



An Employee-Owned Company

June 25, 2021

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Reference: Final Report for the Rice Canyon Sensitive Plant Species Management Project (SANDAG Grant Number 5005508; RECON Number 9429)

Executive Summary

The primary goal of the Rice Canyon Sensitive Plant Species Management Project (project) was to reduce the threat from invasive stinknet (*Oncosiphon pilulifer*) and illegal trespassing to sensitive plant species. Reducing these threats was a benefit to sensitive animal species that occupy Rice Canyon as well. Sensitive plant species that were the focus of the project include Otay tarplant (*Deinandra conjugens*), San Diego thornmint (*Acanthomintha ilicifolia*), and Orcutt's bird's-beak (*Dicranostegia orcuttiiana*). Sensitive animal species that also occur in Rice Canyon include coastal California gnatcatcher (*Polioptila californica californica*) and coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) among other Multiple Species Conservation Plan-covered species.

Otay tarplant is included in the San Diego Management and Monitoring Program (SDMMP) Management and Monitoring Strategic Plan (MSP) as a Category SS (a moderate risk of loss of significant occurrences from the Conserved Lands in the Management and Monitoring Strategic Planning Area [MSPA]), San Diego thornmint is included in the SDMMP MSP as a Category SO (a moderate risk of loss of significant occurrences from the Conserved Lands in the MSPA) and Orcutt's bird's-beak a MSP Category SL species (a moderate risk of loss from Conserved Lands in the MSPA).

The goals/expected results for this project include the following:

- Decrease illegal trespassing.
- Remove invasive weed-stinknet.
- Remove threats to Otay tarplant, San Diego thornmint, and Orcutt's bird's-beak populations.

The project has been successful at installing protective fencing and additional signage to reduce trespassing and to inform the public of the sensitive nature of the three target plant species. Approximately 2,648.5 feet of new fencing were installed, approximately 2,371 feet of existing fence were repaired. The existing fence had previously been installed by RECON Environmental, Inc. (RECON) in 2011 as part of the Central City Preserve Otay Tarplant and San Diego Thornmint Restoration and Enhancement Program (San Diego Association of Governments [SANDAG] Grant Number 5001590). Seven new locations for informational signs were installed and three existing signs that had been vandalized or stolen were replaced.

Treatment of stinknet in Rice Canyon was done in two phases. First, pre-emergent herbicide was applied in December 2020 along the Rice Canyon access road to prevent the germination of stinknet seedlings. Second, follow-up spraying of any stinknet seedlings (March 2021) that were not killed by the pre-emergent herbicide was done using a glyphosate-based herbicide. The total number of stinknet that still germinated after the application of the

pre-emergent herbicide was very small (approximately 50 to 75 plants). Finally, the project biologist walked the treatment area (April 2021) after the follow-up spraying of glyphosate and hand-pulled and properly disposed of additional stinknet plants. The treatment area was searched for stinknet again in May and June 2021 to ensure that no stinknet successfully set seed in the treatment area. Any stinknet plants observed were removed prior to setting any seeds.

This short-term SANDAG grant project was successful at reducing threats to Otay tarplant, San Diego thornmint, and Orcutt's bird's-beak by installation and repair of protective fencing, adding new locations for informational signage and preventing stinknet from setting seeds during the 2020-21 growing season.

1.0 Introduction

The project location is in the Central City Preserve of Chula Vista. The Central City Preserve is in the central portion of the city of Chula Vista, east of Interstate 805, south of State Route 54 and Bonita Road, and north of Otay Lakes Road (Figure 1; see Attachment 1 for all figures and photographs). The Central City Preserve covers approximately 1,350 acres and is subdivided further into four Preserve Management Areas (PMAs) for data management purposes and the development of the Area Specific Management Directives that were prepared in 2004 (Figure 2). Each PMA consists of a number of open space areas, referred to as subunits, which are surrounded by residential development. Each of these subunits was assigned a number to organize and distinguish each distinct survey area (Figure 3). Threat reduction work for Otay tarplant, San Diego thornmint, and Orcutt's bird's-beak was performed in PMA 1 subunit 1-2b. The fencing and stinknet treatment areas in this subunit are shown in Figures 4 and 5.

Sensitive habitat communities identified within the Central City Preserve include maritime succulent scrub, coastal sage scrub, valley needlegrass grassland, southern willow scrub, freshwater marsh, cismontane alkali marsh, and Baccharis floodplain scrub. Sensitive plant species that were the focus of this short-term threat reduction project include Otay tarplant, San Diego thornmint, and Orcutt's bird's-beak.

2.0 Stinknet Biology

The following summarizes the general biology and ecology of stinknet.

Stinknet is a fast-spreading invasive plant from South Africa that has become established in Southern California and Arizona. It is an annual flowering plant that germinates with fall/winter rains and often occurs in arid to semi-arid regions. It is very prolific, and especially abundant in disturbed agriculture fields, open scrublands, and along roadsides. It has a strong unpleasant odor and medicinal properties. California Invasive Plant Council (Cal-IPC) gives stinknet a rating of High. Species with a Cal-IPC rating of High have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment (Cal-IPC 2021).

Stinknet was originally introduced into Riverside County in 1981 and San Diego County in 1998. It is becoming very abundant and widespread in the San Pasqual Valley and is well established in western Otay Mesa and many other locations along the coast and inland western San Diego County. Because it is so abundant and dense in coastal sage scrub, it poses a potential threat to species of conservation concern, such as rare plant species and the coastal California gnatcatcher (MSP category VF species [species with limited distribution in the MSPA or needing specific vegetation characteristics requiring management]) and coastal cactus wren (MSP category SO species). It also has the potential to impact reptiles, and other species inhabiting openings in scrublands or riparian areas. The SDMMMP has initiated efforts to eradicate small, isolated occurrences, prevent new occurrences from establishing, and, as feasible,

to contain and reduce impacts of larger occurrences. In 2018, the SDMMMP coordinated with weed control experts and land managers to map and treat stinknet in western San Diego County.

3.0 Project Goals

The goals/expected results for this project include the following:

- Decrease illegal trespassing.
- Remove invasive weed-stinknet.
- Remove threats to Otay tarplant, San Diego thornmint and Orcutt's bird's-beak populations.

4.0 Project Tasks Performed

4.1 Pre-implementation Task Summary (Tasks 1 and 5)

Task 1 Project Biologist Field Assessment

The project biologists coordinated and met with the City of Chula Vista (City) Open Space Inspector and Senior Planner in the field on October 29, 2020, to confirm maintenance needs for existing fencing. At the field meeting, the installation of new fencing was discussed and previous growing locations of stinknet were confirmed.

The landscape contractor for the City that performed general weed control in 2020 had previously cleared the majority of the dried stinknet present along the Rice Canyon access road after it had flowered during the spring of 2020. This made the previous growing locations of stinknet indistinguishable at most locations in October 2020. Fortunately, the project biologist had visited the canyon in previous years and had a good knowledge of the distribution of stinknet adjacent to the road. The project biologists mapped the remaining and previously observed locations of stinknet in the field prior to the initial pre-emergent treatment. RECON GIS staff also prepared a field figure of the mapped stinknet locations in Rice Canyon.

Task 5 Photo Monitoring

Pre-implementation photo monitoring was conducted on November 6, 2020, when ten photo points were established at the known previous locations of stinknet along the Rice Canyon access road and along the trail where fencing would be installed. Repeat photo point photos were taken on June 5, 2021. The repeat photos taken along the access road show very little change from November 2020 to June 2021 because the 2020 stinknet had mostly been removed by the City's landscape crew. The little change in the repeat photographs along the access road are also due to the fact that by the time the photos were repeated in June 2021, all of the stinknet had been successfully treated and therefore was not visible. Photo monitoring points are shown on Figure 4. Repeat photo points are presented in Attachment 2.

4.2 Implementation Task Summary

Task 2 Fencing

The new fence installation and existing fencing repair started the week of March 20, 2021 and was completed June 21, 2021. The RECON maintenance staff installed the new fencing (Photographs 1–3). The previously existing fencing was also repaired by the RECON crew (Photographs 4–5) and seven new informational signs were installed and three vandalized or stolen signs were replaced (Photographs 6–10). The new fencing along the trail adjacent to the Otay tarplant and San Diego thornmint was installed per plan in the SANDAG proposal. The location of the newly installed

and existing fencing is shown in Figure 5. Approximately 2,648.5 feet of new fencing were installed, approximately 2,371 feet of existing fence were repaired. The fence lengths presented here and shown on Figure 5 differ somewhat from the lengths listed in the SANDAG proposal because they were measured using a GPS device while the lengths in the proposal were not.

The fencing adjacent to the Orcutt's bird's-beak was modified from the proposed design to address the current trail conditions of the site. The trail that had been located on the eastern side of the small drainage and traversed directly through the Orcutt's bird's-beak is no longer open to foot traffic due to the growth of shrubs, including lemonadeberry (*Rhus integrifolia*) and jojoba (*Simmondsia chinensis*) (Photograph 11). A small section of fencing was installed behind the shrubs to further discourage any foot traffic (Photograph 12). No Orcutt's bird's-beak was observed in 2021 east of the drainage.

There is an active trail on the west side of the small drainage. The entrance to this unauthorized trail has already been fenced by the City (Photograph 13). Approximately five Orcutt's bird's-beak were observed in flower east of this trail in 2021 (Photograph 14). A new section of fence was installed behind the City's fence between the unauthorized trail and the bird's-beak population (Photograph 15). A sign stating that the area is closed to foot traffic was also installed (Photograph 16). This should further reduce threats of trampling of the bird's-beak plants.

Task 3 Initial Treatment and Removal of Stinknet

The project biologists attended two virtual meetings to coordinate the use of pre-emergent herbicide that would provide initial control of stinknet. Meeting attendees included Kristine Preston of the U.S. Geological Survey, Chris McDonald of the University of California, and others. The second virtual meeting included Chris McDonald, Jason Giessow of DENDRA, Inc. and Kristine Preston to discuss the use of pre-emergent herbicide to control stinknet specifically in the Rice Canyon open space. The project biologist also coordinated internally and with the City to assess the potential cost and effects of various pre-emergent brands on native plants prior to selecting a pre-emergent.

Prior to applying the pre-emergent herbicide, the project biologists coordinated with City staff for a public closure of the trail through Rice Canyon on the day pre-emergent spraying was scheduled. The biologist provided language to the City to be used on the closure signs posted one week ahead of the scheduled spraying. The closure signs informed the public that herbicide was going to be applied so that they should stay out of the treated area for the day. The closure signs included a "Notice of Pesticide Treatment," pesticide names and active ingredients and the date of the canyon closure to the public.

A field meeting including the project biologist, RECON field director, and maintenance crew leader was conducted prior to spraying pre-emergent to outline the treatment area and to discuss herbicide application methods (December 15, 2020).

Spraying of pre-emergent herbicide (Surflan®) was completed by the RECON maintenance staff on December 16, 2020. The application of pre-emergent was monitored by the project biologist. The maintenance crew sprayed areas where stinknet had previously grown to prevent stinknet seedlings from germinating after rainfall (Photographs 17–19). Over one-half inch of rain fell on December 28, 2020, which activated the pre-emergent spray to prevent germination of stinknet.

Task 4 Follow-up Maintenance

The project biologist surveyed and flagged the locations of germinated stinknet plants along the Rice Canyon access road on March 24, 2021, prior to the RECON crew implementing follow-up maintenance tasks. On March 26, 2021,

the RECON crew sprayed newly germinated stinknet that had not been controlled by the pre-emergent herbicide (Photographs 20–22). The small number of stinknet present were sprayed with a glyphosate-based herbicide. The project biologist supervised the crew during the follow-up spraying.

The project biologist also checked the canyon access road for additional stinknet plants on April 23, 2021. A few widely scattered stinknet plants were found by the biologist and removed from the site. Another check for stinknet was conducted on May 11, 2021 and only one plant was observed and this plant was also removed prior to setting seeds (Photograph 23).

Task 6 Reporting

The project biologist prepared the first and second quarterly report for the City. The first quarterly report was submitted to the City on January 13, 2021. The second quarterly report was submitted to the City on April 13, 2021. Labelled photos of work tasks conducted between October 16, 2020 and April 2, 2021 were also submitted with the quarterly reports.

4.3 2020–21 Rainfall Summary

Between October 2020 and May 2021, rainfall at Chula Vista (the closest reporting station) was 3.63 inches (Table 1), which was well below normal (the average annual rainfall in Chula Vista is approximately 9.58 inches).

The early portion of the rainy season (October through December) was well below normal with a rainfall deficit of over 1.8 inches. A rain event on December 28, 2020, was heavy enough to cause germination of stinknet and activate the pre-emergent herbicide that had been applied on December 16, 2020. Heavier rainfall occurred in January, and this resulted in additional germination of annual species. The total rainfall for the 2020-21 season was below normal by 5.95 inches.

Table 1 October 2020 through May 2021 Rainfall Compared to Normal Rainfall			
Month	Precipitation (inches) ¹	Normal Rainfall: Precipitation (inches) ²	Difference (inches)
2020			
October	0.04	0.53	-0.49
November	0.43	0.91	-0.48
December	0.57	1.43	-0.86
<i>Total</i>	<i>1.04</i>	<i>2.87</i>	<i>-1.83</i>
2021			
January	1.41	1.94	-0.53
February	0.13	2.30	-2.17
March	0.97	1.69	-0.72
April	0.06	0.69	-0.63
May	0.02	0.09	-0.07
<i>Total</i>	<i>2.59</i>	<i>6.71</i>	<i>-4.12</i>
GRAND TOTAL	3.63	9.58	-5.95
¹ SOURCE: National Oceanic and Atmospheric Administration 2021 – Chula Vista Station.			
² SOURCE: National Oceanic and Atmospheric Administration 2015 – Chula Vista.			

4.4 Quarterly Reports (Task 6)

Quarterly reports that summarized ongoing tasks for the project were submitted in January 2021 (Quarterly Report I) and April 2021 (Quarterly Report II). The final report was submitted to the City on June 25, 2021.

5.0 Conclusions and Recommendations

The use of pre-emergent herbicide (Surflan®) was very effective at controlling the germination of stinknet in Rice Canyon. Follow up spraying with a glyphosate-based herbicide and periodic checks and hand removal of stinknet along the Rice Canyon access road when the plant typically flowers also added to the successful control of stinknet.

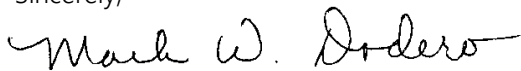
Installation of new fencing, repairs to existing fences and additions of new informational signs also reduced the threats to Otago tarplant, San Diego thornmint and Orcutt's bird's-beak.

As part of the original project proposal submitted to SANDAG, the City was required to hold a public outreach event prior to installing fencing at Rice Canyon to inform residents and trail users of the importance of staying on formal trails. Due to the COVID-19 pandemic this event was cancelled. However, the project biologist consultant did engage residents visiting the canyon and informed them of the ongoing work effort to control the invasive weeds and install fencing.

As required in the proposal for the project, over the long-term, the City Open Space Inspector will continue to monitor for stinknet occurrences and will be able to treat and hand-weed if new occurrences are found. The Open Space Inspector will also continue to monitor and evaluate access control needs.

Please do not hesitate to contact me at 619-308-9333 extension 115 or mdodero@reconenvironmental.com.

Sincerely,



Mark Dodero
Restoration Biologist

MWD:jg

Attachments

6.0 References Cited

California Invasive Plant Council (Cal-IPC)

2021 The Cal-IPC Inventory. <https://www.cal-ipc.org/plants/inventory>. Accessed June 22, 2021.

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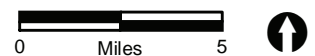
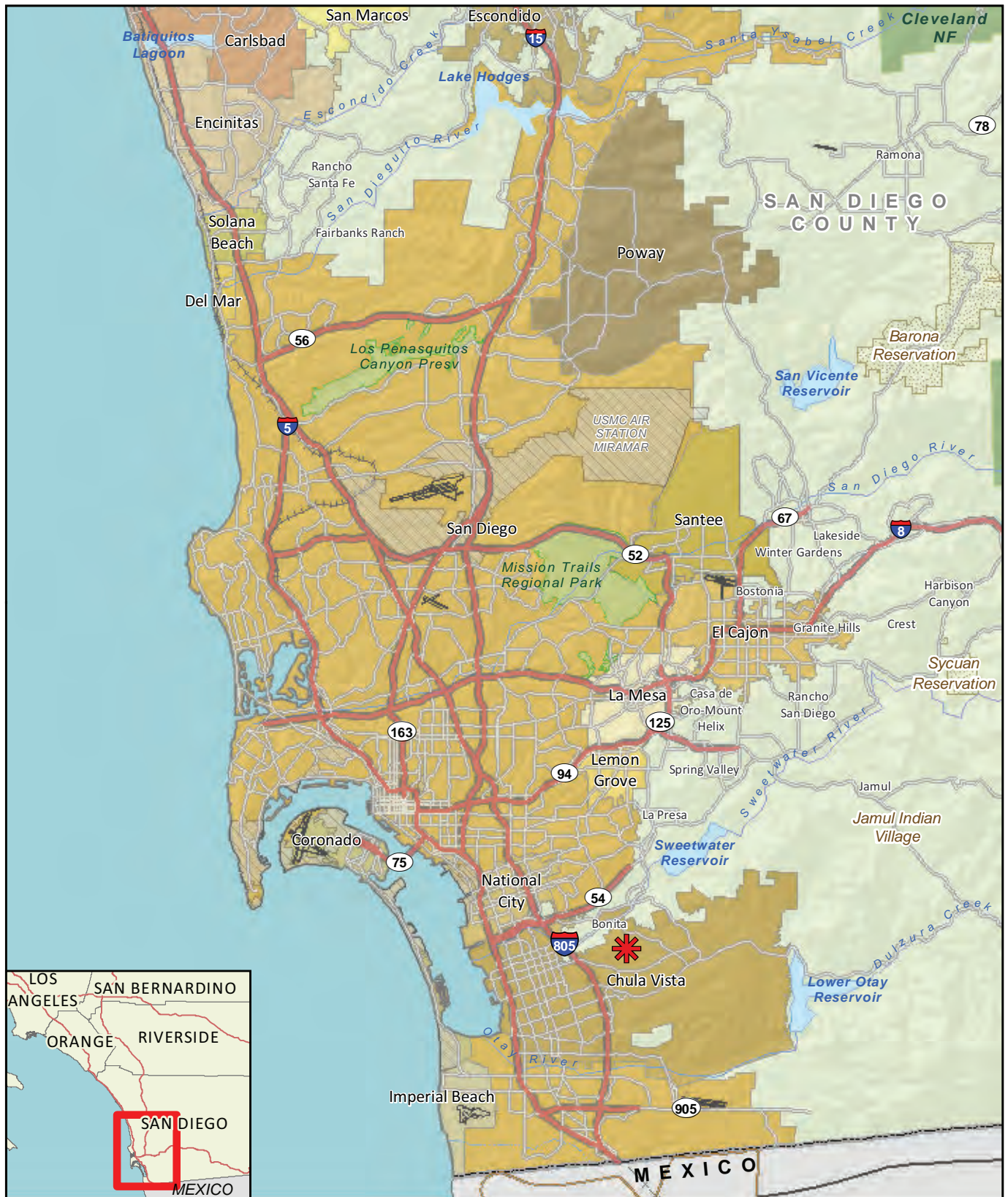
<http://www.wrh.noaa.gov/sgx/obs/rtp/brown.html>. Accessed on June 19, 2021.

7.0 Contributors to this Report

RECON biologists that conducted field surveys, attended virtual and field meetings include Anna Leavitt, Jason Sundberg, Ruth Vallejo-Reviczky and Mark Dodero. GIS figures and maps were prepared by Frank McDermott.

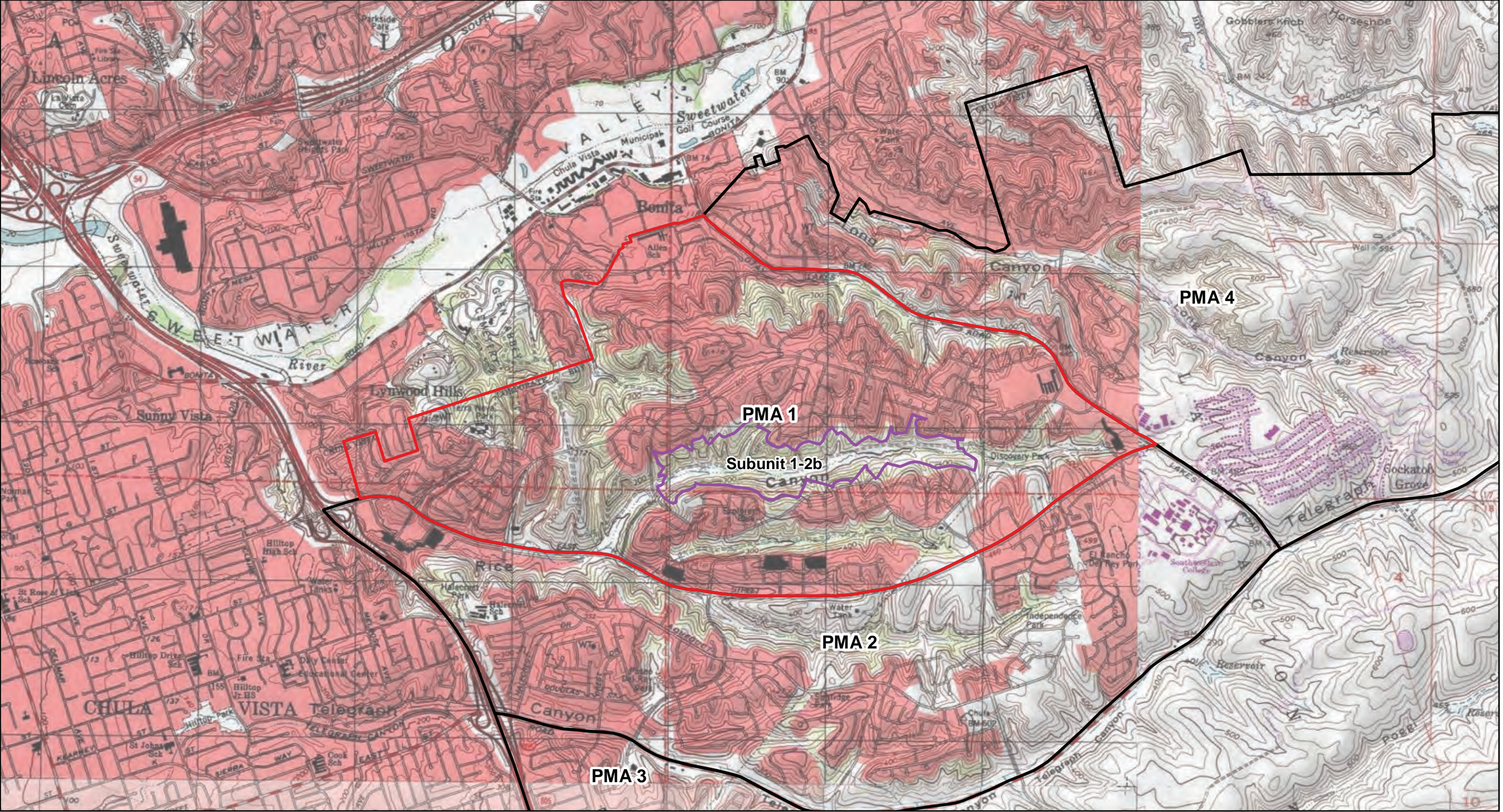
ATTACHMENT 1

Figures and Photographs



 Project Location

FIGURE 1
Regional Location



Preserve Management Areas

- PMA 1
- Other PMAs
- PMA Subunit 1-2b



FIGURE 2
Project Location on USGS Map



Preserve Management Areas

- PMA 1
- Other PMAs
- PMA Subunits
- Work Area

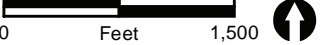
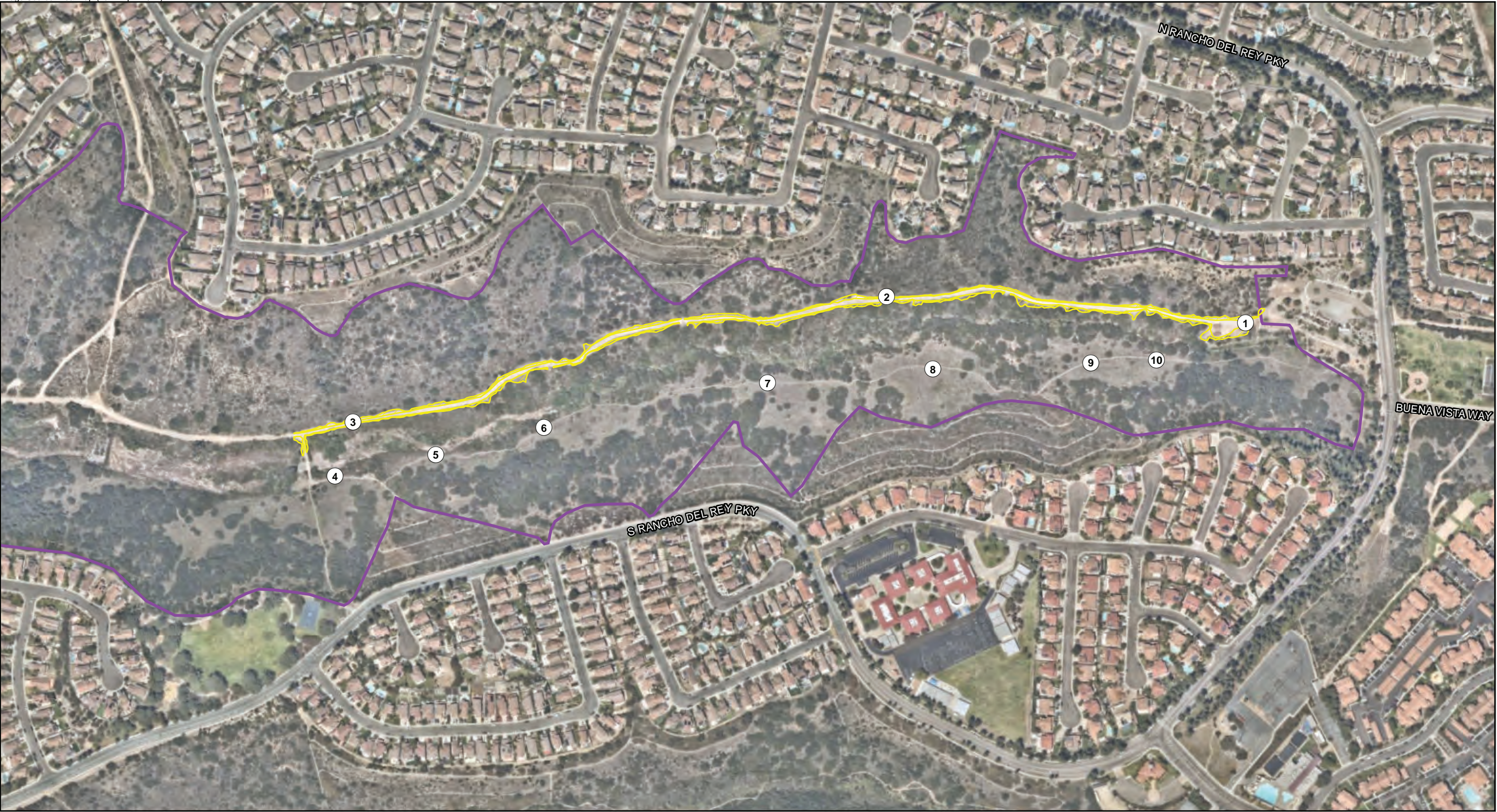
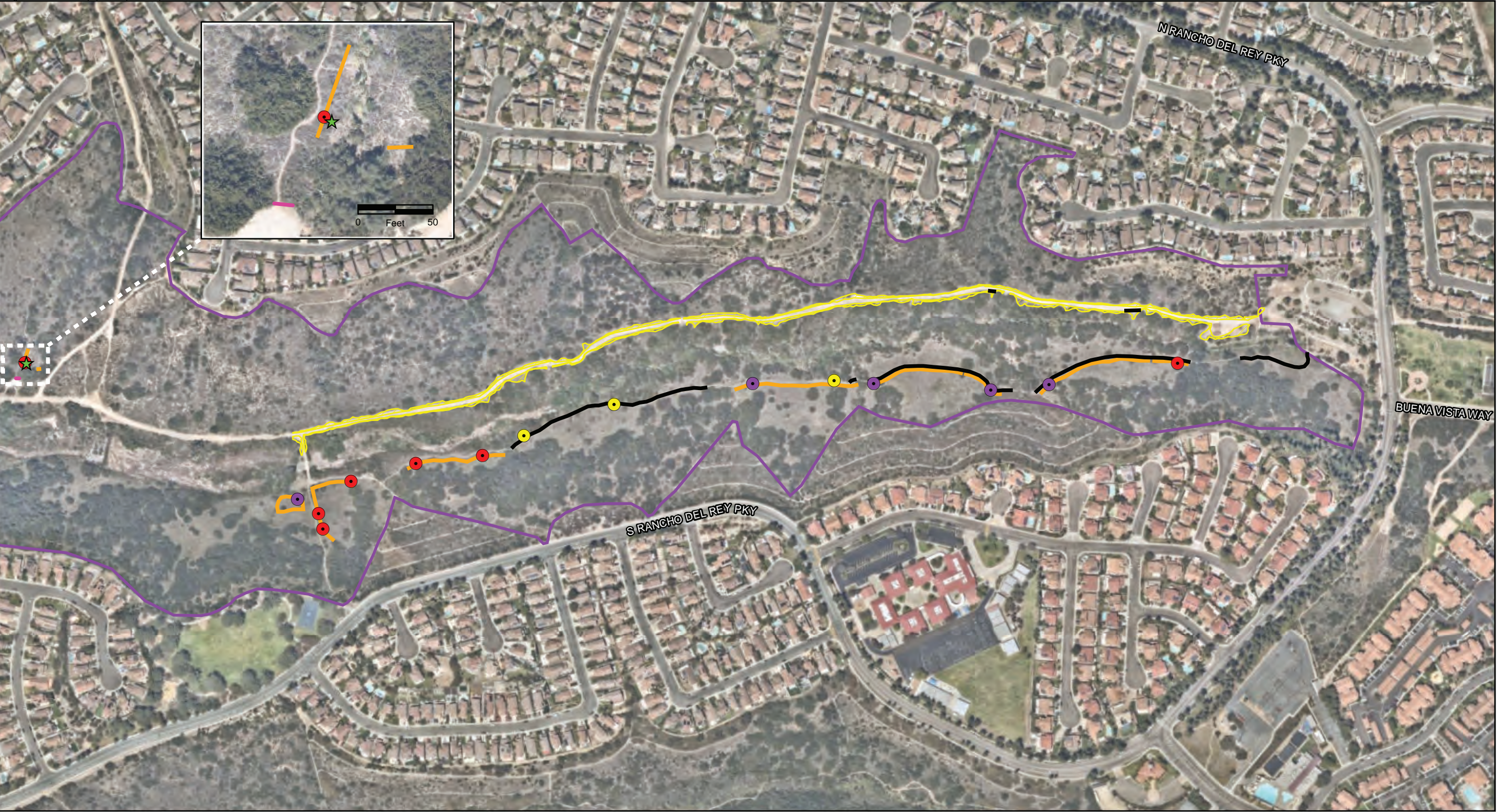


FIGURE 3
PMA Subunit 1-2b Work Areas



- PMA Subunit 1-2b
- Stinknet Treatment Area
- Photo Point

FIGURE 4
Photo Point Locations



- | | | |
|-------------------------|--|----------------------|
| PMA Subunit 1-2b | Previously Installed Fence (2011) - 2,371 feet | Existing Sign |
| Stinknet Treatment Area | New Fence - 2,648 feet | Newly Installed Sign |
| Orcutt's Bird's-beak | City fence - 13 feet | Replaced Sign |

0 Feet 400



FIGURE 5
Locations of Fences and Signs



PHOTOGRAPH 1
RECON Crew Installing New Fence in Rice Canyon–March 2021



PHOTOGRAPH 2
RECON Crew Installing New Fence in Rice Canyon–
March 2021



PHOTOGRAPH 3
RECON Crew Attaching New Fence Lines in Rice Canyon–March 2021



PHOTOGRAPH 4
RECON Crew Repairing Existing Fence in Rice Canyon–April 2021



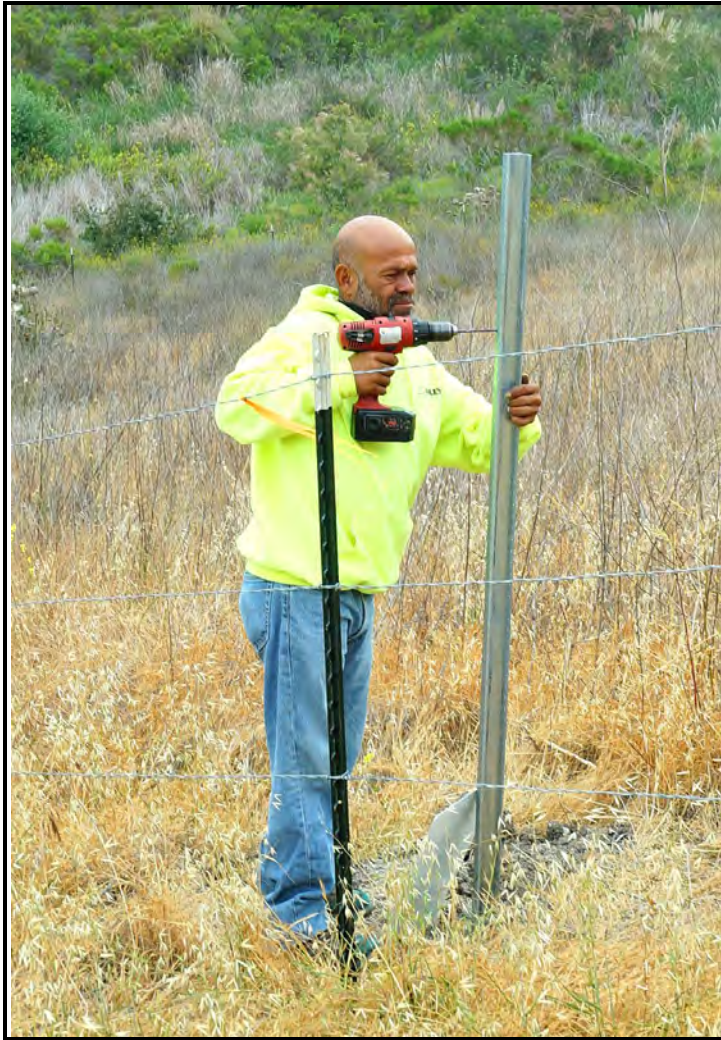
PHOTOGRAPH 5
RECON Crew Repairing Existing Fence in Rice Canyon–April 2021



PHOTOGRAPH 6
RECON Crew Installing New Signpost in
Rice Canyon–April 2021



PHOTOGRAPH 7
RECON Crew Cementing in New Signpost in
Rice Canyon–April 2021



PHOTOGRAPH 8
RECON Crew Drilling Holes to Attach New Sign in
Rice Canyon–May 2021



PHOTOGRAPH 9
RECON Crew Attaching New Sign in
Rice Canyon–May 2021



PHOTOGRAPH 10
New Replacement Sign Along Trail in Rice Canyon–
May 2021



PHOTOGRAPH 11

View of Former Trail Through Orcutt's Bird's-beak Population Closed by Shrub Growth—June 2021



PHOTOGRAPH 12

Newly Installed Fence Section South of the Orcutt's Bird's-beak Population—June 2021



PHOTOGRAPH 13
Protective Fence Installed by the City to Close Trail Adjacent to Orcutt's
Bird's-beak Population—June 2021



PHOTOGRAPH 14
Orcutt's Bird's-beak Growing in Rice Canyon—June 2021



PHOTOGRAPH 15
Newly Installed Fence Between the Unauthorized Trail and
Orcutt's Bird's-beak Population–June 2021



PHOTOGRAPH 16
Newly Installed Fence and Sign Adjacent to the
Orcutt's Bird's-beak Population–June 2021



PHOTOGRAPH 17
RECON Crew Preparing to Spray Pre-emergent
Herbicide to Control Stinknet Germination in Rice
Canyon–December 2020



PHOTOGRAPH 18
RECON Crew Spraying Pre-emergent Herbicide to Control Stinknet Germination in Rice Canyon–December 2020



PHOTOGRAPH 19
RECON Crew Spraying Pre-emergent Herbicide to Control Stinknet Germination in Rice Canyon–December 2020



PHOTOGRAPH 20
RECON Crew Follow-up Spraying Glyphosate Herbicide to Control Stinknet
in Rice Canyon–March 2021



PHOTOGRAPH 21
RECON Crew Follow-up Spraying Glyphosate Herbicide to Control Stinknet
in Rice Canyon–March 2021



PHOTOGRAPH 22

RECON Crew Follow-up Spraying Glyphosate Herbicide to Control Stinknet in Rice Canyon–March 2021



PHOTOGRAPH 23

A Single Individual Stinknet Plant Prior to Removal in Rice Canyon–May 2021

ATTACHMENT 2

Repeat Photo Points



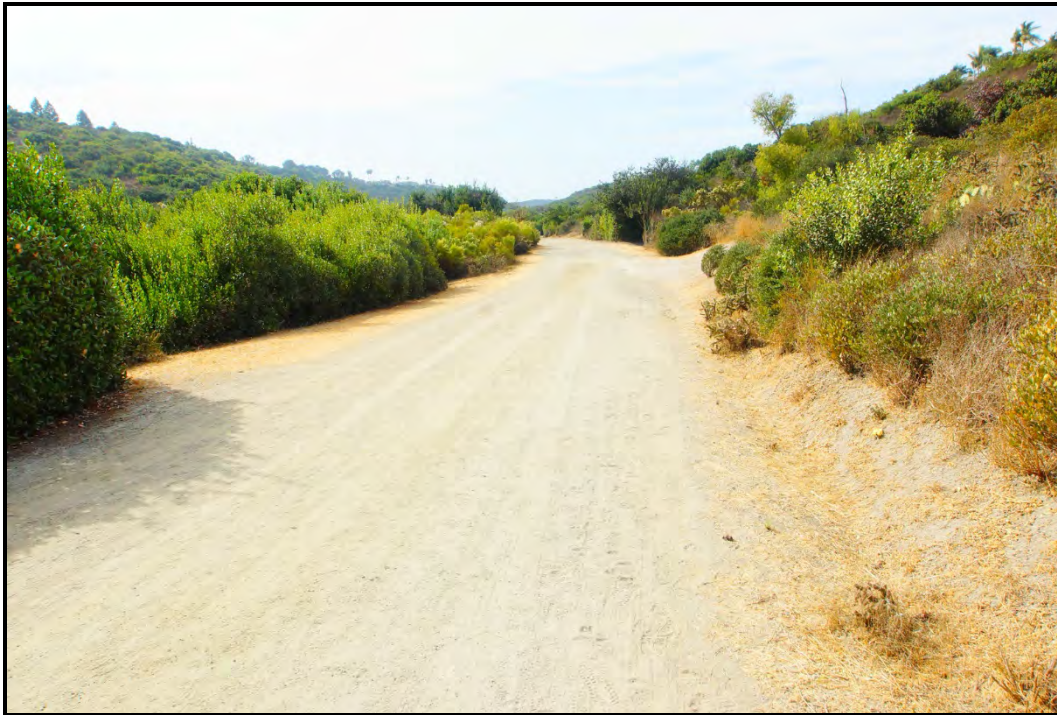
PP1 11.6.20

Photo Point 1 taken November 6, 2020–Rice Canyon Access Road



PP1 6.5.21

Photo Point 1 taken June 5, 2021–Rice Canyon Access Road



PP2 11.6.20

Photo Point 2 taken November 6, 2020—Rice Canyon Access Road



PP2 6.5.21

Photo Point 2 taken June 5, 2021—Rice Canyon Access Road



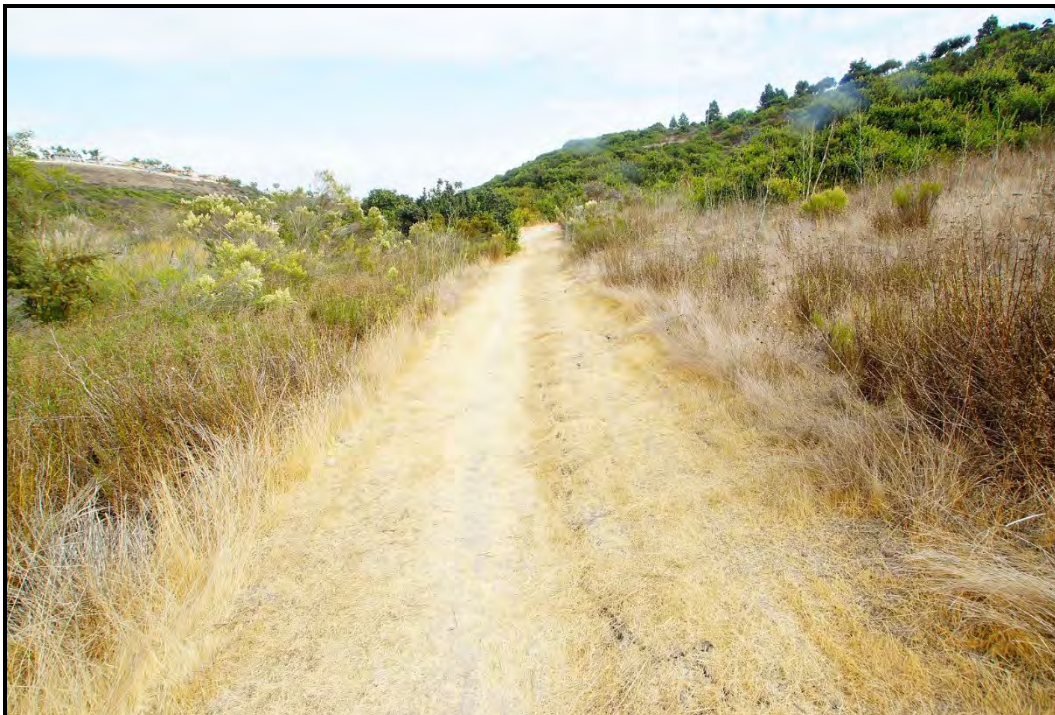
PP3 11.6.20

Photo Point 3 taken November 6, 2020–Rice Canyon Access Road



PP3 6.5.21

Photo Point 3 taken June 5, 2021–Rice Canyon Access Road



PP4 11.6.20

Photo Point 4 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



PP4 6.5.21

Photo Point 4 taken June 5, 2021–Rice Canyon Trail–Showing New Fence



PP5 11.6.20

Photo Point 5 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



PP5 6.5.21

Photo Point 5 taken June 5, 2021–Rice Canyon Trail–Showing New Fence



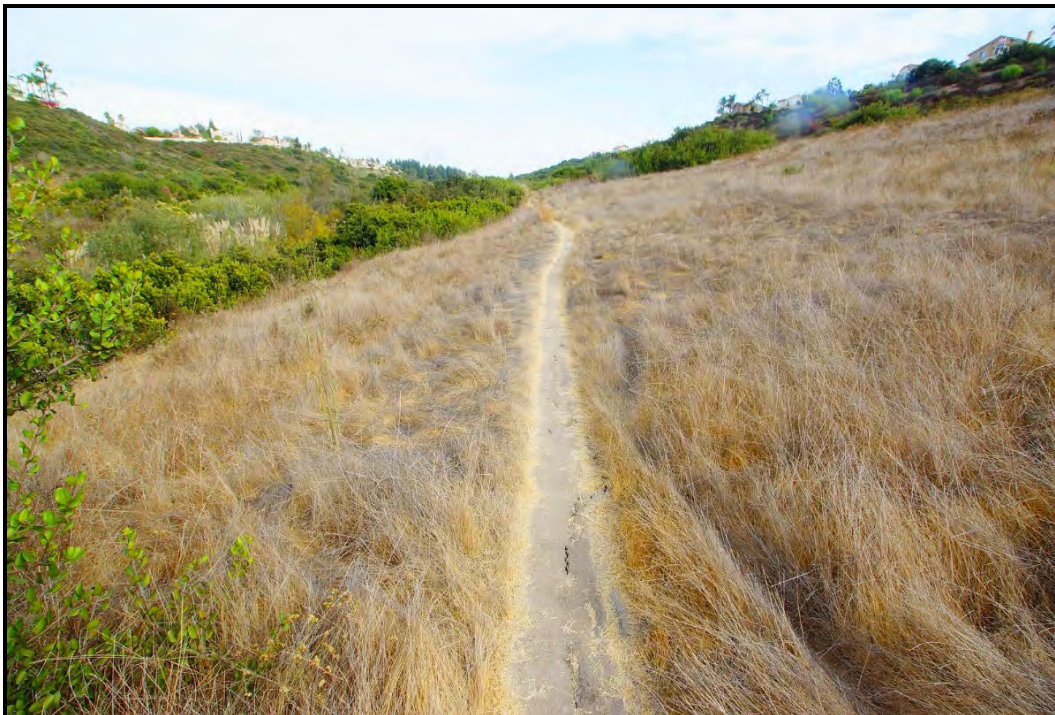
PP6 11.6.20

Photo Point 6 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Repair



PP6 6.5.21

Photo Point 6 taken June 5, 2021–Rice Canyon Trail–After Fence Repair



PP7 11.6.20

Photo Point 7 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



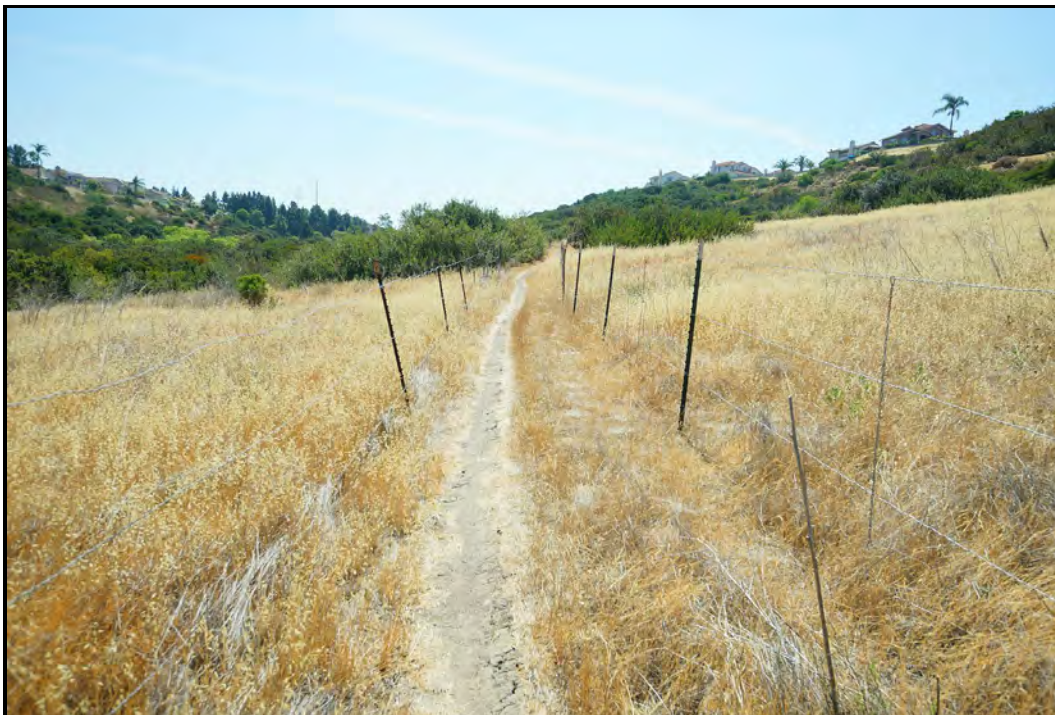
PP7 6.5.21

Photo Point 7 taken June 5, 2021–Rice Canyon Trail–Showing New Fence



PP8 11.6.20

Photo Point 8 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



PP8 6.5.21

Photo Point 8 taken June 5, 2021–Rice Canyon Trail–Showing New Fence



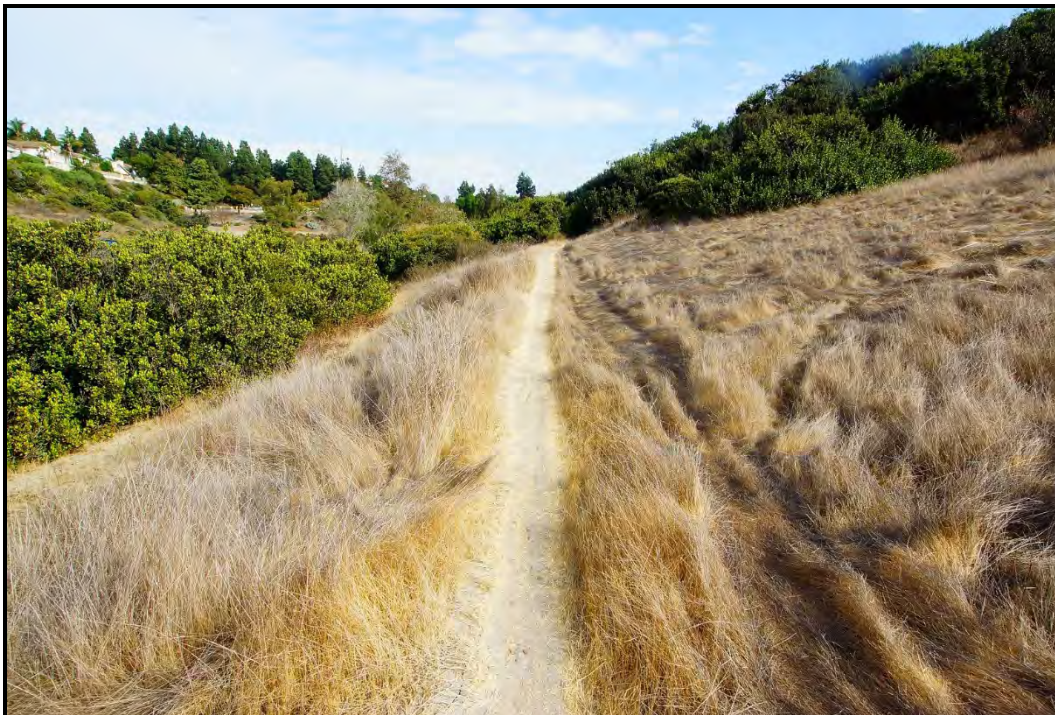
PP9 11.6.20

Photo Point 9 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



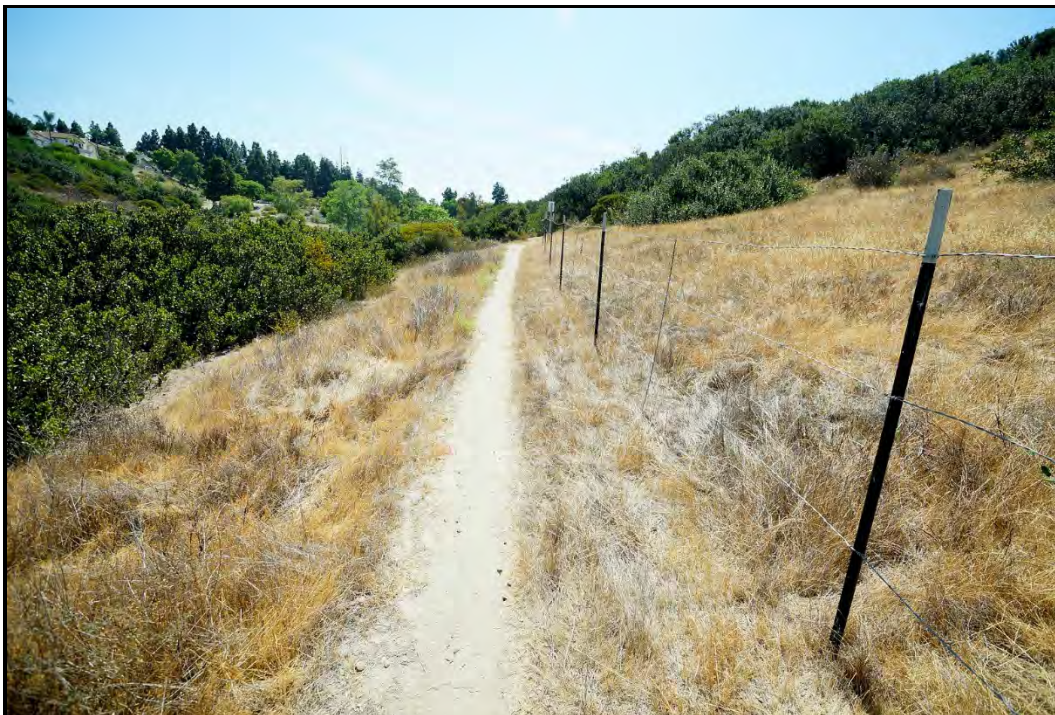
PP9 6.5.21

Photo Point 9 taken June 5, 2021–Rice Canyon Trail–Showing New Fence



PP10 11.6.20

Photo Point 10 taken November 6, 2020–Rice Canyon Trail–Prior to Fence Installation



PP10 6.5.21

Photo Point 10 taken June 5, 2021–Rice Canyon Trail–Showing New Fence