwheat, lemonade berry, Iyicum, common fowntail (*D. fasciculatum*) *Dudleya viridis* (caged for protection); natural precipitation; bluff habitat (top of bluff)

dropped point on Avenza map at: 33.74679 N
118.41305 W

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Vicente Bluffs sites 11, 12, 14, 15 + new site at 17
Site 11 and 12 are a short drive south to Pelican Cove. Portions are managed by the Terranea Resort (site 12)

SITE 14

EHG counts

♂	♀	unb.
1	1	11

other species.

FIELD NOTES, Page 2 of 5

Observer Name: Irena Mendez

Job Number:	200	Survey Date:	July 19, 2019
Project Name:	2019 EBB surveys for PVPLC	Project Location (include County/ USGS Quad Sheet):	San Diego L
Client:	Palos Verdes Peninsula Land Conservancy (PVPLC)		

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Ventie Bluffs

SITE 17 New site established today

Pinned at 33.74463 N
(Avenida) 118.11181 W

Native garden at Ventie Bluffs. Planted by Megan Wolff of PVPLC. Receives irrigation. Toast buckwheat - referred to as sea-cliff buckwheat (*E. parvifolium*); California sage brush, *Encelia*, milkweed → narrow-leaved, CA buckwheat that is slowly being replaced (discussed adverse effects w/Megan as per Gordon Pratt's research at *E. parvifolium*); purple sage, poppy, black sage, monkey flower, CA fuchsia, isocoma m. *Opuntia littoralis* upland habitat on east side of trail. On west side of trail sea-cliff buckwheat is also present (4-6 good sized plants) together with Bladder Pod and non-native *Pitcairnia echinoides*.

SITE 15 Pinned at 33.74471 N
118.11121 W

Only three plants observed - bluff habitat disturbed. dominated by crown daisy, non-native annual grasses, iceplant, Russian thistle.

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

EBB counts

♂ undet
♀
TH 111 TH 1

Other species

Marin blue (1)

EBB counts

♂ undet
♀
♂

Other species

Irena Mendez, PhD

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Santa Monica, CA 90405



Observer Name:

Irene Mendez and Austin Parker

Job Number:	200	Survey Date:	July 19, 2019
Project Name:	2019 EBB surveys for PVPLC,	Project Location (include County/ USGS Quad Sheet):	See Page 1
Client:	Dolores Verdes Peninsula Land Conservancy (PVPLC)		

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Short Drive to Delicata Cove - portion of Vicente Bluffs Reserve: sites 11 and 12

HITE 11 pinned at 33.74186 N
118.40392 W

Observed 5-6 plants in full bloom - plants are very small (1-1.5 ft width/height) covered with many small snails. Disturbed bluff habitat other than sea cliff buckwheat observed. Encelia, Didyma vivens clumps, Opuntia, but dominated by Star thistle, Russian thistle, iceplant, Atriplex semibaccata, Conyza, and fountain grass - Pennisetum setosum.

HITE 12 pinned at 33.74166 N
118.40359 W

Bluff landscaped with native veg. - dominated by Encelia californica - managed by Terranea Resort - plants are kept in hedge form. One coast buckwheat growing out of the encelia planting - also Artemisia. Vegetation at parking lot also kept as hedge - some coast buckwheat present theretoo.

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

EB counts
♂ ♀ undet
♂ ♂ ♂

EB counts
♂ ♀ undet
♂ ♂ ♂

Other species
Strymon melinus.
AGIN (11)

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FIELD NOTES, Page 4 of 5

Observer Name: Irena Mendez with Austin Parker

Job Number:	200	Survey Date:	July 19, 2019
Project Name:	2019 Ebb surveys for PVPLC	Project Location (include County/ USGS Quad Sheet):	See page 1
Client:	Dolos Verdes Peninsula Land Conservancy		

General Observations:	Species Observed:
-----------------------	-------------------

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Drive to Abalone Cove. Nice service roads to sites 8, 9, and 13.

SITE 8 pinned at 33.74090 N
118.37653 W

One coast buckwheat plant along a rocky incised drainage flowing to the ocean on upper bluff. eriogonum cinereum, lemonade berry, artemisia, bladderpod, malacothrix s. erosion visible as shale loosened from the bluff - likely covered habitat based on 2016 data.

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

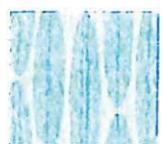
Ebb counts: Abalone Cove
♂ ♂ Under ♂ ♂ ♂ Other species

SITE 9 Bluff habitat / eroded slope with sparse vgs. Approximately 9 buckwheat plants in bloom - non-natives include acacia, iceplant, tree tobacco. Also good sized bladderpod and murch murchampia plants about dozen feet from rock shore (on bluff). pinned at 33.73841 N
118.37486 W

♂ ♂ ♂

SITE 13
pinned at 33.74033 N 118.37508 W Disturbed Bluff habitat. 10 robust coast buckwheat - w/ many flowers. invaded by iceplant, mustard, star thistle, non-native grasses. also *A. kentiformis* / *Lycium*.

♂ ♂ ♂ CARM



Observer Name: Wendy Mendoza W Austin Parker

Job Number:	1001	Survey Date:	July 19, 2019
Project Name:	2019 EBB surveys for PVPHC	Project Location (include County/ USGS Quad Sheet):	See Page 1
Client:	Puerto Verdes Peninsula Land Conservancy (PVOLC)		
Comments:		Surveyor:	

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Alta Vizcaya Reserve sites 16 + 18
(new)

~~HITE 1b~~ pinned at 33.74355N
18.40768W

Approximately 5 acres of restored habitat.

several dozen coast buckwheat plants doing very well. Other natives include *Encelia*, laurel sumac, *Opuntia*, Black sage. Plenty of *Encelia* recruit also buckwheat. Some buckwheat still in bud here. *Eriogonum* *Utrinum* also present.

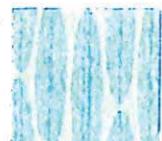
SITE 18 pinned at 33.74546 N
118.40760 W

New site established today. Also a site under going restoration by the PPPLC. Several dozen buckwheat plants observed with good blooms.

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Marina blue
|||



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Managing Our Natural Resources

FIELD NOTES Page 1 of 2

Observer Name:

Irena Mendez / w/ Austin Parker under supervision

Job Number:	200	Survey Date:	July 23, 2019	Survey #2
Project Name:	2019 E5B surveys for PPPLC	Start/End Time:	1:45 pm - 4:18 pm	
Client:	Polos Verdes Peninsula Land	Project Location (include County/USGS Quad Sheet):	Polos Verdes Peninsula - Vicente Bluffs Alta Vicente and Abalone Cove Reserves. Portions of R. Beach/Torrance/B. Pedro and Rancho Topos.	
Participating Personnel (Name/Affiliation):	Austin Parker (PPPLC)			
Survey Purpose:	Distribution surveys for E5B during 2019 flight season at 3 reserves. Polos Verdes Topos.			

Starting Weather Conditions:

Temp (F):	% Cloud Cover:	Wind (Beaufort*):	Temp (F):	% Cloud Cover	Wind (Beaufort*):
82F	5%	1-2	82F	5%	1-2

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Vicente Bluffs

	0	+	undet.	Other
H	1	1	1	Cabbage white, mating blue (1) troy hairstreak
H	1	1	1	
15	1	1	1	
11	1	1	1	snails on buckwheat.
12	1	1	1	

Abalone Cove

13	1	1	1
8	1	1	1
9	1	1	1

maybe we are too late to see any E5B's?

FIELD NOTES, Page 2 of 2

Observer Name: Irena Mendez W

Austin Parker

Job Number:	201	Survey Date:	July 23, 2019
Project Name:	2019 EBB Survey for PVPLC	Project Location (include County/ USGS Quad Sheet):	See page 1 of survey #1 and #2
Client:	Palos Verdes Peninsula Land Conservancy		

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Alta Vizcaya Reserve

site 16

EBB counts
♂ ♀ undet.

site 18

♂ ♂ ♂

Other species.

Checkered white

marina blue (ii) Hairstreak
honey bees.

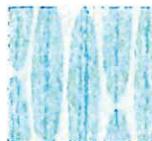
Irena Mendez, PhD

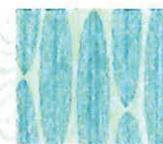
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FIELD NOTES Page 1 of 1

Observer Name: Irena Mendez w/ Austin Parker under supervision

Job Number:	209	Survey Date:	July 31, 2019 Survey #3
Project Name:	2019 EBB surveys for PNPCL	Start/End Time:	9:30 am - 12:43 pm
Client:	Palos Verdes Peninsula Land Conservancy	Project Location (include County/USGS Quad Sheet):	Palos Verdes Peninsula, Vicente Bluffs, Alta Vicente, Abalone Cove, Redondo, Portions of R. Beach, Torrance, b. Pedro and Rancho Tops.
Participating Personnel (Name/Affiliation):	Austin Parker (PNPCL)		
Survey Purpose:	Distribution surveys for the EBB during the 2019 flight season.		

Starting Weather Conditions:			Ending Weather Conditions:		
Temp (F):	% Cloud Cover:	Wind (Beaufort*):	Temp (F):	% Cloud Cover	Wind (Beaufort*):
71 F	100 %	1-2	72	80 %	1-2

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Vicente Bluffs

↑ ♀ Undetermined

seen Other species

14

♀ 1 ♂

Marina blue

15

1 1 1

CA Hairstreaks

16

♂ ♂ ♂

17

♂ ♂ ♂

18

♂ ♂ ♂

Alta Vicente

Cabbage white

19

♂ ♂ ♂

Marina blue

Abalone Cove - not surveyed.

Irena Mendez, PhD

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2801 Ocean Park Blvd, #370

Santa Monica, CA 90405



Managing Our Natural Resources

FIELD NOTES Page 1 of 1

Observer Name:

Irena Mendez w/ Austin Parker under supervision

Job Number:	200	Survey Date:	August 11, 2014 Survey #5
Project Name:	2014 EBB Survey for PAPLC	Start/End Time:	12:07pm-1:10pm
Client:	Palos Verdes Peninsula Land	Project Location (include County/USGS Quad Sheet):	Palos Verdes Peninsula: Vicente Bluffs and Alta Vicente; Portions of R. Beach, Torrance, S. Pedro and Rancho Palos Verdes
Participating Personnel (Name/Affiliation):	Austin Parker (PAPLC)		topos
Survey Purpose:	Distribution surveys for the EBB during the 2014 flight season at 3 Reserves.		

Starting Weather Conditions:

Temp (F):	% Cloud Cover:	Wind (Beaufort):	Temp (F):	% Cloud Cover	Wind (Beaufort):
75°F	0%	1-2 some gusts of 3	79°F	80%	1-2

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Vicente Bluffs



undetermined

Other species:

17



1 (bluff side)

Marin blue (|||||)

14



2

Grey hairstreak (||)

15



2

Grey hairstreak (1)

Alta Vicente

16

Not surveyed.

18

" "

Abalone Cove

Not surveyed

Irena Mendez, PhD

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Santa Monica, CA 90405



Managing Our Natural Resources

FIELD NOTES Page 1 of 1

Observer Name: Irena Mendez

Job Number:	200	Survey Date:	August 17, 2019 Survey #6
Project Name:	2019 EBB Survey for PVPLC	Start/End Time:	11:30pm - 1:30pm
Client:	Palos Verdes Peninsula Land Conservancy	Project Location (include County/USGS Quad Sheet):	Palos Verdes Peninsula, Viento Bluffs, Portions of Redondo Beach, Torrance, Rancho Palos Verdes Topo Guards.
Participating Personnel (Name/Affiliation):	—		
Survey Purpose:	Distribution Survey for the EBB during the 2019 flight season at 3 Reserves		

Starting Weather Conditions:			Ending Weather Conditions:		
Temp (F):	% Cloud Cover:	Wind (Beaufort*):	Temp (F):	% Cloud Cover	Wind (Beaufort*):
70°F	5%	1-2	70°F	5%	1

General Observations:

(include habitat types/plant communities, soils, topography, surrounding land uses, GPS points)

Species Observed:

(Include approximate number and behavior [if applicable] for wildlife; seen(S)/heard(H) for birds; dominance [e.g. abundant(A), common(C), uncommon(U), scarce(S)] and/or condition for plants)

Viento Bluffs:		♂	♀	Undetermined	Other Species
11	(agarden side)	1	0	0	Cabbage White (II) 14: Cabbage white
14		0	0	0	Marina Blue (III) Marina blue (III)
15		0	0	0	Grey Hairstreak (III) also at site 14

Alta Viento

Not Surveyed

Abalone Cove

Not Surveyed

APPENDIX F

VOLUNTEER PROGRAMS

I. INTRODUCTION AND SUMMARY

I.1 Volunteer Programs

This report describes the components included within the larger Volunteer Program that serviced the Palos Verdes Nature Preserve. Specific activities are detailed for the reporting period January 1, 2019 to December 31, 2019.

Since 1988, volunteers have played an essential role in fulfilling the Palos Verdes Peninsula Land Conservancy's (PVPLC) mission to preserve land and restore habitat for the education and enjoyment of all. PVPLC is a non-profit organization that relies heavily on the support of community involvement to perform many of the tasks necessary to manage the Nature Preserves. Volunteers donate thousands of hours each year to help with office assistance, event planning, community education, habitat restoration, trail maintenance, and much more. This report divides the various volunteer programs into two categories: Community Involvement Volunteers and Stewardship Volunteers.

The first category, Community Involvement Volunteers, supports volunteer activities that focus on friend making, fundraising, and recommendations to staff on a variety of topics. This category is further divided into four sections which are detailed within the report:

- Committees and Advisory Boards
- Special Events and Office Assistance
- Education Docents and Nature Walk Leaders
- Interns

The second category, Stewardship Volunteers, supports activities that are performed on the land to assist with habitat management of the Preserve. In all, there are seven elements within this category that are described in more detail in the Stewardship Volunteer section of this report. The backbone of the program is our regularly scheduled Saturday Outdoor Volunteer Days that are open to participation by all and require no long-term commitment. Periodically, there are also individuals or groups that complete stewardship projects outside of the normally scheduled outdoor events. Boy Scouts and Girls Scouts interested in obtaining their final awards are two such groups. There are also several Stewardship Volunteer opportunities that require long term commitments. The seven programs are listed below:

- Outdoor Volunteer Days
- Team Leaders
- Scout Projects
- Adopt-a-plot
- Trail Crew
- Volunteer Trail Watch
- Citizen Science

In 2019, volunteers provided a grand total of **27,105** hours (an increase of 7,720 hours from 2018, an 8.7% increase) of service to support conservation, restoration and management of the Palos Verdes Nature Preserve. According to the Independent Sector, volunteer time in California is valued at \$31.51 per hour (based on Dollar Value of a Volunteer Hour, by State: 2019, Independent Sector), thus generating a total of \$854,078.55 of in-kind services. The amount of volunteer hours donated at each Nature Preserve or for a specific volunteer category depends on the size of property or specific projects that transpired during the reporting period.

2. COMMUNITY INVOLVEMENT

2.1 Committees and Advisory Boards

PVPLC is driven and supported by a thirteen-member volunteer board, which meets on a regular basis to strategize and direct the organization's mission. The PVPLC maintains numerous committees and advisory boards as well for the following purposes:

- To provide review and recommendations regarding organizational plans and policies
- To provide assistance with the operations of the organization
- To provide community input for PVPLC activities
- To provide a training and evaluation ground for potential members of the Board of Directors

This year, the Conservancy's committees contributed 1,130 hours in serving the Land Conservancy's mission. Hours for committee-involved board members are compiled with their board volunteer time. The committees that were active during the reporting period are listed below:

- Board of Directors
- Audit Committee
- Finance Committee
- Development Committee
- Investment Committee
- Special Events Committee(s)

2.2 Special Events and Office Assistance Volunteers

The PVPLC relies on individual volunteers and community groups, such as the National Charity League (NCL) to assist PVPLC staff with all major fundraising and friend-raising events. We have built very strong and fulfilling relationships with these groups and strive to provide an environment that lets volunteers know they are indispensable and an integral part of our organization. Special events supported by committees and volunteers this year such as Palos Verdes Pastoral held at Terranea Resort.

2.3 Nature Walks

Nature Walk Leaders donated a total of 433 hours in 2019. PVPLC Board of Directors member Allen Franz and volunteer, Cindy Akiyama co-coordinate this group of dedicated volunteers and each prospective walk leader must have a high level of knowledge the local ecosystem, particularly the native and non-native plants found on the Peninsula. Leaders must go through extensive training and be willing to research and learn about local history, geology, flora and fauna. Continued research and exploration serves to add to a walk leader's knowledge base, preparing them to give accurate and in-depth presentations to the public.

Walks are held all over the Peninsula, from the edge of the coast to deep within the canyons. Each leader designs his or her presentation to include special attributes and stories particular to a site. Nature walks occur once a month every month throughout the year, featuring a different location every time.

2.4 Internships

Interns dedicate much of their volunteer time to helping the Land Conservancy's mission to educate and restore. In 2019, 48 interns dedicated a total of 2638.18 hours to various projects such as educational outreach, field trips, weed mapping, native plant propagation, wildlife monitoring and much more.

3. STEWARDSHIP VOLUNTEERS

Volunteers play an integral part in helping PVPLC staff exceed our goals for restoring land in the Preserve. Outdoor volunteer days provide an opportunity for public volunteers to contribute to habitat and trail restoration efforts. Team Leaders provide leadership on Saturday events, the Trail Crew class volunteers build skills to maintain the trail system, and Volunteer Trail Watch reports vandalism and trail maintenance needs. The Adopt-a-Plot program, Citizen Science wildlife monitoring, scout projects, local environmental clubs and nursery volunteers are also Stewardship volunteers that support Conservancy conservation efforts within the Palos Verdes Nature Preserve, the native plant nursery and other management areas (PVNP and nursery are the only metrics outlined for this report).

Palos Verdes Nature Preserve Stewardship volunteer highlights in 2019:

- 27,105 hours of volunteer time, an increase of 7,720 hours from 2018
- Volunteers planted over 1,653 plants to assist with critical habitat restoration projects such as installing PVBB host plants and removing 71,000 invasive species.
- Hosted 17 corporations and organizations at special volunteer days to support the conservancy's work restoring lands and maintaining public nature preserves
- Trained 10 new VTW, 24 new Trail Crew, and 97 new Team Leaders to help with Outdoor

Volunteer Days

- Grant from Santa Monica Patagonia to support volunteer programs, youth engagement, and restoration initiatives

3.1 Outdoor Volunteer Days

The PVPLC holds outdoor volunteer days nearly every Saturday of the year, held from 9am-12pm, excluding holiday weekends. The focus of these events is to restore native habitat, maintain the trail system, and do general maintenance of lands. We engage and empower young people through these programs to ensure education and stewardship on the Preserves in perpetuity. We work with local schools and colleges to have teachers bring groups of students or give incentives such as extra credit and service-learning hours for students who participate on the Saturday volunteer events. Also included in this summary are events catered for special groups and corporations. Rapid Response is an Outdoor Volunteer Opportunity held almost every Friday and Saturday from 9am to 12pm. During these events volunteers are invited to work alongside staff closing spur trails. 70 Rapid Response Volunteer Days were held in 2019. Refer to Appendix G for maps of spur trail closures.

3.1.1 Native Plant Nursery

Activities in the Native Plant Nursery include transplanting seedlings from flats into individual containers, removing weeds from the containers. On occasion, groups and scouts help maintain the shade structure, build plant benches and repair the weed barrier cloth. Volunteers help at the nursery on select Saturday events as well as during the week throughout the year. A total of 2296.65 volunteer hours were contributed to nursery efforts in 2019.

3.2 Team Leader Program

The Team Leader program began in 2007 in response to the growing number of volunteers that were attending the Outdoor Volunteer Days. Team Leaders are volunteers, sixteen years or older, who assist in supervising the Saturday outdoor volunteer activities. They ensure that volunteers have adequate instruction and the tools necessary to complete the task. They also assist in educating the public about the PVPLC.

The program requires that interested volunteers go through an application and interview process. Candidates then attend a half-day weekend workshop where they learn the skills necessary to motivate and supervise volunteers during Saturday Outdoor Volunteer Days. Training involves practicing leadership skills and communicating restoration techniques. Team Leaders commit to working at least four volunteer days within one season or half-year. The goal of the PVPLC is to hold two Team Leader workshops each year and train a minimum of six new Team Leaders at each one. In 2019, four workshops were held which trained 97 leaders at White Point Preserve on April 6, May 19th, June 8th, and September 7th.

The Team Leader Program has helped develop leadership skills in participants and has greatly contributed to the success of our Outdoor Volunteer Days. The quality of work from regular volunteers has increased with the guidance of Team Leaders. In addition to adult participants, many of the Team Leaders attend local high schools and universities. During the reporting period, the program has allowed these students to build leadership skills that they will find useful in their future

3.3 Scout Projects

The PVPLC encourages Boy Scouts and Girl Scouts who are looking for projects to complete their final awards, Eagle Awards for Boy Scouts and Gold Awards for Girl Scouts, by providing them with opportunities to complete their projects on preserves the PVPLC manages. This collaboration is beneficial to the scout groups, the PVPLC, and the public that uses the preserves. Scouts work under the mentorship of one of the PVPLC staff to complete their projects and are steered toward objectives that meet the PVPLC stewardship goals. In 2019, 11 scout projects were completed, including native plant nursery infrastructure improvements, habitat restoration, and trail projects.

3.4 Trail Crew Program

The Volunteer Trail Crew class offered is based on the Basic Trail Maintenance class developed by Frank Padilla, Jr. (retired California State Parks Supervisor), and Kurt Loheit. Originally started in 1992, the class focused on both volunteer and agency skill building. Adopted by the Los Angeles District of California State Parks and later the Southern California Trails Coalition, it became the first step in advanced classes for crew leader training and design and construction classes, allowing a structured path for participants to build skills associated with trails from basic maintenance to highly advanced techniques. The class is a combination of classroom and hands-on training to familiarize the participants in all aspects of trail maintenance. The course emphasizes safety, assessments, basic maintenance skills, water control, erosion sources, terminology, proper tool use, basic survey skills, resource considerations, and user experience and maintenance value. Volunteers who demonstrate proficiency in each learned skill and fulfill a yearly indoctrination will maintain status as a qualified Trail Crew member.

In 2019, the volunteer Trail Crew contributed a total of 319 hours to maintaining the Preserve's trail system. These hours include the second-Saturday monthly class trainings as described below, as well as additional trail work, such as weed whacking or spur trail closures, executed by Trail Crew members outside of the classes. This year, Leadership Training was offered for graduates and dedicated Trail Crew members through two workshops to help prepare volunteers to initiate additional trail projects with smaller teams outside of the monthly Trail Crew classes.

Participants must be at least 18 years old and must first take the introductory course. The 50-hour course can be taken at the participant's own pace and it is estimated to take about a year to complete. There are scheduled Trail Crew Skills Classes that coordinate with the trail instructor's availability and the PVPLC Outdoor Volunteer Workday schedule.

Table 1. Trail Crew training classes

Date	# Volunteer Hours	Location	Project/Skill Learned
January 12	9	Forrestal	Pruning and grade dips on Pirate, Cristo que Viento
February 9	41	PVPLC office	Introductory Course
March 16	21	Portuguese Bend	Water bar and tread repair on Vanderlip
April 20	21	Forrestal	Tread repair and outsloping on Dauntless
May 11	6	Portuguese Bend	Tread repair and retaining wall on Kelvin Canyon
June 8	24	Alta Vicente	Pruning and brushing on North Spur and Alta Vicente
July 13	18	Filiorum	Tread repair and pruning on Ford trail
August 17	48	Filiroum	Tread repair, pruning, brushing on Ford and Zotes
September 14	24	Forrestal	Grade dips, water bar on Pirate and Mariposa
October 12	27	Three Sisters	Grade dips, tread repair, pruning on Barkentine
November 9	24	Forrestal	Water bar, outsloping, tread repair on Dauntless
December 14	21	Abalone Cove	Grade dips and tread repair on Abalone Cove

3.5 Volunteer Trail Watch Program

The mission of the Palos Verdes Nature Preserve Volunteer Trail Watch Program is to serve as eyes and ears of the City of Rancho Palos Verdes and the Palos Verdes Peninsula Land Conservancy with a view to 1) protect the natural resources of the Palos Verdes Nature Preserve, including the flora and fauna as well as the geology, topography and scenic landscape, and 2) enhance the safety of, and promote an enjoyable experience for all Preserve visitors. The Volunteer Trail Watch Program was initiated in 2013 to help educate trail users about appropriate trail use and monitor preserve misuse. In 2019, volunteers dedicated 4333.94 hours to the program through training and field implementation activities, and reporting observations through the web portal for record keeping. A large portion of this year's hours was contributed by the Volunteer Trail Watch co-coordinators, who dedicated much of their time to training and coordinating the program's volunteers in addition to their time as VTW volunteers on the trails.

3.6 Community Science

Volunteers help the PVPLC monitor wildlife on the Preserve in order to document populations and their response to restoration efforts. Community Science volunteers contributed 820.75 hours to documenting the behavior of cactus wrens and the evidence of mammalian populations like coyotes and foxes through tracking efforts.

4. GRANTS SUPPORTING VOLUNTEER ENGAGEMENT

In 2019, the Conservancy received a grant from Patagonia, Santa Monica for \$10,000 to help with volunteer efforts to restore habitat.

APPENDIX G

TRAIL MANAGEMENT AND SIGNAGE ACTIVITIES

2019 UNAUTHORIZED TRAIL CLOSURES

Abalone Cove Reserve



Alta Vicente Reserve

Palos Verdes Dr West

North Spur Trail

Hawthorne Blvd

Alta Vicente Trail

South Spur Trail

Nike Trail

Prickly Pear Trail

Palos Verdes Dr South

Toveemor Trail

Pelican Cove

Alta Vicente Trail

 Vicinity of Spur Trail Closures

 RPV City Hall

 Parking

 Restrooms

 Trailhead

 Multiuse Trail

 Pedestrian & Equestrian Trail

 Road

 Reserve Boundary

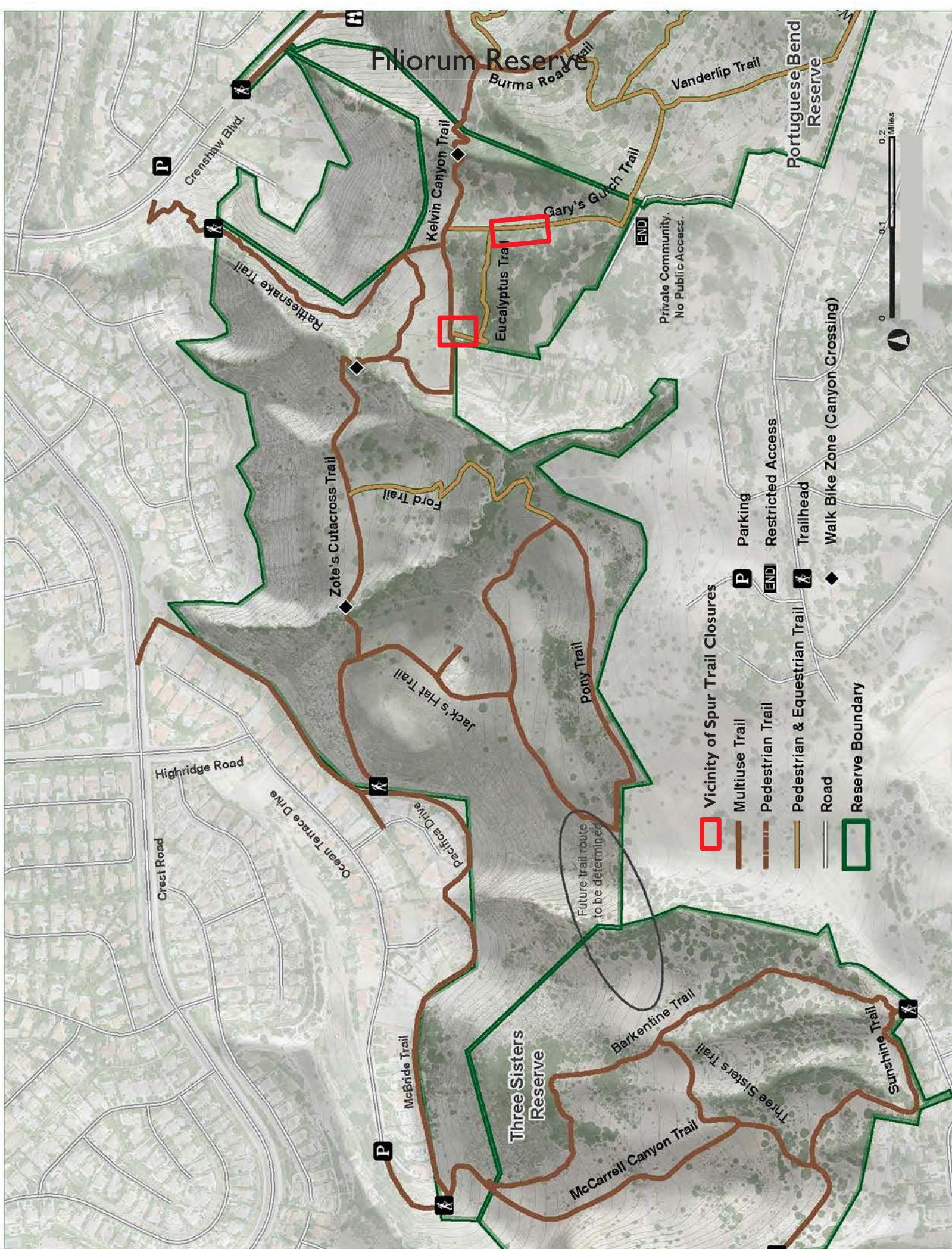


0

0.1

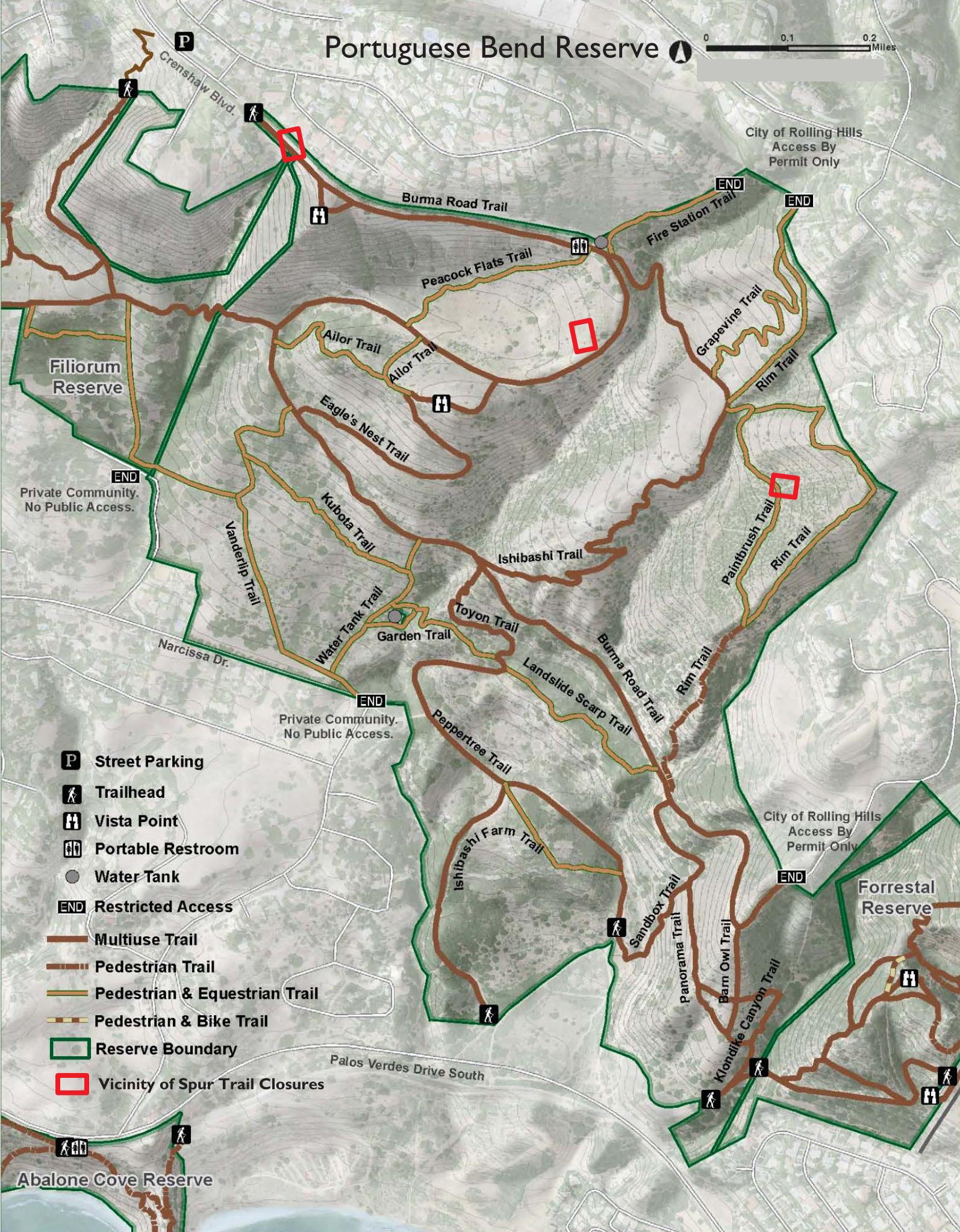
0.2 Miles

Fliorum Reserve



Portuguese Bend Reserve

0 0.1 0.2 Miles



San Ramon Reserve



Map updated May 10, 2016

0.1
0.2 Miles

Vicinity of Spur Trail Closures

Trailhead

Pedestrian Trail

Pedestrian & Bike Trail

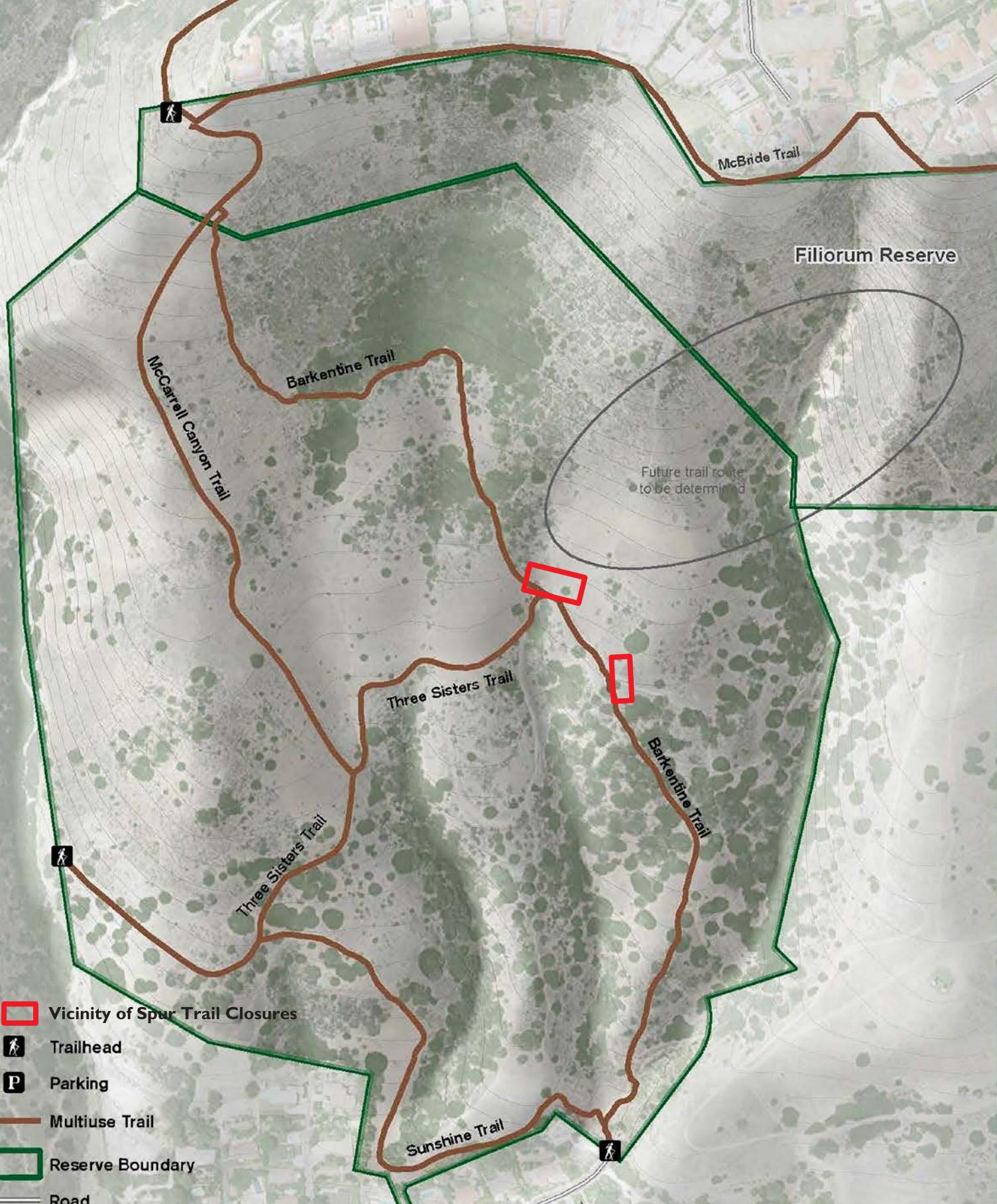
Road

Reserve Boundary



Three Sisters Reserve

Ocean Terrace



FUTURE TRAIL PROJECTS LIST

2020 Trail Projects List

The following is a list of trail projects planned for the year based on priority and funding opportunities. This list is intended to outline project needs including trail repairs, spur trail closures and signage improvements but may be amended as conditions may change. Projects not completed will carry over to the following year and projects may be added to the list on an ongoing basis. In addition to the list below, smaller-scale projects including spur trail closures, signage repairs, tread repairs, etc. may be accomplished by the Volunteer Trail Crew, PVPLC Staff or City of Rancho Palos Verdes staff on an as-needed basis.

Priority Ranking:

The following projects are ranked low to high with consideration of impacts to habitat, user safety, severity of damage and other issues. These rankings also take other considerations such as funding, feasibility, availability of staff or volunteers to accomplish project, and other factors into account.

High = poses immediate safety concern, significant impact to habitat, trespassing, etc.

Medium = spur trails and erosion issues that affect trail quality, may cause user dissatisfaction, or mildly impact habitat

Low = spur trails and erosion issues that are minor and may not impact habitat, but may not meet user satisfaction

Reserve Name	Trail Name	Issues	Priority
Abalone Cove			
	Cave Trail	Trail erosion. Closed until fixed.	High
	Olmstead	Drainage needs improvement	Low - ongoing
	Sacred Cove (West to beach)	Trail erosion. Closed until fixed.	High
	Sacred Cove View Trail	Spur Trail Closures	Medium
	Sea Dahlia Trail	Erosion at stairs. Closed until fixed	High
	Smuggler's Trail	Spur Trail Closures	Medium – Ongoing
Agua Amarga			
	Lunada Canyon Trail	Delineate single path	Low – Ongoing
Alta Vicente			
	Prickly Pear Trail	Spur trail closures	Low – Ongoing
Filiorum			
	Ford Trail	Repair trail erosion	Medium - ongoing

	Gary's Gulch	Delineate single path	Medium - ongoing
	Jack's Hat Trail	Maintain spur trail closure	Low - ongoing
	Jack's Hat Trail	Trail Erosion	Low - ongoing

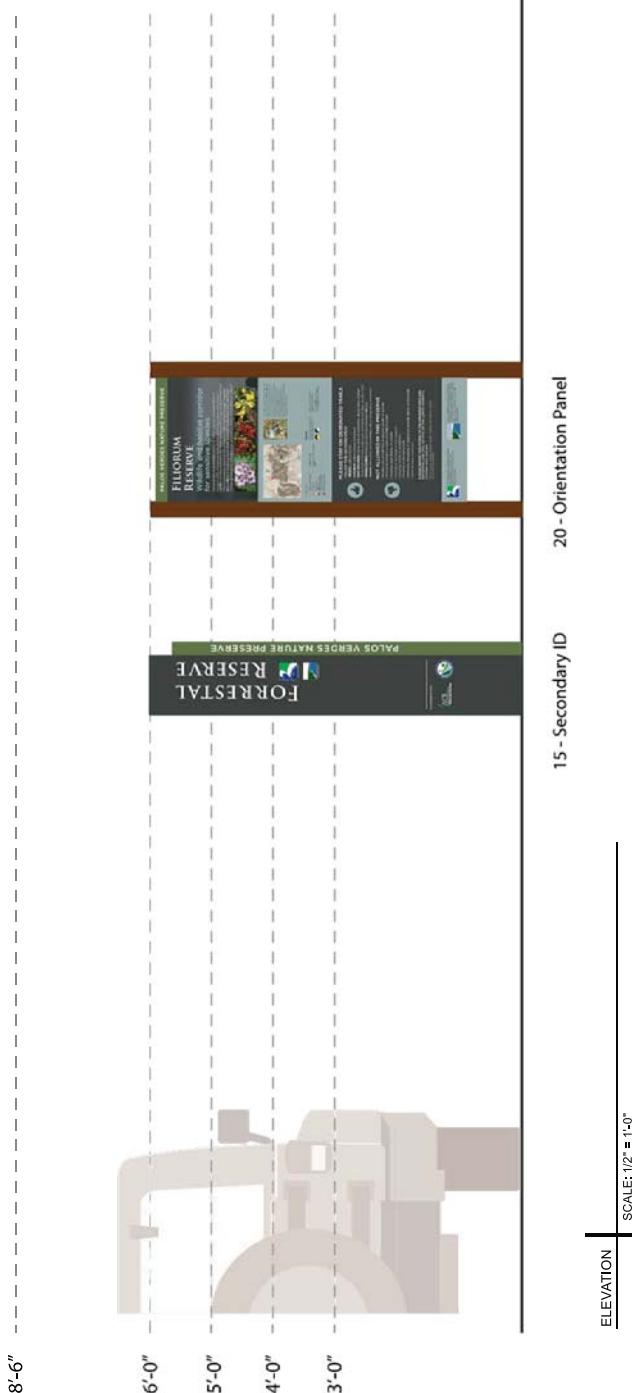
	Pony Trail	Maintain Spur trail closure across Barkentine Canyon	Low – ongoing
Forrestal			
	Cool Overlook	Spur trail closure	Medium - ongoing
	Cristo que Viento Trail	Spur trail closure	Low - ongoing
	Dauntless Trail	Spur trail closure (upper section) and repair trail erosion	Medium
	Exultant Trail	Maintain spur trail closure	Low - ongoing
	Flying Mane Trail	Maintain spur trail closure	Low - ongoing
	Mariposa Trail	Maintain bridge stability	Low - ongoing
	Pirate Trail	Maintain post and cable repair and check dams	Low - ongoing
	Quarry Trail	Erosion. Need to fill ruts and maintain water bars	Low - ongoing
	Quarry Trail	Spur trail closure	Medium - ongoing
	Vista Trail	Spur trail closure	Low - ongoing
Portuguese Bend			
	Barn Owl	Erosion. Need to improve drainage	Low - ongoing
	Burma Road	Erosion Gully between Peacock Flats Trail and Landslide Scarp Trail	High
	Fire Station Trail	Maintain closure into private property	Low – ongoing
	Fire Station Trail	Erosion. Need to fill ruts and install water bars	Medium - ongoing
	Ishibashi Trail	Maintain spur trail closures and remove embankments	Medium - ongoing
	Ishibashi Trail	Evaluate measures to improve user safety	High

	Peppertree Trail	Erosion caused by seasonal rains.	High
	Rim Trail	Consider reroute to reopen lower segment of trail	Low
	Sandbox	Erosion undercutting steps	High
San Ramon			
	Switchback trail	Delineate single path	Low
Three Sisters			
	Barkentine Trail	Spur trail closure	Medium

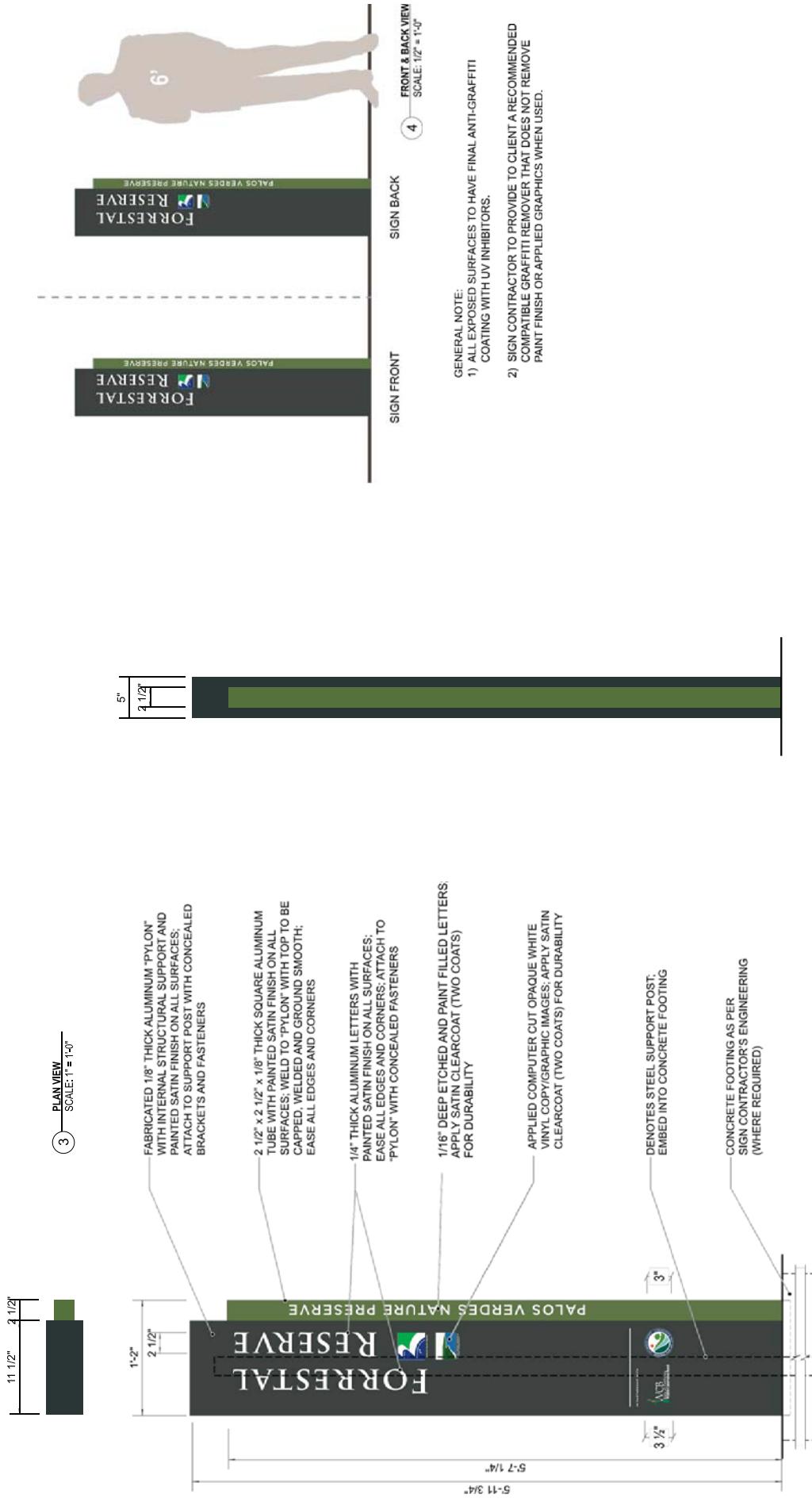
	Barkentine Trail	Erosion. Need to improve drainage	Medium
	McCarrell Canyon Trail	Trail erosion and spur trail closure	Low – Ongoing
Vicente Bluffs			
	Toveemor Trail	Close spur trail	Low -- Ongoing
Vista del Norte			
	Vista Del Norte Trail	Erosion from fuel mod	Low - ongoing

PVNP SIGNAGE DESIGNS

SIGN TYPES



1120 W. Slauson Ave. Los Angeles, CA 90047	Representative: Edgar Acuñero Drawn by: Simon Jeong	Revisions: [1] Palos Verdes Nature Preserve - PHASE III (02-26-2019) [2] Palos Verdes Nature Preserve - PHASE III (03-16-2019) [3] - [4] - [5] -
STATE LIC. #642841 U.L. LISTED #E 141997		



S o r



ST 15 - eccentric identification

Project: Palos Verdes Nature Preserve

Phase III

Revisions:	1 Palos Verdes Nature Preserve - PHASE III (02-26-2019)
Representative:	Edgar Acuñino
Drawn by:	Simon Jeong
	2 Palos Verdes Nature Preserve - PHASE III (03-18-2019)
	3 -
	4 -
	5 -

1720 W. SLAUSON AVE.
LOS ANGELES, CA 90047
STATE LIC. #6423841
U.L. LISTED #E 141997

LOS ANGELES, CA 90047
T: 323.291.3333
F: 323.291.3704

EXPRESS
SIGN & NEON COMPANY

① ELEVATION
SCALE: 1" = 1'-0"

② SIDE VIEW
SCALE: 1" = 1'-0"



QTY=3

① FORESTAL
SCALE: 1" = 1'-0"

QTY=4

② FILIORUM
SCALE: 1" = 1'-0"

③ THREE SISTERS
SCALE: 1" = 1'-0"

QTY=3

S o r

T 2C - Orientation Panel

SHEET

1720 W. SLAUSON AVE. LOS ANGELES, CA 90047	Representative: Edgar Acuña Drawn by: Simon Jeong	Revisions: [1] Palos Verdes Nature Preserve - PHASE III (02-26-2019) [2] Palos Verdes Nature Preserve - PHASE III (03-18-2019) [3] - [4] - [5] -
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APPENDIX H

HABITAT IMPACTS

Habitat Impacts Summary

In the spring of 2019, vegetation clearing for the assessment of the storm drain renovation/removal project at Abalone Cove was done. The project was completed in late summer and PVPLC staff verified that no impacts to habitat had occurred.

In the summer of 2019, a project to “blade” Burma Road to mitigate erosion issues from the previous season’s rains was completed. PVPLC staff worked closely with the city to recommend side casted material be used for other projects and to check on the health of damaged plants, which was minimal and did not cause any impacts.

Table I. Habitat Impacts in the PVNP in 2019

Date	Project	Impact	Size
Spring	Vegetation clearing for storm drain assessment	None	-
Summer	Burma Road “blading”	None	-

RPV NCCP/HCP Habitat Impact Tracking

City Project Name	Total Habitat Loss (Acres)		Habitat Loss in Preserve (Acres)	
	CSS allowed	Grassland allowed	CSS allowed	Grassland allowed
1. Altamira Canyon Drainage Project (Future Project)	<u>2.5</u>	<u>3</u>	<u>0</u>	<u>0</u>
Remaining	<u>2.5</u>	<u>3</u>	<u>0</u>	<u>0</u>
2. Dewatering Wells (Ongoing)	2.5	2.5	2.5	2.5
<i>2014 City of RPV</i>			<u>0.08</u>	
<i>2016 ACLAD</i>			<u>0.1</u>	
Remaining	<u>2.5</u>	<u>2.42</u>	<u>2.32</u>	<u>2.5</u>
3. Landslide Abatement Measures (Ongoing)	5	15	3.3	9.9
<i>2012 City of RPV</i>			<u>0.04</u>	
<i>2015 City of RPV</i>				<u>0.1</u>
<i>2018 City of RPV</i>			<u>0.22</u>	
Remaining	<u>5</u>	<u>14.86</u>	<u>3.04</u>	<u>9.8</u>
4 Misc. Drainage Repair in Landslide Areas (Ongoing)	10	15	6.6	9.9
<i>2011 Repair "Archery Range" Area</i>			<u>0.009</u>	
<i>2013 City of RPV</i>			<u>0.009</u>	
Remaining	<u>10</u>	<u>14.982</u>	<u>6.591</u>	<u>9.9</u>
5. PVDE Draniage Improvement Project (Future Project)	<u>5</u>	<u>15</u>	<u>0</u>	<u>0</u>
Remaining	<u>5</u>	<u>15</u>	<u>0</u>	<u>0</u>
6. Misc. Drainage Improvements (Ongoing)	20	60	6.6	20
<i>2013 City of RPV</i>			<u>0.005</u>	
Remaining	<u>20</u>	<u>59.995</u>	<u>6.595</u>	<u>20</u>
7. Abalone Cove Beach Project (Ongoing)	1	2	1	2
<i>City of RPV</i>				
Remaining	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>
8. RPV Trails Plan Implementation (Future Project)	<u>4</u>	<u>10</u>	<u>2</u>	<u>5</u>
Remaining	<u>4</u>	<u>10</u>	<u>2</u>	<u>5</u>
9. Lower San Ramon Canyon Repair (Complete)	5	15	2.5	7.5
<i>2011 San Ramon Project</i>			<u>0.34</u>	
Remaining	<u>5</u>	<u>14.66</u>	<u>2.5</u>	<u>7.5</u>
10. Lower Point Vicente (Future Project)	<u>1.5</u>	<u>11.2</u>	<u>0</u>	<u>0</u>
Remaining	<u>1.5</u>	<u>11.2</u>	<u>0</u>	<u>0</u>
11. Palos Verdes Drive South Road Repair	5	15	5	15
<i>2010 PVDS Repair</i>				<u>1.4</u>
Remaining	<u>5</u>	<u>13.6</u>	<u>5</u>	<u>13.6</u>
12. Upper Point Vicente (Future Project)	<u>2</u>	<u>22</u>	<u>1</u>	<u>11</u>
Remaining	<u>2</u>	<u>22</u>	<u>1</u>	<u>11</u>

13. Preserve Fuel Modification	12	18	12	18
<i>2012 City of RPV</i>			<i>0.7</i>	
Remaining	<u>12</u>	<u>17.3</u>	<u>11.3</u>	<u>18</u>
14. Utility Maintenance and Repair	10	20	5	10
<i>2006 SCE</i>			<i>0.03</i>	
<i>2008 LA County Sanitation</i>			<i>0.01</i>	
<i>2009 Cox Cable</i>			<i>0.01</i>	
<i>2011 Cal Water</i>			<i>0.1</i>	
<i>2012 Cal Water</i>			<i>0.1</i>	
<i>2012 Sanitation District</i>			<i>0.02</i>	
<i>2013 Sanitation District</i>			<i>0.02</i>	
Remaining	<u>10</u>	<u>19.71</u>	<u>4.71</u>	<u>10</u>
15. Unimproved City Parks (Future Project)	<u>10</u>	<u>20</u>	<u>0</u>	<u>0</u>
Remaining	<u>10</u>	<u>20</u>	<u>0</u>	<u>0</u>
16. Malaga Canyon Drainage Improvements (Future Project)	<u>5</u>	<u>15</u>	<u>5</u>	<u>15</u>
Remaining	<u>5</u>	<u>15</u>	<u>5</u>	<u>15</u>
17. Other Misc. Projects	20	60	10	30
<i>2010 Lightman</i>				<i>0.9</i>
<i>2010 Cal Water/City Burma Road Repair</i>				<i>0.4</i>
<i>2010 Ginsburg Grading</i>				<i>0.5</i>
<i>2012 Fire</i>				<i>12.7</i>
<i>2012 Sunshine</i>				<i>0.01</i>
<i>2012 Fire</i>				<i>0.2</i>
<i>2012 Unauthorized Trail Creation</i>				<i>0.12</i>
<i>2013 Private Resident</i>			<i>unknown</i>	<i>unknown</i>
<i>2013 Chase Bank</i>				<i>0.45</i>
<i>2016 Toyon/Peppertree Grading</i>				<i>0.3</i>
<i>2016 CalWater</i>				<i>0.1</i>
<i>2018 CalWater (Forrestal)</i>				<i>0.1</i> <i>0.02</i>
Remaining	<u>20</u>	<u>45.67</u>	<u>8.02</u>	<u>28.88</u>
<i>Total Acreage of Habitat Loss Allowed</i>	120.5	318.7	62.5	155.8
<i>Habitat lost</i>	5.5	20.643	3.424	2.62
<i>Remaining Acreage of Habitat Loss Allowed</i>	<u>115</u>	<u>298.057</u>	<u>59.076</u>	<u>153.18</u>

Private Covered Projects	Total Habitat Loss (acres)	
	CSS allowed	Grassland allowed
Lower Filiorum Development	11.9	70
Portuguese Bend Club Remedial Grading	3	10
Fuel Modification for Private Projects	10	20
Plumtree Development	2.8	19.7
Misc. Private Projects throughout the City	71.8	143.1
	<u>99.5</u>	<u>262.8</u>

APPENDIX I

CITY OF RPV
2019 NIGHT HIKE ACTIVITY

2019 Night Hike Activity
Palos Verdes Nature Preserve

Sierra Club Night Hikes via City Permit:

November 4, 2019 (15 participants)

TOTAL NIGHT HIKE PARTICIPATION: 15