CNLM ANNUAL REPORT OF MANAGEMENT ACTIVITIES FOR THE 2017-2018 FISCAL YEAR

(October 1, 2017 – September 30, 2018)

DANA POINT PRESERVE (S033)

Owned and Managed by CNLM

Provided to:

U.S. Fish and Wildlife Service
Jonathan Snyder, jonathan_d_snyder@fws.gov,

California Department of Fish and Wildlife
Kyle Rice, Kyle.rice@wildlife.ca.gov

City of Dana Point
Jeff Rosaler, JRosaler@danapoint.org

Prepared by: Korie C. Merrill, M.S.; Preserve Manager, kmerrill@cnlm.org

Reviewed by: Deborah L. Rogers, PhD; Director of Conservation Science and Stewardship

Center for Natural Lands Management

Center for Natural Lands Management
27258 Via Industria, Suite B
Temecula, CA 92590
Phone: 760.731.7790
Web: www.cnlm.org

4 March 2019

TABLE OF CONTENTS

SUMMARY of 2017-18 ACTIVITIES

- Trail base and trail fencing maintenance activities were conducted
- Coastal California gnatcatcher (*Polioptila californica californica*) surveys were conducted
- Pacific pocket mice (*Perognathus longimembris pacificus*) were monitored using track-tubes
- Argentine ant (*Linepithema humile*) surveys were conducted
- Invasive exotic plant species removal was conducted
- Erosion control measures were implemented along the bluff edge
- Dead native perennial vegetation was thinned selectively
- CNLM rangers patrolled the Preserve to protect the habitat and educate visitors
- Visitors were provided with information about the Preserve
- Communications and coordination with the City of Dana Point continued
- Workplan and budget for 2018-19 activities were prepared
- A report on 2016-17 stewardship activities was prepared
- Revision of the Preserve Management Plan (Habitat Management and Monitoring Plan) was initiated

I. INTRODUCTION

The Dana Point Preserve (Preserve) is located in the City of Dana Point (City), Orange County, California. The Preserve has been owned and managed by the Center for Natural Lands Management (CNLM) since December 2005. The Preserve was part of the Headlands Development Project (Project), which was led by the Headlands Reserve, LLC. The Project is planned for 125 residential homes, a 65-to-90 room seaside inn, and public open space. The Project was guided by the "Headlands Development and Conservation Plan" (City of Dana Point, 2002; HDCP), which was approved through the California Coastal Commission's certification of the 2004 amendments to the City's Local Coastal Program.

The Preserve consists of 29.4 acres of native coastal sage and coastal bluff scrub habitat. Another 11.5 acres of natural open space owned and managed by the City, known as the Hilltop Park, are adjacent to the Preserve. URS Corporation prepared the initial Habitat Management and Monitoring Plan (HMMP) for Dana Point Headlands Biological Open Space for all preserve lands associated with the Project, including the CNLM-owned and -managed Preserve (URS 2005). The HMMP was reviewed by the California Coastal Commission, United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the City. However, we have no record that the final HMMP, dated April 18, 2005, was approved. Despite this uncertainty, CNLM has been managing the Dana Point Preserve according to the HMMP and will continue to do so until CNLM revises the management plan in consultation with the USFWS and CDFW (Wildlife Agencies) and other information sources. On January 4, 2012, CDFW responded via electronic mail message to CNLM that they are in agreement with CNLM managing the Preserve according to the HMMP until an updated Habitat Management and Monitoring Plan is prepared.

This document details the management activities which occurred during the 2018 Fiscal Year (FY) (October 1, 2017 - September 30, 2018). Four primary management objectives are identified in the HMMP:

1. Maintain the Preserve to permit ecological processes to function.
2. Contribute to the preservation and restoration of the endangered or threatened species and their habitats that are present on the Preserve.
3. Contribute to the preservation and restoration of non-listed sensitive species that contribute to biodiversity.
4. Develop a public awareness program that informs local residents and visitors of the sensitivity and ecological importance of the Preserve.

The tasks identified in the FY 2018 Annual Work Plan (CNLM 2018a) to serve these objectives were to:

- Enforce restrictions over general public access, through use of patrols and maintenance of trails, fences and signs.
- Initiate updates to the HMMP.
- Monitor a subset of vegetation transects for plant community monitoring.
- Track wildlife use of the Preserve.
- Conduct presence-absence monitoring of coastal California gnatcatcher.
- Monitor pacific pocket mice using track tubes.
- Conduct habitat maintenance activities to benefit PPM and CAGN.
- Install erosion control measures on the trail and bluff edge.
- Remove non-native plant species opportunistically throughout the Preserve.
- Continue the public outreach program, installation of interpretive signs, and educational opportunities within the Preserve, including collaborating with the City of Dana Point Natural Resources Protection Officer, Nature Interpretive Center (NIC) facilities, the City docents at the NIC, and the non-profit Friends of the Headlands.
- Provide opportunities for the public, as appropriate, to help in maintenance of the Preserve (trash removal, trail maintenance, non-native plant removal, etc.).
- Coordinate with the City regarding adjacent land use activities.
- Expand the GIS database as necessary and maintain all data.
- Record Preserve management and monitoring activities in an annual report and distribute to the Wildlife Agencies and City.
- Seek additional funding through donations to fund reconstruction of the public trail.
- Participate in professional events and communities that aim to increase and share science-based knowledge regarding PPM and CAGN, in particular.

II. CAPITAL IMPROVEMENTS

Enforce restrictions over general public access through use of patrols and maintenance of trails, fences, and signs

The CNLM Dana Point Preserve continues to be a regional attraction in Southern California, with high daily visitation rates for recreational use by both local residents and tourists. Although the exact number of visitors is unknown, the trail is used relentlessly throughout the year. Thus, the public trail, trail fencing, and perimeter fencing continued to require a substantial amount of CNLM staff time for maintenance throughout the year, such as replacing post caps, picking up trash, leveling out the trail, tightening fence cable slack, and installing new fence cable.

Cable fence repairs were conducted throughout the year as needed by CNLM staff. The Selva Road gate solar panel battery and circuit board were replaced. At the City of Dana Point Nature Interpretive Center (NIC) parking lot, two panels of the wrought-iron fence were replaced after a vehicle drove through the fence into the Preserve.

To better shield the trail base for winter rain, sand bags were again installed along the trail in the most erosive areas. CNLM continued to use the same filled monofilament sandbags used last year, in addition to newly purchased bags. Sandbags were all filled with loose native sand that accumulated on the trail or above grade adjacent to the trail. CNLM continued a policy of closing the trail to the public during rain events and for whatever length of time was required to repair the trail after such events. This year, one rain event required closure of the trail for three consecutive days.

Seek additional funding through grants and donations to fund reconstruction of the public trail

CNLM continued to receive donations via a donation box within the City of Dana Point's NIC for a trail reconstruction project. Donations were deposited into the appropriate CNLM account as per CNLM donation protocols.

III. BIOTIC SURVEYS

Monitor vegetation transects

Five transects (Figure 1) were monitored in 2018 that were previously monitored in 2006, 2009, and 2012 as part of CNLM's long-term coastal sage scrub (CSS) monitoring at the Preserve. Transects were 25m in length, with point-intercept data recorded every 0.5m for a total of 49 points per transect (starting at 0.5m ending at 24.5m). Each start and end point of the transect are marked by rebar stakes. Only shrub data were collected in 2006, whereas in 2009, 2012, and 2018 shrub, herbaceous plant, and ground cover data were collected. Point-line intercepts with a 2m belt transect were conducted on April 2018 by CNLM Preserve Managers Korie Merrill and Sarah Godfrey. Pictures of each transect were taken during the survey (see Appendix A for comparison photos between years 2012 and 2018).

A total of 15 plant species (all native) were recorded during monitoring, seven of which were only documented in belt transects. Notably, only two native forb species were recorded in 2018 monitoring, one individual California sun cup (*Camissoniopsis* bistorta; CAMBIS) was recorded in the belt transect of transect #4 and Ladies' tobacco (*Pseudognaphalium californicum*; *PSECAL*) in belt transects along transect #1 and #4. No nonnative species were documented along the five transects. The most common shrub recorded on all five transects was California buckwheat (*Eriogonum fasciculatum*; ERIFAS) with a percent cover mean of 24.29% standard error (SE) ±0.08. California croton (*Croton californicus*; CROCAL) was recorded on 3 of the 5 transects with a percent cover mean of 5.31% SE ±0.02. Bare ground cover across all five transects was 21.22% SE ±0.08 and leaf litter was 78.78% SE ±0.08, no other ground cover was recorded (i.e., persistent litter or lichen).

The total precipitation for the Preserve in FY 17-18 was 2.8" (John Wayne Airport Station, National Weather Service 2019), approximately 1/5 of average rainfall (12.5" average over 88 years). This low precipitation total likely accounts for the lack of annual forbs during this monitoring period; however, the Preserve Manager did note an increase of PSECAL later in the year (June-July) that was not reflected in the recorded transects.

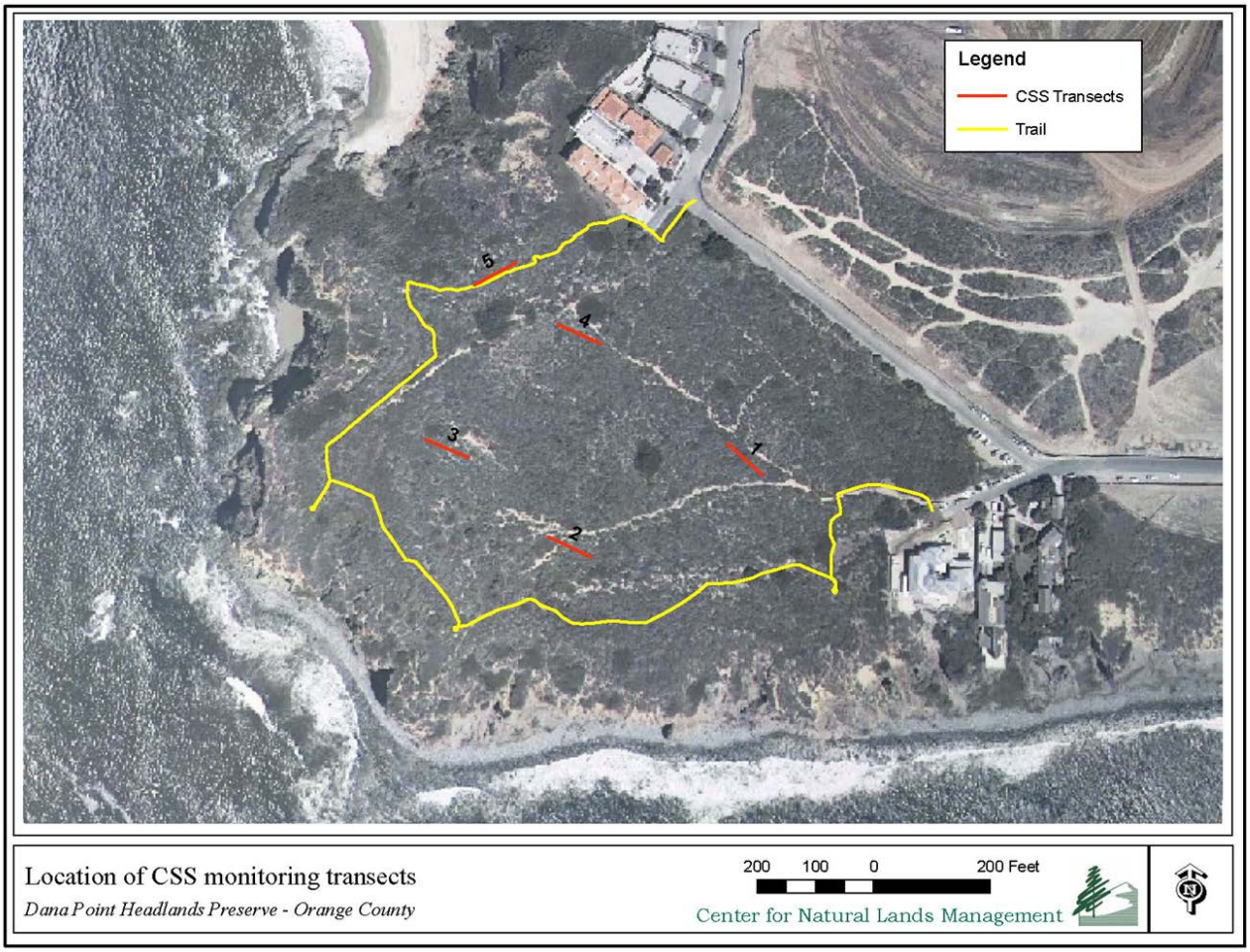

Figure 1. Location of CSS transects.

Monitor rare plants

The HMMP recommends that rare or sensitive annuals and herbaceous perennial plants be monitored during the spring season after the area experiences an annual rainy season that exceeds 75% of the long-term average annual precipitation (URS 2005). This will allow for an unbiased assessment of the population status under comparable weather conditions between monitoring years. Substantially lower than average rainfall in 2013-2016 and 2018 and such surveying for rare plants on the Preserve was not conducted, outside of the transects described above.

Conduct presence-absence monitoring of coastal California gnatcatcher

Monitoring for coastal California gnatcatchers (*Polioptila californica californica*; CAGN) typically is conducted annually on the Preserve both to track presence of this threatened species and to be aware of spatio-temporal use of the Preserve so as to ensure management activities do not result in harassment of CAGN particularly during their nesting season, generally 15 February – 15 September.

Surveys were conducted by CNLM Preserve Manager Kim Klementowski, who is authorized to conduct survey activities under CNLM's TE Recovery Permit 221411-5. Ms. Klementowski was accompanied at various times by CNLM Preserve Manager, Korie Merrill; CNLM Land Steward, Kiran Stacy; CNLM volunteer, Michelle Castellon; and City of Dana Point Natural Resources Protection Officer, Bernice Villanueva, all of whom are working to acquire supervised CAGN survey hours. The Preserve was surveyed four times by Ms. Klementowski February - May 2018 (Table 1). Suitable gnatcatcher nesting habitat was surveyed for presence/absence throughout the entire Preserve area according to the USFWS protocols. One exception to the protocols was made when starting slightly before 0700 hours, or finishing slightly after 1200, when weather permitted. At least two (2) passes were conducted in areas where gnatcatchers were not documented and in areas where pairs were not confirmed. All areas resurveyed were conducted at least seven (7) days from the last visit to the same area. All CAGN observations were mapped (Figure 2).

Past population numbers have ranged from a minimum of three pairs (2006 and 2007) to maximum of seven pairs (2012-2014). In FY 2018, a total of seven observations were documented, of which all CAGN observations were documented as breeding pairs. Thus, based on these surveys, the CAGN breeding population is estimated to be at least seven breeding pairs (Figure 2). One nesting pair (CAGN 07) was observed nesting immediately off the established trail and was observed actively sitting on the nest. Once this nest was recorded, that section of trail was closed to public access to protect the nest; however, shortly after the trail was temporarily closed, the CAGN ceased to be sitting on the nest. As such, it was assumed that the pair failed to produce offspring. Another pair (CAGN 05) was never completely observed alone as a pair (due to multiple interactions with other pairs and individuals); however, on the last survey day, the male was observed actively flying in and out of one sagebrush shrub, thus it is assumed he was paired and feeding.

Table 1. California Gnatcatcher Survey Dates, Times and Weather Conditions.

Date	Time	Weather Conditions	Results
28-February-2018	0659-1155	46-55° F, 0% cloud cover, 5-9 mph wind	• CAGN 01 – single male • CAGN 02 – pair • CAGN 03 – pair • CAGN 04 – pair • CAGN 05 – two single males, one single female, one pair nearby (called CAGN 05b then later renamed CAGN 07) • CAGN 06 – one single male, two single females
19-March-2018	0655-1230	52-62° F, 10-25% cloud cover (marine	• CAGN 01 – pair • CAGN 02 – pair • CAGN 03 – male, interacting with CAGN 04 • CAGN 04 – pair, interacting with CAGN 03 male • CAGN 06 – pair, interacting with CAGN 07 (formerly CAGN 05b) • CAGN 07 – pair, interacting with CAGN 06
06-April-2018	0652-1240	55-61° F, 10-25% cloud cover, 1-5 mph wind	• CAGN 01 – pair • CAGN 02 – pair • CAGN 03 – pair plus one male (likely CAGN 04) interacting • CAGN 04 – pair plus one male (likely CAGN 03) interacting • CAGN 05 – two pairs, potentially interaction with CAGN 02 given direction of flight away • CAGN 06 – pair, nest building
08-May-2018	0645-1245	57-70° F, 100% cloud cover (marine layer), 2-3 mph wind	• CAGN 01 – pair • CAGN 02 – pair • CAGN 03 – male interacting with CAGN 04 • CAGN 04 – pair, interacting with CAGN 03 male • CAGN 05 – male, actively in/out of one sagebrush shrub, suspect pair nesting • CAGN 06 – pair • CAGN 07 – pair, nest right on side of trail

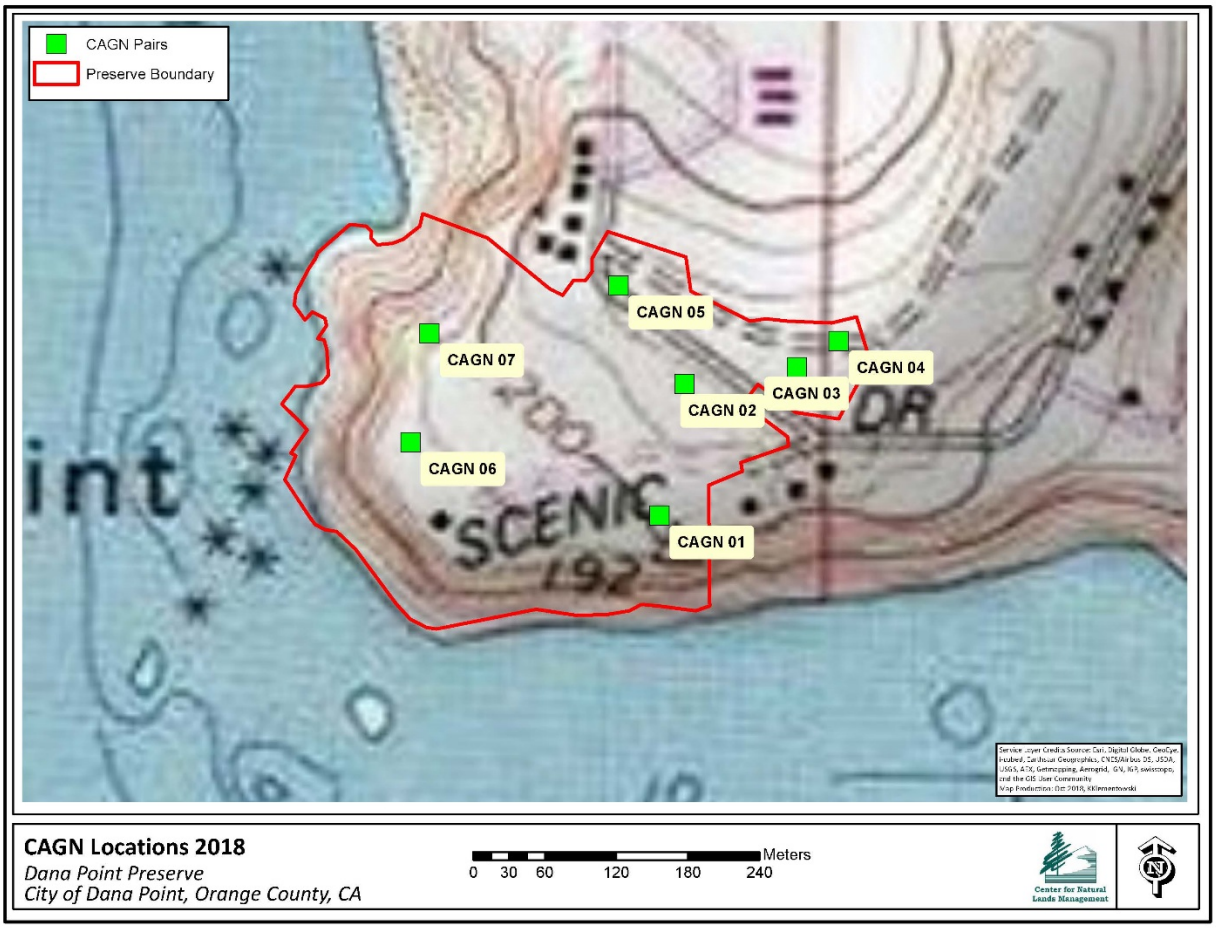

Figure 2. California Gnatcatcher Pair Locations in 2018.

Potential impacts to the resident CAGN pairs continue due to indirect effects from people on the trail, a potential increase in predators due to increased human use of the area, and direct impacts to nesting birds from trail users who do not follow the rules and either go off-trail on foot or bring their dog(s) on the Preserve. A continued presence by the Preserve Manager, Rangers, and NIC City staff and docents is utilized to ensure Preserve visitors follow the trail rules as much as possible. However, even when the trail was closed, trail visitors went over, around, and through barriers in place to protect the CAGN nest adjacent to the trail. In addition, increasing declaration by trail visitors of dogs as being 'companion animals' has complicated CNLM staff's ability to prohibit dogs from being brought onto trails. Staff are investigating laws and provisions for controlling this potential abuse of or extension to the 'service dog' exception to dogs being prohibited onsite.

Monitor Pacific pocket mice

Pacific Pocket Mouse (PPM; *Perognathus longimembris pacificus*) monitoring is typically conducted annually on the Preserve both to track presence of this endangered species and to be aware of spatio-temporal use of the Preserve to ensure management activities

do not result in harassment or take of PPM. Species surveys not only provide information on the status of the local population(s) but can be an indirect indicator of habitat suitability for those species. For animal species, any survey method is an estimate, being based on a sample of the local population. Track-tube surveys have been used successfully for monitoring PPM (Brehme et al. 2014)—providing information on presence/absence, areas occupied, and—depending on survey design—some phenological and demographic data. This information will be valuable in determining any trends in populations that may be important for the long-term management of our preserve, and in aiding the larger conservation community in determining regional trends.

Track-tube surveys were conducted by Preserve Manager, Korie C. Merrill, assisted with PPM track-tube monitoring under supervision by CNLM Preserve Manager, Sarah Godfrey, who is authorized to conduct survey activities under CNLM's TE Recovery Permit 221411-5, and California Department of Fish and Wildlife Scientific Collecting Permit SC-13146. Other volunteers who helped with the 2018 track-tube surveys are: Bernice Villanueva (City of Dana Point), Cheryl Brehme (USGS), Devin Adsit-Morris (USGS), Dave Erickson (former CNLM Preserve Manager), Kathy Baumberger (USGS), Emma Havstad (San Elijo Lagoon Conservancy), Michelle Castellon (CNLM Volunteer Intern), Kiran Stacy (CNLM), Kim Klementowski (CNLM), Will Miller (USFWS), and Tritia Masuda (USGS). All track cards were reviewed by Korie Merrill, supervised by Sarah Godfrey, and any cards with questionable PPM prints were also reviewed by Devin Adist-Morris, Tristan Edgarian (USGS), or Cheryl Brehme for a definitive identification.

Monitoring was conducted via track tubes with a two-part study design:

a) An initial study – to determine when the PPM were active above ground and to serve as a trigger for a more comprehensive sampling effort.
b) Site-wide survey – to determine PPM activity over the entire Preserve.

Initial Survey:

An initial activity survey was conducted from March 5 to May 15, 2018. Track-tube monitoring was conducted within a subset of cells (E4, E5, H13, I13, C18, D18, C10, E8, D8, C8, C9, and C10) in the Preserve. A total of 30 track-tubes were deployed, spaced approximately 24 meters apart within each grid cell. Every three days the track-tubes were checked and the track cards with prints were removed and labeled on the back with the date and the unique grid cell location and the track cards were replaced with clean cards. Any prints on the track cards were identified by Sarah Godfrey and Korie Merrill. Any questionable prints were also reviewed by Devin Adist-Morris, Tristan Edgarian, or Cheryl Brehme for a definitive identification. Little disturbance of track-tubes was recorded during this survey. The bait used was 100 percent millet that was treated in a microwave for two minutes prior to use to render the seed unviable.

On May 15, 2018, the initial survey was discontinued; the track-tubes were removed by Sarah Godfrey and Korie Merrill to prepare for the site-wide survey.

Site-wide Survey:
Phase 1: To repeat sampling methods used in previous years, the entire Preserve was sampled with one track-tube located at the center of a 24m^2 grid cell. Each track-tube was set in the nearest suitable location within 5 meters of the flagged GPS position of the center point of each grid cell. The track-tubes were baited with sterile millet.

On June 1, 2018, 125 track tubes were deployed across the Preserve by Korie Merrill and Sarah Godfrey with volunteer help from Kim Klementowski, Kiran Stacy, Dave Erickson, and Emma Havstad. Two grid cells (A11 and G4) were removed from sampling due to active gnatcatcher nests in the center of the grid cells. During this survey period, track cards were reset every 3-4 days for a total of 8 data sets. The track cards were removed at the end of the survey on June 29, 2018 by Sarah Godfrey and Korie Merrill with the help of Michelle Castellon and Bernice Villanueva.

During this phase of monitoring there was a high number of track-tubes moved, flipped and/or base cards pulled out and destroyed by non-target wildlife (Figure 3). Throughout this phase different techniques to secure the track-tubes were implemented but none were effective. Techniques to secure base cards inside the tubes included adding stronger magnets and modifying the tube ends with 1" PVC, reducing the size of the entrance and prevent larger mammals from pulling the cards out. Techniques to secure the track-tubes themselves, included using a 6" garden staple to secure the track-tube to the soil followed by adding multiple garden staples, typically 3 were used, and in one case rocks were piled on the track-tube put it was still pulled out and flipped. These techniques did not deter track-tube disturbances. As a result, few track-cards had any small mammal prints or were readable, of which only one grid cell (E-08) had PPM prints detected during phase 1 monitoring. Due to the high frequency of disturbance, we decided to extend the site-wide survey with an additional modification to the sampling design (focusing on the area with PPM) and methods (modified track-tubes).

Phase 2: This phase was undertaken to address issues experienced in phase I, modifying sampling design and methods, as indicated above. We decided to conduct this intensive survey for a two-week period. On July 15, 2018, 105 tubes were set on the Dana Point Preserve, spaced every 12m concentrating around grid E08, where PPM were detected during Phase 1. Volunteers from USGS helped with the deployment and modification of the track-tube design to reduce the likelihood of disturbance from California ground squirrels (*Spermophilus beecheyi*). The modification made was using longer base cards that were clipped to the wood base of the track-tube with binder clips; making it more difficult to remove the card (Figure 4). This modification also made the tube entrance slightly smaller, so ground squirrels couldn't stick their heads into the track-tubes. Of the 105 track-tubes, every-other one (52 total) were small track tubes (1" rather than 1.5" diameter) with binder clips. During this survey, track cards were reset twice, for a total of three datasets (Table 2). The grid cells surveyed were: D06, D07, D08, D09, D10, D11, D12, C06, C07, C08, C09, C10, C11, E10, E09, E08, and E07 (Figure 5). The track cards and track-tubes were collected and removed on July 27, 2018 by Korie Merrill, Cheryl Brehme, Devin Adist-Morris, and Kiran Stacy.

Phase 3: Methods tested in Phase 2 were implemented on July 27, 2018, with 127 track tubes set across the Dana Point Preserve spaced 24m apart for a second full-site survey. Similar to Phase 2, track-tubes were modified from the previous site-wide survey to use longer base cards and binder clips to reduce the continued disturbance of track-tubes by ground squirrels. Every seven days, the track cards were removed from each track tube and labeled on the back with the date and the unique grid cell location for four datasets (Table 2). The track cards were removed at the end of the survey on August 23, 2018 with the help of Sarah Godfrey, Korie Merrill, and Bernice Villanueva.

Results

There were no significant rain events during the 2018 PPM survey. In addition to PPM, other species recorded on track-cards were harvest mouse (*Reithrodontomys megalotis*; REME) and deer mouse (*Peromyscus maniculatus*; PEMA). California ground squirrels commonly disturbed track-tubes during the first site-wide survey (Phase 1) but after modifications to the track tubes with binder clips, that problem was minor with only a few track-tubes flipped during Phases 2 and 3 of monitoring.

Initial Survey:
No PPM were detected during the initial survey focused on a small (~9%) area of the Preserve (Table 2). Nevertheless, it was decided to deploy track tubes for a full-site survey in June (after consultation with Cheryl Brehme); since PPM were active above ground at Camp Pendleton at that time, it was likely that PPM were active at Dana Point Preserve at that time as well, but we were not detecting them in our selected grid cells.

Site-wide Surveys:
Phase 1: Only one grid cell had PPM prints, E08. A total of seven cards had PPM prints (Table 2). On average during Survey 1, 43% of the track cards were pulled out of their respective track-tube or the track-tubes were displaced from flipping or dragging; the range of disturbance was 5%-75%. California ground squirrels were documented moving track-tubes through using wildlife cameras (Figure 3).

Phase 2: A total of 67 track cards were identified with PPM prints during the Intensive Survey (Table 2, Figure 5). During this survey the amount of disturbance was close to zero.

Phase 3: A total of 53 track cards were identified with PPM prints with a range of 12 to 15 per sampling dataset in Survey 2 (Table 2). Other species recorded were REME and PEMA. During this survey the amount of disturbance from ground squirrels was close to zero.

In addition to confirming PPM presence on the Preserve, track tube data can also be useful in estimating habitat use (Brehme et al. 2014; Wilkinson et al. 2012). For this purpose, we used the Occupancy Estimation function in Program MARK (White and Burnham 1999) and applied the single season, single species (MacKenzie et al. 2002, MacKenzie et al. 2006) to track tube data collected at each sampled grid cell or "site." This analysis pools individual animal capture records within each site by capture occasion to estimate the proportion of sites occupied or used (Ψ) by the target species. The data were analyzed using the single season time dependent model [p(t), psi(.)] with a constant capture probability among survey occasions. Missing track cards were assumed to be a zero detection of PPM in the model. The 2018 model averaged habitat use estimate as 23.5 percent (95%C.I. 16.4 - 32.5%). The Program MARK results suggest a slightly higher use estimate than the naïve estimate of 21.3%. Spatial distribution of PPM is shown in Figure 6.

If the average PPM use area is less than 24 meters, each track tube with PPM presence recorded could be assumed to represent a unique individual. With that assumption, between 12 and 27 unique PPM would be estimated conservatively. However, each track tube could conversely represent more than one PPM.

Figure 3. Examples of track-tube disturbance during 2018 phase 1 of monitoring.

Figure 4. Binder clips placed at the end of the tubes secured base cards and limited disturbance.

Table 2. Number of track-tubes with PPM detected during each monitoring round.

	Design	Date (2018)	Track-tubes w/ PPM	Comments
Initial Survey	30 track-tubes deployed	6-Mar	0	Track-tubes spaced 12m apart in 3 areas of the Preserve
		7-Mar	0	
		8-Mar	0	
		12-Mar	0	
		15-Mar	0	
		19-Mar	0	
		22-Mar	0	
		26-Mar	0	
		30-Mar	0	
		2-Apr	0	
		6-Apr	0	
		9-Apr	0	
		12-Apr	0	
		16-Apr	0	
		19-Apr	0	
		24-Apr	0	
		3-May	0	
		10-May	0	
		12-May	0	
		15-May	0	
Phase 1	125 track-tubes deployed	5-Jun	0	High rate of disturbance, track-tubes spaced 24m apart
		8-Jun	1	
		12-Jun	1	
		15-Jun	1	
		19-Jun	1	
		22-Jun	1	
		26-Jun	1	
		29-Jun	1	
Phase 2	105 track-tubes deployed	19-Jul	23	Modified track-tubes spaced 12m apart
		24-Jul	19	
		27-Jul	25	
Phase 3	127 track-tubes deployed	3-Aug	12	Modified track-tubes spaced 24m apart
		10-Aug	12	
		17-Aug	15	
		24-Aug	14	

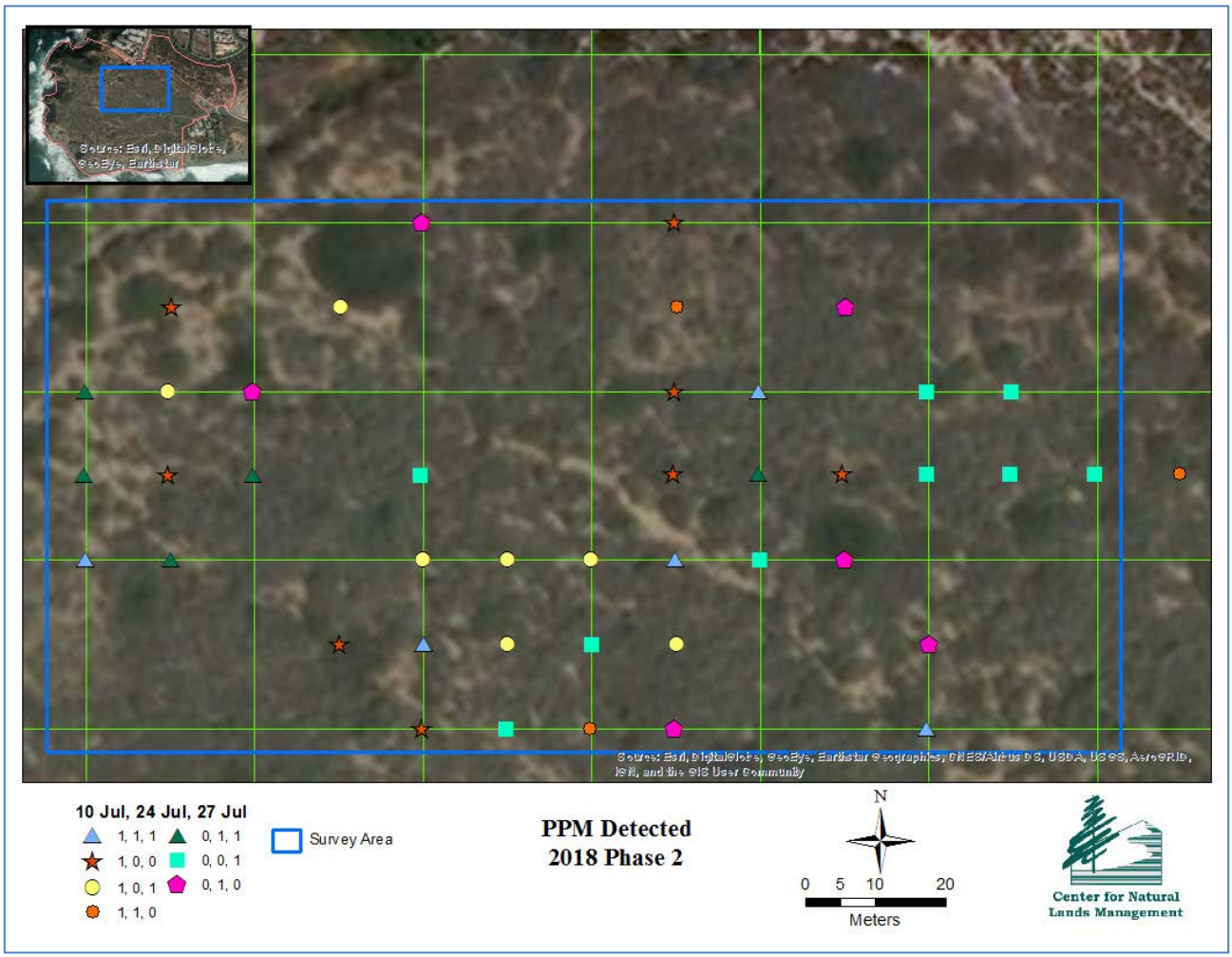

Figure 5. PPM detection during Phase 3 monitoring (July 27 – August 23, 2018).

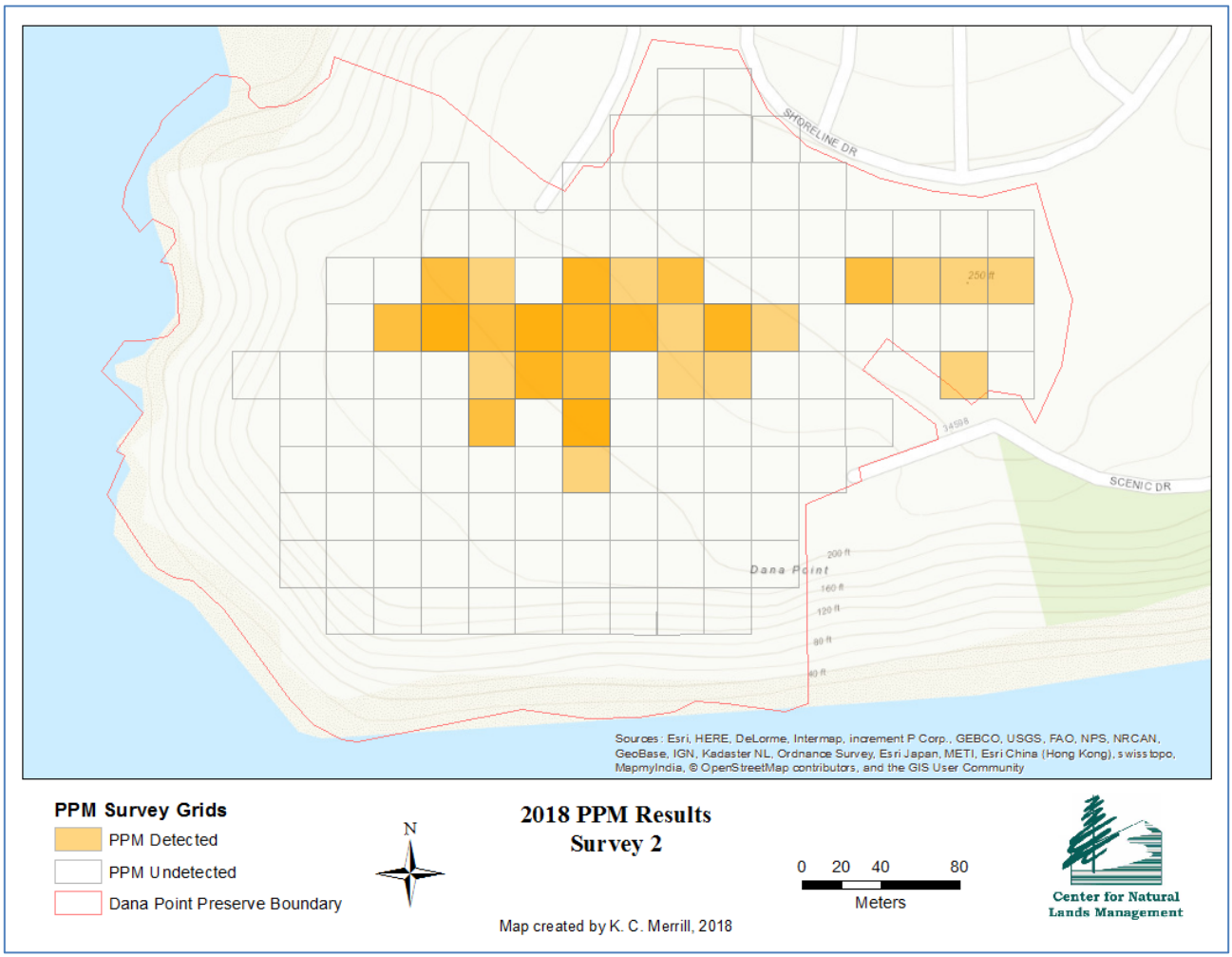

Figure 6. 2018 PPM Locations. Grids cells with PPM detected using track-tubes are shaded in orange. The darker the shade, the higher frequency PPM were detected in that grid cell.

Small mammal populations often exhibit considerable temporal and spatial variability, perhaps particularly those in arid environments (Thibault et al. 2010). It is likely that PPM populations generally do well in years of drought and low rainfall. However, even this generalization must be interpreted within the context of cumulative drought events (e.g., too many consecutive drought years or extreme drought events may result in insufficient food availability) and vegetation dynamics. Plant species composition and spatial pattern affect PPM in terms of food availability, cover from predators, cover from unnatural light, intraspecific communications, moderators of microclimate, and other direct and indirect effects. Further, optimum vegetation composition, pattern, and coverage relative to bare ground, depends on context (e.g., ability of PPM to move, even occasionally to offsite areas), edge effects, and the relationship between vegetation and competitors, predators, or both. The complicated interactions among vegetation, climate, and PPM response suggests caution in interpretation of limited studies. Although confounded by differences in methods (track tube versus live traps), trapping effort, and monitoring season, monitoring efforts on the Preserve do show considerable temporal fluctuation since trapping began in

1992 (Table 3), both before and after the property was restricted for conservation purpose. Similar to the complications in detecting trends in PPM presence, the influences on PPM are multiple, cumulative, and mutually interactive.

Table 3. Historical PPM results.

Year	PPM Monitoring Type	Trap Effort (trap/tube nights)	PPM (Individual)	PPM (Naïve Occupancy)
1992-93	Sherman traps	648	25-36	na
1995-96	Sherman traps	815	8	na
1996-97	Sherman traps	2782	21	na
1997-98	Sherman traps	3325	19	na
1998-99	Sherman traps	3710	11	na
1999-2000	Sherman traps	3080	6	na
2000-01	Sherman traps	4835	4	na
2005	Preserve created December 2005			
2006-07	Sherman traps	925	1	na
2007-08	Sherman traps	3280	30	na
2008-09	Sherman traps	3362	82	na
2010-11	track tube	7088	na	42.8%
2011-12	Sherman traps	3330	57	na
2011-12	track tube	1776	na	94.0%
2012-13	track tube	1890	na	51.6%
2013-14	track tube	1500	na	80.0%
2015-16	track tube	4030	na	70.7%
2016-17	Sherman traps	2286	6	na
2017-18	Track tube	na	na	23.0%

Maintain an inventory of flora and fauna

No newly recognized taxa of flora were recorded on the Preserve in FY 2018. The total number of plant species having been recorded as occurring on the Preserve is 166, of which 105 are native.

Wildlife monitoring activities included scat and print identification opportunistically by CNLM staff and the continued use of infrared cameras (Bushnell Scout®) located throughout the Preserve (Table 4 and Figure 7). Two new wildlife taxa for the Preserve were recorded with wildlife cameras: a mallard duck (*Anas platyrhynchos)* and a barn owl (*Tyto alba*); the list of animals that have been observed on the Preserve since 2006 consists of 26 invertebrate taxa, 115 bird taxa, 11 amphibian and reptile taxa, and 21 mammal taxa excluding service dogs and domestic cats.

Notable predators recorded in FY2018 were: bobcat (*Lynx rufus*), coyote (Canis latrans), California kingsnake (Lampropeltis *getula californiae*), San Diego gopher snake (*Pituophis*

catenifer annectens), raccoon (*Procyon lotor*), barn owl, domestic cat (*Felis catus*) and Peregrine falcons (*Falco peregrinus*) which were observed nesting on the Preserve and had two chicks successfully fledge. This was the third year in a row that both a domestic cat and trespassers were captured by the wildlife cameras within the Preserve, the latter being more frequent than the former.

Figure 7. Examples of wildlife captured using cameras: A) domestic cat, B) bobcat, C) barn owl, and D) mallard duck.

Table 4. Species Documented by Wildlife Cameras in FY 2018.

Common Name	**Latin Name**
Western Harvest Mouse	*Reithrodontomys megalotis*
CA Thrasher	*Toxostoma redivivum*
Roadrunner	*Geococcyx californianus*
Coyote	*Canis latrans*
Bobcat	*Lynx rufus*
Ground Squirrel	*Otospermophilus beecheyi*
Desert Woodrat	*Neotoma lepida*
Pacific Pocket Mouse	*Perognathus longimembris pacificus*
Domestic cat	*Felis catus*
Common Poorwill	*Phalaenoptilus nuttallii*
Barn owl	*Tyto albus*
Mallard Duck	*Anas platyrhynchos*

Conduct ant surveys

Argentine ant (*Linepithema humile*) monitoring was conducted in August 2018 during expected peak ant activity. Due to the cryptic nature of Argentine ants, it is important to conduct Argentine ant monitoring during daily (in the morning or afternoon when temperatures are within the rage of 65F-80F) and seasonal peak activity (late summer) to reduce the likelihood of false negatives when determining presence of the species. Monitoring protocols followed previous efforts (CNLM 2018b) by placing an attractant (¼ of a Sandies ® Pecan cookie) on an index card (together referred to as "bait cards") near the middle of 130 previously established 24m^2 monitoring grids in the best suitable habitat for Argentine ants—typically at the base of a shrub (i.e. *Eriogonoum fasiculatum*) or sub-shrub (i.e., *Croton californica*). The bait cards were left in the field for 30- 45 minutes before being reviewed by CNLM Preserve Manager K. Merrill. A photo was taken of each bait card at the time of review; these photos are saved on CNLM's cloud server. The number of Argentine ants on and under the bait card was estimated and then grouped into four categories: 0, 1-50, 51-100 and more than 100 individual Argentine ants.

Results from the August survey show high Argentine ant activity at the Preserve with 81.54% of monitoring grids having ant activity greater than 100 individuals recorded (Figure 8).

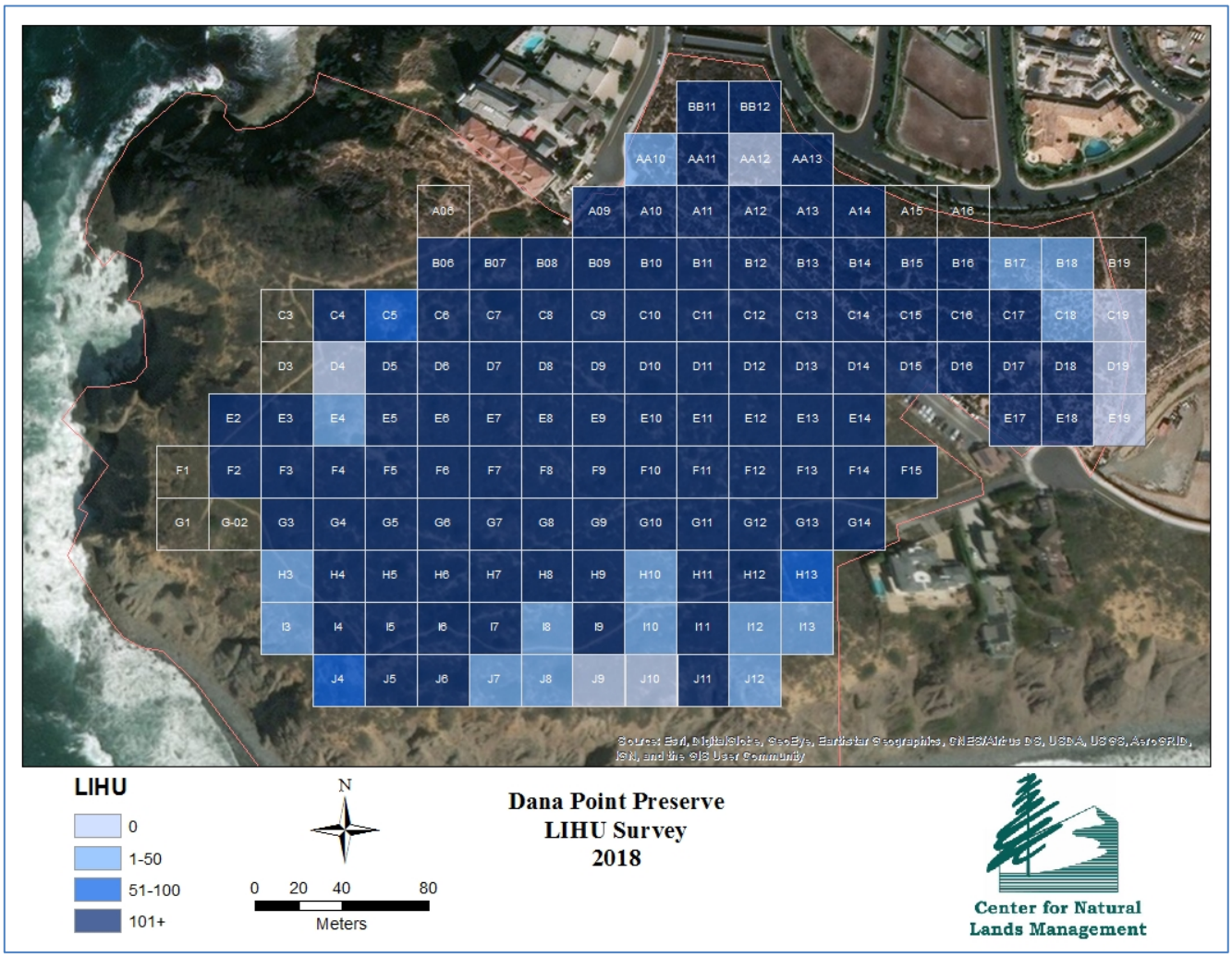

Figure 8. Argentine ant survey results 2018.

IV. HABITAT MAINTENANCE AND RESTORATION

Remove non-native plant species opportunistically

CNLM staff opportunistically removed individuals of four non-native plant species during FY18: bridal creeper (*Asparagus asparagoides*), tree tobacco (*Nicotiana glauca*), yellow star-thistle (*Centaurea solstitialis*), and black mustard (*Brassica nigra*). Plants were removed by hand without the use of herbicide, bagged, and removed off site to prevent further spread of propagules. All activities were conducted with the supervision of the Preserve Manager to minimize any negative affects to PPM and CAGN by avoiding nesting areas, and surveying for and avoiding PPM burrows prior to pulling plants. One area of bridal creeper was treated with 1 oz of 4% Round Up Pro Max© (active ingredient glyphosate) by the Preserve Manager on 10 May 2018.

Install erosion control measures on the bluff edge

Since 2011, CNLM has been using straw wattles to slow water flowing downhill in the exposed areas and gullies on the bluff edges which are above rare plant populations. CNLM has also been using dead vegetation and duff cleared from grid cells as erosion control materials in these same areas. In addition to erosion caused by rain, trespassers walking and sitting on the bluff edges continue to prevent vegetation from growing in these areas. Thus, prickly pear (*Opuntia littoralis*) propagules were planted along the bluff edge to stabilize the edges as well as deter people from walking off-trail.

Conduct habitat maintenance activities to benefit the Pacific pocket mouse

To reduce accumulated duff and increase bare soil for PPM use within the Preserve, CNLM continued to conduct duff and vegetation removal treatment in specifically identified areas. This FY (2017-18) was the fifth consecutive year that staff had conducted a focused vegetation removal effort (Figure 9). Leaf litter, woody debris, and other organic material collectively referred to here as duff has accumulated under the mature Coastal Sage Scrub vegetation throughout the Preserve. Although a positive statistically significant treatment effect on PPM has not been shown, duff and dead shrub removal have been effective at increasing openness and not shown to be harmful to PPM within certain conditions (Brehme et al. 2014).

It is important to note that vegetation treatment, given the context of habitat for listed species—PPM and CAGN—is not simple and must be done with caution. Not just the activity of picking up duff and dead shrubs, but the location, process, and manner in which the material is hauled off must be considered. Due to the significant number of hours required to complete dead shrub and duff removal of one 24 square meter grid cell (23 hours by one person), contractors were hired to complete the task and supervised by the Preserve Manager. The workload associated with duff and dead shrub removal is substantial. It also requires careful action. Areas cleared were selected based on the following criteria: 1) No grid cells on the bluff edge; 2) No grid cells in the former roadbed or north of the roadbed; and 3) No grid cells that had PPM present in the last two years. The area cleared in FY 2018 was flagged out by the Preserve Manager and surveyed for potential PPM burrows, if anything resembling a burrow was found it was marked with red pin flags and contractors avoided the area. The duff and dead shrub removal treatment increases the amount of openness of the Preserve substantially. Although this has not been further quantified by CCS transect data or inferred from imagery, visual estimates suggest 30-70% more openness after treatment (Figure 10).

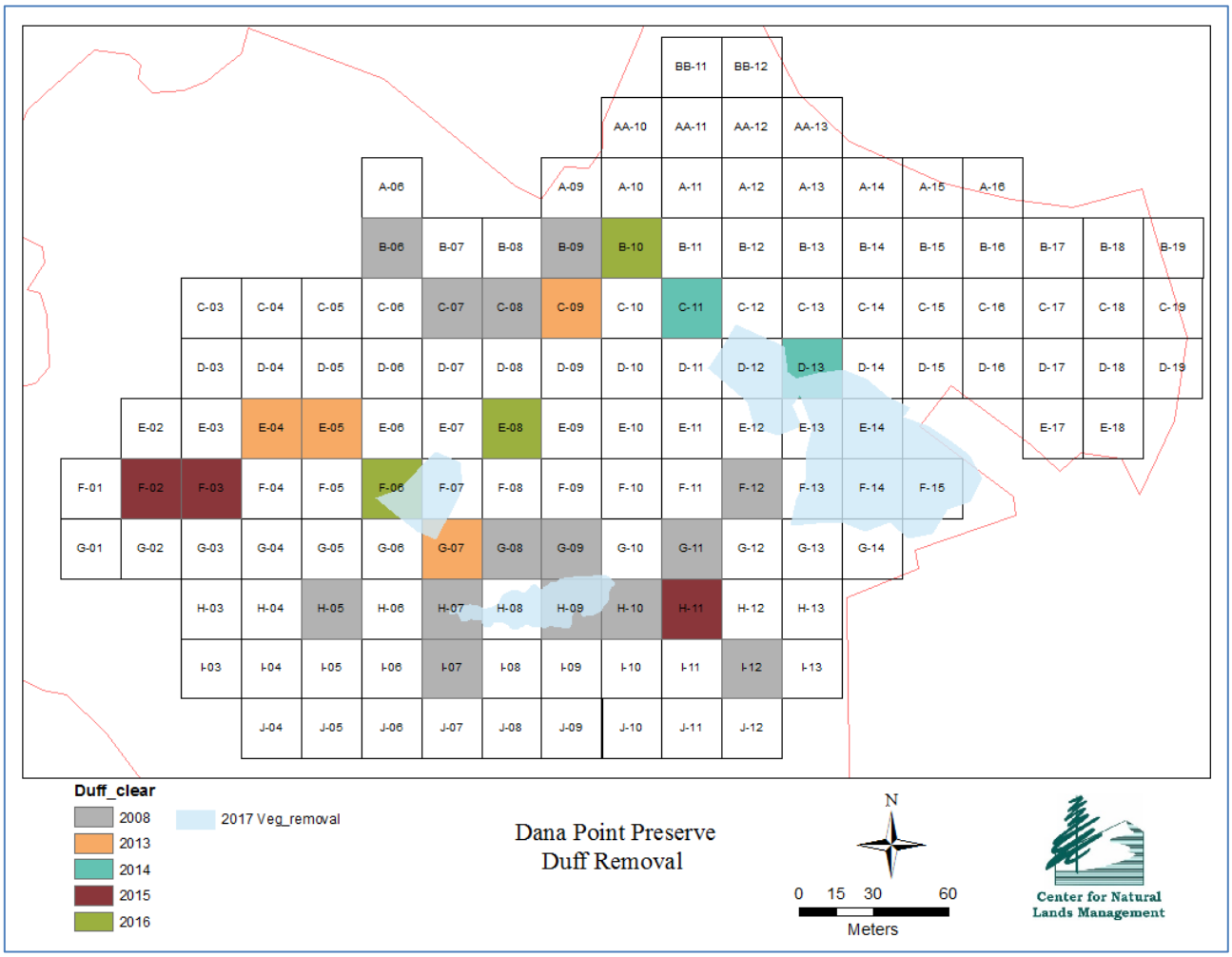

Figure 9. Vegetation and duff removal. Areas that have been cleared are colored according to the year clearing occurred.

Figure 10. Workers in the background clear areas of dead vegetation in grid F15.

V. PUBLIC SERVICE AND GENERAL MAINTENANCE

Enforce restrictions over general public access through use of patrols and maintenance of trails, fences, and signs

The trail was open to the public daily from 7:00 a.m. to sunset, except when it was closed due to heavy rain and trail maintenance. The solar-powered magnetic gate lock and gate closer mechanism for the Selva Road entrance gate were operational the entire year.

The trail counters installed on April 12, 2011, with funding through Nature Reserve of Orange County, remained functional. A substantial amount of variation of use occurred between the two gate entrances and among the months of the year during this fiscal year. These results have not been analyzed. An analysis of trail use data will be provided at some later time, either in a separate report or a subsequent annual report.

Unwanted public use issues continue to include off-trail use, bike riding (and bike walking), smoking, people with dogs (pets), littering (mainly cigarette butts), and trespass by contractors working on the adjacent condo. The number of people bringing their dogs on the trail was higher than in FY 2017, as reported by CNLM Rangers' reports, with more people stating they didn't know dogs were not allowed. Off-trail activities continued to persist throughout the year and any such activity is potentially harmful to conservation values on the Preserve. The most common locations of off-trail activity remained at the

second and third overlooks. Most prohibited activity is by children and young adults seeking a private ocean view while drinking and/or smoking. They often leave trash, and contribute to erosion, potential crushing of PPM burrows, limiting the expansion of the rare plant populations, and increase risk to the Preserve from fire. Off-trail use is an even greater threat during the bird nesting season where such activity likely disrupts the peregrine falcon, the CAGN whose territories include these areas, and other nesting bird species.

Three part-time CNLM Rangers continued to patrol the Preserve in the late afternoon/evening hours before closing on school holidays and weekends. Even with a CNLM Ranger or staff person present on-site, there were continued violations of Preserve rules. Trespass is evidenced not only by Rangers who catch and educate trespassers, but includes the following: 1) foot tracks observed off-trail; 2) items recovered off-trail which confirm off-trail use; 3) and violations that occurred when CNLM staff were not on-site. The names of trespassers encountered by CNLM staff are documented to ensure repeat offenders are identified. In attempt to reduce the likelihood of people going off trail at overlooks 2 and 3, dead shrubs removed from duff-treated grid cells, as well as prickly pear cactus pads, were placed along the edge of the fencing at the overlooks. However, the most effective means of keeping people on the trail and dogs off the Preserve is by having onsite presence. In addition to CNLM's own staffing, CNLM works with City staff and docents to expand the enforcement capacity.

The Orange County Sherriff's Department (OCSD) was called on some occasions, with two known citations issued to trespassers on-site in FY 2018. The OCSD does have authorization to act and arrest individuals whom trespass on the Preserve (CNLM 2015). Warden Nick Molsberry, CDFW Game Warden, patrolled the Preserve when time and resources allocated and cited trespassers when encountered.

Unexpected events do occur on the Preserve, one such event was a motorist driving through the fence into the Preserve from the city parking lot in October 2017 (Figure 11). The incident was reported to the police. Ranger Kevin DeNault was on site to document the accident and ensure protection of the Preserve during reclamation activities. An insurance report was filed, and subsequent cost associated with the accident such as repairs, rangers' time and management were billed appropriately. Repairs to the Preserve boundary fence were conducted by LaHabra Fence Co., Inc. on 27 November 2017. The area impacted from the vehicle inside the Preserve recovered but did have invasive plant species: tree-tobacco, oxalis, and castor bean sprout in the cleared area. These plants were pulled, bagged and deposited into the dumpster to prevent spread of propagules.

Figure 11. Vehicle in the Preserve October 2017.

Expand the GIS database as necessary

CNLM managed and added GIS coverages for data collected in FY 2018 (Appendix B).

Continue public outreach and educational opportunities within the Preserve, including collaborating with the City of Dana Point Natural Resources Protection Officer, Nature Interpretive Center (NIC) facilities, and City docents at the NIC

The NIC was open throughout FY 2018 from 10:00 a.m. to 4:00 p.m. Tuesday through Sunday. The Preserve Manager was available to interact with the public and answer questions while at the NIC on average one day a week. CNLM Rangers were onsite on average two evenings a week to answer questions and provide information to the public. In addition to in-person outreach, the Preserve Manager presented information at a Dana Point Science Night and a Docent Monthly Meeting.

Provide opportunities for the public to help in maintenance of the Preserve

Volunteers helped with setting PPM track-tubes. It is anticipated to engage more with the public in subsequent years. CNLM has one regular volunteer that manages the wildlife cameras on the Preserve.

VI. REPORTING

Prepare an updated Habitat Management and Monitoring Plan

A low effect HCP draft permit application was submitted by CNLM to the USFWS in FY 2008 to address the potential for take of CAGN and PPM from future management actions. The process was not completed. In FY 2018, CNLM continued the process of creating a revising the habitat management plan (URS 2005) and that addresses only the Preserve (rather than the entire Headlands area). The revised plan will provide revised and more specific and appropriate management guidance for the Preserve based on preserve management experience, staff expertise, input from others with relevant expertise, and well-reasoned principles from the conservation sciences.

Record Preserve management and monitoring activities in an annual report and provide to the Wildlife Agencies and City

A work plan for FY 2018 (October 1, 2017 through September 30, 2018) was completed and provided to the USFWS, CDFW, and City on 9 February 2018 (CNLM 2018a). An annual report describing the management activities conducted during FY 2017 was completed on 9 May 2018 (CNLM 2018b).

VII. REFERENCES

Brehme, C.S., J. Sebes, T. Matsuda, D. Clark, and Fisher, R.N. 2014. MCBCP Pacific Pocket Mouse Monitoring Results for 2013 and Multi-year Trend Analysis from 2012 to 2013. Prepared for AC/S Environmental Security, Marine Corps Base, Camp Pendleton. 69p.

CNLM. 2014. Dana Point Preserve (S033) 2014 Coastal California Gnatcatcher and Pacific Pocket Mouse Survey Results. 16 August 2014.

CNLM. 2013. CNLM Annual Report of Management Activities for the 2011-2012 Fiscal Year on the Dana Point Preserve (S033), Orange County, California. January 31, 2013.

CNLM. 2015. Trespass Authorization Letter for Dana Point Preserve (S033). January 20, 2015.

CNLM. 2017. Annual Report of Management Activities for the 2015-2016 Fiscal Year on the Dana Point Preserve (S033). 23 April, 2017.

CNLM. 2018a. Annual Work Plan for the Fiscal Year 2017-2018 (October 1,2017-September 30, 2018) on the Dana Point Preserve (S033). 9 February 2018.

CNLM. 2018b. Annual Report of Management Activities for the 2016-2017 Fiscal Year on the Dana Point Preserve (S033). 9 May 2018.

CNLM and San Diego Zoo Global. 2017. Site Access for Research Agreement, Pacific Pocket Mouse Trapping and Captive Breeding Program pertaining to the CNLM Dana Point Preserve S033. Executed May 19, 2017; expired July 31, 2017.

City of Dana Point. 2002. The Headlands Development and Conservation Plan.

Leatherman, S. 2017. Rare Plant Surveys for Dana Point Preserve, Orange County, California. Prepared for CNLM Dana Point Preserve Manager. 28 September, 2017.

Matsuda, T., C.S. Brehme, and R.N. Fisher. 2014. Assessing Presence of Argentine Ants Using the Bait Method. U.S. Geological Survey, Western Ecological Research Center. 13pp.

Miller, W. 2017. Pacific Pocket Mouse Monitoring Performed at the Dana Point Preserve May 21-24, 2017, Dana Point, California. USFWS Memo to File. 28 June, 2017.

National Weather Service. 2019. San Diego Weather Forecast Office. Monthly Weather Summary, John Wayne Airport. https://w2.weather.gov/climate/index.php?wfo=sgx. Accessed on 10 January 2019.

Roberts, F.M. 2008. A Botanical Assessment of the Dana Point Preserve, Dana Point California: A survey of sensitive, rare and endangered plants and floristic inventory. Prepared for CNLM. December 2008.

Thibault, M., S.K.M. Ernest, E.P. White, J.H. Brown, and J.R. Goheen. 2010. Long-term insights into the influence of precipitation on community dynamics in desert rodents. Journal of Mammalogy, 91(4):787-797.

URS Corporation. 2005. Habitat Management and Monitoring Plan for Dana Point Headlands Biological Open Space. 18 April, 2005.

Western Regional Climate Center. 2017. NOAA, Laguna Beach Station 044647. Laguna Beach March 1928 to April 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN. pl?ca4647

White, G.C. and K. P. Burnham. 1999. Program MARK: Survival estimation from populations of marked animals. Bird Study 46 Supplement, 120-138.

Wilkinson, E.R., Branch, L.C., Miller, D.L., and Gore, J.A. 2012. Use of track tubes to detect changes in abundance of beach mice. Journal of Mammalogy. 93(3):791-798

APPENDIX A. Photos of CSS monitoring transects.

Figure 12. Transect 1 2012 (left) and 2018 (right)

Figure 13. Transect 2 2012 (left) and 2018 (right)


Figure 14. Transect 3 2012 (left) and 2018 (right)


Figure 15. Transect 4 2012 (left) and 2018 (right)

Figure 16. Transect 5 2012 (left) and 2018 (right)

APPENDIX B. GIS Coverage.

Coverage	Source	Source Year
Non-native plant locations	CNLM	2018
Gnatcatcher (points, use area, nest locations)	CNLM	2018
Pacific Pocket Mouse Points	CNLM	2018
Argentine ant locations	CNLM	2018
Non-native plant locations	CNLM	2017
Gnatcatcher (points, use area, nest locations)	CNLM	2017
Pacific Pocket Mouse Points	USFWS	2017
Rare Plant Points	Leatherman BioConsultants	2017
Vegetation Transects	CNLM	2016
Northern boundary Fence line	CNLM	2015
Bridal Creeper Locations	CNLM	2016
Gnatcatcher (points, use area, nest locations)	CNLM	2016
Bridal Creeper Locations	CNLM	2013
Gnatcatcher (points, use area, nest locations)	CNLM	2013
Rare Plant Points	CNLM	2013
PPM Capture Locations for captive breeding collection	San Diego Zoo	2012
PPM 24x24 Grid extended to former Marguerita Road bed and North of the road bed	USFWS	2012
Vegetation Transects	CNLM	2012
Gnatcatcher (points, use area, nests locations)	CNLM	2012
Bridal Creeper Locations	CNLM	2012
PPM 16x16 Grid extended to former Marguerita Road bed and North of the road bed	USFWS	2011
Rare Plant Points	CNLM	2011
Gnatcatcher (points, use area, nests locations)	CNLM	2011
Location of dead PPM	CNLM	2010
Rare Plant Points	CNLM	2010
Gnatcatcher (points, use area, nests locations)	CNLM	2010
Rare Plant Points	CNLM	2009
Gnatcatcher (points, use area, nests locations)	CNLM	2009
Veg Baseline Transect Locations	CNLM	2009
Pacific Pocket Mouse Points	USFWS	2009
Aerial Photo	Eagle Aerial	2008
Final Trail Route	CNLM	2008
Rare Plant Points	Fred Roberts	2008
PPM 16x16 Grid	USFWS	2008
Gnatcatcher (points, use area, nests locations)	CNLM	2008
Bobcat Point	CNLM	2007

Coverage	Source	Source Year
Revegetation Areas & Seed mix	URS Corporation	2007
Gnatcatcher (points, use area, nests locations)	CNLM	2007
General Wildlife (whiptail and red racer)	CNLM	2007
Cliff Spurge Points	CNLM	2006
Veg Baseline Transect Locations	CNLM	2006
Aerial Photos	URS Corporation	2006 and 1991
PPM Habitat Areas	URS Corporation	unknown
Vista Points	URS Corporation	unknown
Pacific Pocket Mouse Points	USFWS	1993-2007
Cliff Spurge Points	URS Corporation	2007
Trail Location Options	URS Corporation	2007
Sensitive Species (Cliff spurge and Boxthorn)	URS Corporation	2006
Vegetation Communities	URS Corporation	unknown
Gnatcatcher Locations	URS Corporation	unknown
Coastal Commission ESHA Boundaries	URS Corporation	unknown
Jurisdictional Channels	URS Corporation	unknown
Open Space	URS Corporation	unknown
Headlands LLC Project Boundaries	URS Corporation	unknown
Headlands LLC Revegetation Areas	URS Corporation	unknown

Dana Point Preserve (S033): 2017-2018 Annual Report

Korie Merrill <kmerrill@cnlm.org> Mon, Mar 4, 2019 at 3:59 PM
To: Jonathan Snyder <jonathan_d_snyder@fws.gov>, "Rice, Kyle@Wildlife" <Kyle.Rice@wildlife.ca.gov>, JEFF ROSALER <JROSALER@danapoint.org>
Cc: "Miller, William" <william_b_miller@fws.gov>, Bernice Villanueva <bvillanueva@danapoint.org>, "Deborah L. Rogers" <drogers@cnlm.org>

All,
Attached for your review is the Annual Report for CNLM's Dana Point Preserve (S033) FY18.

Respectfully,

--
Korie C. Merrill, Preserve Manager
Center for Natural Lands Management
Direct/Fax: 949.218.1145
Phone: 760.731.7790 ext. 204

S033 AR 2017-2018 final.pdf
3767K

CNLM ANNUAL REPORT OF MANAGEMENT ACTIVITIES FOR THE 2018-2019 FISCAL YEAR

(October 1, 2018 – September 30, 2019)

DANA POINT PRESERVE (S033)

Owned and Managed by CNLM

Provided to:

U.S. Fish and Wildlife Service
Jonathan Snyder
jonathan_d_snyder@fws.gov

California Department of Fish and Wildlife
Kyle Rice
Kyle.rice@wildlife.ca.gov

Prepared by:
Korie C. Merrill, M.S., Preserve Manager, kmerrill@cnlm.org

Reviewed by:
Deborah L. Rogers, Ph.D., Director of Conservation Science and Stewardship

Center for Natural Lands Management

27258 Via Industria, Suite B
Temecula, CA 92590
Phone: 760.731.7790
Web: www.cnlm.org

13 April 2020

TABLE OF CONTENTS

SUMMARY of 2018-19 ACTIVITIES

- Trail base and trail fencing maintenance activities were conducted
- Coastal California gnatcatcher (*Polioptila californica californica*) surveys were conducted
- Pacific pocket mice (*Perognathus longimembris pacificus*) were monitored using track-tubes and traps
- Argentine ant (*Linepithema humile*) pilot project was implemented
- Invasive exotic plant species removal was conducted
- Erosion control measures were implemented along the bluff edge
- Dead native perennial vegetation was selectively thinned
- CNLM rangers patrolled the Preserve to protect the habitat and educate visitors
- Visitors were provided with information about the Preserve
- Communications and coordination with the City of Dana Point continued
- A workplan and a budget for 2019-20 activities were prepared
- A report on 2017-18 stewardship activities was prepared
- A revision of the Preserve Management Plan (Habitat Management and Monitoring Plan) was initiated

I. INTRODUCTION

The Dana Point Preserve (Preserve) is located in the City of Dana Point (City), Orange County, California. The Preserve has been owned and managed by the Center for Natural Lands Management (CNLM) since December 2005. The Preserve consists of 29.4 acres of native coastal sage and coastal bluff scrub habitat. Adjacent natural open spaces (known as South Strand, Hilltop, and Harbor Point) are owned and managed by the City.

The process to protect the Preserve was initiated when the California Coastal Commission (CCC) required the developer of an oceanfront property project (Project), Headlands Reserve LLC, to dedicate and preserve in perpetuity a portion of its property, as public open space, in its natural habitat. The Project site is included in the NCCP/HCP EIR/EIS as a Covered Project, and the proposed project is included as a "Planned Activity" of a "Participating Landowner". An Endangered Species Act incidental take (Section 10a) permit (TE810581-1) that authorizes incidental take of 44 covered species was issued to Headlands Reserve, LLC on January 21, 2000 by the U.S. Fish and Wildlife Service (USFWS). Therefore, development impacts on federal- and state-listed species, Identified Species designated in the NCCP/HCP EIR/EIS, Covered Habitats designated in the NCCP/HCP EIR/EIS, removal of up to 30 acres of coastal sage scrub, and impacts on species dependent on or associated with the Covered Habitats were authorized and considered mitigated to less than a significant level, consistent with the NCCP/HCP guidelines under the NCCP Act, state and federal ESAs, and CEQA. Some of the mitigation measures required under the NCCP/HCP were to:

- Contribute $500,000 toward the NCCP/HCP 'Non-Profit Corporation' and 'Adaptive Management Program;
- Contribute $350,000 to fund Pacific pocket mouse population propagation, enhancement, relocation and recovery efforts upon issuance of Section 10(a)(1)(A) permit for pocket mouse;
- Commit to transplant, at California Department of Fish and Wildlife's (CDFW's) request, any *Dudleya blochmaniae* (Blochman's dudleya) populations at Headlands Reserve's expense (not to exceed $23,000) that would be directly impacted by development on the property (Note: subject to CDFW approval, the landowner was allowed to collect and sow seed, rather than translocate individual plants); and
- Contribute to the cost of preparation of the NCCP/HCP.

Although the mitigation measures also included establishing a 22-acre (8.9 ha) Temporary Pacific pocket mouse (TPPM) Reserve for eight years, possible extension for four more years, and providing the Wildlife Agencies (USFWS and CDFW) the opportunities to acquire the TPPM Reserve at Fair Market Value if USFWS determined, at or prior to expiration of the 80-year Reserve period, that continuance of the Reserve was necessary to ensure the survival and recovery of the pocket mouse, these actions were not taken. Rather, the trustees of the Steele Foundation, concerned that Headlands Reserve LLC would develop the conservation area as an amenity to the Project without regard to resident and potential conservation values, provided sufficient funding for CNLM to purchase the open space property to protect its important conservation values and to establish an endowment for managing the biological resources onsite in perpetuity. The Steele Foundation vision – and the imposed charitable restriction on its grant to CNLM – was to enable and secure the Preserve to the condition it appeared when first viewed by Richard Henry Dana in 1834. The Steele Foundation and CNLM entered into an agreement for the perpetual management of a stewardship endowment to provide the necessary financial resources for the Preserve's protection and management. The Preserve, as "public open space," is CCC-required mitigation; it is not USFWS (ESA) mitigation.

To further protect the natural resources of the Preserve, CNLM voluntarily granted a Conservation Easement (CE) to the City of Dana Point, which was recorded December 20, 2005, to further protect site conservation values in perpetuity. The CE was not exacted by a resource agency as a regulatory requirement.

Management activities for the City properties and the Preserve have been operating under the guidelines of the initial Habitat Management and Monitoring Plan (HMMP; URS 2005) for Dana Point Headlands Biological Open Space. The HMMP was reviewed by the CCC, USFWS, CDFW, and the City. However, we have no record that the final HMMP, dated April 18, 2005, was approved. Despite this uncertainty, CNLM has been managing the Dana Point Preserve according to the HMMP and will continue to do so until CNLM revises the management plan in consultation with the Wildlife Agencies and other information sources.

This document details the management activities which occurred during the 2019 Fiscal Year (FY) (October 1, 2018 - September 30, 2019). Four primary management objectives are identified in the HMMP:

1. Maintain the Preserve to permit ecological processes to function.
2. Contribute to the preservation and restoration of the endangered or threatened species and their habitats that are present on the Preserve.
3. Contribute to the preservation and restoration of non-listed sensitive species that contribute to biodiversity.
4. Develop a public awareness program that informs local residents and visitors of the sensitivity and ecological importance of the Preserve.

The tasks identified in the FY 2019 Annual Work Plan (CNLM 2018a) to serve these objectives were to:

- Enforce restrictions over general public access, through use of patrols and maintenance of trails, fences and signs.
- Initiate updates to the HMMP.
- Monitor a subset of vegetation transects for plant community monitoring.
- Track wildlife use of the Preserve.
- Conduct presence-absence monitoring of coastal California gnatcatcher.
- Monitor pacific pocket mice using track tubes.
- Conduct habitat maintenance activities to benefit PPM and CAGN.
- Install erosion control measures on the trail and bluff edge.
- Remove non-native plant species opportunistically throughout the Preserve.
- Continue the public outreach program, installation of interpretive signs, and educational opportunities within the Preserve, including collaborating with the City of Dana Point Natural Resources Protection Officer, Nature Interpretive Center (NIC) facilities, the City docents at the NIC, and the non-profit Friends of the Headlands.
- Provide opportunities for the public, as appropriate, to help in maintenance of the Preserve (trash removal, trail maintenance, non-native plant removal, etc.).
- Coordinate with the City regarding adjacent land use activities.
- Expand the GIS database as necessary and maintain all data.
- Record Preserve management and monitoring activities in an annual report and distribute to the Wildlife Agencies and City.
- Seek additional funding through donations to fund reconstruction of the public trail.
- Participate in professional events and communities that aim to increase and share science-based knowledge regarding PPM and CAGN, in particular.

II. CAPITAL IMPROVEMENTS

Enforce restrictions over general public access through use of patrols and maintenance of trails, fences, and signs

The CNLM Dana Point Preserve continues to be a regional attraction in Southern California, with high daily visitation rates for recreational use by both local residents and tourists. Although the exact number of visitors is unknown, the trail is used relentlessly throughout the year. Thus, the public trail, trail fencing, and perimeter fencing continued to require a substantial amount of CNLM staff time for maintenance throughout the year, such as replacing post caps, picking up trash, leveling out the trail, tightening fence cable slack, and installing new fence cable.

Cable fence repairs were conducted throughout the year as needed by CNLM staff. In April 2019, an automatic magnetic lock and emergency release were installed on the Scenic Road trail gate. Power for the lock is routed from the City of Dana Point Nature Interpretive Center (NIC) to the gate via conduit along the Preserve fence. At the same time, all of the locks throughout the Preserve were changed to a universal key, different than the City locks which were previously installed. Copies of the keys were given to City Resource Manager Bernice Villanueva and CDFW Game Warden Nick Molsberry.

To better shield the trail base for winter rain, sandbags were installed along the trail in the most erosive areas to act as water bars. CNLM continued to use the same filled monofilament sandbags used last year, in addition to newly purchased bags. Sandbags were all filled with loose native sand that accumulated on the trail or above grade adjacent to the trail. CNLM continued a policy of closing the trail to the public during rain events and for whatever length of time was required to repair the trail after such events. This year, the trail was closed for 21 days total for rain events and trail maintenance. The total precipitation for the area during FY 18-19 was 18.45 inches (46.86 cm) (Laguna Beach Station, NOAA 2019).

Seek additional funding through grants and donations to fund reconstruction of the public trail

CNLM continued to receive donations via a donation box within the City of Dana Point's NIC for a trail reconstruction project. Donations were deposited into the appropriate CNLM account as per CNLM donation protocols.

III. BIOTIC SURVEYS

Monitor vegetation transects

Five transects (AA11, B15, C18, D14 and B11) were monitored that were previously monitored in June 2012 as part of CNLM's long-term coastal sage scrub (CSS) monitoring at the Preserve (Table 1 and Figure 1). Each start and end point of the transects are marked by rebar stakes with a PVC pipe cover. Point-line intercepts with a 2-m belt transect were monitored March 18, 2019 by CNLM Preserve Manager Korie Merrill. Transects were 25 m in length, with point-intercept data recorded every 0.5m for a total of 50 points per transect (starting at 0.5 m ending at 25.0 m). Shrub, herbaceous plant, and ground cover data were collected in June of 2012 and April of 2019; however, in 2012, ground cover was only recorded if no plants were recorded at that point. Photos of each transect were taken during the survey (see Appendix A for comparison photos between years 2012 and 2019).

Table 1. CSS transects. Twenty transects throughout the Preserve have been monitored at various periods of time. In 2019, transects AA11, B15, C18, D14, and B11 were monitored.

Transects	Years Monitored				
1, 2, 3, 4, & 5	2006	2009	2012	2016	2018
AA11, B15, C18, D14, & B11	2012	2019			
F13, H11, D09, D05, & J05	2013				
H13, J09, E07, D11, & H03	2014				

Figure 1. Map of CSS transects. Five transects north of the old Marguerita Road were monitored in 2019; the other 15 were monitored in previous years.

A total of 26 plant species were recorded during monitoring in 2019; 19 were only documented in belt transects and seven species were recorded on the point-intercept transects. The only shrub found on all five transects was California sagebrush (*Artemisia californica*) with a mean percent cover of 18.37% standard error (SE) ±0.06. Bush sunflower (*Encelia californica*) had the highest mean percent cover across the five transects at 26.80% SE ±0.13. Dead shrubs comprised 9.39% SE ±0.06 of the mean percent cover across the five transects followed by California buckwheat (*Eriogonum fasciculatum*;) at 8.98% SE ±0.04. Other species recorded along the point intercepts were California croton (*Croton californicus*;), lemonade berry (*Rhus integrifolia*), coyote brush (*Baccharis pilularis*) and ladies' tobacco (*Pseudognaphalium californicum*).

The mean ground cover across all five transects was 45.71% SE ±0.11 bare ground, 49.39% SE ±0.03 leaf litter, and 6.12% SE ±0.06 soil crust. In 2019 ground cover was recorded at every point whereas in 2012, only at points with no plant cover were recorded thus ground cover results will not be compared in this report. California sagebrush was the only plant species found on the five transects for both survey years.

While no nonnative plant species were recorded on the point-intercept transects in 2019, two species were recorded were documented on two belt transects (B15 and C18). The mean percent cover of dead shrub increased from 1.6% in 2012 to 9.4% in 2019, while total shrub, sub-shrub and native forb cover declined by 7.4%, 12.8% and 26.4% respectively (Table 2).

Table 2. CSS transects. Comparison by functional groups of five transects monitored in 2012 and 2019.

	Percent Mean Cover by Year	
Functional Group	**2012**	**2019**
shrubs	62.8	55.4
sub-shrubs	13.2	0.4
dead shrubs	1.6	9.4
native forbs	27.2	0.8
non-native forbs	0	0
non-native	18.0	0
native grass	3.2	0

It is expected to see a higher percentage of dead shrub and lower diversity of species in 2019 than in 2012 since there was a significant drought between these monitoring years (2011-2016). Since 2011, seven years had below-average precipitation (six of which had less than 50% of the average 12.52") with above average rainfall in 2017 and 2019. This period of drought, coupled with CSS growth and maturation, likely accounts for the increase in dead shrub cover and relatedly the loss of live shrub, sub-shrub and forb cover documented in 2019 from 2012.

In addition, the difference in seasonality—April monitoring versus June monitoring—may contribute to the difference in herbaceous cover among the years. The CSS report from 2012 recommends conducting surveys later in the season—June, rather than earlier, to capture what the vegetation looks like when Pacific pocket mouse (PPM; *Perognathus longimembris pacificus*) are active above ground (CNLM 2013); however, in 2019, PPM activity was recorded in the first week of May on the Preserve (see PPM section below) and were likely active above ground before that. Since PPM activity fluctuates based on current habitat conditions, it is difficult to recommend a specific time of year to conduct surveys. Instead of using CSS transects for PPM food resource availability, specific PPM habitat surveys should be conducted following USGS protocol and the timeframe for sampling should be based on real-time data (current rainfall amount and patterns, landscape level PPM activity, CAGN activity, floral resources, and etc.). CSS transect monitoring to capture long-term trend analysis and overall health of the vegetation should be done in relatively the same season, early spring.

Monitor rare plants

The HMMP recommends that rare or sensitive annuals and herbaceous perennial plants be monitored during the spring season after the area experiences an annual rainy season that exceeds 75% of the long-term average annual precipitation (the average for the area is 12.52 in (31.81cm, Western Regional Climate Center 2017) or every three years (URS 2005). Rare plant monitoring was conducted in 2017 and although the annual precipitation threshold was met, monitoring was not conducted in 2019.

Conduct presence-absence monitoring of coastal California gnatcatcher

Monitoring for coastal California gnatcatchers (*Polioptila californica californica*; CAGN) typically is conducted annually on the Preserve both to track presence of this threatened species and to be aware of spatio-temporal use of the Preserve. The latter is important so as to ensure management activities do not result in harassment of CAGN particularly during their nesting season, generally 15 February – 15 September.

Surveys were conducted by Preserve Manager, Korie C. Merrill, who is authorized to conduct survey activities under CNLM's TE Recovery Permit 221411-5.2 and Scientific Collecting Permit 13986. Ms. Merrill was accompanied at various times by Tracey Rice, and Alys Arenas, Joseph Vu, and Emma Havstad, all of whom are working to acquire supervised CAGN survey hours. The Preserve was surveyed seven times by Ms. Merrill in February, March, April, and May 2019. The first survey, 8 March, was stopped early due to little CAGN activity and the remainder of the Preserve was surveyed on 12 March 2019. Suitable gnatcatcher nesting habitat was surveyed for presence/absence throughout the entire Preserve, according to USFWS protocols. One exception to the protocols was made when starting slightly before 0700 hours, or finishing slightly after 1200, when weather permitted. At least two (2) passes were conducted in areas where gnatcatchers were not documented and in areas where pairs were not confirmed. All areas resurveyed were conducted at least seven (7) days from the last visit to the same area. All CAGN observations were mapped.

There were at least 15 territories of CAGN, of which at least 14 paired (Figure 2). Past population numbers have ranged from a minimum of three (3) pairs (2006 and 2007) to maximum of seven (7) pairs (2012-2018), thus this year's population is high. Given the size of the Preserve, there was considerable interaction throughout the breeding season between various pairs and individuals. One pair (CAGN 03) was a polyamorous with two females and one male; this was first observed on 22 April and subsequently recorded on 24 April and 29 May. At least eight (8) pairs were successful in producing fledglings, although with the amount of activity throughout the Preserve it was difficult to distinguish family groups. Multiple pairs did attempt a second nest (CAGN 03, 04, 05, 07, 08, 11, 13, 14, and 15); the outcomes of these nests were not monitored.

With such high activity (twice the number of pairs then previously recorded) in such a small area (average territory size of 2.1 ac (0.8ha)) it is expected the number of CAGN pairs in the Preserve will decline in 2020 due to competition stress and resource availability.

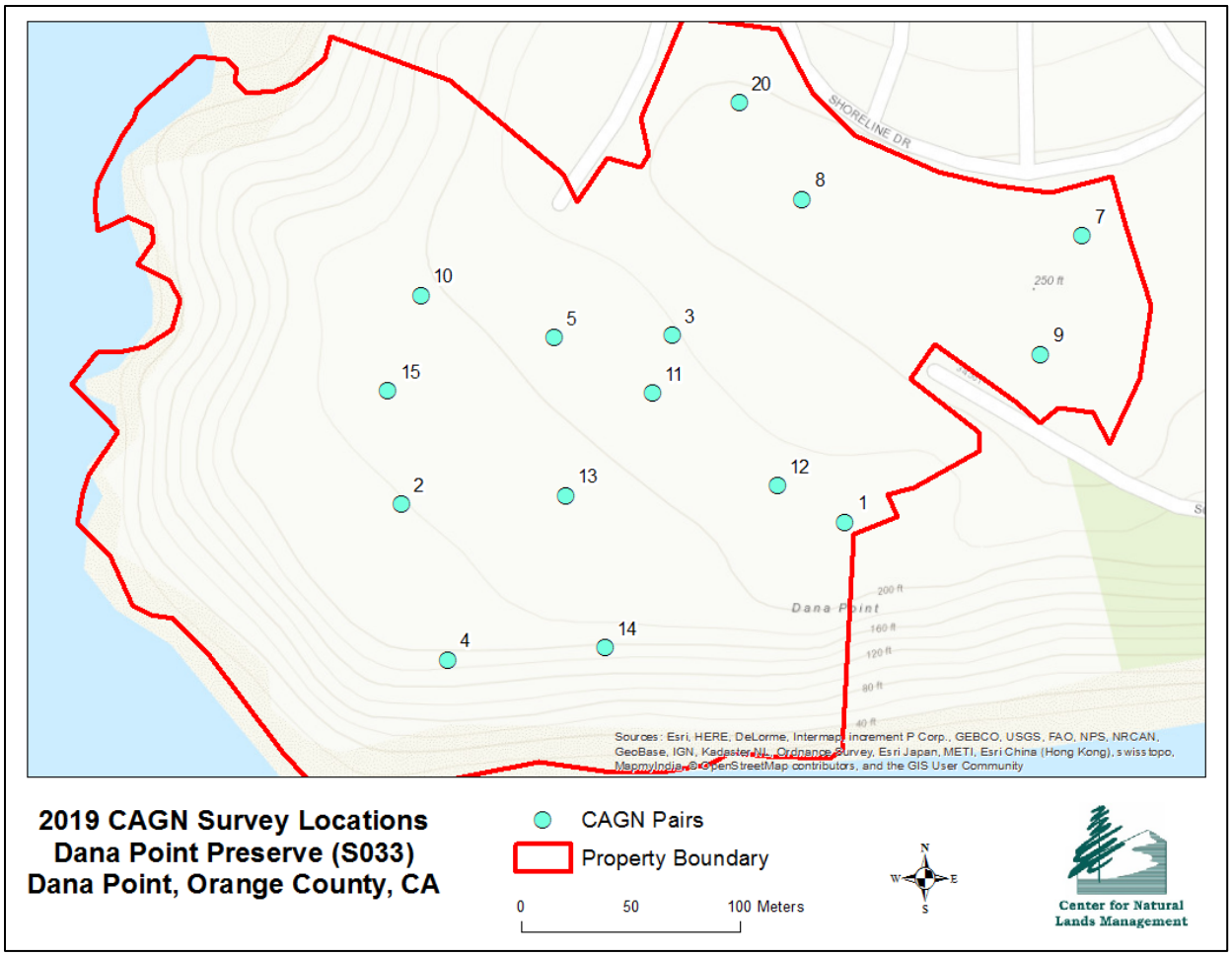

Figure 2. Map of CAGN locations. Points represent the known locations of CAGN pairs on the Preserve in 2019.

Prior to nesting season, dead and downed vegetation was removed ("thinning") in 0.15 ac (0.06 ha) of the Preserve. This was an additional vegetation management activity since the previous nesting season intended to create more areas of bare ground, specifically to improve PPM habitat (see section IV below for details). A concern when implementing this management activity was the impact of thinning on CAGN. Thus, to minimize this impact, thinning was done in a mosaic of small sections to keep CAGN habitat intact. Thinning in this area did not seem to negatively impact CAGN as exhibited by the large number of CAGN pairs within the 29.4 acres in 2019. It is possible that the newly created patches of bare ground increased forb diversity and subsequently arthropod/prey diversity.

Potential impacts to the resident CAGN pairs continue due to indirect effects from people on the trail, a potential increase in predators due to increased human use of the adjacent land (e.g. residential and commercial development), and direct impacts to nesting birds from trail users who do not follow the rules and either go off-trail on foot or bring their dog(s) on the Preserve. A continued presence by the Preserve Manager, Rangers, and NIC City staff and docents is utilized to ensure Preserve visitors follow the trail rules as much as possible. In addition, increasing declaration by trail visitors of dogs as being 'companion animals' has complicated CNLM staff's ability to prohibit dogs from being brought onto trails.

Monitor Pacific pocket mice

Pacific pocket mouse monitoring is typically conducted annually on the Preserve both to track presence of this endangered species and to be aware of spatio-temporal use of the Preserve to ensure management activities do not result in harassment or take of PPM. Species surveys not only provide information on the status of the local population(s) but can be an indirect indicator of habitat suitability for those species. For animal species, any survey method is an estimate, being based on a sample of the local population. Track-tube surveys have been used successfully for monitoring PPM (Brehme et al. 2014)—providing information on presence/absence, areas occupied, and—depending on survey design—some phenological and demographic data. This information will be valuable in determining any trends in populations that may be important for the long-term management of our preserve, and in aiding the larger conservation community in determining regional trends.

Surveys were conducted by Korie C. Merrill, who is authorized to conduct survey activities under TE Recovery Permit 221411-5.2 and California Department of Fish and Wildlife Scientific Collecting Permit SC-13986 by following USFWS protocol. Ms. Merrill was accompanied at various times by CNLM Ranger, Tracey Rice, CNLM Preserve Managers Kim Klementowski and Sarah Godfrey, CNLM Land Steward Kiran Stacy, Alys Arenas (Nature Collective), and Emma Havstad (River Partners), all of whom were working to acquire supervised PPM track tube survey hours. All track cards were reviewed by Ms. Merrill, and any cards with questionable PPM prints were also

reviewed by Devin Adist-Morris, or Cheryl Brehme (both of USGS) for a definitive identification.

Monitoring was conducted via track tubes with a two-part study design:

a) An initial study – to determine when the PPM were active above ground and to serve as a trigger for a more comprehensive sampling effort.
b) Site-wide survey – to determine PPM activity over the entire Preserve.

Initial Survey:

An initial activity survey was conducted from May 2 to May 23, 2019. Track-tube monitoring was conducted within a subset of cells (C06, C07, D05, and D06) in the Preserve. A total of 27 track-tubes were deployed, spaced approximately 12 meters apart within each grid cell and checked weekly. The bait used was 100 percent millet that was treated in a microwave for 2 minutes prior to use to render the seed sterile. All track-tubes used the modified track cards secured by binder clips (see Brehme et al. 2019 for design specifics). The track cards were removed from each track tube and labeled on the back with the date and the unique grid cell location.

PPM were detected at ten of the 27 points during the initial survey (Figure 3) with a range of 2-7 track cards identified with PPM prints per week (Table 3). Other species identified were harvest mouse (*Reithrodontomys megalotis*; REME) and deer mouse (*Peromyscus maniculatus*; PEMA).

Site-wide Survey:

For consistency with sampling methods used in previous years, the entire Preserve was sampled with one track-tube located at the center of a 24m^2 grid cell. Each track-tube was set in the nearest suitable location within 5 meters of the flagged GPS position of the center point of each grid cell. Sterile millet was used as the bait. Track-tubes were modified to use longer base cards and binder clips to reduce disturbance of track-tubes by ground squirrels.

On May 31, 2019, 134 track tubes were deployed across the Preserve. During this survey period, track cards were reset weekly for a total of eight data sets. The track cards were removed at the end of the survey on July 25, 2019.

A total of 30 track cards were identified with PPM prints during the site-wide track-tube survey in 2019. PPM were detected in 22 grids (24m x 24m) throughout the site (Table 3), of which 12 were high to medium confidence detections and 10 were low confidence PPM detections (Figure 3). Other species identified from track-cards were REME and PEMA.

The previous year, California ground squirrels were documented by wildlife cameras moving track-tubes; however, during this survey the amount of disturbance from ground squirrels was close to zero. This is likely due to the use of binder clips rather than magnets to secure the base cards within track tubes.

In addition to confirming PPM presence on the Preserve, track tube data can also be useful in estimating habitat use. For this purpose, we used the Occupancy Estimation function in Program MARK and applied the single season, single species model (MacKenzie et al. 2002) to track tube data collected at each sampled grid cell or "site." This analysis pools individual animal capture records within each site by capture occasion to estimate the proportion of sites occupied or used (Ψ) by the target species. The data were analyzed using the single season time dependent model [p(t), psi(.)] with a constant capture probability among survey occasions. Missing track cards were assumed to be a zero detection of PPM in the model. Only using cards with medium to high confidence of PPM detection the 2019 model averaged habitat use estimate as 14.46 % (95% confidence interval, C.I., 6.68 – 28.52%). If cards with low confidence (typically partial prints) are included with medium to high confidence of PPM detection, the 2019 model averaged habitat use estimate as 28.12 % (95% C.I. 15.13 – 46.20%). The Program MARK results suggest a higher use estimate than the naïve estimate (number of grids with PPM detected per number of grids sampled) of 8.96 and 16.42% (high and low confidence detection respectively). Spatial distribution of PPM is shown in Figure 3.

Table 3. Number of track-tubes with PPM detected during each monitoring period.

	Date (2019)	No. of Points with PPM	Points with PPM
Initial Survey	2-May	3	1361, 1414, 1433
	9-May	6	1414, 1348, 1360, 1362, 1416, 1420
	15-May	2	1362, 1485
	23-May	7	1362, 1485, 1348, 1416, 1433, 1486, 1488
Site Wide Survey	6-Jun	4	E06, D06, E08, E10
	13-Jun	0	
	20-Jun	3	E04, F04, G08
	27-Jun	3	E06, D05, F10
	5-Jul	2	E06, F04
	11-Jul	7	AA11, C08, D15, E08, F10, F11, H08
	18-Jul	9	AA11, C07, C11, D06, D07, D08, D18, E04, F08
	25-Jul	2	A12, B07

Targeted Live trapping

Due to the relatively low occupancy of PPM at the Preserve in 2018, as estimated by track-tube monitoring, and the lack of recorded PPM reproductive activity in 2018 at South San Mateo Camp Pendleton and the introduced occurrence at Laguna Coast Wilderness, CNLM thought it prudent to investigate the reproductive status of the PPM

population at the Preserve in 2019. This was done in addition to the annual track tube PPM monitoring of the Preserve with aid from USGS.

Trapping was conducted June 17-19, 2019 by Cheryl Brehme (USGS) and June 19-20, 2019 by Denise Clark. CNLM staff was on-site during trapping events and assisted as needed.

The average core home range of PPM (n=9) at Camp Pendleton Oscar One was estimated to be 0.017 ha (approximately 13mx13m; Shier 2009), thus sets of 2 traps were placed subjectively (i.e., in what is likely the most suitable habitat) in 12x12m subplots within CNLM's permanent 24x24m grid cells. During live-trapping, track tubes in the area were closed to prevent capture competition (pers comms C. Brehme, May 3, 2019). A total of 132 traps were deployed within 17 grids. Trails to each trap were flagged with reflective tape to allow for biologists to follow these trails during trapping, preventing habitat destruction and take of any coastal California gnatcatchers. Large Sherman traps (12" long) without the modified door were used to prevent woodrat mortality as recorded in previous trapping events on the Preserve (CNLM 2013, CNLM 2018b). Traps were washed with local sand prior to opening the traps for PPM capture. Sterile millet was used as the attractant in each trap. Traps were checked twice (approximately 11:30 PM and 04:30 AM) and closed during the day prior to leaving the area. Any non-target animals were documented and released immediately. Captured PPM were:

- Identified by sex
- Examined for reproductive activity (e.g., lactating females, scrotal males, or juveniles/subadults)
- Hair-clipped only to the extent needed to identify if recaptured during this (potentially three-night) trapping event
- Released as quickly as possible after observations were obtained

In addition, PPM ear-snips were taken for future genetic analysis and fecal samples were taken for future dietary analysis. Samples were stored at the USGS office's freezer and subsequently given to the San Diego Zoo Global for genetic research.

Over three nights of trapping, two PPM were captured. Both were captured during the first check of the second night (18 and 19 June 2019). One scrotal male PPM was captured in grid E09 and one lactating female PPM was captured in grid D06 (Figure 3). No mortalities of PPM or non-target species occurred during this trapping event.

The average number of traps that were open (empty) during checks was 112.5 (approximately 85% of the traps), with the second night having the most captures (n=47), followed by the first night (n=37) and the third night (n=33). Overall, detection was low even with more common species such as REME. The majority of traps (85% average) were not triggered, this could be due to the availability of more preferred food resources onsite which would reduce the attractiveness of millet as a lure.

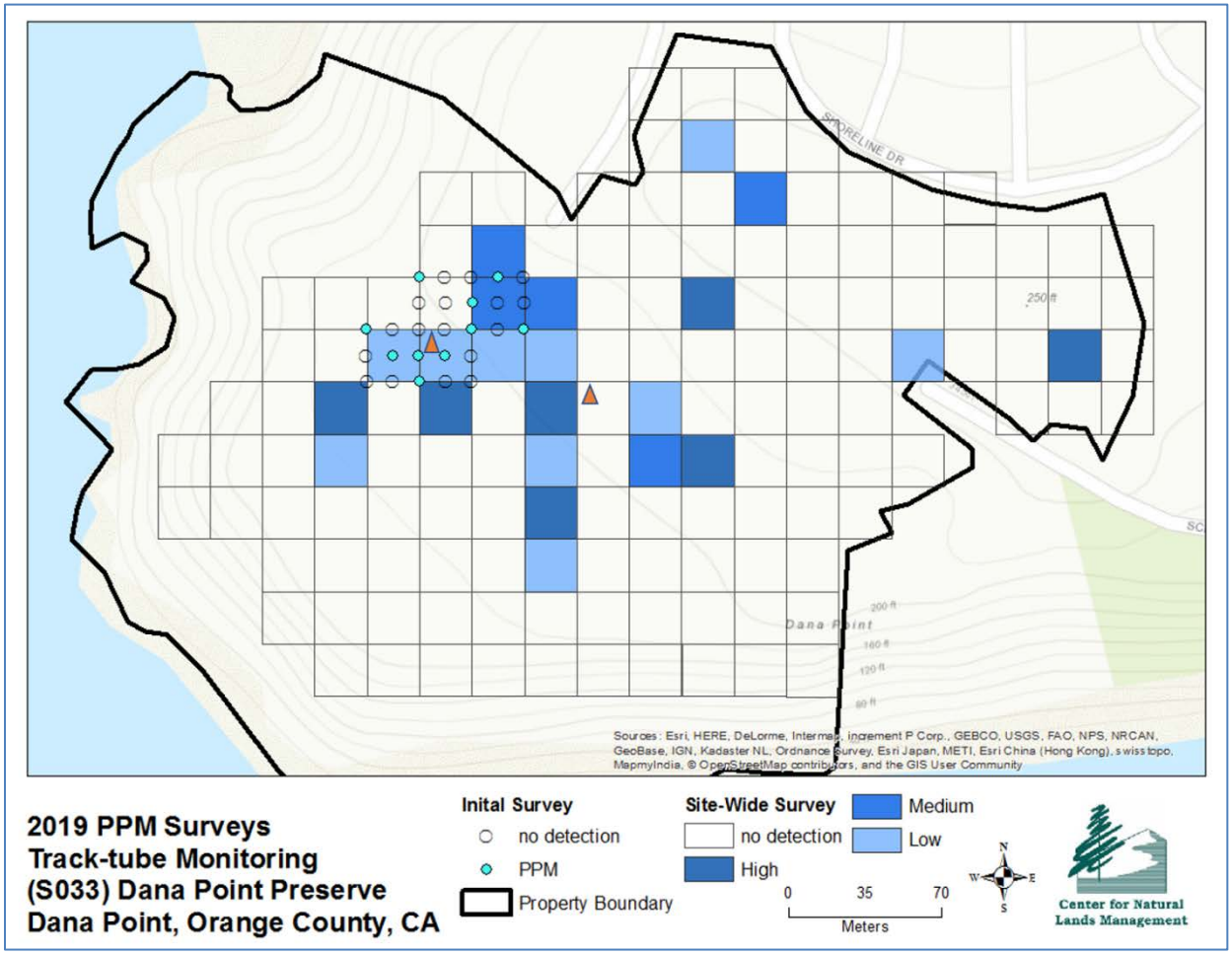

Figure 3. 2019 PPM Locations. Shaded grids represent grids with PPM detected during the site-wide track tube survey; the darker the shade, the higher the confidence PPM were detected in that grid. Colored circles represent points where PPM were detected during the initial site survey, and empty circles represent points where no PPM were detected. Orange triangles show areas where PPM were trapped during a live-trapping event in June 2019.

It is likely that PPM populations generally do well in years of drought and low rainfall. However, even this generalization must be interpreted within the context of cumulative drought events (e.g., too many consecutive drought years or extreme drought events may result in insufficient food availability) and vegetation dynamics. Plant species composition and spatial pattern affect PPM in terms of food availability, cover from predators, cover from unnatural light, intraspecific communications, moderators of microclimate, and other direct and indirect effects. Further, optimum vegetation composition, pattern, and coverage relative to bare ground, depends on context (e.g., ability of PPM to move, even occasionally to offsite areas), edge effects, and the relationship between vegetation and competitors, predators, or both. The complicated interactions among vegetation, climate, and PPM response suggests caution in interpretation of limited studies. Although confounded by differences in methods (track

tube versus live traps), trapping effort, and monitoring season, monitoring efforts on the Preserve do show considerable temporal fluctuation since trapping began in 1992 (CNLM 2019), both before and after the property was restricted for conservation purpose. Similar to the complications in detecting trends in PPM presence, the influences on PPM are multiple, cumulative, and mutually interactive.

Maintain an inventory of flora and fauna

Since 2005, CNLM has implemented opportunistic biological surveys for wildlife on the Preserve, occasionally supplemented with more formal surveys for rare or special-status plant species and live-trapping, track-tube monitoring, protocol surveys and wildlife camera traps for animal species. Eight species of rare or special-status plants have been detected on the Preserve and were last formally surveyed in 2017 (see CNLM 2018b). With this level of effort, it is unlikely that previously unrecorded plant species on the Preserve would be detected. No newly recognized taxa of flora were recorded on the Preserve in FY 19. Wildlife monitoring activities included scat and print identification opportunistically by CNLM staff and the continued use of infrared cameras (Bushnell Scout®) located throughout the Preserve. Taxa identified on the wildlife cameras were recorded by CNLM volunteer Kevin VanFleet (Table 4).

Table 4. Species Documented by Wildlife Cameras in FY 19.

Common Name	**Latin Name**
Western harvest mouse	*Reithrodontomys megalotis*
California thrasher	*Toxostoma redivivum*
Roadrunner	*Geococcyx californianus*
Coyote	*Canis latrans*
Bobcat	*Lynx rufus*
California ground squirrel	*Otospermophilus beecheyi*
Desert woodrat	*Neotoma lepida*
Pacific pocket mouse	*Perognathus longimembris pacificus*
California quail	*Callipepla californica*
Striped skunk	*Mephitis mephitis*
Raccoon	*Procyon lotor*
Desert cottontail	*Sylvilagus audubonii*
Western fence lizard	*Sceloporus occidentalis*
Mourning dove	*Zenaida macroura*
American crow	*Corvus brachyrhynchos*
California towhee	*Melozone crissalis*

Argentine ant pilot project

Argentine ants are considered a potential threat to CAGN and PPM persistence. In response, CNLM initiated a pilot study with researchers from the University of California Riverside to develop and implement ecologically appropriate tools to control Argentine ants on the Preserve. This study is ongoing, and results will be reported in a separate report.

IV. HABITAT MAINTENANCE AND RESTORATION

Remove non-native plant species opportunistically

CNLM staff opportunistically removed individuals of four non-native plant species during FY 19: bridal creeper (*Asparagus asparagoides*), tree tobacco (*Nicotiana glauca*), yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*) and Sahara mustard (*Brassica tournefortii*). Plants were removed by hand without the use of herbicide, bagged, and removed off site to prevent further spread of propagules. All activities were conducted with the supervision of the Preserve Manager to minimize any negative affects to PPM and CAGN by avoiding nesting areas, and surveying for and avoiding PPM burrows prior to pulling plants.

Install erosion control measures on the bluff edge

Since 2011, CNLM has been using straw wattles to slow water flowing downhill in the exposed areas and gullies on the bluff edges which are above rare plant populations. CNLM has also been using dead vegetation and duff cleared from grid cells as erosion control materials in these same areas. In addition to erosion caused by rain, trespassers walking and sitting on the bluff edges continue to prevent vegetation from growing in these areas. In FY 2019, prickly pear (*Opuntia littoralis*) and coastal cholla (*Cylindropuntia prolifera*) propagules were planted along the bluff edge to stabilize the edges as well as deter people from walking off-trail, within a few weeks all of the cactus pads were vandalized, i.e., kicked or thrown off the edge and none survived. To increase survivorship, future cactus plantings should use larger pads/propagules, planted deeper (at least half of the length of the pad), and caged or fenced to prevent vandalism.

Conduct habitat maintenance activities to benefit the Pacific pocket mouse

To reduce accumulated duff and increase bare soil for PPM use within the Preserve, CNLM continued to conduct duff and vegetation removal treatment (“thinning”) in specifically identified areas. Leaf litter, woody debris, and other organic material—collectively referred to here as duff—has accumulated under the mature Coastal Sage Scrub vegetation throughout the Preserve. Although a positive, statistically significant, treatment effect on PPM has not been shown, thinning has been effective at increasing openness and not shown to be harmful to PPM within certain conditions (Brehme et al. 2014).

It is important to note that thinning, given the context of habitat for listed species—PPM and CAGN—is not simple and must be done with caution. Not just the activity of picking up duff and dead shrubs, but the location, process, and manner in which the material is hauled off must be considered. The workload associated with duff and dead shrub removal is substantial, contractors were hired to complete the task and supervised by the Preserve Manager. The area cleared in FY 2019 was flagged out by the Preserve

Manager and surveyed for potential PPM burrows, if anything resembling a burrow was found, it was marked with red pin flags and contractors avoided the area. On January 22, 2019 a group of USGS staff volunteered for a day to remove dead and downed vegetation. In September, contractors from Habitat West removed 0.77-ac of dead and downed material over a two-day period. In FY2019, a total of 0.92-ac of habitat was thinned (Figure 4). Thinning vegetation increases the amount of openness of the Preserve substantially. Although this has not been further quantified by CCS transect data or inferred from imagery, visual estimates suggest 30-70% more openness after treatment (see Appendix for photos of the areas thinned).

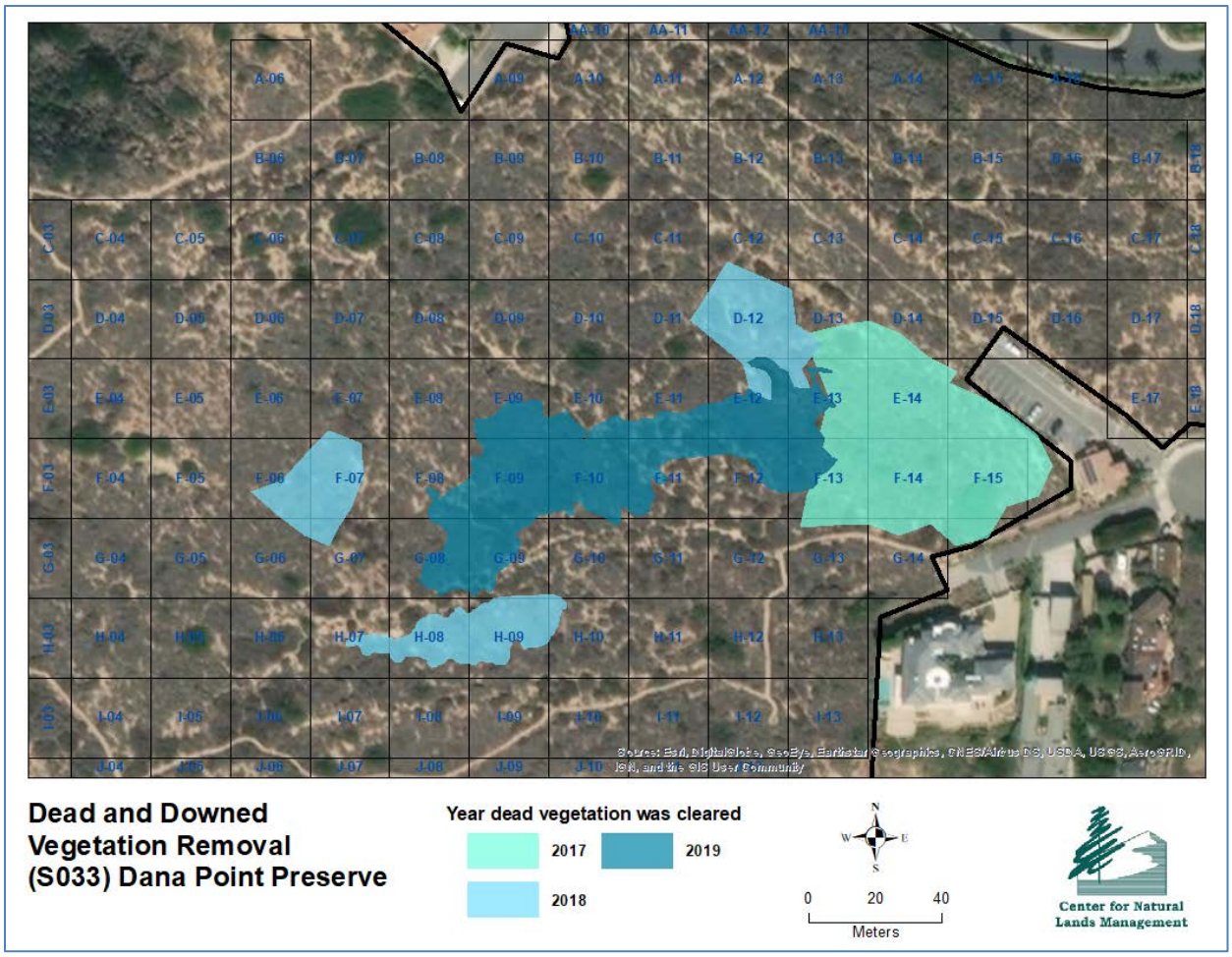

Figure 4. Vegetation and duff removal. Areas that have been cleared are colored according to the year clearing occurred.

V. PUBLIC SERVICE AND GENERAL MAINTENANCE

Enforce restrictions over general public access through use of patrols and maintenance of trails, fences, and signs

The trail was open to the public daily from 7:00 a.m. to sunset, except when it was closed due to heavy rain and trail maintenance. The solar-powered magnetic gate lock and gate closer mechanism for the Selva Road entrance gate were operational the entire year.

Unwanted public use issues continue to include off-trail use, bike riding (and bike walking), smoking, people with dogs (pets), littering (mainly cigarette butts), and trespass by contractors working on the adjacent condo. The number of people bringing their dogs on the trail seems to increase each year, as reported by CNLM Rangers' reports, with more people stating they didn't know dogs were not allowed or that they would carry their dog and thus the rule didn't apply. When this occurred CNLM staff or City volunteers educated the public about the impact pets can have on wildlife.

Off-trail activities by the public continued to persist throughout the year and any such activity is potentially harmful to conservation values on the Preserve. The most common locations of off-trail activity remained at the second and third overlooks. Most prohibited activity is by children and young adults seeking a private ocean view while drinking and/or smoking and to take photographs. They often leave trash, and contribute to erosion, potential crushing of PPM burrows, limiting the expansion of the rare plant populations, and increase risk to the Preserve from fire. Off-trail use is an even greater threat during the bird nesting season where such activity likely disrupts the peregrine falcon, the CAGN whose territories include these areas, and other nesting bird species.

Three part-time CNLM Rangers continued to patrol the Preserve in the late afternoon/evening hours before closing on school holidays and weekends. Even with a CNLM Ranger or staff person present on-site, there were continued violations of Preserve rules. Trespass is evidenced not only by Rangers who catch and educate trespassers, but includes the following: 1) foot tracks observed off-trail; 2) items recovered off-trail which confirm off-trail use; 3) and violations that occurred when CNLM staff were not on-site. The names of trespassers encountered by CNLM staff are documented to ensure repeat offenders are identified. In attempt to reduce the likelihood of people going off trail at the second and third overlooks, dead shrubs removed from duff-treated grid cells, as well as prickly pear cactus pads, were placed along the edge of the fencing at known areas of trespass. However, the most effective means of keeping people on the trail and dogs off the Preserve is by having onsite presence. In addition to CNLM's own staffing, CNLM works with City staff and volunteers to expand enforcement capacity.

The Orange County Sherriff's Department (OCSD) was called on some occasions, with two known citations issued to trespassers on-site in FY 19. The OCSD does have authorization to act and arrest individuals who trespass on the Preserve (CNLM 2015); in addition, Game Warden Nick Molsberry, CDFW, patrolled the Preserve when time and resources allocated and cited trespassers when encountered. In 2019, CNLM Rangers collaborated with Warden Molsberry more regularly during shifts so that when a Ranger observed a trespass situation they would directly contact the Warden, who

would then wait for the alleged trespasser to leave through one of the gates and give them a citation based on photos or videos taken by the Ranger. Of those ticketed in FY 19, 100% were prosecuted and violators were fined $280.00.

Unexpected events do occur on the Preserve; one such event was a suicide on the Preserve in March 2019. The incident was reported to Ranger Kevin DeNault by an officer working for OCSD Harbor Patrol. Ranger DeNault then notified the Preserve Manager who immediately traveled to the Preserve to document the incident and ensure protection of the Preserve during evacuation activities. The next day, an officer with OCSD was onsite to survey the overlook where the apparent suicide occurred. No further details were given to CNLM regarding the incident.

A Conservation Easement violation was documented by CNLM in May 2019 when trespass occurred by our neighbor's (3485 Dana Strand Rd) window cleaners who worked for AV Windows Pros. The Preserve Manager spoke to Alex Vogel, the owner of AV Windows Pros, and informed him about the illegal nature of trespass and the biological concerns relating to trespass. Undeterred, AV Windows Pros workers were documented trespassing again in August 2019. In addition to speaking with Alex, concerns were also discussed in May and August with the property manager, Tina Byrne, who is the point of contact for the property. A notice of violation letter was sent to AV Windows Pros with Tina Byrne copied but there was no response from AV Windows Pros. Tina Byrne replied that no more trespass would occur. CNLM did coordinate monitoring for trespass with Warden Molsberry and was assured that if CNLM wanted to press for charges it could be done up to a year after the violation occurred. At this point, CNLM has declined to move forward with filing charges.

Expand the GIS database as necessary

CNLM managed and added GIS coverages for data collected in FY 2019 (Appendix C).

Continue public outreach and educational opportunities within the Preserve, including collaborating with the City of Dana Point Natural Resources Protection Officer, Nature Interpretive Center (NIC) facilities, and City docents at the NIC

The NIC was open throughout FY 2019 from 10:00 a.m. to 4:00 p.m. Tuesday through Sunday. The Preserve Manager was available to interact with the public and answer questions while at the NIC on average two days a week. CNLM Rangers were onsite on average two evenings a week to answer questions and provide information to the public.

On 10 February 2019 the Preserve Manager hosted an Orange County chapter of the California Native Plant Society (CNPS) field trip on the Preserve lead by Jonathan Frank and Ron Vanderhoff. There were light showers during the field trip, but 12 enthusiastic members attended anyway to learn about the importance of the Preserve

and view the native and rare plant species on exhibit.

CNLM staff, with our partners at USGS and the City, made a short informational video about the Preserve and the species protected, focusing on the partnerships to monitor and manage for PPM and CAGN. The film is posted on the CNLM website.

On June 28, 2019 the Preserve Manager lead a tour of the Preserve for the CNLM Board Directors and invited guests to promote the Preserve and the CNLM mission.

In July the Preserve Manager was interviewed by Ben Brazil after being contacted by member of the CNLM board. The article was published in the LA Times (see Brazil 2019).

Provide opportunities for the public to help in maintenance of the Preserve

Volunteers helped with building and setting PPM track-tubes. CNLM has one regular volunteer that manages the wildlife cameras on the Preserve. Furloughed government workers volunteered for a day on the Preserve helping to removed dead and downed vegetation when the federal government was shut down for a prolonged period of time in FY 2019.

VI. REPORTING

Prepare an updated Habitat Management and Monitoring Plan

A low effect HCP draft permit application was submitted by CNLM to the USFWS in FY 2008 to address the potential for take of CAGN and PPM from future management actions. The process was not completed. In FY 19, CNLM continued the process of creating a revised habitat management plan that addresses only the Preserve rather than the entire Headlands area. The revised plan will provide specific and appropriate management guidance for the Preserve based on management experience, staff expertise, input from others with relevant expertise, and well-reasoned principles from the conservation sciences.

Record Preserve management and monitoring activities in an annual report and provide to the Wildlife Agencies and City

A work plan for FY 2019 (October 1, 2018 through September 30, 2019) was completed and provided to the USFWS, CDFW, and City on 18 October 2018 (CNLM 2018a). An annual report describing the management activities conducted during FY 2018 was completed on 4 March 2019 (CNLM 2019).

VII. REFERENCES

Brazil, B. 2019. The Dana Point Headlands is setting an example for how conservation can be done in urban areas. LA Times. 27 Jul 2019.

Brehme, C.S., J. Sebes, T. Matsuda, D. Clark, and Fisher, R.N. 2014. MCBCP Pacific Pocket Mouse Monitoring Results for 2013 and Multi-year Trend Analysis from 2012 to 2013. Prepared for AC/S Environmental Security, Marine Corps Base, Camp Pendleton. 69p.

[CNLM] Center for Natural Lands Management. 2013.CNLM Annual Report of Management Activities for the 2011-2012 Fiscal Year on the Dana Point Preserve (S033), Orange County, California. January 31, 2013.

…. 2015. Trespass Authorization Letter for Dana Point Preserve (S033). January 20, 2015.

.... 2018a. Annual Work Plan for the Fiscal Year 2018-2019 (October 1, 2018-September 30, 2019) on the Dana Point Preserve (S033). 18 October 2018.

.... 2018b. CNLM Annual Report of Management Activities for the 2016-2017 Fiscal Year on the Dana Point Preserve (S033). May 9, 2018.

.... 2019. Annual Report of Management Activities for the 2017-2018 Fiscal Year on the Dana Point Preserve (S033). 4 March 2019.

MacKenzie, D. I., J. D. Nichols, G. B. Lachman, S. Droege, J. A. Royle, and C. A. Langtimm. 2002. Estimating site occupancy rates when detection probabilities are less than one. Ecology 83: 2248-2255. [NOAA] National Oceanic & Atmospheric Administration. 2019. Record of Climatological Observations. Laguna Beach, CA. Station US1CAOR0050.

Shier, D. 2009. Behavioral ecology and translocation of the endangered Pacific little pocket mouse (*Perognathus longimembris pacificus*).

URS Corporation. 2005. Habitat Management and Monitoring Plan for Dana Point Headlands Biological Open Space. 18 April, 2005.

Western Regional Climate Center. 2017. NOAA, Laguna Beach Station 044647. Laguna Beach March 1928 to April 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN. pl?ca4647

APPENDIX A. Photos of CSS monitoring transects.

Figure A1. Transect C18, 2012 (left) and 2019 (right)

Figure A2. Transect AA11, 2012 (left) and 2019 (right)

Figure A3. Transect B11, 2012 (left) and 2019 (right)

Figure 5. Transect B15, 2012 (left) and 2019 (right)

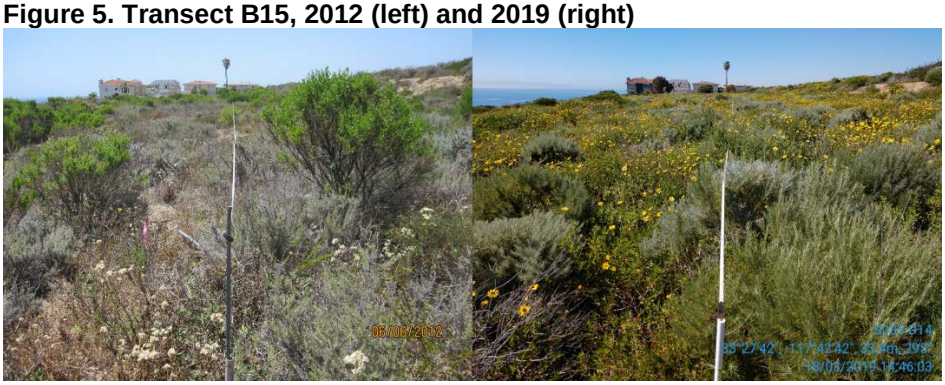

Figure A56. Transect D14, 2012 (left) and 2019 (right)

APPENDIX B. PPM habitat maintenance photos.

Before (left column) and after (right column) photos of areas with dead and downed vegetation removed in FY 2019.

APPENDIX C. GIS Coverage.

Coverage	Source	Source Year
Non-native plant locations	CNLM	2019
Gnatcatcher (points, use area, nest locations)	CNLM	2019
Pacific Pocket Mouse Points	CNLM	2019
Veg thinning polygons	CNLM	2019
Non-native plant locations	CNLM	2018
Gnatcatcher (points, use area, nest locations)	CNLM	2018
Pacific Pocket Mouse Points	CNLM	2018
Argentine ant locations	CNLM	2018
Non-native plant locations	CNLM	2017
Gnatcatcher (points, use area, nest locations)	CNLM	2017
Pacific Pocket Mouse Points	USFWS	2017
Rare Plant Points	Leatherman BioConsultants	2017
Vegetation Transects	CNLM	2016
Northern boundary Fence line	CNLM	2015
Bridal Creeper Locations	CNLM	2016
Gnatcatcher (points, use area, nest locations)	CNLM	2016
Bridal Creeper Locations	CNLM	2013
Gnatcatcher (points, use area, nest locations)	CNLM	2013
Rare Plant Points	CNLM	2013
PPM Capture Locations for captive breeding collection	San Diego Zoo	2012
PPM 24x24 Grid extended to former Marguerita Road bed and North of the road bed	USFWS	2012
Vegetation Transects	CNLM	2012
Gnatcatcher (points, use area, nests locations)	CNLM	2012
Bridal Creeper Locations	CNLM	2012
PPM 16x16 Grid extended to former Marguerita Road bed and North of the road bed	USFWS	2011
Rare Plant Points	CNLM	2011
Gnatcatcher (points, use area, nests locations)	CNLM	2011
Location of dead PPM	CNLM	2010
Rare Plant Points	CNLM	2010
Gnatcatcher (points, use area, nests locations)	CNLM	2010
Rare Plant Points	CNLM	2009
Gnatcatcher (points, use area, nests locations)	CNLM	2009
Veg Baseline Transect Locations	CNLM	2009
Pacific Pocket Mouse Points	USFWS	2009
Aerial Photo	Eagle Aerial	2008
Final Trail Route	CNLM	2008

Coverage	Source	Source Year
Non-native plant locations	CNLM	2019
Gnatcatcher (points, use area, nest locations)	CNLM	2019
Pacific Pocket Mouse Points	CNLM	2019
Veg thinning polygons	CNLM	2019
Rare Plant Points	Fred Roberts	2008
PPM 16x16 Grid	USFWS	2008
Gnatcatcher (points, use area, nests locations)	CNLM	2008
Bobcat Point	CNLM	2007
Revegetation Areas & Seed mix	URS Corporation	2007
Gnatcatcher (points, use area, nests locations)	CNLM	2007
General Wildlife (whiptail and red racer)	CNLM	2007
Cliff Spurge Points	CNLM	2006
Veg Baseline Transect Locations	CNLM	2006
Aerial Photos	URS Corporation	2006 and 1991
PPM Habitat Areas	URS Corporation	unknown
Vista Points	URS Corporation	unknown
Pacific Pocket Mouse Points	USFWS	1993-2007
Cliff Spurge Points	URS Corporation	2007
Trail Location Options	URS Corporation	2007
Sensitive Species (Cliff spurge and Boxthorn)	URS Corporation	2006
Vegetation Communities	URS Corporation	unknown
Gnatcatcher Locations	URS Corporation	unknown
Coastal Commission ESHA Boundaries	URS Corporation	unknown
Jurisdictional Channels	URS Corporation	unknown
Open Space	URS Corporation	unknown
Headlands LLC Project Boundaries	URS Corporation	unknown
Headlands LLC Revegetation Areas	URS Corporation	unknown

CNLM ANNUAL REPORT OF MANAGEMENT ACTIVITIES FOR THE 2019-2020 FISCAL YEAR

(October 1, 2019 – September 30, 2020)

DANA POINT PRESERVE (S033)

Owned and Managed by CNLM

Provided to:

U.S. Fish and Wildlife Service
Jonathan Snyder
jonathan_d_snyder@fws.gov

California Department of Fish and Wildlife
Kyle Rice
Kyle.rice@wildlife.ca.gov

Prepared by:
Korie C. Merrill, M.S., Preserve Manager, kmerrill@cnlm.org

Reviewed by:
Deborah L. Rogers, Ph.D., Co-Executive Director and Director of Conservation Science and Stewardship
&
Nicole Shaw, M.S., Stewardship Manager

Center for Natural Lands Management

27258 Via Industria, Suite B
Temecula, CA 92590
Phone: 760.731.7790
Web: www.cnlm.org

9 February 2021

Table of Contents

SUMMARY OF 2019-20 ACTIVITIES

- Trail base and trail fencing maintenance
- Coastal California gnatcatcher (*Polioptila californica californica*) surveys were conducted
- Pacific pocket mice (*Perognathus longimembris pacificus*) were monitored using track-tubes and traps
- Argentine ant (*Linepithema humile*) pilot project was continued
- Invasive exotic plant species removal was conducted
- Erosion control measures were implemented along the bluff edge
- Dead native perennial vegetation was selectively thinned
- CNLM rangers patrolled the Preserve to protect the habitat and educate visitors
- Visitors were provided with information about the Preserve
- Communications and coordination with the City of Dana Point, USGS and USFWS
- A workplan and a budget for 2020-21 activities were prepared
- A report on 2018-19 stewardship activities was prepared
- A revision of the Preserve Management Plan (Habitat Management and Monitoring Plan) was continued
- COVID-19 response including trail restrictions planning and communication

I. INTRODUCTION

The Dana Point Preserve (Preserve) is located in the City of Dana Point (City), Orange County, California. The Preserve has been owned and managed by the Center for Natural Lands Management (CNLM) since December 2005. The Preserve consists of 29.4 acres of native coastal sage and coastal bluff scrub habitat. Adjacent natural open spaces (known as South Strand, Hilltop, and Harbor Point) are owned and managed by the City.

The process to protect the Preserve was initiated when the California Coastal Commission (CCC) required the developer of an oceanfront property project (Project), Headlands Reserve LLC, to dedicate and preserve in perpetuity a portion of its property, as public open space, in its natural habitat. The Project site is included in the NCCP/HCP EIR/EIS as a Covered Project, and the proposed project is included as a "Planned Activity" of a "Participating Landowner". An Endangered Species Act incidental take (Section 10a) permit (TE810581-1) that authorizes incidental take of 44 covered species was issued to Headlands Reserve, LLC on January 21, 2000 by the U.S. Fish and Wildlife Service (USFWS). Therefore, development impacts on federal- and state-listed species, Identified Species designated in the NCCP/HCP EIR/EIS, Covered Habitats designated in the NCCP/HCP EIR/EIS, removal of up to 30 acres of coastal sage scrub, and impacts on species dependent on or associated with the Covered Habitats were authorized and considered mitigated to less than a significant level, consistent with the NCCP/HCP guidelines under the NCCP Act, state and federal ESAs, and CEQA. Some of the mitigation measures required under the NCCP/HCP were to:

- Contribute $500,000 toward the NCCP/HCP 'Non-Profit Corporation' and 'Adaptive Management Program;
- Contribute $350,000 to fund Pacific pocket mouse population propagation, enhancement, relocation and recovery efforts upon issuance of Section 10(a)(1)(A) permit for pocket mouse;
- Commit to transplant, at California Department of Fish and Wildlife's (CDFW) request, any *Dudleya blochmaniae* (Blochman's dudleya) populations at Headlands Reserve's expense (not to exceed $23,000) that would be directly impacted by development on the

property (Note: subject to CDFW approval, the landowner was allowed to collect and sow seed, rather than translocate individual plants); and
- Contribute to the cost of preparation of the NCCP/HCP.

Although the mitigation measures also included establishing a 22-acre (8.9 ha) Temporary Pacific pocket mouse (TPPM) Reserve for eight years, possible extension for four more years, and providing the Wildlife Agencies (USFWS and CDFW) the opportunities to acquire the TPPM Reserve at Fair Market Value if USFWS determined, at or prior to expiration of the 80-year Reserve period, that continuance of the Reserve was necessary to ensure the survival and recovery of the pocket mouse, these actions were not taken. Rather, the trustees of the Steele Foundation, concerned that Headlands Reserve LLC would develop the conservation area as an amenity to the Project without regard to resident and potential conservation values, provided sufficient funding for CNLM to purchase the open space property to protect its important conservation values and to establish an endowment for managing the biological resources onsite in perpetuity. The Steele Foundation vision – and the imposed charitable restriction on its grant to CNLM – was to enable and secure the Preserve to the condition it appeared when first viewed by Richard Henry Dana in 1834. The Steele Foundation and CNLM entered into an agreement for the perpetual management of a stewardship endowment to provide the necessary financial resources for the Preserve's protection and management. The Preserve, as "public open space," is CCC-required mitigation; it is not USFWS (ESA) mitigation.

To further protect the natural resources of the Preserve, CNLM voluntarily granted a Conservation Easement (CE) to the City of Dana Point, which was recorded December 20, 2005, to further protect site conservation values in perpetuity. The CE was not exacted by a resource agency as a regulatory requirement.

Management activities for the City properties and the Preserve have been operating under the guidelines of the initial Habitat Management and Monitoring Plan (HMMP; URS 2005) for Dana Point Headlands Biological Open Space. The HMMP was reviewed by the CCC, USFWS, CDFW, and the City. However, we have no record that the final HMMP, dated April 18, 2005, was approved. Despite this uncertainty, CNLM has been managing the Dana Point Preserve according to the HMMP and will continue to do so until CNLM revises the management plan in consultation with the Wildlife Agencies and other information sources.

This document details the management activities which occurred during the Fiscal Year (FY) 2020 (October 1, 2019 - September 30, 2020). Four primary management objectives are identified in the HMMP:

1. Maintain the Preserve to permit ecological processes to function.
2. Contribute to the preservation and restoration of the endangered or threatened species and their habitats that are present on the Preserve.
3. Contribute to the preservation and restoration of non-listed sensitive species that contribute to biodiversity.
4. Develop a public awareness program that informs residents and visitors of the sensitivity and ecological importance of the Preserve.

Three events affected some management activities in FY 2020: Rabbit Hemorrhagic Disease Virus Serotype-2 (RHDV2), the COVID-19 pandemic, and collaboration with USGS.

1. RHVD2 is a threat to wild lagomorph populations in CA with a mortality rate of up to 80% of affected populations (CDFW 2020). RHDV2 was recorded in southern California in

May 2020. Subsequently CDFW sent notification in June 2020 which provided recommendation for Scientific Collecting Permit holders to reduce the risk of RHDV2 spread (CDFW 2020). Following those recommendations, CNLM implemented precautions including the requirement that all Orange County CNLM staff and contractors were required to disinfect field crews' shoes and field equipment with 10% bleach solution prior to entering the Preserve habitat.

2. In 2020, while the COVID-19 pandemic changed CNLM's and contractors field protocols (e.g., only one person in a vehicle at a time, personnel must wear face covers, field equipment is to be cleaned before and after each use, etc.) which had impacts to management activities, CNLM was able to perform its responsibilities to maintain and protect the Preserve based on goals and objectives described in the HMMP and FY 2020 Annual Work Plan (CNLM 2019b). In addition, to help protect the Preserve, CNLM staff, volunteers, and the public, CNLM closed the trail to public access March through September 2020.
3. External funding provided to USGS from USFWS, was used to support CNLM and the City's management of PPM through PPM track-tube and live trap monitoring, and vegetation thinning and monitoring. These specific management activities are discussed in more detail below.

II. CAPITAL IMPROVEMENTS

The CNLM Dana Point Preserve continues to be a regional attraction in Southern California, with high daily visitation rates for recreational use by both locals and tourists. Although the exact number of visitors is unknown, the trail is heavily used throughout the year. Trail usage data has been collected by automated trail counters at both gates since 2011. The trail counters are triggered by motion (i.e., an individual or group) with a reset time of 0.03 seconds, each trigger gives a "hit". This data can offer a rough approximation of the number of visitors, it can be assumed one hit is at least one person but is best to be used to compare the trend over time rather than number of individuals, as it cannot determine if only one person entered or a group and if that person exited the same gate or the other. While not every day since 2011 have data been collected due to general maintenance issues such as battery failure, removal for upkeep, blocked sensor, improper setup, etc.; a preliminary analysis of the data shows the Scenic Gate entrance to the trail average 378.8 hits is per day, while at Strand Gate the average is 394.3 hits is per day. City staff and docents working at the Nature Interpretive Center (NIC) count and track visitors to the NIC while it is open (Tuesday through Sunday, 10 AM to 4 PM and closed on holidays open a total of 309 days). The total counted visitors in 2018 was 29,409 an average of 95.2 visitors per day and in 2019 the total was 31,080 an average of 100.9 visitors per day. While these numbers do not reflect the number of daily visitors on the Preserve trail, they can be used to supplement the trail counter data for tracking long-term trends of annual visitation rates. It is important to remember that these averages are preliminary but offer a glimpse to the number of public visitors through hits.

As a result of high public use of the Preserve, the trail, trail fencing, and perimeter fencing continued to require a substantial amount of CNLM staff time for maintenance throughout the year, such as replacing post caps, picking up trash, leveling out the trail, tightening fence cable slack, and installing new fence cable. High usage, or misuse by visitors, resulted in a panel of the perimeter fence at the Scenic Drive gate to detach and fall, likely from the stress of repeated climbing and pulling on it when the trail was closed. It was reattached by La Habra Fence Co. a few days later, in between that time the vegetation in that area was trampled by trespassers. In addition, cable fence repairs were conducted throughout the year as needed by CNLM staff.

During the pandemic, when the trail was closed to the visiting public, staff opportunistically painted the metal trail posts to prevent further corrosion. The task was not completed in FY 2020. To better shield the trail base for winter rain, sandbags and eucalyptus logs were installed along the trail in the most erosive areas to act as water bars. Sandbags were all filled with loose native sand that accumulated on the trail. CNLM continued a policy of closing the trail to the public during rain events and for whatever length of time was required to repair the trail after such events. Trail maintenance due to erosion by trail use and weather exposed portions of a buried chain-link fence running from OL 3 to OL4. This is an ongoing issue that CNLM staff have and will continue to work to remove the exposed sections as they occur.

CNLM receive donations via a donation box within the NIC for a trail reconstruction project throughout the year. Donations were deposited into the appropriate CNLM account as per CNLM donation protocols.

III. BIOTIC SURVEYS

Rare plants

The HMMP recommends that rare or sensitive annuals and herbaceous perennial plants be monitored during the spring season after the area experiences an annual rainy season that exceeds 75% of the long-term average annual precipitation (the average for the area is 12.52 in (31.81cm, Western Regional Climate Center 2017) or every three years (URS 2005). The total precipitation for the area during FY 2020 was 13.93 inches (35.38 cm) (Laguna Beach Station, NOAA 2020). Although the annual precipitation threshold was met in FY20, rare plant monitoring was not conducted due to the shelter-in-place order from March to May 2020.

Vegetation transects

Five vegetation transects (F13, H11, D09, D05, and J05) were monitored in FY 2020 that were previously monitored in FY 2013 as part of CNLM's long-term coastal sage scrub (CSS) monitoring at the Preserve (Table 1 and Figure 1). There are twenty transects, a portion of which have been monitored intermittently beginning in 2006. Each start and end point of the transects were marked by rebar stakes with a PVC pipe cover when they were established. Transects are 25 m in length, with point-intercept data recorded every 0.5 m for a total of 50 points per transect (starting at 0.5 m ending at 25.0 m). Shrub, subshrub, dead shrub, herbaceous plant, and ground cover data were collected on 31 May 2020 along the same transects previously collected 5 June 2013. Any dead shrubs intercepting the transect point were not identified by species. Photos of each transect were taken during both surveys (see Appendix A for comparison photos between years, 2013 and 2020).

Table 1. CSS transects on the Preserve and Dates of Monitoring.

Transects	Years Monitored				
1, 2, 3, 4, & 5	2006	2009	2012	2016	2018
AA11, B15, C18, D14, & B11	2012	2019			
F13, H11, D09, D05, & J05	2013	2020			
H13, J09, E07, D11, & H03	2014				

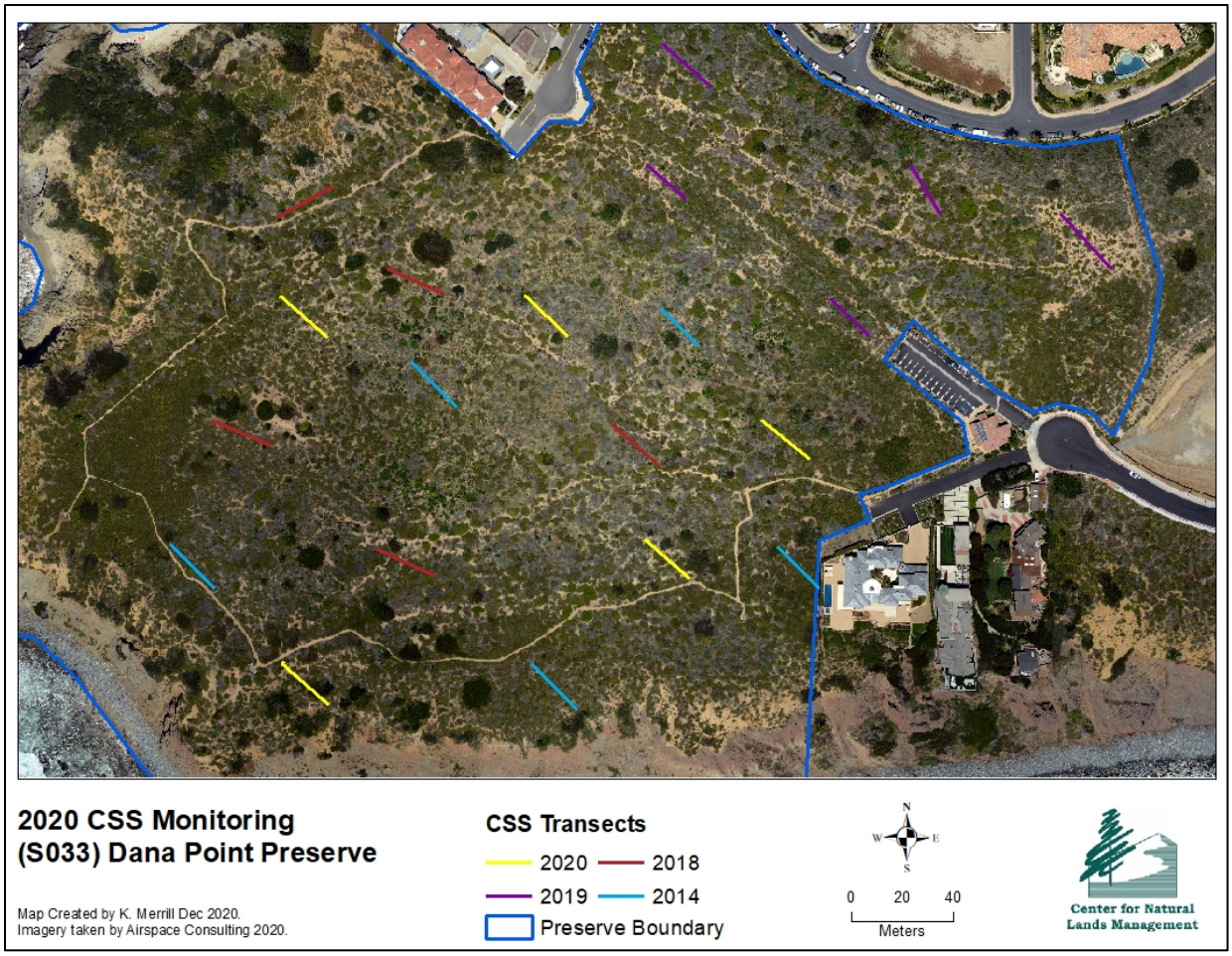

Figure 1. Map of CSS transects. Five transects, previously monitored in 2013, were monitored in 2020; the other 15 transects were last monitored in 2019, 2018, or 2014.

It should be noted that two transects were within polygons of thinned vegetation (F13 thinned in September 2019 and D09 thinned in February 2020); however, it does not seem to have impacted the diversity of species recorded during the survey. In 2013 a total of 19 plant species were recorded on the transects, including the belt transects. Whereas in 2020, a total of 28 plant species were recorded during monitoring on 31 May 2020; 12 species were recorded on the point-intercept transects (Table 2) and 21 species were documented on the belt transects (Table 3), of which 16 species were only documented in belt transects and not on the point-intercept transects. The only shrub found on all five transects was California buckwheat (*Eriogonum fasciculatum),* while California sagebrush (*Artemisia californica*) had the highest mean percent cover across the five transects (28.4% standard error (SE) ±12.1).

Table 2. Summary of the 2020 CSS monitoring transects. Average percent cover, standard error (SE) and percent of transects occupied for species detected along five Preserve CSS transects.

Functional Group	Species	Cover (%) Average	SE	Transects (%)
Native Shrubs				
	Artemisia californica	28.4	12.1	80.0
	Encelia californica	23.2	8.3	80.0
	Eriogonum fasciculatum	13.6	6.7	100.0
	Euphorbia misera	2.8	2.8	20.0
	Rhus integrifolia	7.6	3.4	60.0
Native Sub-shrubs				
	Croton califonicus	9.6	5.0	60.0
Native Forbs				
	Logfia filaginoides	0.4	0.4	20.0
	Marah macrocarpa	1.6	1.6	20.0
	Pseudognaphalium californicum	3.6	1.8	60.0
	Pterostegia drymarioides	1.2	0.8	40.0
Non-native Grasses				
	Bromus madritensis	0.4	0.4	20.0
Non-native Forbs				
	Pseudognaphalium luteoalbum	0.4	0.4	20.0

Table 3. 2020 CSS belt transects. All species recorded on the 2-m belt transects.

Belt Species	
Acmispon glaber	*Mesembryanthemum crystallinum*
Antirrhinum nuttallianum	*Mirabilis laevis* var. *crassifolia*
Baccharis pilularis	*Pseudognaphalium californicum*
Camissonia bistorta	*Pseudognaphalium luteoalbum*
Erigeron sp.	*Pterostegia drymarioides*
Cryptantha intermedia	*Solanum* sp.
Eriogonum parvifolium	*Solanum parishii*
Lepidium sp.	*Sonchus asper*
Logfia filaginoides	*Stephanomeria exude*
Lysimachia arvensis	*Vulpia* sp.
Marah macrocarpa	

In Southern California there was a seven-year drought from 2011 to 2016 (six years of which had less than 50% of the annual average precipitation of 12.52” in the Dana Point area). As such, a higher percentage of dead shrub and lower diversity of species along the transects would be expected in 2020 than recorded in 2013. However, since 2013, portions of the Preserve were manipulated by removing dead shrubs and thatch to create more bare ground and open the canopy (see the Habitat Maintenance section below for details). The average

mean percent cover of dead shrubs in 2020 was lower than in 2013 (Table 4). Native forb cover decreased from 2013 (13.2 % to 6.9 %), likely due to a decrease in fairy mist (*Pterostegia drymarioides*) cover from 10.8% to 1.2%. In 2020 the only sub-shrub species recorded on the transects was Croton (*Croton califonicus*), a known PPM food source. Which increased from 2.8% to 9.6% cover between 2013 and 2020. The Preserve Manager noted that Croton quickly colonized areas recently thinned of dead and downed vegetation which could account for this increase in cover.

Table 4. Comparison of 2013 and 2020 functional groups. A comparison of mean percent cover by functional groups of five permanent CSS transects monitored in 2013 and 2020.

	Mean Percent Cover by Year	
Functional Group	**2013**	**2020**
Shrubs	63.6	72.0
Sub-shrubs	4.8	9.6
Dead shrubs	16.8	12.0
Native forbs	13.2	6.0
Non-native forbs	0.0	0.4
Non-native grasses	28.4	0.4
Native grasses	3.2	0
Bare ground*	24.8	20.8
Leaf litter	73.2	79.2

* Ground cover data was missing for one point in 2013, thus total ground cover is only 98%.

The 2011-12 annual preserve stewardship report contained recommendations to conduct monitoring later in the season, rather than earlier (e.g., in July rather than in March), to capture what the vegetation looks like when Pacific pocket mouse (PPM, *Perognathus longimembris pacificus*) are active above ground (CNLM 2013). However, in 2020, PPM activity was recorded in the first week of May on the Preserve (see PPM section below) and were likely active above ground before that. Since PPM activity fluctuates based on current habitat conditions, it is difficult to recommend a specific time of year to conduct CSS monitoring based on PPM activity. Instead of using CSS transects for determining the PPM food resource availability, specific PPM habitat surveys should be conducted following USGS protocol and the timeframe for sampling should be based on real-time data (current rainfall amount and patterns, landscape level PPM activity, CAGN activity, floral resources, etc.). Thus, CSS transect monitoring to capture long-term trend analysis and overall health of the vegetation should be done at relatively the same time annually in spring (e.g., May or June) and not relied upon for PPM food resource availability measurements.

Aerial imagery of the Preserve was taken in May 2020 by contractors, Airspace Consulting, as a tool for monitoring vegetation trends and informing vegetation management activities. These data can be used in the future but were not used in FY 2020 to monitor CSS.

Coastal California gnatcatcher

Monitoring for coastal California gnatcatchers (*Polioptila californica californica*, CAGN) typically is conducted annually on the Preserve both to track presence of this threatened species and to be aware of spatio-temporal use of the Preserve. The latter is important to ensure management

activities do not result in harassment of CAGN, particularly during their nesting season, generally 15 February – 31 August.

In 2020, surveys were conducted by Preserve Manager, Korie Merrill, who is authorized to conduct survey activities under CNLM's TE Recovery Permit 221411-5.3 and Scientific Collecting Permit 13986. The Preserve was surveyed six times during February- July 2020. Throughout the Preserve nesting habitat was surveyed for presence/absence according to USFWS protocols. All CAGN observations were mapped.

There were 22 observations of CAGN, of which at least 20 paired (Figure 2). Past population numbers have ranged from three pairs (2006 and 2007) to 14 pairs (2019); thus, this year's population is relatively high. Given the size of the Preserve and relative density of CAGN, there was considerable interaction throughout the breeding season between various pairs and individuals. A minimum of nine pairs were successful in producing chicks, although with the amount of activity throughout the Preserve it was difficult to distinguish family groups. Multiple pairs did attempt a second nest; the success of second nests was not recorded.

In December 2019 - February 2020, approximately 3.0 ac of dead and downed vegetation within the Preserve was removed prior to the nesting season (see Habitat Maintenance and Restoration section below for details) in the area that would become CAGN 1, 2, 7, and 11 territories. The removal of dead vegetation in this area did not seem to negatively impact CAGN habitat as exhibited by the large number of CAGN pairs within the Preserve in 2020. It is possible that the newly created patch of bare ground increased forb diversity and subsequently arthropod/prey diversity. The trail which is typically open daily for public access from 0700 until sunset was closed for much of the nesting season (March-September 2020) due to COVID-19 concerns. The reduced public pressure from trail use may have had an impact on the number of pairs within the Preserve but more analysis is warranted to discern whether this is a direct response. With such high activity in such a small area, and with the expectation that the trail will be open to public use in 2021, it is probable the number of CAGN pairs in the Preserve will decline in 2021- likely due to competition stress, heavy trail use (and trespass) and resource availability.

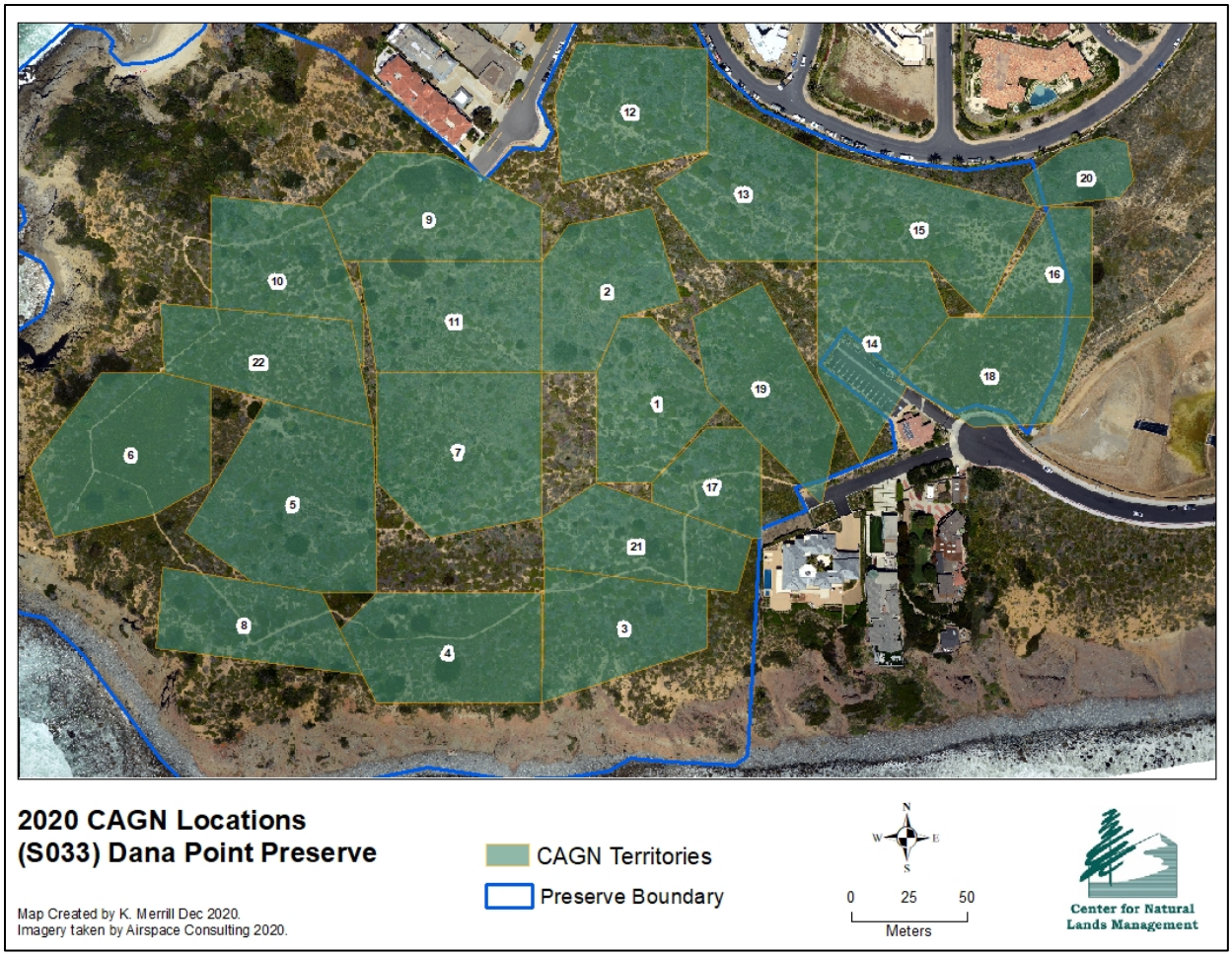

Figure 2. Map of CAGN locations. Polygons represent the estimated CAGN territories within the Preserve in 2020.

Pacific pocket mice

PPM monitoring is typically conducted annually on the Preserve both to track presence of this endangered species and to be aware of spatio-temporal use of the Preserve to ensure management activities do not result in harassment or take of PPM. Species surveys not only provide information on the status of the local population(s) but can be an indirect indicator of habitat suitability for those species. For animal species, any survey method is an estimate, being based on a sample of the local population. Track-tube surveys have been used successfully for monitoring PPM (Brehme et al. 2014), providing information on presence/absence, areas occupied, and, depending on survey design, some phenological and demographic data. This information will be valuable in determining any trends in populations that may be important for the long-term management of our Preserve, and in aiding the larger conservation community in determining regional trends.

USGS was funded by USFWS to assist CNLM with conducting vegetation management and monitoring, assisting with track tube monitoring, and conducting live-trapping on the Preserve. These funds were used to augment the management activities outlined in the FY 2020 Work Plan (CNLM 2019b).

PPM track-tube monitoring was conducted by CNLM staff, Korie Merrill and Sarah Godfrey (CNLM), in collaboration with USGS staff, Cheryl Brehme, Devin Adist-Morris, and Tristan Edgarian. All are authorized to conduct PPM survey activities following USFWS protocol. All track cards were reviewed by Korie Merrill, Devin Adist-Morris, Cheryl Brehme, or Tristan Edgarian for definitive identification.

Track-tube monitoring was conducted across the Preserve in two sessions. Track tubes were reset and checked weekly for the month of May plus one check on 12 June ("Session 1") and weekly for the month of August ("Session 2"). During both sessions, two track-tubes (a 1.0" tube at point "A" in the southeast and a 1.5" tube at point "B" in the northwest corners) were set within CNLM's alpha-numeric grid cells (24 meters x 24 meters) approximately 12.5 meters apart (in a subplot) from the nearest track tube for two monitoring points per grid with two exceptions: grid cell G-09 had three track tubes and row J only had one track tube per grid cell (Figure 3). Each track-tube was set in the nearest suitable location within 5 meters of the flagged GPS position of each monitoring point. A total of 268 track tubes were set within the 136 grid cells across the Preserve. Additionally, 30 track tubes were set across 15 grids in the adjacent City property. All trails to the track tubes were flagged prior to monitoring to minimize impact to the habitat and wildlife within the Preserve. Sterile millet was used as the bait.

There were 268 points across the 136 grids with track tubes, of which 40 unique points had PPM tracks in Session 1 and 173 in Session 2 (Figure 3). PPM were detected at 31 of the 136 grids (24m x 24m) during Session 1 and 106 in Session 2 (Table 5). Of the 268 points within the Preserve with track tubes, 40 unique points had PPM tracks in Session 1 and 168 points in Session 2 (Figure 3). PPM were detected at 31 of the 136 grids during Session 1 and 96 in Session 2 (Table 5). In the adjacent City property, 3 points had PPM detected along the property boundary. In addition to confirming PPM presence on the Preserve, track tube data can also be useful in estimating habitat use. Only using cards with medium to high confidence of PPM detection the naïve habitat use estimate (number of grids with PPM detected per number of grids sampled). The naïve habitat use estimate for Session 1 was 22.8%. Naïve habitat use estimate increased to 72.1% during Session 2, spatial distribution of PPM is shown in Figure 3.

Table 5. Summary of PPM track-tube surveys. Grids (24m x 24m) with PPM tracks in 2020 during two monitoring sessions. Session 2 grids where PPM tracks were recorded in both sessions are in bold.

Grids with PPM					
Session 1	A-06	C-06	D-05	E-06	F-06
	B-06	C-10	D-06	E-09	F-09
	B-07	C-11	D-07	E-11	F-11
	B-12	C-12	D-08	E-12	
	B-13	C-13	D-09	E-17	
	C-04	C-14	D-13	E-19	
	C-05	D-04	E-05	F-05	
Session 2	**A-06**	BB-12	**D-06**	**E-09**	F-13
	A-10	C-03	**D-07**	E-10	F-14
	A-11	**C-04**	**D-08**	**E-11**	F-15
	A-12	**C-05**	**D-09**	**E-12**	G-03
	A-14	**C-06**	D-10	E-13	G-04
	A-16	C-07	D-11	E-14	G-05
	AA-11	C-08	D-12	**E-17**	G-06
	AA-12	C-09	**D-13**	E-18	G-07
	B-06	**C-10**	D-14	**E-19**	G-08
	B-07	**C-11**	D-15	F-02	G-09
	B-08	**C-12**	D-16	F-03	G-11
	B-09	**C-13**	D-17	F-04	G-14
	B-10	**C-14**	D-18	F-05	H-05
	B-11	C-15	D-19	**F-06**	H-08
	B-12	C-17	E-03	F-07	H-09
	B-13	C-18	E-04	F-08	I-08
	B-14	C-19	**E-05**	**F-09**	I-09
	B-15	D-03	**E-06**	F-10	J-07
	B-17	**D-04**	E-07	**F-11**	AA-21*
	BB-11	**D-05**	E-08	F-12	

* Grid is on City property.

As with PPM track-tube monitoring, USGS was funded by USFWS to assist CNLM with live-trap PPM surveys. Trapping was conducted 29 Jun - 4 Jul by USGS. CNLM staff was on-site during trapping events and assisted as needed. Sets of 2 traps were placed subjectively (i.e., in what is likely the most suitable habitat) in 12x12m subplots (A and B) within 45 of CNLM's permanent 24x24m grid cells. During live-trapping, track tubes in the area were closed to prevent capture competition. A total of 132 traps were deployed within 45 grids (Figure 3). Trails to each trap were flagged with reflective tape to allow for biologists to follow these trails during trapping, minimizing habitat destruction and take of any coastal California gnatcatchers. Large Sherman traps (12" long) without the modified door were used to prevent woodrat mortality as recorded in previous trapping events on the Preserve (CNLM 2013, CNLM 2018). Traps were washed with local sand prior to opening the traps for PPM capture. Sterile millet was used as the attractant in each trap. Traps were checked twice (approximately 11:30 PM and 04:30 AM) and closed

during the day prior to leaving the area. Any non-target animals were documented and released immediately. Captured PPM were:

- Identified by sex.
- Measured (e.g., length, weight, and ear height).
- Examined for reproductive activity (e.g., lactating females, pregnant, scrotal males, or juveniles/subadults).
- Marked with dye, needed to identify if recaptured during the trapping event.
- Released as quickly as possible after observations were obtained.

In addition, PPM ear-snips were taken for future genetic analysis and if available, fecal samples were taken for future dietary analysis. Samples were stored at the NIC's freezer and subsequently given to the San Diego Zoo Global (Zoo) and USGS for research purposes.

Over five nights of trapping, 77 unique PPM were captured in 40 of the 45 grids (Figure 3). Two mortalities of PPM and no non-target species mortality occurred during this trapping event. The reason for PPM mortality is unknown, as carcasses were found outside individual traps, both were likely predation. These mortalities were reported to USFWS and the two PPM specimens were recovered and given to Zoo for genetic research.

A full analysis of PPM habitat monitoring, track-tube survey and live-trapping results will be reported with USGS in a separate report.

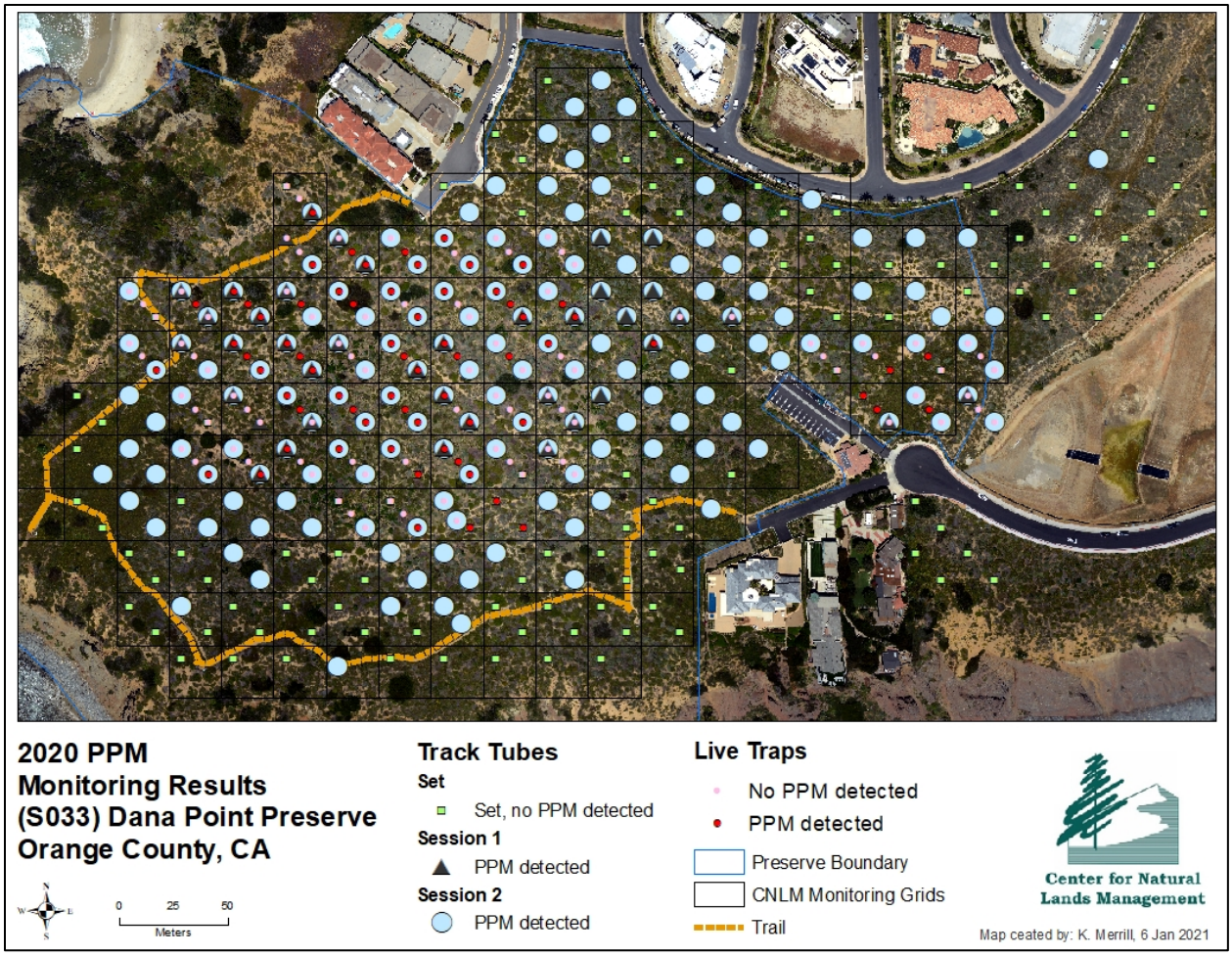

Figure 3. 2020 PPM Survey Results Map. Grids are a 24m x 24m overlay.

The complicated interactions among vegetation, climate, and PPM response suggests caution in interpretation of limited studies. Although confounded by differences in methods (track tube versus live traps), trapping effort, and monitoring season, monitoring efforts on the Preserve do show considerable temporal fluctuation since trapping began in 1992 (CNLM 2019a), both before and after the property was restricted for conservation purpose. Similar to the complications in detecting trends in PPM presence, the influences on PPM are multiple, cumulative, and mutually interactive.

Two of those potential influences in 2020 that warrant additional investigation include:

1. Habitat management activities - in December 2019 and February 2020, dead and downed plant material in ~3.0 acres within the Preserve were removed to open the vegetation canopy which created patches of bare ground for suitable PPM habitat (see §III for details).
2. Trail closure - the trail which is typically open daily for public access from 0700 until sunset was closed due to COVID-19 concerns for the entirety of monitoring (March-September 2020).

Generalizations about PPM must be interpreted within the context of cumulative weather events (e.g., too many consecutive drought years or extreme drought events may result in insufficient food availability) and vegetation dynamics. Plant species composition and spatial

pattern affect PPM in terms of food availability, cover from predators, cover from unnatural light, intraspecific communications, moderators of microclimate, and other direct and indirect effects. Further, optimum vegetation composition, pattern, and coverage relative to bare ground, depends on context (e.g., ability of PPM to move, even occasionally to offsite areas), edge effects, and the relationship between vegetation and competitors, predators, or both. At the beginning of the PPM monitoring season in 2020, USGS collected vegetation data at each monitoring point, this data will be used to model suitable PPM habitat and guide long-term management activities on the Preserve. Until those results have been analyzed, it is not reasonable to interpret or suggest what treatment effects removal of the dead and downed plant material had on PPM activity in 2020. Reduced public pressure from trail use may have had an impact on the number of PPM within the Preserve - PPM were found across the trail for the first time since 2016. No PPM burrows were found within the trail. As with vegetation removal, further investigation is warranted to better determine whether there is a relationship between PPM and the trail and/or trail use.

Flora and fauna inventory

Since 2005, CNLM has implemented opportunistic biological surveys for wildlife on the Preserve, occasionally supplemented with more formal surveys for rare or special-status plant species and live-trapping, track-tube monitoring, protocol surveys and wildlife camera traps for animal species. Wildlife monitoring activities included scat and print identification opportunistically by CNLM staff and the continued use of infrared cameras located throughout the Preserve. A pair of peregrine falcons (*Falco peregrinus*) were recorded nesting on the Preserve's southern cliff in FY 2020. This is the tenth consecutive year of falcons nesting on the Preserve. The nest was successful with three juveniles fledged. Long-tailed weasel (*Mustela frenata*) was observed twice by CNLM staff on the Preserve near OL2. Other taxa identified on the wildlife cameras were recorded by CNLM staff (Table 6) throughout the year.

Table 6. Wildlife Species. Wildlife taxa documented by wildlife cameras in FY 2020.

Common Name	**Scientific Name**
American crow	*Corvus brachyrhynchos*
Bobcat	*Lynx rufus*
California ground squirrel	*Otospermophilus beecheyi*
California quail	*Callipepla californica*
California thrasher	*Toxostoma redivivum*
California towhee	*Melozone crissalis*
Coyote	*Canis latrans*
Desert cottontail	*Sylvilagus audubonii*
Desert woodrat	*Neotoma lepida*
Mourning dove	*Zenaida macroura*
Pacific pocket mouse	*Perognathus longimembris pacificus*
Raccoon	*Procyon lotor*
Roadrunner	*Geococcyx californianus*
Striped skunk	*Mephitis mephitis*
Western fence lizard	*Sceloporus occidentalis*
Western harvest mouse	*Reithrodontomys megalotis*

Eight species of rare or special-status plants have been detected on the Preserve and were last formally surveyed in 2017 (see CNLM 2018). Two taxa of flora not previously recorded on the

Preserve were recorded in FY 2020: ball Gilia (*Gilia capitata* spp*. abrotanifolia*) and stinknet (*Oncosiphon piluliferum*).

IV. HABITAT MAINTENANCE AND RESTORATION

Non-native species

CNLM staff removed individuals of six non-native plant species during FY 2020: bridal creeper (*Asparagus asparagoides*), tree tobacco (*Nicotiana glauca*), yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), Sahara mustard (*Brassica tournefortii*) and stinknet. Plants were removed by hand without the use of herbicide, bagged, and removed off site to prevent further spread of propagules. All activities were conducted with the supervision of the Preserve Manager to minimize any negative affects to PPM and CAGN by avoiding nesting areas and surveying for and avoiding PPM burrows prior to pulling plants.

Argentine ants are considered a potential threat to CAGN and PPM persistence. In response, CNLM initiated a pilot study with researchers from the University of California Riverside to develop and implement ecologically appropriate tools to control Argentine ants on the Preserve. This study is ongoing from FY 19, and results will be reported in a separate report.

Erosion control measures on the bluff edge

Since 2011, CNLM has been using straw wattles to slow water flowing downhill in the exposed areas and gullies on the bluff edges which are above rare plant populations. CNLM has also been using dead vegetation and duff cleared from grid cells as erosion control materials in these same areas. In addition to erosion caused by rain, trespassers walking and sitting on the bluff edges continue to prevent vegetation from growing in these areas. In FY 2020, prickly pear (*Opuntia littoralis*) and coastal cholla (*Cylindropuntia prolifera*) propagules were planted along the bluff edge to help stabilize the edges as well as deter people from walking off-trail. This is not only important for wildlife and vegetation but for protection of the slope. Falling rocks, erosion and landslide are all potential risks from vegetation degradation due to frequent trespass. While we expect some erosion and falling rocks to occur on the bluffs as a natural condition, these management activities may help minimize the risk of erosion.

Pacific pocket mouse habitat maintenance

To reduce accumulated duff and increase bare soil for PPM use within the Preserve, CNLM continued to conduct duff and vegetation removal treatment (“thinning”) in specifically identified areas. Leaf litter, woody debris, and other organic material, collectively referred to here as duff, has accumulated under the mature Coastal Sage Scrub vegetation throughout the Preserve. Although a positive, statistically significant, treatment effect on PPM has not been shown, thinning has been effective at increasing openness and not shown to be harmful to PPM within certain conditions (Brehme et al. 2014).

It is important to note that thinning, given the context of habitat for listed species (PPM and CAGN), is not simple and must be done with caution. Not just the activity of picking up duff and dead shrubs, but the location, process, and manner in which the material is hauled off must be considered. The workload associated with duff and dead shrub removal is substantial and contractors were hired to complete the task and supervised by the Preserve Manager. NDVI imagery was used to calculate percentages of grid cells occupied by dead vegetation. The

percentages were used to draw polygons in areas with greater than 50% dead shrub cover. The polygons were used to identify priority areas for vegetation maintenance activities.

Prior to contractors working in the Preserve, the area boundary was flagged out by the Preserve Manager and surveyed for potential PPM burrows. Locations of burrows were marked with red pin flags and contractors avoided the area. CNLM collaborated with the City Resource Manager, Bernice Villanueva, to determine work areas, organize green waste bins, and monitor progress of the contractor's work. The contractual process was led by USGS. Starting in December 2019, contractors thinned and removed dead and downed material within 3-ac of the Preserve (Figure 5) and 2-ac of the City's adjacent Hilltop Preserve over multiple weeks (16-20 December 2019, 13-16 January 2020, and 3-14 February 2020). Thinning vegetation increased the amount of openness of the Preserve, although this has not been further quantified by CSS transect data or inferred from imagery, visual estimates suggest 10-70% more openness after treatment (see Appendix B for before and after photos of the areas thinned).

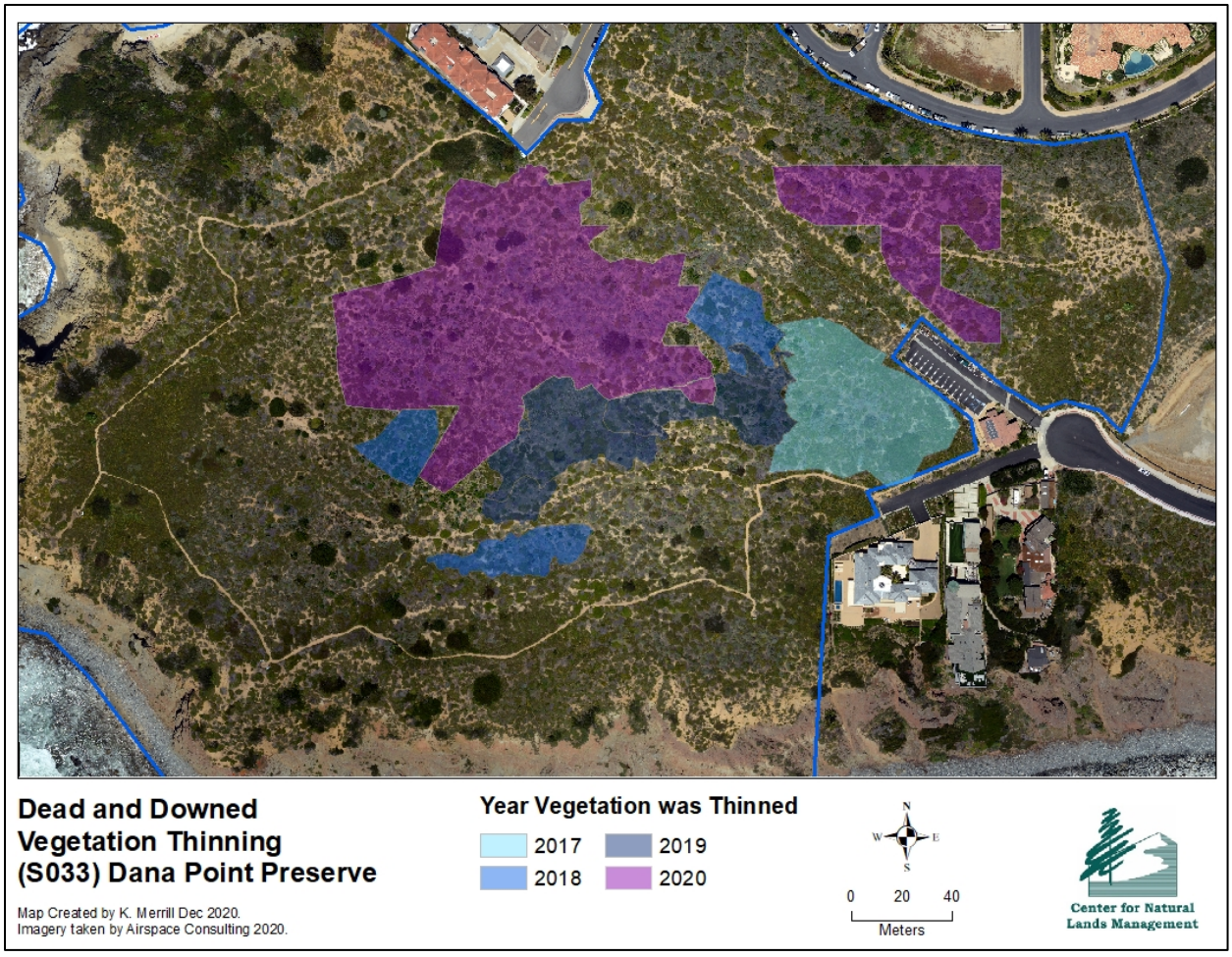

Figure 4. Vegetation and duff management. Areas where dead and downed vegetation was removed are shaded according to the Fiscal Year management occurred.

V. PUBLIC SERVICE AND GENERAL MAINTENANCE

Enforcement over public access

The trail was open to the public daily from 7:00 a.m. to sunset, except when it was periodically closed due to heavy rain and trail maintenance (November-March) and fully closed in response to COVID-19 (April-September). For these closures, the City and the public were notified and provided details via signs posted onsite and the CNLM website. The solar-powered magnetic gate lock and gate closer mechanism for the entrance gates were operational the entire year.

Unwanted and restricted public use issues continue from year to year and include off-trail use, smoking, people with dogs (pets), littering (mainly cigarette butts), and trespass after hours. The number of people bringing their dogs on the trail seems to increase each year, as reported by CNLM Rangers.

Off-trail activities by the public continued to persist throughout the year and any such activity is potentially harmful to conservation values on the Preserve. The most common locations of off-trail activity are at the Scenic Gate and at the second and third overlooks. Most prohibited activity is by children and young adults seeking a private ocean view while drinking and/or smoking and to take photographs. They often leave trash, contribute to erosion, increase risk of crushing of PPM burrows, limit the expansion of the rare plant populations, and increase risk to the Preserve from fire. Off-trail use is an even greater threat during the bird nesting season when such activity likely disrupts the peregrine falcon, the CAGN whose territories include these areas, and other nesting bird species. Off-trail use, and trespass continued to occur even when the trail was closed April-September. CNLM Rangers, through patrols and wildlife cameras, recorded an increase in the frequency of people jumping over the perimeter fence to trespass. This particular type of trespass damaged both (Selva and Scenic) trail gates, the adjoining perimeter fence panels and the interior trail cables from people climbing and pulling on the infrastructure to access the Preserve when it was closed.

Three part-time CNLM Rangers continued to patrol the Preserve. Even with a CNLM Ranger or staff person present onsite, there were continued violations of Preserve rules. Trespass is evidenced not only by Rangers who catch and educate trespassers but includes the following: 1) foot tracks observed off-trail; 2) items recovered off-trail which confirm off-trail use; 3) and violations that occurred when CNLM staff were not on-site. The names of trespassers encountered by CNLM staff are documented to ensure repeat offenders are identified. In an attempt to reduce the likelihood of people going off trail at the second and third overlooks, dead shrubs removed from duff-treated grid cells, as well as prickly pear cactus pads, were placed along the edge of the fencing at known areas of trespass. However, the most effective means of keeping people on the trail and dogs off the Preserve is by having onsite presence. In addition to CNLM's own staffing, CNLM works with volunteers to expand enforcement capacity.

The Orange County Sherriff's Department (OCSD) was called on some occasions, with citations or warnings issued to trespassers on-site in FY 2020. The OCSD does have authorization to act and arrest individuals who trespass on the Preserve (CNLM 2015). In addition, Game Warden Nick Molsberry, CDFW, patrolled the Preserve when time and resources were allocated and cited trespassers when encountered.

Unexpected events do occur on the Preserve that require CNLM staff's time and resources; one such event was the discovery and retrieval of a body below OL3, at the base of the Preserve, in January 2020. The body was removed via helicopter, but witnesses did trespass at OL3 to

watch the removal operation. OCSD said it did not appear to be a suicide from the Preserve cliffs. No further details were given to CNLM regarding the incident.

Public outreach

The NIC was open throughout FY 2020 from 10:00 a.m. to 4:00 p.m. Tuesday through Sunday, except through April-May during the State stay-at-home Order. The Preserve Manager was available to interact with the public and answer questions while at the NIC on average two days a week. CNLM Rangers were onsite on average two evenings a week to answer questions and provide information to the public.

The Preserve Manger gave a virtual presentation to a local charter school on the importance of Orange County local ecosystems and the importance of protected spaces such as the Dana Point Preserve for endangered species.

Volunteers helped throughout the year with checking wildlife cameras, enforcing trail rules and helping with outreach materials. CNLM has one regular volunteer that manages the wildlife cameras on the Preserve.

GIS database

CNLM managed and added GIS coverages for data collected in FY 2020 (Appendix C). In May 2020, AirSpace Consulting flew over the Preserve and collected and processed vegetation imagery; CIR, RGB and NVDI rasters were provided by the consultant to CNLM in June 2020.

VI. REPORTING

Habitat Management and Monitoring Plan

A low effect HCP draft permit application was submitted by CNLM to the USFWS in FY 2008 to address the potential for take of CAGN and PPM from future management actions. The process was not completed. In FY 2020, CNLM continued the process of creating a revised habitat management plan that addresses only the Preserve rather than the entire Headlands area. The revised plan will provide specific and appropriate management guidance for the Preserve based on management experience, staff expertise, input from others with relevant expertise, and well-reasoned principles from the conservation sciences.

A specific Enhanced Management Plan (EMP) for PPM management, to be funded through the US Marine Corps Cooperative Agreement, was finalized in August 2020. The EMP is expected to be implemented in coordination with the Preserve HMMP starting in FY 2021. Future annual reports for the EMP will be prepared by CNLM and attached to the Dana Point Preserve reports.

Annual reports

A work plan for FY 2020 (October 1, 2019 through September 30, 2020) was completed and provided to the USFWS, CDFW on 23 August 2019 (CNLM 2019b). An annual report describing the management activities conducted during FY 2019 was completed on 13 April 2020 (CNLM 2020).

VII. REFERENCES

Brehme, C.S., J. Sebes, T. Matsuda, D. Clark, and Fisher, R.N. 2014. MCBCP Pacific Pocket Mouse Monitoring Results for 2013 and Multi-year Trend Analysis from 2012 to 2013. Prepared for AC/S Environmental Security, Marine Corps Base, Camp Pendleton. 69p.

[CDFW] California Department of Fish and Wildlife. 2020. Notice of Changes to Scientific Collecting Permits (SCP) and Memorandums of Understanding (MOU) Authorizations and information Related to Rabbit Hemorrhagic Disease Virus Serotype 2 (RHVD2). June 11, 2020.

[CNLM] Center for Natural Lands Management. 2013.CNLM Annual Report of Management Activities for the 2011-2012 Fiscal Year on the Dana Point Preserve (S033), Orange County, California. January 31, 2013.

…. 2015. Trespass Authorization Letter for Dana Point Preserve (S033). January 20, 2015.

.... 2018. CNLM Annual Report of Management Activities for the 2016-2017 Fiscal Year on the Dana Point Preserve (S033). May 9, 2018.

.... 2019a. Annual Report of Management Activities for the 2017-2018 Fiscal Year on the Dana Point Preserve (S033). 4 March 2019.

.... 2019b. Annual Work Plan for the Fiscal Year 2019-2020 (October 1, 2019-September 30, 2020) on the Dana Point Preserve (S033). 23 August 2019.

.... 2020. Annual Report of Management Activities for the 2018-2019 Fiscal Year on the Dana Point Preserve (S033). 13 April 2020.

[NOAA] National Oceanic & Atmospheric Administration. 2019. Record of Climatological Observations. Laguna Beach, CA. Station US1CAOR0050.

Shier, D. 2009. Behavioral ecology and translocation of the endangered Pacific little pocket mouse (*Perognathus longimembris pacificus*).

URS Corporation. 2005. Habitat Management and Monitoring Plan for Dana Point Headlands Biological Open Space. 18 April 2005.

[WRCC] Western Regional Climate Center. 2017. NOAA, Laguna Beach Station 044647. Laguna Beach March 1928 to April 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN. pl?ca4647

VIII. APPENDIX A. Photos of CSS monitoring transects.

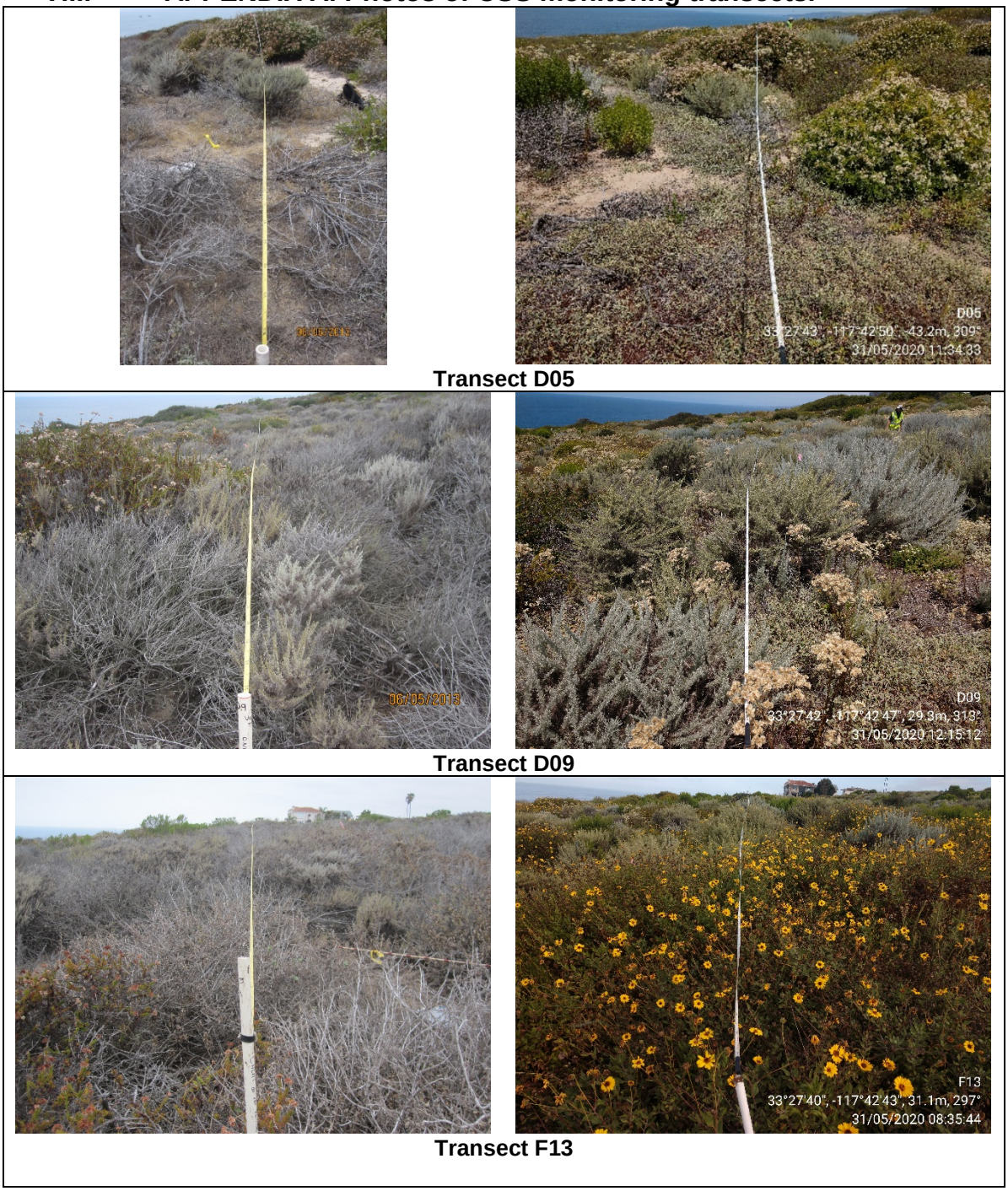

Figure 5. Comparison photos of 2013 (left) and 2020 (right) five CSS monitoring transects. Monitoring was conducted on 5 June 2013 and 31 May 2020.

IX. APPENDIX B. PPM habitat maintenance photos.

Before (left column) and after (right column) photos of areas with dead and downed vegetation removed in FY 20.

X. APPENDIX C. GIS Coverage.

Coverage	Source	Source Year
Aerial Imagery	Airspace Inc	2020
Non-native plant locations	CNLM	2020
Gnatcatcher (points, use area, nest locations)	CNLM	2020
Pacific Pocket Mouse Occupancy	CNLM	2020
Pacific Pocket Mouse Monitoring Points and Trails	CNLM	2020
Veg thinning polygons	CNLM	2020
Non-native plant locations	CNLM	2019
Gnatcatcher (points, use area, nest locations)	CNLM	2019
Pacific Pocket Mouse Points	CNLM	2019
Veg thinning polygons	CNLM	2019
Non-native plant locations	CNLM	2018
Gnatcatcher (points, use area, nest locations)	CNLM	2018
Pacific Pocket Mouse Points	CNLM	2018
Argentine ant locations	CNLM	2018
Non-native plant locations	CNLM	2017
Gnatcatcher (points, use area, nest locations)	CNLM	2017
Pacific Pocket Mouse Points	USFWS	2017
Rare Plant Points & Polygons	Leatherman BioConsultants	2017
Vegetation Transects	CNLM	2016
Northern boundary Fence line	CNLM	2015
Bridal Creeper Locations	CNLM	2016
Gnatcatcher (points, use area, nest locations)	CNLM	2016
Bridal Creeper Locations	CNLM	2013
Gnatcatcher (points, use area, nest locations)	CNLM	2013
Rare Plant Points	CNLM	2013
PPM Capture Locations for captive breeding collection	San Diego Zoo	2012
PPM 24x24 Grid extended to former Marguerita Roadbed and North of the roadbed	USFWS	2012
Vegetation Transects	CNLM	2012
Gnatcatcher (points, use area, nests locations)	CNLM	2012
Bridal Creeper Locations	CNLM	2012
PPM 16x16 Grid extended to former Marguerita Roadbed and North of the roadbed	USFWS	2011
Rare Plant Points	CNLM	2011
Gnatcatcher (points, use area, nests locations)	CNLM	2011
Location of dead PPM	CNLM	2010
Rare Plant Points	CNLM	2010
Gnatcatcher (points, use area, nests locations)	CNLM	2010
Rare Plant Points	CNLM	2009
Gnatcatcher (points, use area, nests locations)	CNLM	2009

Veg Baseline Transect Locations	CNLM	2009
Pacific Pocket Mouse Points	USFWS	2009
Aerial Photo	Eagle Aerial	2008
Final Trail Route	CNLM	2008
Rare Plant Points	Fred Roberts	2008
PPM 16x16 Grid	USFWS	2008
Gnatcatcher (points, use area, nests locations)	CNLM	2008
Bobcat Point	CNLM	2007
Revegetation Areas & Seed mix	URS Corporation	2007
Gnatcatcher (points, use area, nests locations)	CNLM	2007
General Wildlife (whiptail and red racer)	CNLM	2007
Cliff Spurge Points	CNLM	2006
Veg Baseline Transect Locations	CNLM	2006
Aerial Photos	URS Corporation	2006 and 1991
PPM Habitat Areas	URS Corporation	unknown
Vista Points	URS Corporation	unknown
Pacific Pocket Mouse Points	USFWS	1993-2007
Cliff Spurge Points	URS Corporation	2007
Trail Location Options	URS Corporation	2007
Sensitive Species (Cliff spurge and Boxthorn)	URS Corporation	2006
Vegetation Communities	URS Corporation	unknown
Gnatcatcher Locations	URS Corporation	unknown
Coastal Commission ESHA Boundaries	URS Corporation	unknown
Jurisdictional Channels	URS Corporation	unknown
Open Space	URS Corporation	unknown
Headlands LLC Project Boundaries	URS Corporation	unknown
Headlands LLC Revegetation Areas	URS Corporation	unknown

CNLM's DANA POINT PRESERVE (S033)
ANNUAL REPORT OF MANAGEMENT ACTIVITIES FOR THE 2021 FISCAL YEAR

(October 1, 2020 – September 30, 2021)

Owned and Managed by CNLM

Provided to:

U.S. Fish and Wildlife Service
Carol Roberts
carol_a_roberts@fws.gov

California Department of Fish and Wildlife
Hans Sin
Hans.sin@wildlife.ca.gov

Prepared by:

Korie C. Merrill, M.S., Preserve Manager, kmerrill@cnlm.org

Reviewed by:

Deborah L. Rogers, Ph.D., Co-Executive Director & Director of Conservation Science and Stewardship

Center for Natural Lands Management

27258 Via Industria, Suite B
Temecula, CA 92590
Phone: 760.731.7790
Web: www.cnlm.org

9 March 2022

Table of Contents

SUMMARY OF 2020-2021 ACTIVITIES

- Public access was controlled based on scientific guidance and best management principles
- CNLM rangers patrolled the Preserve to protect the habitat and provide information to visitors
- Trail and fence infrastructure was maintained as needed.
- Coastal California gnatcatcher (*Polioptila californica californica*) surveys were conducted
- Pacific pocket mice (*Perognathus longimembris pacificus*) were monitored using track-tubes
- Argentine ant (*Linepithema humile*) pilot project was continued
- Invasive non-native plant species removal was conducted
- Erosion control measures were implemented along the bluff edge
- Dead native perennial vegetation was selectively thinned
- Communications and coordination with appropriate partners were continued
- A workplan and a budget for 2021-2022 activities were prepared
- A report on FY 2020 stewardship activities was prepared
- An update of the Preserve's Habitat Management and Monitoring Plan was continued
- CNLM's COVID-19 response was continued including planning and communication with appropriate partners

INTRODUCTION

The Dana Point Preserve (Preserve) is located in Dana Point, Orange County, California. The Preserve has been owned and managed by the Center for Natural Lands Management (CNLM) since December 2005. The Preserve consists of 29.4 acres of native coastal sage and coastal bluff scrub habitat. Adjacent natural open spaces (known as South Strand, Hilltop, and Harbor Point conservation parks) are owned and managed by the City of Dana Point (City).

The process to protect the Preserve was initiated when the California Coastal Commission (CCC) required the developer of an oceanfront property project (Project), Headlands Reserve LLC, to dedicate and preserve in perpetuity a portion of its property, as public open space, in its natural habitat. The Project site is included in the NCCP/HCP EIR/EIS as a Covered Project, and the proposed project is included as a "Planned Activity" of a "Participating Landowner". An Endangered Species Act incidental take (Section 10a) permit (TE810581-1) that authorizes incidental take of 44 covered species was issued to Headlands Reserve, LLC on January 21, 2000 by the U.S. Fish and Wildlife Service (USFWS). Therefore, development impacts on federal- and state-listed species, Identified Species designated in the NCCP/HCP EIR/EIS, Covered Habitats designated in the NCCP/HCP EIR/EIS, removal of up to 30 acres of coastal sage scrub, and impacts on species dependent on or associated with the Covered Habitats were authorized and considered mitigated to less than a significant level, consistent with the NCCP/HCP guidelines under the NCCP Act, state and federal ESAs, and CEQA. Some of the mitigation measures required under the NCCP/HCP were to:

- Contribute $500,000 toward the NCCP/HCP 'Non-Profit Corporation' and 'Adaptive Management Program;

- Contribute $350,000 to fund Pacific pocket mouse population propagation; enhancement, relocation and recovery efforts upon issuance of Section 10(a)(1)(A) permit for pocket mouse;
- Commit to transplant, at California Department of Fish and Wildlife's (CDFW) request, any *Dudleya blochmaniae* (Blochman's dudleya) populations at Headlands Reserve's expense (not to exceed $23,000) that would be directly impacted by development on the property (Note: subject to CDFW approval, the landowner was allowed to collect and sow seed, rather than translocate individual plants); and
- Contribute to the cost of preparation of the NCCP/HCP (URS 2005).

Although the mitigation measures also included establishing a 22-acre (8.9 ha) Temporary Pacific pocket mouse (TPPM) Reserve for eight years, possible extension for four more years, and providing the Wildlife Agencies (USFWS and CDFW) the opportunities to acquire the TPPM Reserve at Fair Market Value if USFWS determined, at or prior to expiration of the eight-year Reserve period, that continuance of the Reserve was necessary to ensure the survival and recovery of the pocket mouse, these actions were not taken. Rather, the trustees of the Steele Foundation, concerned that Headlands Reserve LLC would develop the conservation area as an amenity to the Project without regard to resident and potential conservation values, provided sufficient funding for CNLM to purchase the open space property to protect its important conservation values and to establish an endowment for managing the biological resources onsite in perpetuity. The Steele Foundation vision – and the imposed charitable restriction on its grant to CNLM – was to enable and secure the Preserve to the condition it appeared when first viewed by Richard Henry Dana in 1834. The Steele Foundation and CNLM entered into an agreement for the perpetual management of a stewardship endowment to provide the necessary financial resources for the Preserve's protection and management.

To further protect the conservation values of the Preserve in perpetuity, CNLM granted a Conservation Easement (CE) to the City of Dana Point, which was recorded December 20, 2005.

Management activities for the Preserve have been operating under the guidelines of the initial Habitat Management and Monitoring Plan (HMMP; URS 2005) for Dana Point Headlands Biological Open Space dated April 18, 2005. Four primary management objectives are identified in the HMMP:

1. Maintain the Preserve to permit ecological processes to function.
2. Contribute to the preservation and restoration of the endangered or threatened species and their habitats that are present on the Preserve.
3. Contribute to the preservation and restoration of non-listed sensitive species that contribute to biodiversity.
4. Develop a public awareness program that informs residents and visitors of the sensitivity and ecological importance of the Preserve.

CNLM has been managing the Preserve according to the HMMP and will continue to do so until CNLM updates the HMMP in consultation with the appropriate agencies. This document details the management activities, guided by the objectives listed above and the annual work plan (CNLM 2020), which occurred during the Fiscal Year (FY) 2021 (October 1, 2020 – September 30, 2021).

COVID-19

Starting in March 2020, the COVID-19 pandemic changed CNLM's field protocols (e.g., only one person in a vehicle at a time, personnel must wear face covers while indoors, field equipment is to be cleaned before and after each use, etc.). The pandemic continued throughout FY 2021 and CNLM's protocols were updated to reflect the new information, guidance and restrictions at the federal, state and local levels. While the COVID-19 pandemic did alter how CNLM completed some management activities, it did not prevent any anticipated activities planned in FY 2021 (CNLM 2020).

CAPITAL IMPROVEMENTS

Infrastructure Maintenance

As a result of high public use of the Preserve, the trail, trail fencing, and perimeter fencing continued to require a substantial amount of CNLM staff time for maintenance throughout the year, such as replacing post caps, reattaching panels, picking up trash, leveling out the trail, tightening fence cable slack, and installing new fence cable. On April 7, 2021, La Habra Fence Company installed a stabilizing bar on each trail gates to improve the long-term stability of the panels and hopefully reduce the stress and torque of people climbing over the gates. Staff opportunistically painted the metal trail posts when the public was not present, the new coat of paint should delay further corrosion.

At the end of October 2020, the power source to the magnetic lock at Scenic Gate was permanently disrupted, leaving the Preserve vulnerable to uncontrolled access. As a result, CNLM installed a reliable power source, a small solar panel and battery (Figure 1) similar to the existing unit at Selva Gate. The solar panel was placed near the trail entrance on 19 January 2021. The panel provides power to the magnetic lock, time and an emergency release button. It was installed with no ground disturbance or clearing of vegetation. It sits on a 4 ft x 4 ft wood pallet. Sensitivity to other resources (PPM and CAGN) was investigated prior by a qualified biologist (CNLM Preserve Manager, Korie Merrill who is in possession of USFWS 10(A)(1)(a) permits and CDFW Scientific Collection Permit (SCP) for CAGN and PPM monitoring). Also considered was context and view – it is below the visual line of any other structures in the area at a height of 1.5 m (4.9 ft). The solar panel is 6.15 meters (20 ft, 2 in) from the fence with conduit running above ground along the fence and out to the electrical box at a 90° angle. This location was chosen because: 1) it would reduce the likelihood of tampering by the public (i.e., if situated directly next to the fence it would likely be used as a step to climb over the fence, as experienced with other structures nearby like the City wall and fence); 2) no ground disturbance would be necessary; 3) it was a relatively flat area; 4) it allowed for good positioning of the panel to capture solar radiation; and 5) no vegetation would need to be removed to place the panel or to work in the area. This area had already been cleared of dead and downed vegetation for PPM habitat management and an access path had already been cleared when the Anaheim Police Department entered into the habitat to search for a gun earlier in the year; however, a thick layer of duff was still present. The pallet was placed on top of this thick duff layer (see Figure 1). CNLM provided documentation as to the need for the solar panel and its consistency with current permits to the City on 31 July 2021 (D.M. Ivester pers. comms. 2021).

Figure 1. Solar panel and battery at Scenic Gate. The solar panel serves as a reliable power source for the magnetic lock and emergency release mechanism, allowing for safe controlled public access onto CNLM's trail. Photo taken 07/12/2021.

PUBLIC SERVICE AND GENERAL MAINTENANCE

Controlled public access and public outreach

The CNLM Dana Point Preserve continues to be a regional attraction in Southern California, with high daily visitation rates for recreational use by both local residents and tourists. Trail usage data has been collected by automated trail counters at both gates since 2011; however, in FY 2021 only the Scenic Gate trail counter was operational. Although the exact number of unique visitors is unknown, we can infer trail usage over time with data collected from the trail counter. CNLM staff reviewed and analyzed the data collected from the two trail counters. Results and recommendations from that review will be provided in a separate document.

Public access hours to CNLM's trail through the Preserve varied throughout 2020 – 2021. Following federal, state and local health guidelines, in March 2020 the trail was closed to public access due to safety and COVID-19 health concerns (see CNLM 2021). In the beginning of the FY 2021, on 15 October 2020, the trail was open to the public, two-days each week, with safety protocols and guidelines in place to protect not only the visiting public, volunteers, and staff but the habitat and species within the Preserve. These guidelines (posted on the CNLM website and on the Preserve) included requiring face masks, maintaining social distancing, staying on trail, accessing the trail only during hours of operation, and unidirectional trail use. To prevent people from congregating during a global pandemic, temporary fences were put in place at overlooks 1, 2, and 3. As more information regarding COVID-19 transmission and vaccinations became available, guidelines were reviewed and revised as appropriate. By April 2021, CNLM's public access trail was open three days a week with bidirectional access, and face masks were not required. From June 2021 to the end of the reporting period (30 September 2021) the public

could access the trail every Tuesday, Thursday, and Saturday during daylight hours, 0800 – 1600.

Signage was revised and replaced frequently throughout the year, informing the public of new hours and rules for trail use. In addition, CNLM staff and volunteers from the non-profit organization Friends of Dana Point Headlands were onsite when the trail was open, educating visitors on the importance of the Preserve, explaining trail guidelines, answering general inquires, receiving public feedback, completing public trail use surveys, and enforcing the controlled public access guidelines throughout FY 2021. While the vast majority of the public were understanding and followed the rules, staff and volunteers were occasionally harassed but took these opportunities to inform the public on the importance of preserving conservation values.

During the hours of public access, even with an increased presence of staff and volunteers on the trail, public access issues with visitors occurred and include off-trail use, smoking, people with pets (typically dogs), littering (mainly cigarette butts, vape pens and bottles), not following safety guidelines, and trespass after hours. The number of people bringing their dogs on the trail seems to increase each year. The most effective means of keeping people on the trail and dogs off the Preserve is by having onsite presence. In addition to CNLM's own staffing, CNLM works with volunteers to expand enforcement capacity. CNLM staff conducted patrols (1 to 4-hour shifts) on average six-days per week. This was an increase compared to previous years when rangers patrolled on average three days per week. With Rabbit Hemorrhagic Disease Virus 2 posing a threat to lagomorphs, staff and volunteers were frequently stationed at the Selva Gate to educate the public and ask that they clean their shoes with a boot brush prior to entering the Preserve.

Off-trail activities by the public continued to persist throughout the year and any such activity is potentially harmful to conservation values on the Preserve. Based on CNLM staff patrol reports, we can tell the second and third overlooks are common locations of off-trail activity. Over the course of the fiscal year the temporary fence at the second overlook was ripped down 15 times and the temporary fence at the third overlook was ripped down 32 times. Most prohibited activity is by young adults seeking a private ocean view while drinking and/or smoking and to take photographs. They often leave trash, contribute to erosion, increase risk of crushing of PPM burrows, limit the expansion of the rare plant populations, and increase risk to the Preserve from fire. Off-trail use is an even greater threat during the bird nesting season when such activity likely disrupts the peregrine falcon, the CAGN whose territories include these areas, and other nesting bird species. CNLM Rangers, through patrols and wildlife cameras, recorded an increase in the frequency of people jumping over the perimeter fence to trespass.

The Orange County Sherriff's Department (OCSD) was called on some occasions, with citations or warnings issued to trespassers on-site in FY 2020. The OCSD does have authorization to act and arrest individuals who trespass on the Preserve (CNLM 2015).

On 28 and 29 October 2020, the City trespassed into the Preserve and vandalized CNLM's gates, which the City has since described as "self-help." As a result, from the gates being forced open, there was uncontrolled access to the Preserve, the duration of which is uncertain.

Other Preserve Use Incidents

Unexpected incidents/operations related to public access and public safety do occur on the Preserve that require CNLM staff's time and resources – these events can be unnecessarily

impactful. CNLM takes opportunities to better connect and coordinate with agencies to minimize future impacts when or if their services are required within the Preserve. The following three examples highlight impacts from related to public safety that occurred on the Preserve in FY 2021:

1. On 8 October 2020, staff arrived at the Preserve to find Anaheim Police activity within the Preserve. Detectives accessed the habitat by climbing over the perimeter fence using a ladder. The group was searching for pieces of a guns they suspected had been used in a crime the previous day. By the time CNLM staff arrived, the Preserve area next to Scenic Gate was already trampled except thick patched of CSS where the detectives couldn't easily walk (Figure 2). While they did not request permission to enter the habitat, CNLM staff allowed the detectives to continue the search with CNLM staff onsite to ensure no more than necessary trampling occurred in the area. Detectives used metal detectors and a specialized dog to detect the gun parts. At the end of the day, only some parts of the gun were located and removed. CNLM was asked to contact the lead detective in future if other parts of the gun are found.

Figure 2. Anaheim police detectives in the Preserve. Photo taken 8 October 2020.

2. In March 2021, a group of three special operations CDFW personnel were found off trail at OL2 monitoring for poaching along the coast. While CNLM supports the CDFW mission and often collaborates with CDFW Game Wardens at the Preserve, this was unexpected. The Preserve Manager took the opportunity to provide information to the CDFW personnel on the importance of the Preserve and the need to protect endangered species and the Preserve habitat. Subsequently the special operations personnel coordinated with the Preserve Manager prior to conducting further monitoring activities.

3. In June 2021, a group of 10-15 first responders from Orange County Fire Authority (OCFA) trespassed into the coastal bluff habitat with the intent to conduct rope training off overlook 3. Fortunately, they were stopped before installing anchor stakes into the ground. Their reason for training was that they had a recovery incident (a presumed suicide incident of which CNLM was unaware) the previous weekend at the headlands so decided practicing there would be a good idea. They and their supervisors were provided information on the ownership of the Preserve, endangered species and their habitat, the conservation values of the Preserve, why trespass was not encouraged, and the importance of coordinating activities with CNLM prior to entering the Preserve outside of an emergency and how to minimize impacts when responding to an emergency.

Collaborations

CNLM's Preserve Manger collaborated with PPM partners to complete a Strength, Weaknesses, Opportunities, Threats (SWOT) analysis of potential PPM translocation sites, as part of the PPM recovery plan, hosted by the San Diego Zoo Wildlife Alliance (SD Zoo). Results from this process will be reported separately.

In May 2021 Irvine Ranch Conservancy (IRC) requested cliff spurge (*Euphorbia misera*) seeds for a habitat restoration project near Irvine Cove in Crystal Cove State Park. On September 2021, CNLM staff--with the help of Sunny Saroa, from IRC--made a modest collection that was determined to be non-impactful to the donor plants (i.e., collected less than 10% of annual fruit produced by 60 cliff spurge individuals along the southwestern bluffs of the Preserve).

SD Zoo researchers requested to place a soil moisture probe and data logger within the Preserve to monitor soil conditions within occupied PPM habitat. CNLM reviewed the request according to normal CNLM research-request protocols and was inclined to approve the request. However, coincident with this research access request was a notification from the City regarding potential permit requirements that could affect the requested research. CNLM communicated the City's comments to SD Zoo and indicated that CNLM would not be able to move ahead with approving the research request until and unless the City's comments were addressed. No further information was provided, or action requested by SD Zoo on this matter.

Donations

CNLM's donation box was removed by City staff from the NIC on 29 October 2020. The location within the NIC was the only secure location for the donation box, thus CNLM staff did not attempt to relocate it. Donations received onsite have been historically the main avenue for donations to CNLM for the Preserve but in FY 2021 one donation was received via our website for the Preserve.

GIS database

CNLM managed and added GIS coverages for data collected in FY 2021 (Appendix A).

BIOTIC SURVEYS

As discussed in previous sections, there was considerably less public presence on the Preserve for more than a year prior to the 2021 biological monitoring events reported below. The hours of public access via the trail on the Preserve changed during the reporting period—still being affected by COVID-19 precautions and, also, considerations for minimizing public impacts on sensitive natural resources. During the reporting period, there were some weeks when the trail was closed; a period when the hours were 8:00 a.m. to 12:00 p.m. two-days each week; then three days each week with the same hours; and then the hours were 8:00 a.m. to 4:00 p.m. three days per week starting in June 2021.

Annual precipitation for FY 2021 was 4.73 in (12.01 cm) for the area (Santa Ana, CA NOAA 2021), which is 37.8% of the average annual precipitation, 12.52 in.

Vegetation transects

Regular monitoring of coastal sage scrub (CSS) is performed at the Preserve using point-intercept transects. There are twenty permanent transects within the Preserve, a portion of which have been monitored intermittently beginning in 2006. Five transects were monitored in FY 2021 which were last monitored in 2014; two (E07, D11) on 13 April 2021 and three (H13, J09, H3) on 27 April 2021 (Figure 3). Each start and end point of the transects are marked by rebar stakes with a PVC pipe cover. Transects are 25 m in length, with point-intercept data recorded every 0.5 m for a total of 50 points per transect (starting at 0.5 m ending at 25.0 m). All plant species that touched a 0.5-cm diameter rod held vertically to the measuring tape at 0.5-m intervals were recorded, along with the height at each intercept, and ground cover (i.e., leaf litter, bare ground, soil crust or persistent littler). Belt transects (1 m on each side of the point-intercept line) were conducted at the same time to document the local plant community not captured in the point-intercept monitoring. Photos of each transect were taken during both surveys (see Appendix B for comparison photos between years, 2014 and 2021).

Across the five selected transects throughout the Preserve, California brittlebush (*Encelia californica*, x= 30.8, SE = 6.0) accounted for the greatest mean percent cover. The seven other species recorded on the transects had an average percent cover less than 20 (Table 1). Herbaceous cover was similarly low as in 2014. In 2021 only one perennial herb species, California croton (*Croton californica,* x =2.4, SE = 0.5) was recorded across the five transects, with two annual forb species recorded on the belt transects (Table 2). The most common type of ground cover recorded in 2021 was leaf litter (81.8%), an increase from 76.4% in 2014. Bare ground accounted for 18.2% of the monitored area, when in 2014 it had accounted for 20%. With the majority of ground cover leaf litter, the dead shrub cover was low (7.14%) whereas in 2014 dead cover was 18.4%. This is likely due to the two transects, D11 and E07, which fall within polygons recently managed for the thinning of dead and down plant materials in 2020 and 2021. The reduction in dead plant material is visible in the photo-comparisons in Appendix B.

Figure 3. Map of CSS transects. Five transects, previously monitored in 2014, were monitored in 2021.

Table 1. Summary of the 2021 CSS monitoring transects. Average percent cover, standard error (SE) and percent of transects occupied for species detected along five Preserve CSS transects.

Functional Group	Species	Mean % Coverage	SE	% Transects
Native Shrub				
	Encelia californica	30.56	6.01	100.00
	Artemisia californica	17.86	3.67	80.00
	Eriogonum fasciculatum var. foliolosum	8.33	1.83	60.00
	Rhus integrifolia	6.35	1.46	60.00
	Lycium californicum	3.17	1.60	20.00
	Baccharis pilularis	1.19	0.40	40.00
	Acmispon glaber	0.79	0.40	20.00
Native Forb				
	Croton californica	2.38	0.49	60.00
Non-Native Forb				
Non-Native Grass				
Dead Shrub [a]		7.14	0.87	100.00

[a] Dead shrubs or dead portions of live individuals (determined from intercept to stem terminus) inter-mixed among green vegetation.

Table 2. 2021 CSS belt transects. All species recorded on the 2-m belt transects.

Transect	Species
H13	*Artemisia californica* *Eriogonum fasciculatum* var. *foliolosum* *Pseudognaphalium californicum*
J09	*Mirabilis laevis* *Pseudognaphalium californicum*
E07	*Baccharis pilularis* *Acmispon glaber* *Pseudognaphalium californicum* *Solanum umbelliferum*
D11	*Pseudognaphalium californicum* *Logfia arozpmoca* *Rhus integrifolia*
H03	none

Coastal California gnatcatcher

Monitoring for coastal California gnatcatchers (*Polioptila californica californica*, CAGN) typically is conducted annually on the Preserve both to track presence of this threatened species and to be aware of spatio-temporal use of the Preserve. The latter is important to ensure management activities do not result in harassment of CAGN, particularly during their nesting season, generally 15 February – 31 August.

In 2021, surveys were conducted by Preserve Manager, Korie Merrill, who is authorized to conduct survey activities under CNLM's TE Recovery Permit 221411-5.4 and Scientific

Collecting Permit 13986. The Preserve was surveyed 10 times during the breeding season (February- August 2021). Throughout the Preserve nesting habitat was surveyed for presence/absence according to USFWS protocols. All CAGN observations were mapped.

There were 20 observations of potential CAGN territories, of which 17 were confirmed pairs (Figure 4). At least nine of these pairs had successful nests that produced chicks. The density of CAGN on the Preserve is high, given the 29.4 acres of available habitat, and thus interaction between pairs, individuals, and family groups was frequent. Last year, a few more pairs were counted (20 pairs, 2020) but 2021's 17 confirmed pairs are still higher than 2019 (14 pairs) and much higher than historical numbers (i.e., three pairs in 2006 and 2007). With so much CAGN activity in such a small area and the reopening of the public trail through the Preserve ahead of the 2021 CAGN monitoring season, the decline from 20 pairs in 2020 to 17 pairs this year in 2021 was expected (see CNLM 2021). More competition stress and competition for resources including food and territory as well as increased human activity within the Preserve could have contributed to the decline in CAGN activity in 2021. During much of the nesting season (March-September 2021) the trail within the Preserve was open for public use three days a week with trail use averaging ~340 individuals/day.

Figure 4. Map of CAGN locations. Point represents the estimated CAGN territory locations within the Preserve in 2021.

Pacific pocket mice

PPM monitoring is typically conducted annually on the Preserve both to track presence of this endangered species and to be aware of spatio-temporal use of the Preserve to ensure management activities do not result in harassment or take of individual PPM. Species surveys not only provide information on the status of the local population(s) but can be an indirect indicator of habitat suitability for those species. For animal species, any survey method is an estimate, being based on a sample of the local population. Track-tube surveys have been used successfully for monitoring PPM (Brehme et al. 2014), providing information on presence/absence, areas occupied, and, depending on survey design, some phenological and demographic data. This information will be valuable in determining any trends in populations that may be important for the long-term management of our Preserve, and in aiding the larger conservation community in determining regional trends.

PPM track-tube monitoring was conducted by CNLM staff, Korie Merrill and Sarah Godfrey (CNLM, USFWS TE 221411-5.4), in collaboration with USGS staff Devin Adist-Morris and Cheryl Brehme (USGS, TE-045994). All are authorized to conduct PPM survey activities following USFWS protocol. All track cards were reviewed by Korie Merrill or Devin Adist-Morris for definitive identification.

Track-tube monitoring was conducted across the Preserve in two sessions. Track tubes were reset and checked weekly for the month of May (“Session 1”) and weekly for the month of August (“Session 2”). During both sessions, one track-tube (a 1.5” tube at subplot “B” in the northwest corners of each grid) were set within CNLM’s alpha-numeric grid cells (24 meters x 24 meters). Enhanced PPM monitoring was done using additional track-tubes within subplot “A” (southeast corner of the grid) in grids AA11, BB11, B14, B15, B16, C10, D09, G09, G04, G05, H04, H05, H06, I05, and I06. Each track-tube was set in the nearest suitable location within 5 meters of the flagged GPS position marking each monitoring point. A total of 150 track tubes were set within the 136 grid cells across the Preserve (Figure 5). All trails to the track tubes were flagged prior to monitoring to minimize impact to the habitat and wildlife within the Preserve.

In addition to confirming PPM presence on the Preserve, track tube data can also be useful in estimating habitat use. For this purpose, we used the Occupancy Estimation function in Program MARK and applied the single season, single species (MacKenzie et al. 2002) to track tube data collected at each sampled grid cell or “site.” This analysis pools individual animal capture records within each site by capture occasion to estimate the proportion of sites occupied or used (Ψ) by the target species. The data were analyzed using the single season time dependent model [p(t), psi(.)] with a constant capture probability among survey occasions. Missing track cards were assumed to be a zero detection of PPM in the model. Only using cards with medium to high confidence of PPM detection the 2021 model averaged habitat use estimate as 94.9 percent (95%C.I. 89.8-97.5%) for both sessions, slightly below the naïve habitat use estimate (number of grids with PPM detected per number of grids sampled) of 95.3 percent (143/150).

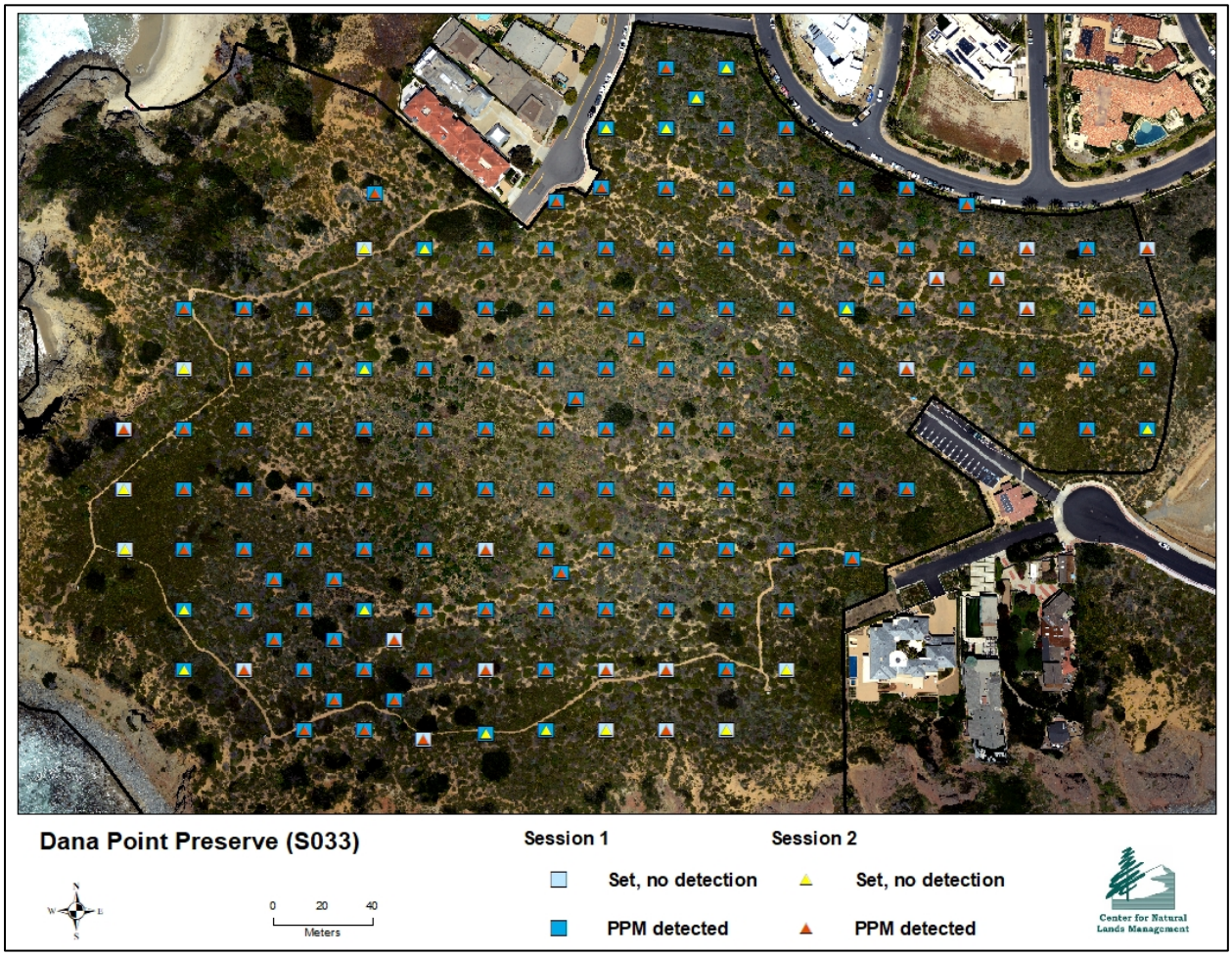

Figure 5. 2021 PPM Survey Results Map.

This substantial increase in the habitat use estimate from 14.5% in 2019 to 94.9% in 2021 is likely due to several; influences, and caution should be used when drawing conclusions. However, two potential influences in 2021 that may be correlated to the increase in PPM occupancy are:

1. Vegetation manipulation activities - in November 2020, dead and downed plant material in ~2.0 acres within the Preserve were removed to open the vegetation canopy which created patches of bare ground (see § V. Habitat Maintenance and Restoration for details.
2. Public impacts - the trail which had been open seven days per week for public access from 0700 until sunset until March 2020 was open three days a week (0800-1600) for the entirety of this monitoring period.

In FY 2021, CNLM worked on a vegetation management plan (VMP) under the PPM enhanced management plan (EMP) which is expected to build on data collected and analyzed in 2020 and 2021 (see CNLM 2022 for details) towards a better understanding of the relationship between vegetation and PPM through long-term monitoring and data-driven modelling. In 2020, after a large vegetation thinning activity (~5-ac managed) a positive correlation between habitat

management frequency and time since management and PPM was detected in modeling (Brehme et al 2021).

Although direct impacts on Preserve natural resources are difficult to ascertain, there is evidence of decreased Pacific pocket mouse presence after the trail initially opened, and an increase in onsite population after the trail was closed to the public in 2020 due to the COVID-19 pandemic. In 2021, CNLM staff worked on improving and updating our information regarding public recreation impacts to wildlife through literature reviews and communications with experts. The outcome from this due diligence and analysis is expected to be provided in a future stand-alone report.

Flora and fauna inventory

Since 2005, CNLM has implemented opportunistic biological surveys for wildlife on the Preserve, occasionally supplemented with more formal surveys for rare or special-status plant species and live-trapping, track-tube monitoring, protocol surveys and wildlife camera traps for animal species. A pair of peregrine falcons (*Falco peregrinus*) was recorded nesting on the Preserve's southern cliff in FY 2021. This is the eleventh consecutive year of falcons nesting on the Preserve. The nest was successful with three juveniles fledged. For the second year in a row, long-tailed weasel (*Mustela frenata*) was observed by CNLM staff (and trail users) on the Preserve near the second overlook. In January 2021, wildlife cameras captured multiple images of a grey fox (*Urocyon cinereoargenteus*) near the fifth overlook. Other taxa identified on the wildlife cameras were recorded by CNLM staff (Table 3) throughout the year.

Table 3. Wildlife Species. Wildlife taxa documented by wildlife cameras in FY 2021.

Common Name	**Scientific Name**
American crow	*Corvus brachyrhynchos*
Bobcat	*Lynx rufus*
Bewick's wren	*Thryomanes bewickii*
Black phoebe	*Sayornis nigricans*
California ground squirrel	*Otospermophilus beecheyi*
California quail	*Callipepla californica*
California thrasher	*Toxostoma redivivum*
California towhee	*Melozone crissalis*
Coyote	*Canis latrans*
Desert cottontail	*Sylvilagus audubonii*
Desert woodrat	*Neotoma lepida*
Grey fox	*Urocyon cinereoargenteus*
Gull (unk)	*Larus* sp.
Mourning dove	*Zenaida macroura*
Northern mockingbird	*Mimus polyglottos*
Osprey	*Pandion haliaetus*
Pacific pocket mouse	*Perognathus longimembris pacificus*
Peregrine falcon	*Falco peregrinus*
Raccoon	*Procyon lotor*
Roadrunner	*Geococcyx californianus*
Striped skunk	*Mephitis mephitis*
Turkey vulture	*Cathartes aura*
Virginia oppossum	*Didelphis virginiana*
Western fence lizard	*Sceloporus occidentalis*
Western harvest mouse	*Reithrodontomys megalotis*
White-crowned sparrow	*Zonotrichia leucophrys*

HABITAT MAINTENANCE AND RESTORATION

Rabbit Hemorrhagic Disease Virus Serotype-2 (RHDV2), RHVD2 is a threat to wild lagomorph populations in CA with a mortality rate of up to 80% of affected populations (CDFW 2020). RHDV2 was recorded in southern California in May 2020. Subsequently CDFW sent notification in June 2020 which provided recommendations for Scientific Collecting Permit holders to reduce the risk of RHDV2 spread (CDFW 2020). Following those recommendations, CNLM implemented precautions including the requirement that all Orange County CNLM staff and contractors were required to disinfect field crews' shoes and field equipment with 10% bleach solution prior to entering the Preserve habitat. Boot brushes were installed at the trail entrances for the vising public to brush their boots/shoes prior to using the trail – this was met with some resistance but for the most part the public complied. As far as we know, RHVD2 has not infected lagomorphs in the Preserve.

Non-native species

CNLM staff removed individuals of six non-native plant species during FY 2021: bridal creeper (*Asparagus asparagoides*), tree tobacco (*Nicotiana glauca*), yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), and Sahara mustard (*Brassica tournefortii*). Plants were removed by hand without the use of herbicide, bagged, and removed off site to prevent further spread of propagules. Notably, stinknet (*Oncosiphon piluferum*), removed the previous year, was not detected in 2021. All activities were conducted with the supervision of the Preserve Manager to minimize any negative affects to PPM and CAGN by avoiding nesting areas and surveying for and avoiding PPM burrows prior to pulling plants.

Argentine ants are considered a potential threat to CAGN and PPM persistence. In response, CNLM initiated a pilot study in 2019 with researchers from the University of California Riverside to develop and implement ecologically appropriate tools to control Argentine ants on the Preserve. This study is ongoing, and results will be reported in a separate report.

Erosion control measures on the bluff edge

Since 2011, CNLM has been using straw wattles to slow water flowing downhill in the exposed areas and gullies on the bluff edges which are above rare plant populations. CNLM has also been using dead vegetation and duff cleared from grid cells as erosion control materials in these same areas. In addition to erosion caused by rain, trespassers walking and sitting on the bluff edges continue to prevent vegetation from growing in these areas. The first overlook bench was sectioned off to public use from October 2020- April 2021 while the small trails to second and third overlooks were fenced off for the entirety of FY 2021. Fencing off the overlooks were originally for COVID-19 prevention but observations of less trespass to the bluff were noted and CNLM staff left the fence in place while allowing for restoration of the areas below the public benches.

Pacific pocket mouse habitat maintenance

To reduce accumulated duff and increase bare soil for PPM use within the Preserve, CNLM continued to conduct duff and vegetation removal treatment (“thinning”) in specifically identified areas (Figure 6). This was a continuation of work initiated in FY 2020 in collaboration with USGS (CNLM 2021), thus the contractual process was led by USGS.

It is important to note that thinning, given the context of habitat for listed species (PPM and CAGN), is not a simple undertaking and must be done with caution. Not just the activity of picking up duff and dead shrubs, but the location, process, and manner in which the material is hauled off must be considered. The workload associated with duff and dead shrub removal is substantial and contractors were hired to complete the task in November 2020 and supervised by the Preserve Manager.

Prior to contractors working in the Preserve, the area boundary was flagged out by the Preserve Manager and surveyed for potential PPM burrows. Locations of burrows were marked with red pin flags and contractors avoided the area. CNLM collaborated with the City Resource Manager, Bernice Villanueva, to determine work areas, organize green waste bins, and monitor progress of the contractor’s work. Thinning vegetation increased the amount of openness of the Preserve, although this has not been further quantified or inferred from imagery. Visual estimates suggest 10-50% more openness after treatment (see Appendix C for before and after photos of the areas thinned).

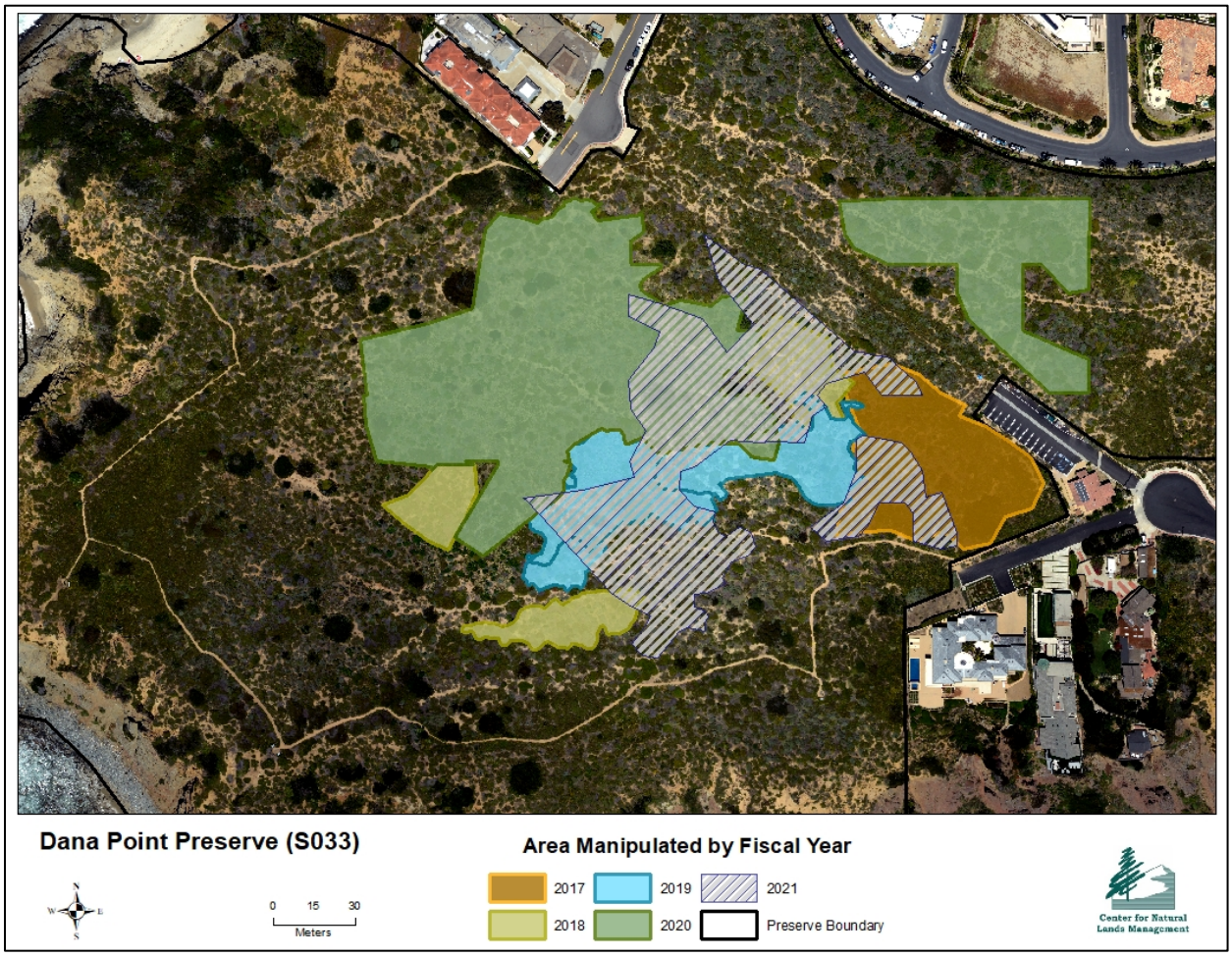

Figure 6. Vegetation and duff management 2017-2021. Areas where dead and downed vegetation was removed are shaded according to the Fiscal Year management occurred.

REPORTING

Habitat Management and Monitoring Plan

In FY 2021, CNLM continued the process of updating the HMMP that would specifically address only the Preserve rather than the entire Headlands area. The updated plan will provide specific and appropriate management guidance for the Preserve based on management experience, staff expertise, input from others with relevant expertise, and well-reasoned principles from the conservation sciences.

Enhanced Management Plan

A specific Enhanced Management Plan (EMP) for PPM management, funded through the US Marine Corps (USMC) Cooperative Agreement, was finalized in September 2020 and implemented in FY 2021. The FY 2021 annual report for the EMP was provided separately to this report.

Annual reports

A work plan for FY 2022 (October 1, 2021 through September 30, 2022) was completed and provided to the USFWS, CDFW (CNLM 2020). An annual report describing the management activities conducted during FY 2020 was completed on 9 February 2021 and provided to CDFW and USFWS (CNLM 2021).

REFERENCES

Brehme, C.S., J. Sebes, T. Matsuda, D. Clark, and Fisher, R.N. 2014. MCBCP Pacific Pocket Mouse Monitoring Results for 2013 and Multi-year Trend Analysis from 2012 to 2013. Prepared for AC/S Environmental Security, Marine Corps Base, Camp Pendleton. 69p.

Brehme, C.S., K. Merrill, D.T. Adsit-Morris, T.K. Edgarian and R.N. Fisher. 2021. Dana Point Headlands (CNLM, City of Dana Point) Pacific Pocket Mouse Monitoring Results for 2020. Prepared for US Fish and Wildlife Service. Interagency Agreement No. 4500139540.

[CDFW] California Department of Fish and Wildlife. 2020. Notice of Changes to Scientific Collecting Permits (SCP) and Memorandums of Understanding (MOU) Authorizations and information Related to Rabbit Hemorrhagic Disease Virus Serotype 2 (RHVD2). June 11, 2020.

[CNLM] Center for Natural Lands Management. 2015. Trespass Authorization Letter for Dana Point Preserve (S033). January 20, 2015.

.... 2020. Annual Work Plan for the 2020-21 Fiscal Year on the Dana Point Preserve (S033). 29 July 2020.

.... 2021. Annual Report of Management Activities for the 2019-2020 Fiscal Year on the Dana Point Preserve (S033). 9 February 2021.

.... 2022. CNLM Dana Point Preserve Pacific Pocket Mouse 5-year Enhanced Vegetation Management Plan. 3 January 2022.

Ivester, D. M. 2021. Re: City's Letter of Notice of Violation CE21-04456, June 9, 2021. Letter to Jeff Rosaler. 31 July 2021.

MacKenzie, D.I., Nichols, J.D., Lachman, G.B., Droege, S., Andrew Royle, J. and Langtimm, C.A.. 2002. Estimateing site occupancy rates when detection probabilities are less than one. Ecology, 83: 2248-2255.

[NOAA] National Oceanic & Atmospheric Administration. 2021. Record of Climatological Observations. John Wayne Airport Station.

URS Corporation. 2005. Habitat Management and Monitoring Plan for Dana Point Headlands Biological Open Space. 18 April 2005.

[WRCC] Western Regional Climate Center. 2017. NOAA, Laguna Beach Station 044647. Laguna Beach March 1928 to April 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN. pl?ca4647

APPENDIX A. GIS COVERAGE.

Coverage	Source	Source Year
Veg thinning polygons	CNLM	2021
Non-native plant locations	CNLM	2021
Gnatcatcher (points, use area, nest locations)	CNLM	2021
Pacific Pocket Mouse Occupancy	CNLM	2021
Pacific Pocket Mouse Monitoring Points and Trails	CNLM	2021
Aerial Imagery	Airspace Inc	2020
Non-native plant locations	CNLM	2020
Gnatcatcher (points, use area, nest locations)	CNLM	2020
Pacific Pocket Mouse Occupancy	CNLM	2020
Pacific Pocket Mouse Monitoring Points and Trails	CNLM	2020
Veg thinning polygons	CNLM	2020
Non-native plant locations	CNLM	2019
Gnatcatcher (points, use area, nest locations)	CNLM	2019
Pacific Pocket Mouse Points	CNLM	2019
Veg thinning polygons	CNLM	2019
Non-native plant locations	CNLM	2018
Gnatcatcher (points, use area, nest locations)	CNLM	2018
Pacific Pocket Mouse Points	CNLM	2018
Argentine ant locations	CNLM	2018
Non-native plant locations	CNLM	2017
Gnatcatcher (points, use area, nest locations)	CNLM	2017
Pacific Pocket Mouse Points	USFWS	2017
Rare Plant Points & Polygons	Leatherman BioConsultants	2017
Vegetation Transects	CNLM	2016
Northern boundary Fence line	CNLM	2015
Bridal Creeper Locations	CNLM	2016
Gnatcatcher (points, use area, nest locations)	CNLM	2016
Bridal Creeper Locations	CNLM	2013
Gnatcatcher (points, use area, nest locations)	CNLM	2013
Rare Plant Points	CNLM	2013
PPM Capture Locations for captive breeding collection	San Diego Zoo	2012
PPM 24x24 Grid extended to former Marguerita Roadbed and North of the roadbed	USFWS	2012
Vegetation Transects	CNLM	2012
Gnatcatcher (points, use area, nests locations)	CNLM	2012
Bridal Creeper Locations	CNLM	2012
PPM 16x16 Grid extended to former Marguerita Roadbed and North of the roadbed	USFWS	2011
Rare Plant Points	CNLM	2011
Gnatcatcher (points, use area, nests locations)	CNLM	2011
Location of dead PPM	CNLM	2010
Rare Plant Points	CNLM	2010

Gnatcatcher (points, use area, nests locations)	CNLM	2010
Rare Plant Points	CNLM	2009
Gnatcatcher (points, use area, nests locations)	CNLM	2009
Veg Baseline Transect Locations	CNLM	2009
Pacific Pocket Mouse Points	USFWS	2009
Aerial Photo	Eagle Aerial	2008
Final Trail Route	CNLM	2008
Rare Plant Points	Fred Roberts	2008
PPM 16x16 Grid	USFWS	2008
Gnatcatcher (points, use area, nests locations)	CNLM	2008
Bobcat Point	CNLM	2007
Revegetation Areas & Seed mix	URS Corporation	2007
Gnatcatcher (points, use area, nests locations)	CNLM	2007
General Wildlife (whiptail and red racer)	CNLM	2007
Cliff Spurge Points	CNLM	2006
Veg Baseline Transect Locations	CNLM	2006
Aerial Photos	URS Corporation	2006 and 1991
PPM Habitat Areas	URS Corporation	unknown
Vista Points	URS Corporation	unknown
Pacific Pocket Mouse Points	USFWS	1993-2007
Cliff Spurge Points	URS Corporation	2007
Trail Location Options	URS Corporation	2007
Sensitive Species (Cliff spurge and Boxthorn)	URS Corporation	2006
Vegetation Communities	URS Corporation	unknown
Gnatcatcher Locations	URS Corporation	unknown
Coastal Commission ESHA Boundaries	URS Corporation	unknown
Jurisdictional Channels	URS Corporation	unknown
Open Space	URS Corporation	unknown
Headlands LLC Project Boundaries	URS Corporation	unknown
Headlands LLC Revegetation Areas	URS Corporation	unknown

APPENDIX B. PHOTOS OF CSS MONITORING TRANSECTS.


Transect H03


Transect J09


Transect H13


Transect E07


Transect D11

Figure 7. Comparison photos of 2014 (left) and 2021 (right) CSS monitoring transects.

APPENDIX C. PPM HABITAT PRE- AND POST- MANIPULATION PHOTOS.

Figure 8. Before (left column) and after (right column) photos of areas with dead and downed vegetation removed in FY 2021.

Gmail

Korie Merrill <kmerrill@cnlm.org>

(CNLM ref. no. S033) CNLM's Dana Point Preserve FY 2021 annual report

Korie Merrill <kmerrill@cnlm.org> Wed, Mar 9, 2022 at 2:03 PM
To: Hans Sin <hans.sin@wildlife.ca.gov>, "Roberts, Carol" <carol_a_roberts@fws.gov>
Cc: Kim Klementowski <kklementowski@cnlm.org>

All,
Attached for your records and review is the 2021 annual report for activities on CNLM's Dana Point Preserve.

V/r,
Korie

--
Korie Merrill, Preserve Manager
Center for Natural Lands Management
Direct/Fax: 949.218.1145
Phone: 760.731.7790 ext. 204

S033 CNLM Dana Point Preserve AR 2021.pdf
7449K