City of Carlsbad Habitat Management Plan Annual Report

Reporting Year 18, November 2021 - October 2022

January, 2023

Environmental Sustainability
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California Department of Fish and Wildlife

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Batiquitos Lagoon Foundation

Buena Vista Audubon

Preserve Calavera

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Acronyms and Definitions

Annual Reports – Preserve-specific annual reports, which summarize management and monitoring activities, threats, and monitoring results, are due in November of every year. Pre-HMP preserves are generally not required to prepare annual reports unless stipulated in previously negotiated agreements with the city and/or Wildlife Agencies. HMP-wide annual reports (e.g., the current report) are due to the Wildlife Agencies in December of every year. HMP annual reports summarize gains and losses in the HMP preserve system, current status of individual preserves and species, management and monitoring activities, and a financial summary. Every third year, the HMP annual report includes an analysis of species monitoring data.

ASMD – Area Specific Management Directive.

BLF – Batiquitos Lagoon Foundation.

Caltrans – California Department of Transportation. Caltrans is responsible for design, construction, maintenance and operation of the California State Highway System and Interstate Highway segments within the state's boundaries.

City – City of Carlsbad.

CDFW – California Department of Fish and Wildlife (formerly CDFG – California Department of Fish and Game).

CNDDB – California Natural Diversity Database, operated and maintained by CDFW.

CNLM – Center for Natural Lands Management, a non-profit organization that provides management and biological monitoring of mitigation and conservation lands in perpetuity.

Compliance Monitoring – Monitoring to determine if the HMP is being properly implemented pursuant to the Implementing Agreement and state and federal take authorizations/permits.

Conservation Easement (as defined in California Civil Code Section 815.1) – Any limitation in a deed, will or other instrument in the form of an easement, restriction, covenant or condition, which is or has been executed by or on behalf of the owner of the land subject to such easement and is binding upon successive owners of such land, and the purpose of which is to retain land predominantly in its natural, scenic, historical, agricultural, forested or open-space condition.

Critical Location – An area that must be substantially conserved for a particular sensitive species to be adequately conserved by the MHCP. Critical locations often coincide with major populations of the same sensitive species, but not all major populations are considered critical.

Edge Effects – Impacts to natural open space resulting from adjacent, contrasting environments, such as developed or disturbed land. When an edge is created, the natural ecosystem is affected for some distance in from the edge.

Effectiveness Monitoring – Monitoring habitat and species to determine if the HMP is protecting sensitive biological resources as planned and if any adaptive management is needed.

EMP – SANDAG's TransNet Environmental Mitigation Program, a funding allocation category for the costs to mitigate habitat impacts for regional transportation projects. Funding grants from this program may be used for habitat acquisition, management, and monitoring activities as needed to help implement the MHCP.

ESA – Endangered Species Act.

Existing Hardline Preserve Areas – Natural habitat open space areas, such as Ecological Reserves and Dawson-Los Monos Reserve that were preserved prior to final approval of the HMP, or areas that were previously Proposed Hardline Areas or Standards Areas that have secured preservation, long-term management and monitoring, and a non-wasting endowment to fund activities in perpetuity.

FPA – Focused Planning Area.

GIS – Geographic Information System.

Gnatcatcher Core Area – An area identified in the MHCP that is considered critical to the recovery of the coastal California gnatcatcher. Approximately 500 acres of core habitat must be conserved by the MHCP jurisdictions as a condition of coverage for gnatcatcher. Although the core area is located outside of the City of Carlsbad, the city is responsible for 307.6 acres of conservation.

Habitrak – A GIS-based tool that was developed and is maintained by CDFW for habitat accounting. The tool calculates the acreage, type and location of vegetation communities that are gained (conserved), or lost (impacted) from the HMP planning area.

HCP – Habitat Conservation Plan, a planning document required as part of an application for an incidental take permit from the USFWS that describes the anticipated effects of the proposed taking, how those impacts will be minimized or mitigated, and how the HCP is to be funded.

HMP – Habitat Management Plan; serves as the MHCP Subarea Plan for the City of Carlsbad.

HMP Hardline – an HMP Hardline is a preserve that has been set aside for permanent conservation and is protected by a conservation easement, which runs permanently with the land. Hardline properties cannot be developed.

HOA – Homeowners' Association.

HRS – Habitat Restoration Sciences, Inc., a for-profit native habitat restoration and general engineering firm specializing in installation and long-term maintenance of natural areas

Implementing Agreement – The legal agreement between the City of Carlsbad, CDFW, and USFWS that ensures implementation of the Carlsbad HMP binds each of the parties to perform the obligations, responsibilities and tasks assigned and provides remedies and recourse should any of the parties fail to perform.

IPM – Integrated Pest Management, a science-based, decision-making process that combines biological, physical and chemical tools in a way that achieves control objectives while minimizing economic, health, and environmental risk.

Landowner – The legal entity that owns the land in fee-title. The landowner has the ultimate responsibility to ensure that preserve management is secured prior to habitat impacts. Often, the management responsibility is contracted to a third party.

LFMZ – Local Facility Management Zone, one of 25 Growth Management Plan sub-areas the City of Carlsbad used for planning and financing infrastructure improvements and other city services and facilities concurrent with development. Standards Area requirements are specific to the LFMZ in which the property resides.

Major Population – As defined by the MHCP, a population of sensitive species considered sufficiently large to be self-sustaining with a minimum of active or intensive management intervention (especially for plants) or that at least supports enough breeding individuals to contribute reliably to the overall meta-population stability of the species (especially for animals). A Major Population also includes smaller populations that are considered important to long-term species survival.

MHCP – Multiple Habitat Conservation Program, a subregional conservation plan prepared and administered by SANDAG that encompasses the cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach and Vista. The goal of the MHCP is to conserve approximately 19,000 acres of habitat and contribute toward the regional habitat preserve system for the protection of more than 80 rare, threatened, or endangered species. The MHCP serves as an umbrella framework to guide the preparation of city-specific plans such as the Carlsbad Habitat Management Plan.

NCCP – Natural Community Conservation Planning, a program of CDFW that takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity throughout the state. The MHCP is a sub-regional component of the statewide NCCP.

Non-Wasting Endowment – An endowment with sufficient principal that provides for the management and monitoring of a preserve in perpetuity through investment returns. The endowment is designed to increase in value over time for the generated revenues to increase, and thus keep pace with inflation. Pre-HMP preserves generally did not require endowments to fund management, unless specified in a previously negotiated agreement with the city and/or Wildlife Agencies.

OSMP – Open Space Management Plan, which serves as the Preserve Management and Monitoring Plan referenced in Section 12.3 of the Implementing Agreement.

PAR – Property Analysis Record, a cost analysis that estimates the management and monitoring costs of a specific preserve in perpetuity, often in the form of an endowment to fund long-term management. A PAR is based on industry-accepted parameters, allows an objective cost/benefit analysis for each line item, and adjusts for inflation.

PMP – Site specific preserve management plan, which outlines the long-term management requirements for a specific preserve. The city has contracted CNLM to develop a master PMP for all city-owned preserves that addresses each preserve individually.

Preserve – Land conserved with a conservation easement, restrictive covenant, deed restriction, or transfer of fee-title to the city or CDFW that is being managed to HMP and MHCP standards. (Note: Lands already set aside for preservation through an open space easement prior to HMP adoption have limited management activities until a regional funding source is available).

Preserve Manager – The entity responsible for monitoring and managing the preserve. The majority of preserve lands are owned/managed by the city, CDFW, non-profit professional land management companies, or private HOAs. Pursuant to state due-diligence legislation that took effect January of 2007, preserve managers must be certified by either the city or CDFW before they can begin managing lands in the city.

Priority Species – Sensitive species that have site-specific permit conditions requiring populations to be tracked individually using GIS.

Proposed Hardline Preserve Areas – Areas identified in the HMP as natural habitat open space that were proposed for permanent conservation and perpetual management during the design phase of development projects but not completed prior to final approval of the HMP.

RY – Reporting Year, or from November 1 to October 31.

Rough Step Assembly – A policy that requires development (losses) occur in "rough step" with land conservation (gains) during preserve assembly to ensure that development does not greatly outpace land conservation. It is generally understood by the Wildlife Agencies that losses should be no more than 10% greater than gains.

SANDAG – San Diego Association of Governments. SANDAG is the San Diego region's primary public planning, transportation, transit construction and research agency, providing the public forum for regional policy decisions about growth, transportation planning and transit construction, environmental management, housing, open space, energy, public safety and binational topics.

SDG&E – San Diego Gas and Electric.

SDHC – San Diego Habitat Conservancy, a non-profit organization that provides management and biological monitoring of mitigation and conservation lands in perpetuity.

SDMMP – San Diego Management and Monitoring Program, a science-based program that provides a coordinated approach to management and biological monitoring of lands in San

Diego that have been conserved through various programs, including the Multiple Species Conservation Program (MSCP), MHCP, TransNet Environmental Mitigation Program, and various other conservation and mitigation efforts.

Standards Areas – Areas that were included in the MHCP Focused Planning Area (i.e., considered high priority for inclusion into the preserve system), but for which projects had not been proposed prior to the city's HMP approval. Because potential protected habitat areas had not been delineated, a set of zone-specific conservation standards were established as a condition of future project approval.

Take – As defined in the Federal Endangered Species Act; to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species or attempt to do so, including impacts to the habitats upon which these listed species depend.

UC – Urban Corps Habitat Services, a non-profit organization that provides management and biological monitoring of mitigation and conservation lands in perpetuity.

USFWS – United States Fish and Wildlife Service.

Wildlife Agencies – Term used collectively for CDFW and USFWS.

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Executive Summary

Covering the period from November 1, 2021 to October 31, 2022, this eighteenth annual Habitat Management Plan (HMP) report summarizes the preserve status, implementation activities, and preserve gains and losses that have occurred during the current reporting period. Highlights of the HMP activities are summarized below.

Current Status of Preserves

The existing preserves continued to be managed, monitored, and/or maintained during the reporting period. Established private and city-owned Hardline Preserves were managed and monitored in accordance with their approved preserve management plans; California Department of Fish and Wildlife (CDFW) preserves were managed subject to available funding and resources; and pre-existing natural open space areas were maintained according to their respective Open Space Easements and/or Covenants, Conditions, and Restrictions, if applicable. Descriptions of the different categories of preserves are contained in Section 1.3.

Lake Calavera Mitigation Parcel

During the reporting period, a total of 17.7 acres of mitigation credit was debited from the mitigation parcel for city projects. To date, cumulative debits and adjustments for wetland mitigation sites are 113.9 acres, leaving a total of 92.2 acres (credits) remaining.

Gnatcatcher Core Area Conservation Obligation

As documented in a letter from the U.S. Fish and Wildlife Service (USFWS) and CDFW dated December 19, 2019, the city has fulfilled its Gnatcatcher Core Area obligation in full.

Land Acquisitions

During the reporting period, there were no acquisitions of open space lands.

Habitat Gains and Losses

During the reporting period, there was a net gain of 9.5 acres of HMP hardline associated with the Veterans Memorial Park Project (described below in HMP Minor Amendments).

HMP Minor Amendments

During the reporting period, two HMP Minor Amendments were processed.

a. A boundary adjustment was made for the city's Veterans Memorial Park Project through an Equivalency Finding, resulting in a net gain of 9.5 acres of HMP Hardline, consisting of

a net gain of 9.93 acres of coastal sage scrub and 0.09 acre of southern willow scrub, and a net loss of 0.52 acres of non-native grassland.

b. A mapping correction was made to the HMP boundary maintained in HabiTrak by California Department of Fish and Wildlife (CDFW) as a result of a citywide analysis. Some HMP Preserve areas previously added as part of the development process had not been adjusted in HabiTrak, resulting in approximately 154 acres being counted as "outside preserve" rather than "inside preserve." HabiTrak adjustments were finalized by CDFW in April, 2022.

Preserve Management and Monitoring

Ongoing management and monitoring activities in HMP preserves conducted this year included invasive species monitoring and control, installation and maintenance of fences and signage, rare plant counts and habitat assessments, vegetation mapping, sensitive bird species surveys, wildlife movement monitoring, and public outreach activities, which are summarized for each preserve area in Appendix B.

In addition, three monitoring efforts were coordinated by the city during the reporting period.

a. Citywide coastal California gnatcatcher (*Polioptila californica californica*) surveys were performed in the spring of 2022. Results showed high occupancy throughout the surveyed areas, suggesting that the population is stable in Carlsbad. The next citywide survey is scheduled for 2031.

b. Site inspections for unmanaged preserves continued to June 2022. To date, Environmental Science Associates has conducted inspections for 11 preserves totaling approximately 667 acres. Threats and opportunities were identified, and potential adaptive management recommendations were provided. Site inspections for the remaining unmanaged preserves will continue.

c. Ongoing monitoring continued on the Village H South property throughout 2022, including wildlife camera monitoring to understand wildlife movement patterns throughout the property, and dog waste monitoring to determine how much waste was left onsite and where (within three feet of a trail or off-trail, into the open space).

Financial Summary

Habitat Mitigation Fee Program: Mitigation fees totaling $33,577.62 were collected during the current reporting period. The city has fulfilled its Core Area Credit obligation in full. However, the purchase of some credits exceeded the available Habitat Mitigation Fee funds, requiring an advance from the General Fund, resulting in a negative fund balance. The current balance of the Habitat Mitigation Fee Fund is -$1,153,586. In-lieu fees will continue to be collected for habitat impacts, and will be used to reimburse the General Fund.

Preserve Management Endowments: During the reporting period, a total of $960,662 was spent by the land managers on management and monitoring activities on 28 preserves or preserve complexes (more than one parcel) that comprise 2,817 acres (does not include most Ecological Reserves owned by California Department of Fish and Wildlife). Endowments for endowment-funded properties totaled $20,220,461.

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1.0 Plan Administration

1.1 Introduction

The Habitat Management Plan (HMP) is a citywide conservation plan that describes how the city will comply with state and federal environmental laws while remaining consistent with the city's General Plan and Growth Management Plan. The HMP was developed in coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife (collectively, the Wildlife Agencies) as part of a regional planning effort under the North County Multiple Habitat Conservation Program (MHCP). Annual tracking and reporting of habitat gains, losses, management, and monitoring is required by Sections 12.1 and 12.2 of the Implementing Agreement (Nov. 12, 2004); the Federal Fish and Wildlife 10(a)(1)(B) Permit No. TE022606-0 (Nov. 12, 2004); and the NCCP Permit No. 2835-2004-001-05 (Nov. 15, 2004). This annual report covers year 18 of the 50-year HMP permit period.

1.2 HMP Compliance Monitoring and Effectiveness Monitoring

1.2.1 HMP Conservation Goals

To evaluate the city's compliance with the HMP and the effectiveness of the MHCP/HMP program with respect to natural resources protection, it is necessary to understand the underlying goals of the plan, which are summarized below (see HMP p. A-2 for a complete list):

- Conserve the full range of vegetation community types, with a focus on sensitive habitat types.
- Conserve populations of narrow endemic species and other covered species.
- Conserve sufficient habitat, functional biological cores, wildlife movement corridors, and habitat linkages, including linkages that connect coastal California gnatcatcher (*Polioptila californica californica*) populations and movement corridors for large mammals, to support covered species in perpetuity.
- Apply a "no net loss" policy to wetlands, riparian habitats, and oak woodlands.
- Implement appropriate land use measures to ensure the protection of preserve lands in perpetuity.
- Meet conservation goals stated above while accommodating orderly growth and development in the city.
- Coordinate and monitor protection and management of conserved lands within the preserve system.
- Minimize costs of Endangered Species Act related mitigation and HMP implementation.

1.2.2 Compliance Monitoring

Compliance monitoring is required by the HMP-related permits and Implementing Agreement to ensure that the city is doing what it agreed to do from a regulatory perspective, such as conserving particular species locations and acres of habitat, monitoring the condition of the habitat and species, and performing required management actions (MHCP Vol. I). The preserve steward assists the city by working with the preserve managers to ensure coordinated management across the city. Habitat tracking results are provided in Section 1.4; regulatory compliance is discussed in Section 1.5 and Appendix A; and management and monitoring activities are summarized in Section 2.0 and Appendix B.

1.2.3 Effectiveness Monitoring

Effectiveness monitoring, also known as biological, ecological, or validation monitoring, determines the effectiveness of the conservation program by evaluating if the preserve assembly and management actions are achieving the HMP and MHCP goals within the city and across the MHCP planning area. The preserve-level monitoring program is used to evaluate the effectiveness of management at specific preserve areas (MHCP Vol. III). At the subregional (MHCP-wide) level, effectiveness monitoring evaluates the status and trends in populations of covered species, and assessing how well the conservation strategy is working to maintain natural ecological processes (MHCP Vol. III).

Monitoring the effectiveness of the MHCP and HMP is more challenging than compliance monitoring because the biological goals are broad and it may take many years or decades before trends in species populations and habitat conditions are detectable. Species and habitat monitoring, and monitoring to evaluate the effectiveness of management are being conducted on individual preserves as well as the regional landscape level. This work is being done through a partnership with the city, preserve steward, preserve managers, Wildlife Agencies and San Diego Management and Monitoring Program, which has developed regional and site-specific monitoring and management strategic plans and protocols for conserved lands across San Diego County.

1.3 Current Status of Preserves

This section contains: (1) a description of the different categories of preserves within the HMP preserve system, (2) an accounting of the mitigation credits at the city's Lake Calavera Mitigation Parcel, (3) the status of the city's Gnatcatcher Core Area conservation obligation, and (4) the status of the HMP Mitigation Fee Fund.

1.3.1 Categories of HMP Preserves

Lands within the HMP preserve system can be grouped into four categories: (1) established private and city-owned Hardline Preserves; (2) CDFW Ecological Reserves; (3) pre-existing natural

open space preserves; and (4) future preserves (Proposed Hardline Preserves and Standards Areas). These categories of preserve lands are distinguished by the level of management, ownership, and/or status as described below and shown in Figure 1.

Established Private and City-Owned Hardline Preserves

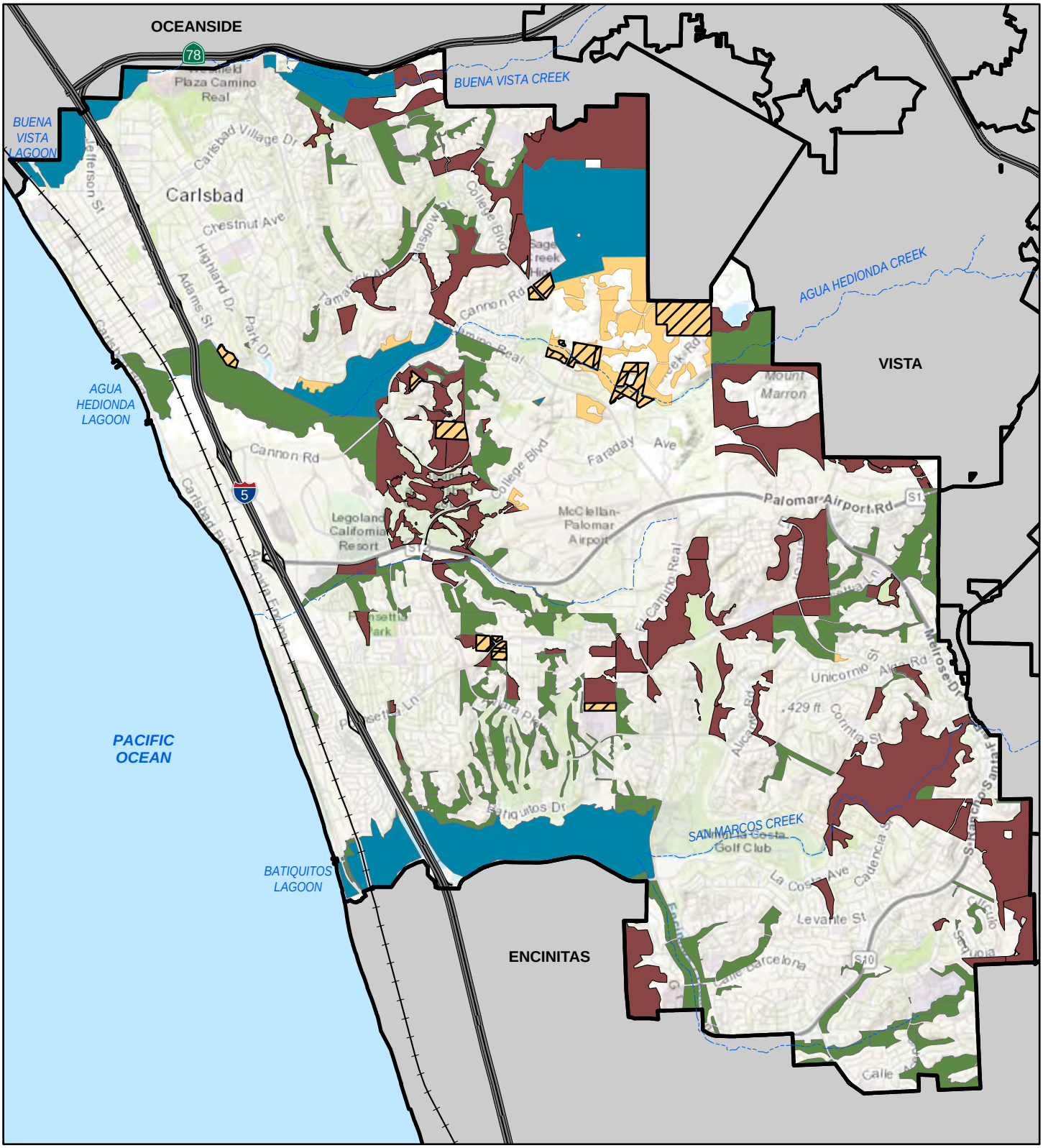
Private and city-owned Hardline Preserves were established during or after the adoption of the HMP. They have approved preserve management plans implemented by preserve managers and are funded through non-wasting endowments or, in the case of the city-owned preserves, through annual budget appropriations. The city requires site specific annual reports for these preserves. The property owners for these preserves are a preserve management entity, homeowners association (HOA), or the city. Except for the city-owned properties, these Hardline Preserves are protected by recorded conservation easements. Examples of these preserves include Rancho La Costa, Carlsbad Oaks North, Lake Calavera and the Crossings Golf Course, among others.

California Department of Fish and Wildlife Ecological Reserves

CDFW-owned Ecological Reserves were established prior to or subsequent to the adoption of the HMP and are all owned by the State of California. According to the HMP Implementing Agreement, the level of management and monitoring of the CDFW preserves is based upon the available state funding and resources. Except for the Buena Vista Creek Ecological Reserve, there are currently no finalized long-term management plans for the CDFW Ecological Reserves in Carlsbad. Management is guided by draft plans, which have not been submitted to the city. CDFW obtains State Wildlife Grant funding annually for management and monitoring activities on CDFW's preserves. Management accounts have been established for Carlsbad Highlands Ecological Reserve and Agua Hedionda Lagoon Ecological Reserve. The Batiquitos Lagoon Ecological Reserve is managed and monitored by CDFW and funded through a mitigation account established by the Port of Los Angeles and held by CDFW. The Buena Vista Creek Ecological Reserve is managed by Center for Natural Lands Management (CNLM), a non-profit land management entity, through a contract and funded by a non-wasting endowment held by CNLM. The city receives some CDFW monitoring data for the lagoon preserves and a CNLM-prepared annual report for the Buena Vista Creek Ecological Reserve.

Pre-Existing Natural Open Space Preserves

Pre-existing natural open space Hardline Preserves predate the HMP and are composed of natural open space areas within subdivisions or master plan communities (owned by the respective HOA), the University of California's Dawson-Los Monos Reserve, and areas owned by Cabrillo Power, San Diego Gas and Electric (SDG&E), and the San Dieguito Union High School District. The lands were included in the HMP because of their biological resources and ecological value. There are no preserve management plans or active management and monitoring associated with these preserves, and maintenance of the property is the responsibility of the property owner. Generally, management



City of Carlsbad
Categories of HMP Preserves

Figure 1

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consists of trash pickup and fence maintenance. The HMP envisioned that future management and monitoring of these lands would be financed through a regional funding source. The preserves owned by HOAs are protected by an Open Space Easement. The Dawson-Los Monos Reserve is owned by the Regents of University of California and has no open space or conservation easement protection. Examples of the HOA-owned preserves include Calavera Hills Phase I, Aviara, and Arroyo La Costa.

Future Preserves (Proposed Hardline Preserves and Standards Areas)

Future preserves are identified in the HMP and are associated with developable lands but have yet to begin management and monitoring. As a condition of approval for any development on the property, the developer is obligated to establish the preserve by preparing a preserve management plan approved by the city and Wildlife Agencies, contracting with a qualified land manager, funding a non-wasting endowment or other secure financing mechanism, and recording a conservation easement. An HMP Minor Amendment - Equivalency Finding, approved by the city and Wildlife Agencies, is required for any alterations to the Proposed Hardline Preserve boundary. Development within Standards areas must be consistent with Local Facilities Management Zone (LFM)-specific conditions, and the final preserve design must be approved by the city and Wildlife Agencies through an HMP Minor Amendment - Consistency Finding. Examples of these future preserves include Mandana and Kato.

1.3.2 Lake Calavera Mitigation Parcel

The city-owned Lake Calavera Mitigation Parcel, also known as the Lake Calavera Preserve, provides mitigation as needed for upland habitat impacts related to city construction projects. Credits are deducted on an acre-for-acre basis, regardless of the type of habitat being impacted, except for impacts to gnatcatcher-occupied coastal sage scrub, southern maritime chaparral, and maritime succulent scrub. No credits can be sold to outside entities.

The HMP (Section D.3.B) states that there are 266.1 available acres on Lake Calavera Preserve and the Implementing Agreement (Section 10.7) states that there are 206.1 acres. The Wildlife Agencies and city have agreed to use the more conservative 206.1 acres stated in the Implementing Agreement for tracking purposes.

In addition to the use of the Lake Calavera Mitigation Parcel for upland mitigation credits, the city has used the property for wetland mitigation through active habitat creation, restoration, and/or enhancement of disturbed areas within the preserve, in coordination with the Wildlife Agencies and wetland permitting agencies. Once an area has been mapped and identified as mitigation for a city project, it is no longer eligible for future mitigation credits, and the acreage of the mitigation site is debited from the available balance. During the reporting period, 17.65 acres were deducted for the Veterans Memorial Park Project, and 0.04 acre was deducted for the El Fuerte-Maerkle Motorized

Valve Project. Cumulative upland debits and adjustments for wetland mitigation sites to date are 113.89 acres, leaving a total of 92.21 acres of mitigation credits remaining (see Table 1).

Table 1. Mitigation Acreage at Lake Calavera Mitigation Parcel RY 18 (2021–2022)

Credits and Debits	Acres
Initial Credits	**206.10**
Total acres of credit available as of November 1, 2021	109.90
Year 18 Deductions (Nov. 2021–Oct. 2022)	
Veterans Memorial Park (impacts to 35.29 acres of non-native grassland, 0. 5:1 ratio	*17.65*
El Fuerte-Maerkle Motorized Valve Project, 0.04 acres of coastal sage scrub	*0.04*
Total acres of credit available as of October 31, 2022	**92.21**

1.3.3 Gnatcatcher Core Area Preservation Obligation Acreage

When the HMP was being developed, the Wildlife Agencies determined there was not enough coastal sage scrub habitat in the city to conserve the coastal California gnatcatcher. Because of this limitation, the city was required to preserve an additional 307.6 acres of coastal sage scrub in the Gnatcatcher Core Area, a large block of high quality habitat southeast of the city, which is regionally important for the long-term survival of the species.

As documented in a letter from the USFWS and CDFW dated December 19, 2019, the city has fulfilled its Gnatcatcher Core Area obligation in full. HMP habitat mitigation fees will continue to be collected to offset the associated costs incurred by the city (see Section 3.1.2 for more details).

1.4 Habitat Gains and Losses

Pursuant to the HMP and Implementing Agreement, the city is required to provide an annual accounting of the amounts and locations of habitat lost and conserved over time due to public and private development projects and land acquisition. This information will be used to demonstrate to the Wildlife Agencies that: (1) the HMP preserve is being assembled as anticipated; (2) the habitat conservation goals of the HMP are being achieved; and (3) habitat conserved is in rough step with development. HabiTrak is a GIS database tool that was designed to satisfy these tracking and reporting requirements by providing standard tracking protocols and reporting output. The tool uses standard baseline spatial databases (e.g., vegetation, preserve boundaries, and parcel boundaries) and development project footprints to prepare standardized tables and maps for annual reporting.

1.4.1 Target Acreage

Some of the habitat types used in the standard HabiTrak table outputs are more specific than those used in HMP Table 8. To make it easier to compare the Habitrak tables with the HMP table for compliance monitoring, Table 3 below lists acres of target conservation and compares habitat categories in HMP Table 8 to categories used in HabiTrak. Note that the GIS data layers used for this analysis included the more detailed habitat categories.

Table 2. HMP Target Conservation of Habitats
(Comparison of Habitat Categories in HMP and Habitrak)

HMP Table 8		Habitrak	
Habitat Type	**Target Acres[1]**	**Habitat type**	**Target Acres[1]**
Coastal sage scrub	2,139	Maritime succulent scrub	29
		Coastal sage scrub	2,003
		Coastal sage-chaparral scrub	107
		Subtotal	*2,139*
Chaparral	676	Chaparral	676
Southern maritime chaparral	342	Southern maritime chaparral	342
Oak woodland	24	Coast live oak	20
		Other oak woodland	4
		Subtotal	*24*
Riparian	494	Riparian forest	82
		Riparian woodland	17
		Riparian scrub	395
		Subtotal	*494*
Marsh	1,252	Southern coastal salt marsh	143
		Alkali marsh	9
		Freshwater marsh	165
		Freshwater	53
		Estuarine	789
		Disturbed wetland	93
		Subtotal	*1,252*
Grassland	707	Grassland	707
Eucalyptus woodland	99	Eucalyptus woodland	99
Disturbed lands	745	Agriculture	185
		Disturbed Land	244
		Developed	316
		Subtotal	*745*
Total Target Conservation within Carlsbad	**6,478[2]**	**Total Target Conservation within Carlsbad**	**6,478[2]**
Gnatcatcher Core Area Requirement	308	Not tracked in Habitrak	N/A
Total HMP Target Conservation	**6,786[2]**		

[1] Rounded to the nearest acre.
[2] Note that the target acreage includes 100% of all Standards Area parcels. However, a portion of these parcels are expected to be developed; therefore, the final total will be slightly less than the target value.

1.4.2 Land Acquisitions

During the reporting period no open space properties were acquired by the city.

1.4.3 Habitat Gains and Losses

During the reporting period, there were no gains or losses within the Focused Planning Area of the HMP (i.e., within Proposed Hardline or Standards Area). Since the adoption of the HMP, approximately 6,195 acres have been gained and approximately 1,760 acres have been lost. Figure 2 shows the current status of the preserve system.

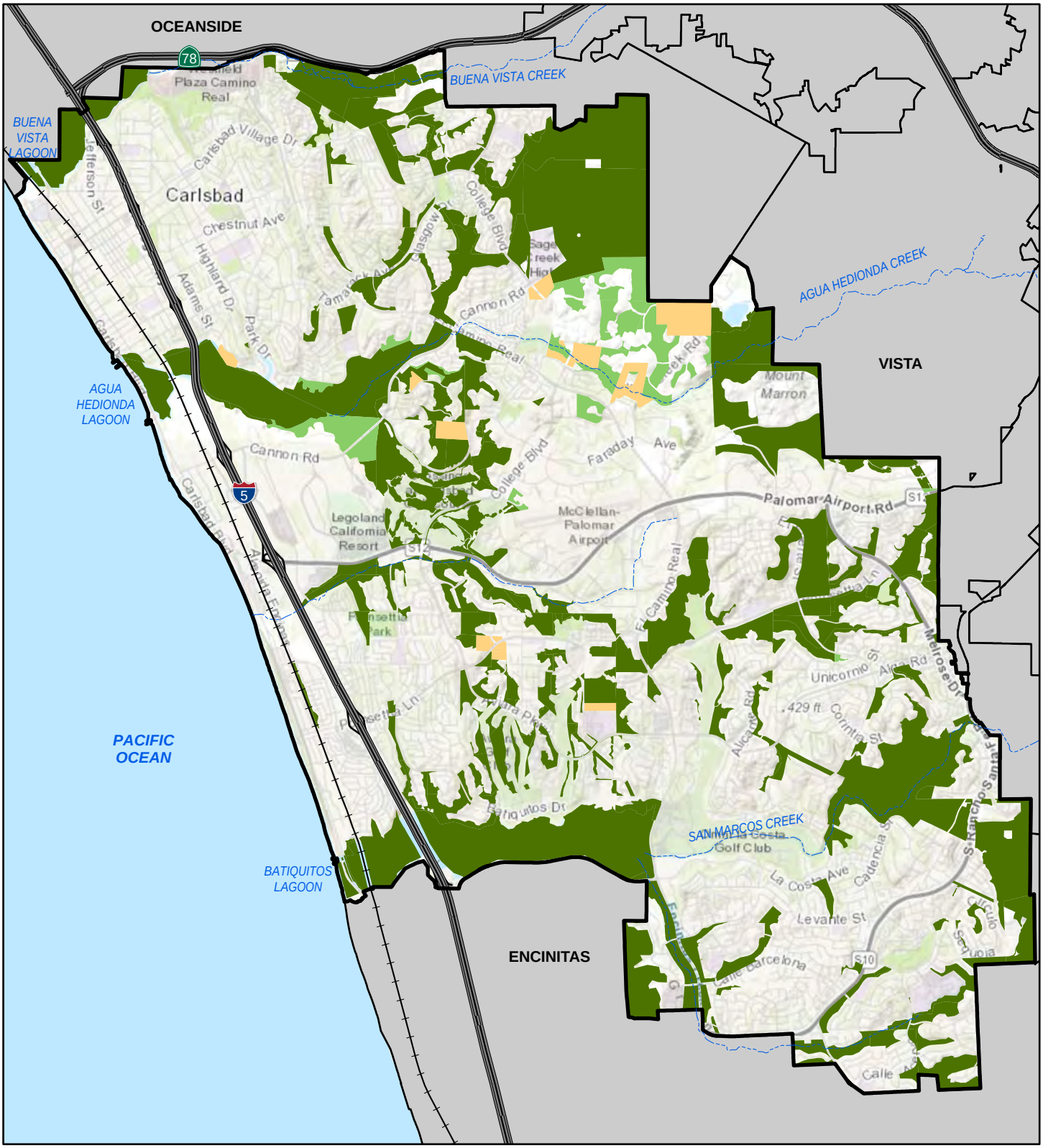
1.5 Regulatory Compliance

To ensure regulatory compliance, the city is implementing the HMP: (1) through the project review process for new development projects, (2) by issuing HMP permits when impacts to habitat or covered species are involved, (3) by issuing incidental take permits when take of a listed species is involved, and (4) by ensuring consistency with the terms and conditions of the Implementing Agreement, and State NCCP and Federal Fish and Wildlife permits.

1.5.1 HMP Amendments

Amendments processed during the reporting period are described below. See HMP Section E-3 and Implementing Agreement Section 20.1 for a description of Minor Amendment types and the HMP amendment process.

1. **Consistency Finding:** During the reporting period, no minor amendments were processed through a Consistency Finding.
2. **Equivalency Finding:** During the reporting period, two minor amendments were processed through an Equivalency Finding.
    a. The Veterans Memorial Park is a city project that was anticipated in the HMP. Veterans Park Preserve and Macario Canyon Preserve were established at the inception of the HMP in anticipation of the park. The park project will remove 3.16 acres of non-native grassland and 0.20 acres of coastal sage scrub from the HMP hardline, and replace it with 10.13 acres of coastal sage scrub (net gain of 9.93 acres), 0.09 acre of riparian scrub (net gain of 0.09 acres) and 2.64 acre of non-native grassland (net loss of 0.52 acre), for an overall net gain of 9.5 acres of HMP hardline. All gains and losses will occur on the 93.62-acre parcel (APN 2122710300). Wildlife Agency concurrence was received on April 27, 2022.



City of Carlsbad

City of Carlsbad
2021 Current Conditions

Figure 2

Document Path: \\shares\GIS_App\RequestsMarch2015\PublicWorks\PEM\MuniProp\RITM0020672_20\Working Map\Working.aprx

Date: 1/12/2022

b. A minor amendment was processed to correct the HMP boundary in HabiTrak maintained by CDFW as a result of a citywide analysis. Previous submissions of gains and losses to CDFW did not result in revisions to the original HMP boundary. Therefore, many of the HMP hardline gains were reported as "outside preserve" rather than "inside preserve," which means that the acres would not be counted toward the city's required hardline target. Three areas were previously approved by the Wildlife Agencies through a minor amendment (36.6 acres of gain, 14.4 acres of loss); the remaining 12 areas (116.9 acres of gain, no losses) had not yet been processed through a minor amendment. Wildlife Agency concurrence was received on February 8, 2022 and the boundary was updated by CDFW in April, 2022.

1.5.2 City Compliance with Terms and Conditions of Take Authorization

To satisfy the terms and conditions of the state and federal take authorization, the city is required to fulfill the obligations outlined in Sections 10-14 of the Implementing Agreement, the Conditions of the State NCCP Permit, and terms and conditions of the Federal ESA Section 10(a)(1)(B) Incidental Take Authorization/Permit. Implementation tasks associated with these regulations are completed or ongoing, and are described in Appendix A.

1.5.3 City Compliance with HMP Zone-Wide Standards

The city is also required to ensure that all projects within Standards Areas comply with the zone-specific standards outlined in HMP Section D (Table 8). All projects that occur within a Standards Area are processed with a Consistency Finding. During this process, projects must demonstrate compliance with the standards before they receive concurrence from the Wildlife Agencies and are approved by the city; therefore, all approved development within Standards Areas is consistent with the HMP. Appendix A summarizes property-specific and linkage-related standards and current status. Refer to HMP Section D pages D-73 through D-82 for additional zone-specific standards.

2.0 Biological Management and Monitoring

The Wildlife Agencies have issued permits to jurisdictions and participating landowners for implementation of regional conservation plans like the HMP throughout California to address the development, conservation, and land management activities of conserved lands. One of the primary commitments made by permittees is to maintain the long-term habitat value of the preserve system and its ability to support viable populations of covered species. This section highlights some of the citywide monitoring and management activities coordinated by the HMP Division that took place during the reporting period. Appendix B includes a preserve-by-preserve summary of activities conducted by preserve managers and environmental organizations.

2.1 Citywide Coastal California Gnatcatcher Monitoring

The City of Carlsbad's HMP and resulting preserve system was designed to protect sensitive habitat and plant and animal species. One of the HMP requirements is to regularly assess the status of "covered" species to determine if the populations are stable, increasing, or decreasing. The coastal California gnatcatcher (CAGN, *Polioptila californica californica*) is monitored on all actively managed preserves within coastal sage scrub habitat. Initially, these surveys were conducted annually. In coordination with the Wildlife Agencies, the city worked with Center for Natural Lands Management and Environmental Science Associates to modify the monitoring protocol in 2010 to reduce monitoring frequency and to coordinate efforts among preserve managers. The purpose of the coordinated citywide effort was to determine the general abundance, status (i.e., pair or single male), and distribution of gnatcatchers across the city, including some of the unmanaged preserves.

The initial coordinated citywide monitoring effort was conducted in 2010, and surveys were subsequently conducted in 2013. All survey areas showed high occupancy, which is consistent with surveys conducted since the inception of the HMP. These results indicated that the CAGN population was stable across the city; therefore, the city elected to further reduce the monitoring frequency to every 9 years (with approval from the Wildlife Agencies), with surveys resuming in 2022. This trend in gnatcatcher population stability is supported by regional studies (Kus et al. 2017, SDMMP 2016, Vandergast et al. 2014), as well as land manager observations in Carlsbad over the course of many years. The advantage of reducing the survey frequency is to allow these management funds to be redirected towards more pressing management needs, such as invasive species removal.

In the spring of 2022, approximately 2,060 acres of coastal sage scrub habitat within approximately 60 preserves (or preserve parcels) was surveyed by Center for Natural Lands Management, Environmental Science Associates, San Diego Habitat Conservancy, Urban Corps

Habitat Services, Helix, and California Department of Fish and Wildlife. A total of 134 pairs and 41 single males were observed in 2022 as compared to 122 pairs and 33 single males in 2013, and 85 pairs and 42 males in 2010 (Table 3). Some of increase in gnatcatchers over time may be attributed to an increase in acres surveyed (1,805 acres were surveyed in 2010 and 1,985 acres were surveyed in 2013). Alternatively, the difference could be from natural population variability or from territories that move between monitored preserves to adjacent unmonitored areas. Based on these results, it appears that the gnatcatcher population within Carlsbad continues to be stable. See Appendix C for the full report.

Table 3. Coastal California Gnatcatcher Survey Results

Year	Acres Surveyed	No. Pairs	No. Single Males
2010	1,805	85	42
2013	1,985	122	33
2022	2,060	134	41

2.2 Unmanaged Preserve Inspection Program

Typically, the unmanaged preserves were established prior to the final adoption of the HMP in 2004 and were not required to have a funded land manager. The city has no obligation to dedicate resources to monitor or manage these preserves per the HMP Implementing Agreement. However, with the HMP preserve system almost fully built out, the city initiated an inspection program to evaluate the status of unmanaged preserves, identify threats, and determine potential management priorities and implementation feasibility based on available resources.

The site inspection program for unmanaged preserves was developed by the city and Environmental Science Associates (ESA), and the program is being implemented by ESA. Program methodology includes the following four steps.

1. **Desktop analysis**. Prior to initiating any site visits, a desktop analysis was conducted to evaluate available aerial maps and GIS data pertaining to vegetation communities and sensitive species to assist with site visit prioritization. Prioritization was based on presence of sensitive species or habitats, potential threats, and accessibility.
2. **Data collection tools**. Electronic field forms supported by mobile data collection applications ArcGIS Field Maps and Survey123 were developed for use during in-person site inspections. These tools enabled biologists to view a variety of data layers in the field while collecting real time data. A unique color code was assigned to biological resources, threats, and adaptive management or restoration opportunities. The Survey123 form was developed to (1) document the overall condition of the unmanaged preserve, including the status of plant populations or other sensitive resources, status of fencing and signage, and presence/sign of wildlife movement corridors, and (2) determine the urgency and potential opportunities for adaptive management or restoration.

3. **Site inspections.** Site inspections were conducted generally from south to north for prioritized unmanaged preserves. Preserves with the potential to support listed or sensitive species were visited during months with the best opportunity for detection. Inspections were conducted in good weather, on foot, during daylight hours, keeping to authorized trails as much as possible. In areas that were difficult to access, binoculars were used to aid in surveying. Inspections consisted of baseline condition assessment, threats assessment (unauthorized access, illegal trails, trash, invasive species and erosion) and opportunities assessment (adaptive management, restoration potential and opportunities for grants and/or volunteers).
4. **Post-field processing**. Photos and data collected on the ArcGIS Field Map were reviewed for accuracy and the Survey123 data forms were exported and saved. Adaptive management opportunities and urgency rankings were entered into the *HMP Unmanaged Preserves Matrix,* which is a live file where changes can be viewed in real time by all team members.

ESA biologists conducted site inspections for 11 unmanaged preserves totaling approximately 667 acres. Site inspections occurred from September 30, 2021, to June 8, 2022, across eight site inspection survey days. Examining threats and opportunities, the highest ranked preserves for potential adaptive management actions were Santa Fe Trails, La Costa Valley, The Ranch, La Cresta, and Aviara Master Association. Invasive species were the most common threat, although unauthorized access and trash were also identified in some areas. A number of opportunities were identified, including targeted invasive species removal, enhancement/restoration, and thatch removal, which would improve habitat for a variety of endangered plant species and reduce fire fuel load. See Appendix D for the full report.

2.3 Village H Wildlife Movement and Dog Waste Monitoring

Wildlife movement and dog waste monitoring has been conducted by the city and Environmental Science Associates in the Village H South property since 2019 to better understand specific details about the use of this area by the public, dogs, and wildlife subsequent to the opening of a formal trail by the city in this location.

The Village H Property, acquired by the city in January, 2019, is located at Carlsbad Village Drive and Victoria Avenue, which divides the property into a 36.1-acre area to the north and a 24.8-acre area to the south. The northern area is an existing hardline that is part of the Calavera Hills - Robertson Ranch Preserve, and is not included in this study. The 23.9-acre southern portion of Village H (study area) consists of a 2.8-acre recreational vehicle storage area, 11.1 acres of undeveloped open space, and two HMP hardline preserve parcels at the southern end (a 4.2-acre area to the southwest and a 4.4-acre area to the southeast).

The Village H area is part of an important wildlife movement linkage (Link B) between core habitat areas, Core #2 (Buena Vista Creek Ecological Reserve) and Core #4 (Calavera Hills/Robertson Ranch Preserve, Lake Calavera Preserve and Carlsbad Highlands Ecological Reserve), which were identified during the planning phase of the HMP. Village H, specifically, was identified as an important wildlife movement corridor (M1) in a citywide wildlife movement study conducted in 2015 (City of Carlsbad et al. 2015). Four "pinchpoints" (locations where animal movement becomes funneled due to barriers such as roads) have been identified in the vicinity of Village H South.

When the study area was privately owned, it was used by local residents with off-leash dogs. When the city took ownership of the property, the historic on-site trail was improved, formalized and opened to the public on August 1, 2019. Off-leash dog use was no longer allowed because the city does not allow off-leash dogs on city trails or within HMP hardline areas. Several residents expressed a desire to continue to use this area for off-leash dogs. After much community outreach, City Council voted on April 14, 2020 to establish an off-leash dog area onsite in an area outside of the city trail.

Because the presence of humans and domestic dogs (including dog waste) may deter wildlife from using a site, the city initiated a monitoring program to better understand how the site was being used by wildlife, people and dogs and to determine if human/dog presence might be affecting wildlife movement onsite. The monitoring consisted of three components: wildlife cameras, roadkill, and dog waste. Specifically, the purpose of the monitoring program was to (1) collect quantitative data on the presence of wildlife, people, and domestic dogs on Village H, (2) determine if wildlife are being killed on the road while moving into or out of the site, (3) qualitatively evaluate wildlife movement patterns, (4) assess the amount and location of dog waste, which can deter wildlife, and (5) assess the amount of dog waste left off trail as a proxy for off-leash dog use within Village H. The monitoring program is not a statistically rigorous research study, but rather, was designed to understand general patterns. This information will help the city evaluate the current use by wildlife and changes in wildlife behavior potentially caused by changes in the allowable uses of the Village H site, including the future off-leash dog area.

2.3.1 Remote Wildlife Cameras

A total of 22 remote wildlife cameras were installed at Village H over the course of the study period to monitor the diversity of wildlife species using the site and determine potential wildlife movement patterns. Approximately three to ten cameras were active at any given time. The first wildlife camera was installed on June 25, 2019, and the last wildlife camera was removed on November 17, 2022 for a total of 844 camera days. The following data were collected from the photos and videos: species, number of individuals, and time.

Species detected included coyote (*Canis latrans*), bobcat (*Lynx rufus*), skunk (*Mephitis mephitis*), rabbit (*Sylvilagus spp.*), California ground squirrel (*Otospermophilus beecheyi*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), various bird species, various rodent species, off-leash dogs, on-leash dogs, and humans. The most common wildlife species detected at Village H were coyotes, small mammals (rodents/rabbits/raccoons), and birds. Based on wildlife camera data, presumed wildlife movement patterns within Village H were identified.

2.3.2 Roadkill Monitoring

Roadkill was studied to determine if animals were being hit by cars while traveling over a road to enter or leave the site. To ensure all four pinchpoints were monitored, portions of Tamarack Avenue, Carlsbad Village Drive, and Glasgow Avenue that border Village H were included in the study area. Roadkill monitoring began July 25, 2019, and ended on July 25, 2020, with a minimum of three surveys completed per week. A total of 15 roadkill occurrences were detected during the 129 survey dates from July 25, 2019, to July 25, 2020. All roadkill observations ranged from birds to small mammals, including opossum, rabbit, squirrel, barn owl (*Tyto alba*) and hawk (*Accipitridae*). No coyote or bobcat roadkill were observed.

2.3.3 Dog Waste Monitoring

The purpose of monitoring dog waste was to determine how much dog waste is being left behind each week (number and weight) and where (e.g., native habitat, on or near the trail). Dog waste stations were installed as part of the trail improvements; this study captures dog waste left by dog owners along a leash-only trail and surrounding open space area that is off-limits to dogs. Surveyors walked meandering transects throughout the Village H South in areas that were open enough to walk through. All observations of dog waste, coyote scat, or tennis balls (i.e., dog toys) were documented with ArcGIS Collector mobile application. Dog waste, coyote scat, tennis balls, and any litter found were then collected and thrown away at the end of each survey. Collected dog waste was weighed at the end of each collection period.

Surveys were conducted approximately every other week from August 28, 2019, to October 23, 2019, and then reduced to once a month in response to the COVID-19 pandemic, through December 13, 2022. Note that the initial survey on August 28, 2019, includes all previously uncollected waste from the site; therefore, only subsequent collections were used to determine weekly and monthly coyote scat and waste left by dog owners.

2.2.4 Conclusions

The following is a summary of what has been learned from the Village H monitoring program. See the full report in Appendix E.

1. The trails are heavily used by people and dogs. When the trail first opened, most of the dogs were off leash. By the end of the study, it appears that most dogs are leashed;

however, based on the location and amount of dog waste and tennis balls (dog toys), there is still significant off-leash use beyond the trail in the grassy area just south of Carlsbad Village Drive.

2. Many people continue to not pick up after their dogs. A total of 3,023 piles of dog waste were collected during the monitoring period, which weighed 200 lbs. Most of these were observed on the trail or within three feet, but a large number were observed well off of the trail in the grassy area south of Carlsbad Village Drive. Although the amount of dog waste was consistently high from year to year, it did vary by season, with summer months (June, July and August) being the most abundant, and the fall months (September, October, November) being the least abundant.
3. Although the site is heavily used by people and dogs, target wildlife species (coyotes and bobcats) and other mammals do regularly move through the site north-south, and east-west.
4. Moving on and offsite:
    a. Movement through a culvert under Tamarack Avenue just south of Carlsbad Village Drive (pinchpoint M1-2) was initially blocked by a gate (smaller mammals such as skunks were able to pass through the gate, but not bobcat or coyote). When the gate was removed on August 26, 2019, bobcats began using this undercrossing within two days.
    b. Elsewhere, wildlife appear to be crossing at grade (across Carlsbad Village Drive and other areas along Tamarack Avenue). Although there were no coyote or bobcat observed during the roadkill study, a number of smaller mammals (roadkill) were observed along these two very busy streets.
5. There is a strong difference in use patterns between people/dogs (daytime) vs. wildlife (nighttime). Wildlife are likely shifting their activity patterns to a nocturnal time frame to avoid people/dogs. This could mean that they have adapted to the presence of people and dogs; however, this monitoring program does not evaluate the long-term effects of this shift on reproduction, long-term survival, etc.

Although the wildlife camera monitoring at Village H has been completed for the time being, additional wildlife monitoring will be conducted after the off-leash dog area and parking lot have been built to determine if wildlife still move through the site. The off-leash dog area will be fenced off from the trail and open space area, and will be closed at night. Therefore, it is anticipated that wildlife will continue using Village H at night. Dog waste monitoring and removal will continue.

3.0 Financial Summary

3.1 City Funding in Support of HMP

The city uses funding to support implementation of the HMP in two ways: (1) permanent funding allocated specifically for HMP coordination and management of city lands, and (2) existing resources, including administrative staff and staff from the Environmental Sustainability Department, Planning Division, Parks and Recreation Department, and Police Department.

3.1.1 HMP Implementation

The majority of the city's ongoing costs to support HMP implementation are activities required by the HMP or the Implementing Agreement. Two of the city's main responsibilities are: (1) oversight of the HMP Preserve System and (2) direct, active management of 667 acres of preserve land owned by the city.

To fulfill the first responsibility, the city dedicates a senior-level coordinator and provides other staff support for HMP implementation. The city also contracted with a biological consulting firm to serve as the city's preserve steward, coordinating management throughout the HMP preserve and evaluating management effectiveness. This reporting period, the city provided $97,623 in the annual budget to fund the contract for preserve steward costs.

The second responsibility is being accomplished through the city's contract with CNLM, a non-profit preserve management company for the management of city-owned HMP preserves. CNLM conducts regular biological monitoring and habitat management throughout the city's preserves, including maintenance fences and signage, closure of unauthorized trails, regular patrols, invasive species removal, and public outreach.

In addition, although not funded through the HMP Program, the city has two permanent full time rangers who patrol open space areas, including parks, trails, and habitat preserves. The ranger program is administered by the Police Department, which allows the rangers to have citation authority and close contact with the Homeless Outreach Team and police officers, which are often needed to deal with issues such as encampments and other unauthorized access.

3.1.2 Habitat Mitigation Fees

As described in Section 1.3.5, habitat mitigation fees are collected from developers for project-related impacts to certain types of native habitat and deposited into the Habitat Mitigation Fee Fund. Impacted habitats that require a fee include unoccupied coastal sage scrub, coastal sage/chaparral mix, and chaparral (except southern maritime chaparral) (Group C); occupied coastal sage scrub (Group D); non-native grassland (Group E); and disturbed lands, eucalyptus, or agricultural lands (Group F). The purpose of the habitat mitigation fee program is to fund the city's obligation to acquire, protect, and manage lands in the Gnatcatcher Core Area.

As shown in Table 4, mitigation fees totaling $33,577.62 were collected during the current reporting period. The current balance of the Habitat Mitigation Fee Fund is -$1,153,585.78. Since the adoption of the HMP, the city has taken advantage of opportunities to purchase Core Area credits when they become available. As of February 20, 2020, the city has fulfilled its Core Area Credit obligation in full. However, on several occasions, the cost of credits exceeded the available Habitat Mitigation Fee funds, requiring an advance from the General Fund and resulting in a negative fund balance. In-lieu fees will continue to be collected for habitat impacts, as appropriate, and will be used to reimburse the General Fund.

Table 4. Habitat Mitigation Fee Fund Activity in RY 16 (2021–2022)

Date	Description	Habitat Impacted	Total
11/01/21	**Beginning Fund Total**		**-$1,187,163.40**
Fees Collected			
11/23/21	DEV 15043	0.51 acre Group F (Ag, Disturbed, Eucalyptus)	$1,814.58
12/09/21	A. Moghaddam Residence	0.73 acre Group F (Ag, Disturbed, Eucalyptus)	$2,597.34
2/22/22	Aviara Apartments	0.15 acre Group E (Non-Native Grassland) 0.42 acre Group F (Ag, Disturbed, Eucalyptus)	$2,636.85 $1,476.72
03/09/22	Hamdard Residence	0.44 acre Group F (Ag, Disturbed, Eucalyptus)	$1,565.52
07/09/22	Cascada Verde Project	0.28 acre Group D (Coastal Sage Scrub) 0.29 acre Group E (Non-Native Grassland) 0.22 acre Group F (Ag, Disturbed, Eucalyptus) 0.57 acre Group F (Ag, Disturbed, Eucalyptus)	$9,961.56 $5,159.10 $782.76 $2,028.06
07/13/22	Adams St Homes ADUS	0.15 acre Group E (Non-Native Grassland) 0.83 acre Group F (Ag, Disturbed, Eucalyptus)	$2,636.85 $2,918.28
		Total Fees Collected	***$33,577.62***
10/31/21	**Account Balance**		**-$1,153,585.78**[1]

[1] Does not include interest earned

3.2 Status of Preserve Management Endowments

The endowment activity and status for preserves funded through endowments are provided in Table 5. During the reporting period, a total of $960,662 was spent by the land managers on management and monitoring activities on 28 preserves that comprise 2,817 acres. Endowments for endowment-funded properties totaled $20,220,461. Seventeen preserves (667 acres) managed by the city are funded through annual budget appropriations. Four additional preserves (1,378 acres) managed by California Department of Fish and Wildlife, are funded by other means. Buena Vista Lagoon, Carlsbad Highlands and Agua Hedionda Lagoon Ecological Reserves are funded through State Wildlife Grant funding, and the Batiquitos Lagoon Ecological Reserve is funded through a mitigation account established by the Port of Los Angeles and held by CDFW.

Table 5. Endowment Status for HMP Preserves in Year 18 (2021–2022)

Preserve Name	Acres	Land Manager	Inception Date	Original Endowment	Inflation-Adjusted Endowment	2021-22 Budget	2021-22 Expend.	Total Funds as of 9/30/22[1]
Bressi Ranch Preserve	173	SDHC	July 2020	$994,610	$1,139,356	$38,226	$22,322	$954,570
Buena Vista Creek Ecol. Rsv.	143	CNLM	April 2007	$776,644	$1,123,347	$50,272	$50,272	$1,629,266
Calavera Hills II/Rob. Ranch	241	CNLM	June 2006	$1,834,813	$2,694,519	$120,963	$121,793	$4,130,339
Carlsbad Oaks North	220	CNLM	March 2006	$1,020,311	$1,502,578	$67,046	$67,046	$2,419,130
Carlsbad Raceway	43	SDHC	April 2014	N/A[2]	N/A[2]	$26,097	$16,877	N/A2
Cassia Professional Offices	0.6	CNLM	Jan. 2007	$104,600	$149,444	$6,682	$6,682	$219,471
City-owned Preserves	667	City/CNLM	2005	N/A[2]	N/A[2]	$218,400	$218,400	N/A2
Daybreak Church	4	SDHC	Apr. 2017	$172,368	$186,789	$11,059	$10,486	$204,091
Emerald Pointe	10	SDHC	Aug. 2008	$194,948	$286,730	$12,215	$12,886	$259,749
Encinas Creek	18	CNLM	May 2007	$427,004	$593,505	$26,668	$26,422	$931,989
Fox Miller	21	Helix	Nov. 2005	N/A[2]	N/A[2]	$48,850	$18,757	N/A[2]
Kelly Ranch	70	CNLM	March 2002	$296,125	$515,125	$20,719	$21,183	$765,918
La Costa Collection	8	UC	July 2005	$378,756	$498,148	$19,426	$19,426	$459,978
La Costa Glen	108	CNLM	Jan. 2013	$624,800	$826,976	$37,282	$28,690	$1,308,397
La Costa Villages	831	CNLM	Feb. 2002	$1,364,400	$2,356,570	$114,500	$114,578	$2,999,831
Laurel Tree Lane Preserve	7	SDHC	Dec. 2017	$365,092	$439,561	$24,147	$17,630	$425,755
Manzanita Partners	33	HRS	Oct. 2012	$51,000	$61,281	$1,600	$1,600	$42,843
Morning Ridge	19	UC	Oct. 2021	$280,000	$312,459	$0	$0	$265,882
Muroya	10	SDHC	Oct. 2015	$314,867	$401,904	$15,842	$13,969	$376,110
New Crest Preserve	0.04	UC	May 2015	$91,393	$114,069	$4,406	$4,406	$104,599
North Coast Calvary Chapel	13	Helix	Sept 2001	N/A[2]	N/A[2]	$18,950	$15,222	N/A[2]
Paseo Del Norte	1	UC	Aug. 2016	$100,009	$123,245	$5,435	$5,435	$129,423
Poinsettia Place	12	UC	July 2011	$167,935	$220,627	$8,372	$8,372	$198,474
Poinsettia Station Vernal Pools	8	City (Dudek/HRS)	Mar 2018	$181,904	$217,226	$25,000[3]	$34,730[3]	$223,692.89
Quarry Creek	92	SDHC	June 2015	$806,496	$931,512	$37,968	$41,623	$765,903
Sage Creek	6	SDHC	April 2016	$275,404	$341,644	$12,879	$15,106	$391,256
Sonata	3	SDHC	January 2016	$398,396	$499,110	$29,021.20	$23,062	$452,593
Southern	55	UC	Nov. 2013		$534,618	$23,687	$23,687	$561,201
TOTAL	**2,817**			**$11,455,673**	**$16,070,343**	**$1,025,712**	**$960,662**	**$20,220,461**

[1] Total funds are reported as of 10/31/20 for HRS, Urban Corps, and Helix

[2] Long-term management is funded through an annual contract rather than an endowment. City preserves are funded through the General Fund.

[3] Additional as-needed funds are provided by the city for more intensive start up management until 2024 to allow the endowment account to grow.

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Appendix A

City Compliance with Terms and Conditions of Take Authorization and Zone-Wide Standards

November 1, 2021 - October 31, 2021

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City Compliance with Terms and Conditions of Take Authorization

To satisfy the terms and conditions of the state and federal take authorization, the city is required to fulfill the obligations outlined in Sections 10-14 of the IA, the Conditions of the State NCCP Permit, and Terms and Conditions of the Federal ESA Section 10(a)(1)(B) Incidental Take Authorization/Permit. Implementation tasks associated with these regulations are completed or ongoing, and are described in Tables 1 through 3.

City Compliance with HMP Zone-Wide Standards

The city is also required to ensure that all projects within Standards Areas comply with the zone-specific standards outlined in HMP Section D (Table 8). All projects that occur within a Standards Area are processed as a Consistency Finding. During this process, projects must demonstrate compliance with the standards before they receive concurrence from the Wildlife Agencies and are approved by the city; therefore, all approved development within Standards Areas is consistent with the HMP.

Upon commencement of the HMP, there was a total of 189.3 acres of coastal sage scrub within Standards Areas throughout the HMP. Zone-wide standards require at least 67 percent (126.8 acres) of the coastal sage scrub to be conserved. To date, 83.7 acres have been conserved (44.2 percent) and 27.9 acres have been lost (14.7 percent). Therefore, the city must conserve at least 43.1 more acres of the remaining 77.7 acres of coastal sage scrub within the Standards Areas. Table 4 summarizes property-specific and linkage-related standards and current status. Refer to HMP Section D pp. D-73 through D-82 for additional zone-specific standards.

Table 1. Summary of City Compliance with HMP Implementing Agreement Requirements through RY 18 (2021–2022)

IA Section[1]	Obligation	City Compliance
10.10	**Duty to Enforce:** To enforce the terms of the Take Authorization, HMP, and IA and ensure HMP lands are conserved in perpetuity.	▪ The city requires compliance with the HMP as a condition of approval for new development projects, which includes conservation in perpetuity, a non-wasting endowment, and a management agreement with a preserve manager. ▪ On March 14, 2006, the city passed the Habitat Preservation and Management Requirements Ordinance (Carlsbad Municipal Code Section 21.210), which includes a section on enforcement (Section 21.210.19) for violations of the HMP. ▪ The city council approved the permanent continuation of the ranger program in December 5, 2017, which includes two full-time rangers patrol preserves, lagoons, beaches, and parks and they have the authority to issue citations for any violations to posted regulations. Complaints made by citizens regarding possible violations of the HMP within preserves are investigated on a case-by-case basis.
11.1	**Preserve System:** To ensure the establishment and management in perpetuity of a 6,757-acre preserve system.	▪ The city has currently gained 6,189 acres of habitat within the HMP planning area and 294.67 acres of habitat within the MHCP Gnatcatcher Core Area (96% of the overall target acreage).
11.2	**Project Mitigation Measures:** To require additional mitigation measures to mitigate impacts to covered species in all future development projects.	▪ As a condition of approval for new development projects, the city requires that all potential impacts to HMP-covered species be avoided, minimized, and/or mitigated.
11.3	**Regulatory Implementation:** A. Urgency Ordinance – interim HMP enforcement B. Amend Open Space and Conservation Element of General Plan to incorporate HMP C. Amend Open Space Ordinance to incorporate Conserved Habitat Areas D. Amend Municipal Code to incorporate Standards Area compliance E. Amend General Plan to identify HMP as priority use for open space lands F. Wetlands Protection Program	A. The Emergency Ordinance was approved by the City Council in November 9, 2004. B. Revisions to the policy statements regarding the HMP were approved by the City Council in July 2005. C. Revisions were made to Carlsbad Municipal Code Chapter 21.33 and approved by the City Council in March 2006. Conserved Habitat Areas were included as undevelopable open space lands preserved exclusively and in perpetuity for conservation purposes consistent with the HMP. D. A new chapter (Section 21.210) was added to the Zoning Ordinance to address habitat preservation and management requirements. Section 21.210.040 B. specifically addresses Standards Area compliance. The section was approved by the City Council in March 2006. The new chapter will be included in the implementation plan portion of the Local Coastal Program update, currently under way. E. The General Plan was revised to make conservation of habitat a priority use for the 15% of otherwise developable land which the Growth Management Plan already requires to be set aside for open space purposes (the city defines five categories of open space). This revision was approved by the City Council in July 2005, and carried through into the updated General Plan (2015). F. New subsections (Section 21.210.040 D.5 and Section 21.210.070 A.5) were added to the Municipal Code to address the protection of wetland habitat. The ordinance states that wetlands impacts will be avoided, minimized, or mitigated (in that order). These new subsections were approved by the City Council in March 2006. The sections will be included in the implementation plan portion of the Local Coastal Program update, currently under way. Compliance is enforced on a project-by-project basis during environmental review and in conjunction with other wetland permitting agencies such as the Coastal Commission, CDFW, and USACE.

IA Section	Obligation	City Compliance
11.4	**Additional Implementation Measures:** To implement measures included in MHCP.	▪ The MHCP, HMP, and Open Space Management Plan (OSMP) conservation measures are currently being implemented during the approval process for all development projects and preserve management activities.
11.5	**Regional Conservation:** To effectuate the conservation of 307.6 acres of land within the MHCP Gnatcatcher Core Area, and convey the property to a qualified preserve manager.	▪ The city has met 294.67 acres of its coastal sage scrub conservation obligation through acquisition (80.22 acres), project mitigation (150.26 acres), and habitat enhancement credit (64.19 acres). ▪ The city reimbursed Lennar (developer) for the 50.13 acres that were purchased up-front (see above) on April 26, 2011. ▪ The city entered into an agreement on July 26, 2011, with the Wildlife Agencies and Conservation Fund to acquire 30.09 acres of conservation credit over 4 years. The city made the final payment on October 22, 2014. ▪ The Core Area properties are protected under a conservation easement, and are being monitored and managed by the CNLM.
11.6	**Cooperative Regional Implementation:** To participate in MHCP Elected Officials Committee.	▪ To date, the city is the only MHCP jurisdiction with an approved subarea plan, so this is not applicable at this time; however, the city participates in meetings to discuss MHCP-wide issues with other MHCP jurisdictions and SANDAG as needed.
12.1 **12.2** **12.4** **12.5**	**Monitoring and Reporting:** To track habitat gains and losses within the HMP area (which should occur in rough step with one another); to maintain its database of biological resources; to submit an annual report by December 1 of each year; to hold a public meeting to discuss HMP implementation; to provide the Wildlife Agencies with additional reports if necessary for compliance monitoring; and to certify all reports.	▪ Habitat gains and losses are being tracked through Habitrak. Rough step preserve assembly is built into the city's permitting process. ▪ Currently, the city is working with the Preserve Steward, preserve managers, city GIS staff, and SDMMP to determine the best approach to collect and manage monitoring data. ▪ Protocols and standards have been developed with regard to baseline surveys and monitoring (survey methods and data format), entry and attributing of GIS data, and data management. ▪ Annual public HMP workshops are held every year to give participants an opportunity to learn about current HMP preserve assembly, management, and monitoring, and to ask questions and provide comments. ▪ Annual HMP status reports are submitted to Wildlife Agencies each year. The public also has an opportunity to view these reports prior to the annual meeting and provide comments.
12.3	**Preserve Management and Monitoring Plan:** To prepare a preserve management and monitoring plan that will detail recommendations in HMP Section F.	▪ The OSMP is the Preserve Management and Monitoring Plan described in IA Section 12.3, and the subarea framework management plan described in MHCP Vol. III, Section 1.2. The first complete draft was finalized in May 2004. The document was completed in September 2004 and accepted by the Carlsbad City Council in December 2005.

IA Section	Obligation	City Compliance
13.0	**Adaptive Management:** To ensure that adaptive management actions do not result in less mitigation than provided for the HMP Covered Species under the original terms of the HMP, unless approved by the Wildlife Agencies.	▪ The city complies with this policy by having ongoing discussions with preserve managers on management activities and by requiring adaptive management within all actively managed preserves and annual reporting. ▪ The city is coordinating with the regional adaptive management and monitoring efforts through the San Diego Management and Monitoring Program. ▪ The city has developed Guidelines for Preserve Management (TAIC 2009), which include monitoring and management priorities and a monitoring report checklist (Appendix C).
14.0	**Funding:** 14.1 MCHP Core Area Participation 14.2 Preserve Management and Monitoring Plan 14.3 Management of city-owned public lands 14.4 Management of private lands in HMP area 14.5 Management of Existing Hardline areas 14.6 Program Administration 14.7 Habitat In-Lieu Mitigation Fees	14.1 The city has met 294.67 acres of its 307.6-acre coastal sage scrub conservation obligation. The city must cause conservation of an additional 12.93 acres; this obligation will be funded through habitat mitigation fees. 14.2 The Preserve Management and Monitoring Plan (known as the Open Space Management Plan, or OSMP) was completed in September 2004 using city funds and a Local Assistance Grant from CDFW. 14.3 City-owned preserves are currently being actively managed and monitored by CNLM. 14.4 The city requires all private development projects within the HMP to fully fund perpetual management of associated preserve land prior to issuing a grading permit. 14.5 Hardline preserves in existence before final HMP approval are owned and managed by several other entities, including the CDFW, private HOAs, University of California, SDG&E, Cabrillo Power, and San Dieguito Union High School District. 14.6 The HMP program is overseen by Rosanne Humphrey (City of Carlsbad Environmental Management Division). In addition, the city has contracted with Environmental Science Associates to serve as the city's Preserve Steward, who coordinates management throughout the HMP Preserve and monitors HMP compliance and management effectiveness. 14.7 The city has implemented a habitat mitigation fee program for new development that will fund the city's remaining Gnatcatcher Core Area obligations.

[1] IA – Implementing Agreement

Table 2. Summary of City Compliance with Terms and Conditions of CDFW Permit through RY 18 (2021–2022)

CDFW NCCP Permit Terms and Conditions (T&C)	Description of City Compliance
Section 6.1 Conditions A through F are the same as those stated in A through F of the Implementing Agreement (IA), Section 11.3 (See Table 12). They are summarized below. A. Urgency Ordinance – interim HMP enforcement. B. Amend Open Space and Conservation Element of General Plan to incorporate HMP. C. Amend Open Space Ordinance to incorporate Conserved Habitat Areas. D. Amend Municipal Code to incorporate Standards Area compliance. E. Amend General Plan to identify HMP as priority use for open space lands. F. Wetlands Protection Program.	See Table 5, IA Section 11.3.
G. This permit is subject to compliance with the MHCP Volumes I–III, HMP, including Addenda 1 and 2, and the IA.	All project approvals within the city are subject to these requirements as a condition of approval.
H. Coverage for thread-leaved brodiaea (*Brodiaea filifolia*) and approval of the Fox-Miller Project. The conditions are as described in the USFWS 10(a) Permit Condition 7 (Table 12).	See Table 7, USFWS 10(a) Permit Condition 7 for a description of compliance.
I. All monitoring and reporting must comply with MHCP Vol. I and III, and IA Section 12. Annual reports are due no later than December 1 of each year. MHCP Volume II includes the following policies and conditions: • Standard Best Management Practices (Appendix B) • General Outline for Revegetation Plans (Appendix C) • Narrow Endemic Species and Critical Population Policies (Appendix D) • Conditions for Estuarine Species (Appendix E) • CEQA requirements for quantifying and mitigating impacts	See description for Condition G. MHCP Vol. II policies and conditions are reviewed during regular HMP compliance review for all new projects within Carlsbad. In addition, these policies have been integrated and/or referenced in the city's Guidelines for Biological Studies.

Table 3. Summary of City Compliance with the Terms and Conditions of USFWS Permit through RY 18 (2021–2022)

Federal ESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
1. All sections of Title 50 Code of Federal Regulations (CFR) 13, 17.22, and 17.32 are conditions of this permit.	Appropriate language has been integrated into the HMP and IA; therefore, compliance with these documents ensures compliance with Title 50 CFR sections.
2. The permittee is subject to compliance with the MHCP, HMP, and IA.	The city complies with all regulations as described in Tables 5 and 6.
3. The amount and form of take are authorized as described below. Referenced tables are from Attachment 2 of the T&C, and are the same as List 1-3 Species in HMP Section C. Coverage for species in HMP Tables 2 and 3 below require the city to submit in writing a request for coverage, including documentation showing compliance. Table 1. (a) No take authorized for the following species: *Chorizanthe orcuttiana* – Orcutt's spineflower *Dudleya blochmaniae* ssp. *blochmaniae* – Blochman's dudleya *Euphorbia misera* – Cliff spurge *Hazardia orcuttii* – Orcutt's hazardia *Quercus dumosa* – Nuttall's scrub oak *Pelecanus occidentalis californicus* – California brown pelican *Falco peregrinus* – American peregrine falcon *Rallus longirostris levipes* – Light-footed Ridgway's rail *Sterna antillarum browni* – California least tern *Charadrius alexandrinus nivosus* – Western snowy plover *Sterna elegans* – Elegant tern Table 1. (b) Take authorization is or will be (upon listing) granted for: **Listed species:** *Empidonax traillii extimus* – Southwestern willow flycatcher *Vireo bellii pusillus* – Least Bell's vireo *Polioptila californica californica* – Coastal California gnatcatcher	Table 1 (a). No take of these species has been authorized by the city. Table 1 (b). No Incidental Take Permits have been issued by the city for these species.

Federal ESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
Not yet listed: *Panoquina errans* – Salt marsh skipper *Euphyes vestris harbisoni* – Harbison's dun skipper *Plegadis chihi* – White-faced ibis *Accipiter cooperii* – Cooper's hawk *Pandion haliaetus* – Osprey *Icteria virens* – Yellow-breasted chat *Aimophila ruficeps canescens* – So. California rufous-crowned sparrow *Passerculus sandwichensis beldingi* – Belding's savannah sparrow *P.s. rostratus* – Large-billed savannah sparrow *Aspodoscelis hyperythrus beldingi* – Orange-throated whiptail	Table 1 (b). No Incidental Take Permits have been issued by the city for these species.
Table 2. Take authorization contingent upon other MHCP subarea plans being permitted for the following species: *Acanthomintha ilicifolia* – San Diego thornmint *Ambrosia pumila* – San Diego ambrosia *Ceanothus verrucosus* – Wart-stemmed ceanothus *Dudleya viscida* – Sticky dudleya *Ferocactus viridescens* – San Diego barrel cactus *Quercus engelmannii* – Engelmann oak	Table 2. No other MHCP subarea plans have been permitted, and thus take authorization for these species has not been granted by the city.
Table 3. (a) Take authorization contingent upon adequate funding and legal access to manage and monitor the following species: *Arctostaphylos glandulosa* ssp. *crassifolia* – Del Mar manzanita *Baccharis vanessae* – Encinitas baccharis *Brodiaea filifolia* – Thread-leaved brodiaea *Comarostaphylis diversifolia* ssp. *diversifolia* – Summer-holly *Corethrogyne filaginifolia* var. *linifolia* – Del Mar sand aster *Pinus torreyana* ssp. *torreyana* – Torrey pine	Table 3 (a). Take authorization for thread-leaved brodiaea was granted by the Wildlife Agencies to the city on December 2, 2005, based upon the management required for Fox-Miller property. Take of this species was not granted during the reporting period. No take of any other species from this list has been granted by the city.

Federal ESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
Table 3. (b) Take is contingent upon (a), described above, *and* the city receiving legal control over the vernal pools adjacent to the Poinsettia Train Station. *Eryngium aristulatum* var*. parishii* – San Diego button-celery *Myosurus minimus* ssp. *apus* – Little mousetail *Navarretia fossalis* – Spreading navarretia *Orcuttia californica* – California Orcutt grass *Streptocephalus woottoni* – Riverside fairy shrimp *Branchinecta sandiegonensis* – San Diego fairy shrimp Table 3. (b) Take is contingent upon (a) and (b), described above, and upon other MHCP subarea plans being permitted. *Iva hayesiana* – San Diego marsh-elder	Table 3 (b). The city received legal control over the vernal pools by accepting the Coastal Commission's Irrevocable Offer to Dedicate a Conservation Easement in 2015. Take for vernal pool species has not been requested. No other take authorizations have been requested.
4. The FESA Section 10(a) constitutes a Special Purpose Permit for the take of HMP covered species which are listed as threatened or endangered under the FESA, and which are also protected by the Migratory Bird Treaty Act of 1918, as amended. The Special Purpose Permit will be valid for three years after effective date and may be renewed as long as 10(a) permit conditions are being met. *Sterna antillarum browni* – California least tern *Empidonax traillii extimus* – Southwestern willow flycatcher *Vireo bellii pusillus* – Least Bell's vireo *Passerculus sandwichensis beldingi* – Belding's savannah sparrow	The Special Purpose Permit has been in effect during the current reporting period. No take of these species has been granted.
5. The Permittee shall not allow clearing and grubbing in known or potentially occupied California gnatcatcher habitat between February 15 and August 31.	This requirement is included in Municipal Code 21.210.040 and HMP Table 9. Compliance is a condition of approval for every new development project.
6. Specific standards (described in the T&C) must be met if the city proceeds with any of the following plans: (a) Cannon Road Reach 4 (b) Extension of Melrose Drive through the Shelley Property (c) Marron Road through Buena Vista Creek Ecological Reserve	None of these projects have been proposed at this time.

Federal ESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
7. To receive coverage for thread-leaved brodiaea, the city must demonstrate that: (a) The Fox-Miller project meets the narrow endemic standards for this critical location and major population of this species. (b) The proposed hardline shown in Addendum 2 (2003) of the HMP is not permitted (it does not meet the MHCP standards). (c) The Wildlife Agencies must concur with the Fox-Miller project proposal, and the conserved area must be managed and monitored to MHCP standards in perpetuity. (d) If all conditions are met, the Fox-Miller project can be permitted under the HMP through the HMP amendment process.	(a) The NE standards have been met. (b) The boundary was expanded to meet MHCP standards. (c) The Wildlife Agencies approved the Fox-Miller project. Mitigation requirements have not been completed. Interim management is conducted by Helix via annual contract with the landowner. Long-term management will be provided by SDHC upon mitigation signoff. (d) Brodiaea coverage was granted by the Wildlife Agencies through a minor amendment December 2, 2005.
8. To minimize impacts to the California gnatcatcher, rufous-crowned sparrow, and orange-throated whiptail, the city must: (a) Maintain and/or widen the habitat corridor between the city and Oceanside as much as feasible. (b) If the driving range adjacent to the Kelly/Bartman property is proposed for a different use, the city will ensure that an onsite corridor is established on the driving range property.	(a) The corridor on the NE boundary of Carlsbad is conserved. Along the northern boundary, the Buena Vista Creek ER was acquired in 2007, resulting in 100% conservation, and the Summit (Kelly-Bartman) property was acquired by CDFW in 2010. (b) No other uses for this property have been proposed at this time.
9. As part of the project review process, a qualified biologist shall survey for all species with immediate and conditional coverage.	The city has included this as a condition of approval for all new projects.
10. The city will contact the USFWS Carlsbad Office immediately regarding any violations or potential violations of the FESA or the Migratory Bird Treaty Act.	The city regularly communicates with the USFWS on regulatory issues, and contacts the appropriate personnel immediately upon learning of any potential problems.
11. The city will notify the USFWS within one working day of finding any dead, injured, or sick threatened/endangered species.	No such individuals have been reported to or observed by the city.
12. All monitoring and reporting for this permit shall be in compliance with the MHCP (Vol. I and III) and the IA (Section 12).	See IA Section 12 discussion in Table 10 above for compliance information.
13. A copy of this permit must be on file with the city, its authorized agents, and third parties under the jurisdiction and direct control of the city.	A copy of this permit is on file with the city and is available to any interested parties.

Table 4. Compliance with Zone-Wide Standards through RY 18 (2021–2022)

Zone	Zone-Specific Standard	Current Status
All Zones	A minimum of 67% of coastal sage scrub and 75% of the gnatcatchers shall be conserved overall within the Standards Areas.	Baseline acres of coastal sage scrub habitat within Standards Areas: 189.3. Coastal sage scrub gains = 83.7 acres (44.2%). Coastal sage scrub loss = 27.9 acres (14.7%). An additional 43.1 acres must be conserved to meet 67% conservation in the Standards Areas (126.8 acres). Occupied gnatcatcher habitat is mitigated at 2:1; therefore, there will be no net loss of gnatcatcher habitat within Standards Areas. The 75% standard is applied to every project individually.
Zone 1	Preserve at least 50% of coastal sage scrub and avoid areas occupied by gnatcatchers. Applies to several vacant lots on north shore of Agua Hedionda Lagoon and a larger, vacant in-fill lot SW of El Camino Real and Kelly Drive.	Vacant lots on the north shore of Agua Hedionda Lagoon: no projects have been finalized for these parcels. In-fill parcel (Aura Circle): property changed to a Proposed Hardline preserve during Coastal Commission processing of the HMP. A tentative map conserving the Proposed Hardline preserve was approved; however, no grading permit has been issued.
Zone 2	1. Kelly/Bartman property: 50% of this property shall be conserved and must form a continuous corridor from the SE corner of the property to the northern edge. 2. Spyglass property: grasslands impacted on this property shall have offsite mitigation at 2:1 ratio.	Kelly-Bartman property (Summit): Existing Hardline preserve approved with 50% conservation, including an open space corridor from the southeast to the northern site boundary. Spyglass property: has been developed and grassland impacts were mitigated at a 2:1 ratio through restoration at Carlsbad Highlands Mitigation Bank.
Zone 8	1. Kirgis property: a maximum of 25% can be developed. 2. Callaghan property: a maximum of 50% can be developed. No impacts to narrow endemic species on either property.	Kirgis property: tentative map approved with 75% percent conservation; however, no grading permit has been issued. Callaghan property: no tentative map has been approved for this property.
Zone 14	Areas of upland habitat outside Linkage B may be taken in exchange for restoration and enhancement inside of the linkage as long as the result is conservation of at least 67% coastal sage scrub and associated gnatcatcher populations within southern portions of the zone.	Robertson Ranch encompasses the entirety of Zone 14. Due to agricultural activities, very little coastal sage scrub existed in the southern portion of the zone. The Existing Hardline Preserve, as approved by the Wildlife Agencies in 2005, 2007, and 2012, preserves 70% of the coastal sage scrub throughout the zone.
Zone 15	Maintain and enhance habitat linkages across Linkage C and adjoining Cores 3 and 5. Areas of upland habitat outside Linkage C may be taken in exchange for restoration and enhancement inside of the linkage as long as there is a no net loss of coastal sage scrub and associated gnatcatcher populations within southern portions of the zone.	Terraces at Sunny Creek and Rancho Milagro occur within Core Area 5 in the southern portion of Zone 15. No net loss of coastal sage scrub has occurred.
Zone 20	Create continuous habitat through Linkage F between Core Areas 4 and 6. No net loss of coastal sage scrub or maritime succulent scrub within standards areas of the zone.	Projects: Emerald Pointe, North Coast Calvary Chapel, and Muroya. All three projects were processed through a Consistency Finding and approved by the city and Wildlife Agencies. No net loss of coastal sage scrub or maritime succulent scrub occurred.
Zone 21	Ensure habitat connectivity and wildlife movement east-west across the zone.	Projects: Poinsettia Place, Manzanita Partners, and Poinsettia 61 Preserves provide east-west connectivity from El Camino Real to the Local Facilities Management Zone boundary.
Zone 25	At least 75% of the Sherman property must be conserved.	As of March 2007, 100% of the Sherman property (Buena Vista Creek Ecological Reserve) has been conserved.

Appendix B

Summary of Management and Monitoring Activities within HMP Management Units

November 1, 2021–October 31, 2022

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Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022

Preserve Area	Management Entity	Management and Monitoring Activities
Agua Hedionda Lagoon area	**Agua Hedionda Lagoon Foundation**	▪ Conducted bi-weekly inspections to monitor trails and easements. ▪ Worked with the City of Carlsbad's Trail Rangers program for better enforcement and hiker awareness. ▪ Worked with the City and the California Coastal Commission to ensure public safety on 3.6 miles of public access easements. ▪ Hosted approximately 1,350 volunteers through trail maintenance events and Agua Hedionda Lagoon Foundation/Discovery Center Events. ▪ Monitored 132 acres of open space in the Coastal Zone. ▪ Removed and monitored invasive plant species along trails and preserve areas. ▪ Installed preventative measures for coastal bluff erosion. ▪ Hosted monthly community bird walks and guided hikes around the lagoon. ▪ Worked with the U.S. Fish and Wildlife Service (USFWS) Coastal Program to address infestations of Algerian sea lavender (*Limonium ramosissimum*) in the California Department of Fish and Wildlife (CDFW) preserve and lay tarping to eradicate the species through solarization. ▪ Nurtured and released over 15 monarch butterflies (*Danaus plexippus*) that were established in our pollinator garden. ▪ In the 2021–2022 School Year served 6,590 students through our Academy of Environmental Stewardship school field trips onsite at the Discovery Center. This includes all of Carlsbad Unified School District 3rd and 7th graders, and 8 surrounding districts. ▪ Organized Free Public Education events including World Water Day. ▪ Launched a daily Discover & Learn Series featuring Marine Monday's. Water Table Tuesday's, Chicken Check-in Wednesday's, Tecolote (our Western Screech Owl) Thursday's, and Falcon Feeding Friday's. ▪ Attended Science Days & School Outreaches totaling 5 schools. ▪ Helped approximately 97 Boy & Girl Scouts earn badges. ▪ Educated 36 students through our Discovery Camps daily, across 7 weeks this summer and 5 students through After School Enrichment throughout the year. ▪ Provided 60 high school students from San Diego Union School District a one-week coastal exploration camp. ▪ Educated 30–40 students daily through our Preschool Playdates Program. ▪ Provided animal outreach opportunities to 126 families through our Hilton Grand Vacations Club at Marbrisa and Carlsbad Seapointe Resort membership partnership. ▪ Removed 1,570 pounds of trash and invasive species from the lagoon during our annual Lagoona Kahuna Team Challenge Event, for corporate companies locally. ▪ 50,000 visitors walked through our doors, attended our events, and visited our trails.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Provided 14 outreach groups with concentrated educational opportunities on Raptor Species native to San Diego using our ambassadors: Western Screech Owl, Peregrine Falcon, American Kestrel, and Great Horned Owl. ▪ Partnered with 8 different organizations to provide outreaches supporting mental health awareness, environmental stewardship, volunteerism opportunities, Eco Tours, and more. ▪ Planted 6 Torrey Pine saplings at the Discovery Center and 4 at our Hubbs Trail to help combat climate change as part of our Arbor Day efforts led by George Wever. ▪ Collaborated with SDG&E and the Rincon Band of Luiseño Indians to plant 9 native trees at the Rincon Ball Fields, and provide saplings for the families of the tribe.
	Preserve Calavera	▪ Conducted bi-monthly water quality and stream condition evaluations at four locations in sub-watershed.
Agua Hedionda Lagoon Ecological Reserve	**California Department of Fish and Wildlife**	▪ Treated invasive Algerian sea lavender and continued solarization project with the Agua Hedionda Lagoon Foundation. ▪ Continued restoration efforts at Park Drive Restoration site (1.25 acres). ▪ Continued invasive stinkwort (*Dittrichia graveolens)* removal program at Park Drive Restoration site. ▪ Maintained boundary trail along Park Drive to connect to Kelly Trail. ▪ Removed invasive plants within reserve. ▪ Conducted weekly inspections to monitor trails and easements. ▪ Conducted coastal California gnatcatcher (*Polioptila californica californica*) surveys as part of the city-wide survey effort. ▪ Conducted western snowy plover (*Charadrius alexandrinus nivosus)* winter window surveys. ▪ Maintained boundary fencing and signage.
Batiquitos Lagoon area	**Batiquitos Lagoon Foundation**	Dune: ▪ Conducted ragweed (*Ambrosia* sp.) control. ▪ Conducted site inspection. Cholla Point: ▪ Installed and watered 40 container plants. ▪ Removed planted ornamental species. ▪ Implemented erosion control. East Trail: ▪ Monitored container plant survivorship. ▪ Watered newly installed plants and all plants on the east side of the trail.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Removed non-native mustards (Brassicaceae), grasses (Poaceae), star thistle (*Centaurea* sp.), and Russian thistle (*Salsola tragus*). Rookery: ▪ Removed four planted avocado trees. ▪ Removed non-native mustards and grasses. ▪ Installed and watered 30 tree container plants. All sites: ▪ Completed vegetation monitoring transects. ▪ Conducted nesting bird monitoring.
Batiquitos Watershed	**Preserve Calavera**	▪ Continued bi-monthly water quality and stream condition evaluation at four locations in the sub-watershed. ▪ Continued volunteer work sessions restoring coastal sage scrub and native grasslands at La Costa Canyon. ▪ Supported planning for Cal Nat native planting project in HOA area.
Batiquitos Lagoon Ecological Reserve	**California Department of Fish and Wildlife**	▪ Performed habitat management and breeding season surveys for California least tern (*Sterna antillarum browni*), western snowy plover breeding season and wintering window surveys. ▪ Performed coastal California gnatcatcher surveys as part of the city-wide survey effort. ▪ Maintained nesting sites. ▪ Conducted Nuttall's acmispon (*Acmispon prostratus*) monitoring following San Diego Management and Monitoring Program's (SDMMP) inspect and manage protocol. ▪ Controlled invasive non-native plant species within the preserve. ▪ Conducted weekly inspections to monitor trails and easements. ▪ Maintained boundary fencing and signage.
Bressi Ranch Preserve	**San Diego Habitat Conservancy**	▪ Conducted bi-monthly general site patrols to observe and document the biodiversity of the site and substantial changes in habitat composition, remove trash, remove and/or map invasive non-native plant species for removal, look for signs of trespass, and assess the need for remedial measures. ▪ Updated preserve signage with information and noted locations for additional signage and dumped material. ▪ Mapped locations of invasive non-native plants, including Ward's weed (*Carrichtera annua*) and hand-weeded several populations. ▪ Surveyed and mapped populations of Nuttall's scrub oak. ▪ Conducted habitat maintenance, including installing 5 signs, treating invasive non-native plant species (tree tobacco [*Nicotiana glauca*], artichoke thistle [*Cynara cardunculus*], pampas grass [*Cortaderia selloana*], mustard

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		[Brassicaceae], tocalote [*Centaurea melitensis*], sweetclover [*Melilotus* sp.], sweet fennel [*Foeniculum vulgare*], and tamarisk [*Tamarix* sp.]). ▪ Documented and removed vandalism from preserve signs. ▪ Documented and repaired trespasser damage to fencing. ▪ Coordinated and met with neighboring residents to locate trespasser structure and remove material. ▪ Provided HOA newsletter and attended HOA meeting.
Buena Vista Creek Ecological Reserve	**Landowner: California Department of Fish and Wildlife** **Preserve Manager: Center for Natural Lands Management**	▪ Conducted bat monitoring – 4 species detected, including special-status species western red bat. ▪ Conducted shot-hole borer (*Euwallacea* spp.) monitoring – none detected. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 3 pairs observed. ▪ Conducted sensitive species monitoring. ▪ Treated/removed invasive non-native species, with a focus on sweet fennel, black mustard (*Brassica nigra*), castor bean (*Ricinus communis*), and pampas grass. ▪ Mowed fuel zones in May 2022. ▪ Conducted weekly patrols. Trespass is common, but no major issues to report. ▪ Updated kiosk materials quarterly. ▪ Routinely maintained gates and fences. Picked up trash as necessary. ▪ Completed annual stewardship plan, budget, and report.
Buena Vista Lagoon Ecological Reserve	**California Department of Fish and Wildlife**	▪ Performed western snowy plover wintering window surveys. ▪ Controlled invasive plant species within the preserve. ▪ Cleaned up 10 homeless encampments. ▪ Removed 28 feral cat feeding stations. ▪ Conducted trail maintenance activities. ▪ Performed fire fuel reduction along north shore. ▪ Conducted weekly inspections to monitor trails and easements.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
Buena Vista Lagoon/Watershed	**Preserve Calavera**	▪ Continued bi-monthly water quality and stream condition evaluations at four locations in sub-watershed. ▪ Continued monitoring and action to reduce edge effects at El Salto falls and in Buena Vista Creek Ecological Reserve. ▪ Sponsored trash cleanup events with San Diego Habitat Conservancy (SDHC) and I Love a Clean San Diego (ILACSD).
Calavera Area	**Preserve Calavera**	▪ Continued monitoring of wildlife movement corridors. ▪ Collected native milkweed seeds for San Diego Pollinator Alliance. ▪ Supported wildlife movement and biological surveys at Village H. ▪ Continued participation in the city's Trails Volunteer Program. ▪ Held wildflower and special family-oriented hike.
Calavera Hills Phase II/Robertson Ranch	**Center for Natural Lands Management**	▪ Completed coastal sage scrub monitoring – cover of native and exotic forbs/grasses was low, consistent with little rainfall; native shrub cover declined slightly. ▪ Conducted non-native Argentine ant (*Linepithema humile*) assessment. ▪ Conducted clay lens assessments at 4 locations – all areas appear healthy with little non-native cover. ▪ Established California Native Plant Society (CNPS) rapid/relevé assessments for 2 southern maritime chaparral plots – habitat appears healthy despite drought conditions. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 10 pairs and 1 individual male were observed. ▪ Conducted least Bell's vireo (*Vireo bellii pusillus*) surveys – 3 individuals were observed. ▪ Conducted surveys for San Diego coast horned lizard (*Phrynosoma coronatum blainvillii*) – none detected. ▪ Mounted a wildlife camera in the College Avenue wildlife tunnel primarily to document reptiles – none detected. ▪ Repaired minor fence breaks or issues – no major maintenance was required. ▪ Treated/removed non-native invasive plant species, including tamarisk (*Tamarix* spp.], pampas grass, and black mustard. ▪ Conducted weekly patrols – no major issues to report. ▪ Updated information kiosks regularly. ▪ Completed the annual stewardship plan and budget, annual report, and Conservation Easement (CE) compliance report.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
Carlsbad Highlands Ecological Reserve	**California Department of Fish and Wildlife**	▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort. ▪ Removed graffiti from Department signage. ▪ Removed 7 unsafe trail features and conducted trail maintenance. ▪ Continued habitat restoration on 2 acres. ▪ Conducted weekly inspections to monitor trails and easements. ▪ Conducted fire fuel reduction along property boundary. ▪ Continued efforts on a narrowleaf milkweed (*Asclepias fascicularis)* seed collection project to improve monarch butterfly (*Danaus plexippus)* habitat with USGS. ▪ Controlled invasive plant species within the preserve. ▪ Maintained boundary fencing & signage. ▪ Engaged in Public Education efforts concerning allowed and prohibited activities within the Ecological Reserve.
Carlsbad Oaks North Preserve	**Center for Natural Lands Management**	▪ Conducted sensitive plant species monitoring for San Diego thornmint (*Acanthomintha ilicifolia*) and Blochman's dudleya (*Dudleya blochmaniae*) – San Diego thornmint counts were below average in extant occurrence; low count of Blochman's dudleya with no flowering individuals. ▪ Completed coastal sage scrub monitoring – cover of native and exotic forbs/grasses was low, consistent with little rainfall; native shrub cover was the highest on record. ▪ Regularly assessed and searched for sign of gold-spotted oak borer (*Agrilus coxalis*) and invasive shot-hole borer (*Euwallacea* sp.) – none detected. ▪ Conducted drone aerial imagery in July 2022 to analyze oak health. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 13 pairs, 1 single male, and 1 unidentified CAGN were observed. ▪ Conducted animal movement analysis – generally consistent movement through the eastern tunnel was observed; observations in the western tunnel were infrequent with some evidence of human trespass. ▪ Removed hundreds of invasive non-native species (pampas grass [*Cortaderia jubata*], stinkwort [*Dittrichia graveolens*], and stinknet [*Oncosiphon piluliform*]) using manual, chemical, and mechanical methods. ▪ Maintained plants and removed invasive species with Nature Collective. ▪ Maintained lemonadeberry (*Rhus integrifolia*) planted in 2020. ▪ Initiated restoration planning at area impacted by illegal grading around Oakmont development. ▪ Removed invasive non-native species and performed plant counts/assessments within the San Diego thornmint extant population. ▪ Maintained San Diego thornmint out-seeding areas free of invasive non-native species, assessed habitat and counted plants.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted regular patrols. Coordinated with City rangers and Homeless Outreach Team to remove homeless individuals. ▪ Installed new fencing and signage behind new development to deter illegal trails. ▪ Completed the annual stewardship plan and budget, annual report, and CE compliance monitoring and reporting.
Carlsbad Raceway Preserve	**San Diego Habitat Conservancy**	▪ Conducted quarterly site patrols to observe and document the biodiversity of the site and substantial changes in habitat composition, remove trash, remove and/or map invasive non-native plant species for removal, look for signs of trespass, and assess the need for remedial measures. ▪ Conducted presence/absence surveys for Cooper's hawk and yellow-breasted chat (*Icteria virens*) during each patrol. ▪ Visually assessed vernal pool for presence of fairy shrimp (*Branchinecta* spp.) and vernal plant species – no fairy shrimp or vernal pool plant species observed. ▪ Reported encampments to the Homeless Outreach Team (HOT). ▪ Reported graffiti to the City's Graffiti Hotline for removal. ▪ Collected shot-hole borer traps – no positive identification of beetles. ▪ Conducted IMG monitoring for San Diego thornmint (*Acanthomintha ilicifolia*)– individuals observed and notified San Diego Zoo Wildlife Alliance for seed collection. ▪ Conducted habitat maintenance and treated invasive non-native species, including pampas grass, fountain grass (*Pennisetum setaceum*), mustard, tamarisk, and poison hemlock (*Conium maculatum*). ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 pair and 1 unidentified CAGN were observed. ▪ Conducted maintenance and installed warning signs near San Diego thornmint area. ▪ Conducted vegetation sampling. ▪ Provided HOA newsletter.
City of Carlsbad Preserves	**Center for Natural Lands Management**	▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 22 pairs and 10 single males were observed. ▪ Conducted oak woodland crown health and gold-spotted oak borer assessments. ▪ Conducted shot-hole borer assessments. ▪ Conducted protocol surveys for least Bell's vireo and southwestern willow flycatcher (*Empidonax traillii extimus*) – none detected. ▪ Documented raptor species observed. ▪ Conducted coastal sage scrub and Argentine ant assessments.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Performed thread-leaf brodiaea abundance counts within index plots. ▪ Revised vegetation mapping for Aura Circle, Aviara Park, and Village H South using the Vegetation Classification Manual for Western San Diego County (VCM). ▪ Performed brown-headed cowbird trapping at The Crossings – 15 cowbirds trapped. ▪ Installed a wildlife camera at the M1-2 tunnel. ▪ Mapped invasive non-native plants at Aura Circle, Aviara Park, and Village H South. ▪ Treated zero-tolerance invasive non-native plants and expanded treatment to species not treated due to need for experimental treatments. ▪ Inspected and cleaned brow ditches within Aura Circle, Carlsbad Village Drive, The Crossings, La Costa Romeria, and Village H South. ▪ Inspected erosion areas within Batiquitos Drive, Carlsbad Village, The Crossings, La Costa Romeria, Lake Calavera, and Village H South. Replaced straw wattles and gravel bags within The Crossings along Palomar Airport Road. ▪ Coordinated and supervised tree trimming near storage area at Village H South. ▪ Maintained M1-2 tunnel with regular patrols and vegetation trimming. ▪ Patrolled 4-7 times a week at Lake Calavera; biweekly at Aura Circle; weekly at Village H North; monthly at Aviara Park, Carlsbad Village Drive, The Crossings, La Costa Canyon Park, Poinsettia Park, and Veteran's Park/Macario Canyon; and quarterly at Batiquitos Drive, Carrillo Ranch, Lagoon Lane, Los Monos, and Research Center. ▪ Maintained and replaced existing signs as necessary at La Costa Canyon and Carlsbad Village Drive. Installed new signs at Aura Circle, Aviara Park, Village H South, and Poinsettia Park. ▪ Maintained 9 mini kiosks across preserves. ▪ Removed trash as needed. ▪ Patrolled for preserve encroachments and removed bike jumps illegally built at Lake Calavera. ▪ Patrolled for trespass and sign of trespass (graffiti, trash) were cleaned up in M1-2 tunnel, Poinsettia Park, and La Costa Canyon Park. ▪ Attended quarterly City of Carlsbad trails meetings, annual HMP meeting, SDMMP meetings, and regular education and outreach to trail users and concerned citizens. ▪ Coordinated with city staff regarding oak planting and watering, trail maintenance, and illegal trail fencing at Lake Calavera.
Daybreak Community Church Preserve	**San Diego Habitat Conservancy**	▪ Conducted vegetation mapping using the VCM and California Native Plant Society Manual of California Vegetation. ▪ Established 6 permanent photo points.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted annual site patrol to observe and document the biodiversity of the site and substantial changes in habitat composition, remove trash, remove and/or map invasive non-native plant species for removal, look for signs of trespass, and assess the need for remedial measures. ▪ Conducted invasive non-native plant treatment and removal, including hand-weeding of shortpod mustard (*Hirschfeldia incana*), treating black mustard, bristly ox-tongue (*Helminthotheca echoides*), horehound (*Marrubium vulgare*), and ice plant (*Mesembryanthemum crystalinum*). ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort (Daybreak was surveyed in conjunction with ESA's survey effort for the Aviara Master HOA parcels). ▪ Coordinated with the church to request notifications of trespassing or disturbances.
Emerald Pointe Preserve	**San Diego Habitat Conservancy**	▪ Conducted quarterly site patrols to map invasive non-native plant species, assist with San Diego thornmint seed collection, monitor erosion control measures, survey for illegal activities such as trespassing or dumping, and remove trash. ▪ Conducted invasive non-native plant control for mustard. ▪ Established permanent photo locations. ▪ Conducted IMG monitoring for San Diego thornmint. ▪ Coordinated and collected San Diego thornmint seed with San Diego Zoo Wildlife Alliance. ▪ Conducted maintenance activities, including watering San Diego thornmint. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair detected. ▪ Conducted surveys for Baja California oatgrass (*Sphenopholis interrupta* ssp. *californica*) – none observed.
Encinas Creek/North County Habitat Bank Preserve	**Center for Natural Lands Management**	▪ Conducted wildlife movement monitoring – bobcat (*Lynx rufus*) and coyote (*Canis latrans*) were observed. ▪ Conducted coastal California gnatcatcher surveys – none were detected. ▪ Conducted invasive shot-hole borer and *Fusarium* dieback monitoring – onsite habitat regrowth is good. ▪ Mapped sensitive species observations. ▪ Removed invasive non-native species (pampas grass, and iceplant (*Carpobrotus edulis*) within willow habitat. ▪ Conducted restoration activities, including non-native species control. ▪ Conducted bi-weekly to monthly patrols – trespass and illegal camping were detected. ▪ Completed the annual stewardship and work plan report. Started revising the Habitat Management Plan.
Fox-Miller Preserve	**Helix Environmental Inc. (*interim management*)**	▪ Treated non-native broad-leaf and grass species, focusing on areas containing thread-leaf brodiaea. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair and 1 single male detected. ▪ Conducted maintenance and trash removal four times.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted assessments of habitat conditions. ▪ Inspected signage and fencing. ▪ Checked for presence of sensitive wildlife species (coastal California gnatcatcher, least Bell's vireo, and Cooper's hawk). ▪ Recorded all plant and animal species observed during monitoring visits. ▪ Conducted a health assessment of the thread-leaf brodiaea population within the translocation plot and the remainder of the grassland. ▪ Inspected the owl box – no use detected due to presence of beehive inside box. ▪ Communicated issues to maintenance personnel.
Kelly Ranch Preserve	**Center for Natural Lands Management**	▪ Conducted Orcutt's hazardia (*Hazardia orcuttii*) monitoring – a total of 105 Orcutt's hazardia detected (84 adults, 21 juveniles, and 0 seedlings). ▪ Conducted clay lens assessment. ▪ Conducted sensitive shrub assessment. ▪ Conducted coastal sage scrub monitoring. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 2 adult pair and 1 individual detected. ▪ Conducted sensitive species monitoring. ▪ Treated invasive non-native plants (pampas grass, natal grass [*Melinis repens*], Russian thistle, tree tobacco, and stinkwort). ▪ Conducted easement compliance monitoring – no issues. ▪ Conducted patrols at least once a month. Littering is common near viewpoint, but no other issues observed. ▪ Contacted neighbors and the HOA regarding issues of concern. ▪ Completed the annual stewardship plan and budget, annual report, and CE compliance report.
La Costa Collections Preserve/City Ventures	**Urban Corps of San Diego County**	▪ Conducted general biological monitoring to monitor sensitive species and habitat condition, identify invasive non-native species, and conduct photo monitoring. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 2 adult pair and 1 individual detected. ▪ Conducted Nuttall's scrub oak (*Quercus dumosa*) monitoring: mapped general distribution and assessed condition and degree of disturbance to habitat. ▪ Conducted Del Mar sand aster (*Corethrogyne filaginifolia* var. *linifolia*) monitoring: delineated population boundaries, counted/estimated population, and assessed condition and degree of disturbance to habitat.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Performed bi-annual general site monitoring: monitored and removed trash/debris, reported any human encroachment, and inspected signs/fencing. ▪ Continued to voluntarily restore 0.13-acre of Diegan coastal sage scrub. ▪ Took photo documentation. ▪ Removed non-native plant material during bi-annual habitat maintenance. ▪ Removed trash during bi-annual habitat maintenance. ▪ Completed annual report.
La Costa Glen Preserve	**Center for Natural Lands Management**	▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort –1 pair detected. ▪ Conducted sensitive plant species monitoring for Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*), summer holly (*Comarostaphylos diversifolia* ssp. *diversifolia*), and seaside calandrinia (*Cistanthe maritima*) – 10 Del Mar manzanita, 1 summer holly, and 50 seaside calandrinia were identified. ▪ Conducted Argentine ant presence survey – Argentine ants present at urban interface but absent within interior area. ▪ Observed general plant and animals – no new species observed. ▪ Treated a large stand of tree tobacco, as well as hundreds of Sahara mustard (*Brassica tournefortii*) plants. ▪ Performed regular patrols and removed several encampments and individuals. ▪ Removed trash from transient encampments as encountered. ▪ Completed the annual stewardship plan and budget and annual report.
Laurel Tree Lane Preserve	**San Diego Habitat Conservancy**	▪ Conducted quarterly patrols to assess and address shot-hole borer/Fusarium treatments and any substantial changes in the habitat composition of the preserve, remove trash, remove and/or map invasive non-native plant species, look for signs of trespass, and assess any need for remedial measures. ▪ Removed 8 trees infected with polyphagous shot-hole borer (*Euwallacea* spp.) and placed 5 baited traps to monitor for the pest. ▪ Conducted invasive non-native removal efforts for shortpod mustard, pampas grass, Bermuda buttercup (*Oxalis pes-caprae*), crown daisy (*Glebionis coronaria*), tocalote, castor bean, poison hemlock, and common iceplant. ▪ Mapped encampments and removed trash onsite. ▪ Provided newsletter to neighboring 24-Hour Fitness corporate office.
Manzanita Partners Preserve	**Dudek/ Habitat Restoration Sciences**	▪ Inspected and replaced signs as needed. ▪ Inspected and repaired or replaced fencing as needed. ▪ Patrolled and conducted site enforcement on a regular basis. ▪ Removed non-native plant species by hand within vernal pools.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Provided support for tasks provided by the Nature Collective and Preserve Steward staff as appropriate and included data provided by other organizations. ▪ Removed trash. ▪ Noted all animal species observed and mapped locations of any sensitive species. ▪ Monitored vernal pools for inundation and presence of fairy shrimp depending on rain events – no pooling or fairy shrimp observed. ▪ Monitored early detection indicators for shot-hole borer invasion – no evidence observed. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair detected. ▪ Reported and described data collected and management actions taken on the preserve to the City.
Morning Ridge Preserve	**Urban Corps of San Diego County**	▪ Inspected fuel modification zone with Carlsbad Fire Department and Morning Ridge HOA. ▪ Conducted habitat maintenance and removed crown daisy. ▪ Assessed mitigation opportunities. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 0 pairs detected.
Muroya Preserve	**San Diego Habitat Conservancy**	▪ Conducted quarterly patrols to observe and document the biodiversity of the site and substantial changes in the habitat composition, remove trash, remove and/or map invasive non-native plant species, look for signs of trespass, and assess the need for remedial measures. ▪ Conducted invasive non-native plant species treatment for tree tobacco, poison hemlock, Italian thistle (*Carduus pycnocephalus*), black mustard, ice plant, and castor bean. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair detected. ▪ Performed Nuttall's scrub oak survey. ▪ Inspected previously eroded area.
New Crest Preserve	**Urban Corps of San Diego County**	▪ Performed annual biological monitoring to monitor sensitive species and habitat condition, identify invasive non-native species, conduct photo monitoring, monitor for trash, erosion, human encroachment, and inspect signs and fencing. ▪ Removed non-native plant material, including crown daisy, black mustard, tree tobacco, and acacia (*Acacia* sp.). ▪ Performed bank erosion monitoring. ▪ Completed annual report.
North Coast Calvary Chapel Preserve	**Helix Environmental (*interim management*)**	▪ Conducted an inventory of wart-stemmed ceanothus (*Ceanothus verrucosus*) in May 2022 – 14 individuals observed. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair detected.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted regular monitoring visits to inspect sensitive habitats, hydrology, erosion, exotic plant species, exotic animal species, as well as fencing, gates, signs, and lighting. ▪ Conducted non-native plant species control and trash removal. Targeted black mustard, Russian thistle, tree tobacco, crown daisy, and non-native grasses. ▪ Hand-seeded bare areas. ▪ Removed bike berm/jump.
Paseo del Norte Preserve	**Urban Corps of San Diego County**	▪ Performed quarterly site visits to monitor sensitive species and habitat condition, identify invasive non-native species, conduct photo monitoring, monitor and remove trash, erosion, human encroachment, and check on and repair signs/fencing. ▪ Repaired signs. ▪ Removed invasive non-native plant material, primarily pampas grass seed heads. ▪ Completed annual report.
Poinsettia Place Preserve	**Urban Corps of San Diego County**	▪ Performed annual biological monitoring to monitor rare plant populations and habitat condition, identify invasive non-native species, and conduct photo-documentation. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 2 adult pairs detected. ▪ Conducted Nuttall's scrub oak monitoring: mapped general distribution and assessed condition and degree of disturbance to habitat. ▪ Conducted wart-stemmed ceanothus monitoring: mapped general distribution and assessed condition and degree of disturbance to habitat. ▪ Conducted summer holly (*Comarostaphylis diversifolia* ssp. d*iversifolia*) monitoring: mapped general distribution and assessed condition and degree of disturbance to habitat. ▪ Conducted Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*) monitoring: mapping general distribution, identify non-native species and disturbance attributes, measure relative abundance, and assess condition and degree of disturbance to habitat. ▪ Conducted quarterly general site monitoring to monitor and remove trash/debris, report human encroachment, check on and repair signs/fencing, and monitoring compliance with the Restrictive Covenant. ▪ Removed non-native plant material, acacia, crown daisy, stinging nettle, mustard, castor bean. ▪ Removed trash during two site visits. ▪ Completed annual report.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
Poinsettia Station Vernal Pools	**City of Carlsbad (Dudek/ Habitat Restoration Sciences)**	▪ Conducted vernal pool indicator plant surveys. ▪ Assessed vernal pool sensitive species populations. ▪ Assessed non-native plant populations for management. ▪ Conducted weed control and coyote bush (*Baccharis polularis*) removal at the north end of the preserve. ▪ Trimmed vegetation along the southern trail. ▪ Developed interpretive signage for the preserve.
Quarry Creek Preserve	**San Diego Habitat Conservancy**	▪ Conducted monthly patrols to document biodiversity of the site, changes in habitat composition, remove trash, check signage, monitor invasive plant species, and assess the need for remedial measures. ▪ Met with the City of Carlsbad Police Department, City of Oceanside Police Department, the City of Oceanside Code Enforcement, California Department of Fish and Wildlife, San Luis Rey Band of Mission Indians, Preserve Calavera, Center for Natural Lands Management, and RG Investment Real Estate Services, Inc. to discuss strategies for coordinated trespasser prevention. ▪ Applied for SANDAG's TransNet Environmental Mitigation Program grant to fund additional fencing and trash removal – grant will be awarded in late 2022 for 2023 implementation. ▪ Performed invasive non-native plant species removal for castor bean, Mexican fan palm (*Washingtonia robusta*), tree of heaven (*Ailanthus altissima*), tree tobacco, sweet fennel, black mustard, crown daisy, and wild radish (*Raphanus* sp.). ▪ Raked and set native seed in alternate native grassland restoration area. ▪ Documented and addressed encampments and removed trash. ▪ Covered graffiti. ▪ Installed new sign. ▪ Mapped new area with San Diego sagewort (*Artemisia palmeri*). ▪ Conducted volunteer cleanup event focusing on trash removal along Buena Vista Creek. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 5 adult pairs detected. ▪ Conducted protocol surveys for least Bell's vireo (*Vireo bellii pusillus*) – 3 individuals detected; brown-headed cowbird observed as well. ▪ Provided HOA brochure. ▪ Monitored for animal pest species, including shot-hole borer and Argentine ant.
Rancho La Costa Preserve	**Center for Natural Lands Management**	▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 36 adult pairs, 9 single males, and 1 individual detected ▪ Conducted wildlife movement monitoring –southern mule deer (*Odocoilus hemionus fuliginatus*) and coyote at key movement pinch points.

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted San Diego thornmint monitoring – 988 individuals were detected. ▪ Harmony Grove Partners Association observed and noted flora and fauna. ▪ Removed hundreds of invasive non-native species, including Ward's weed, pampas grass, sweet fennel, onionweed (*Asphodelis fistulosus*) and fountain grass, using chemical and mechanical methods. ▪ Monitored and maintained all brow ditches and areas of concern for erosion. ▪ Cleared fuel zones in May 2022. ▪ Monitored and completed reporting for conservation easements. ▪ Maintained coastal sage scrub demonstration garden, removed hundreds of fennel, installed ~140 grassland plants adjacent to Gibraltar Street in collaboration with Preserve Calavera, Coastal Academy, and Boy Scouts. ▪ Conducted patrols multiple times a week. ▪ Completed annual stewardship plan, budget, and report. ▪ Completed reporting for Harmony Grove Partners Association portion of Copper Creek.
Sage Creek High School Preserve	**San Diego Habitat Conservancy**	▪ Conducted quarterly patrols to document biodiversity of the site, changes in habitat composition, remove trash, remove/map invasive plant species, look for signs of trespass, and assess the need for remedial measures. ▪ Documented bike trespass and removed ladder and dismantled bike ramp. ▪ Line-trimmed all invasive non-natives mapped, including artichoke thistle, black mustard, castor bean, and sweet fennel. ▪ Coordinated and met with Carlsbad HOT to remove encampment. ▪ Coordinated with the Carlsbad Unified School District to install "No Trespass" signs. Conducted photo documentation.
Sonata Preserve	**San Diego Habitat Conservancy**	▪ Conducted property site inspection. ▪ Established permanent photo-documentation points. ▪ Verified baseline vegetation mapping/ ▪ Installed 3 signs along fence boundary on Camino De Los Caches. ▪ Conducted 3 monitoring visits consisting of two biannual inspections and one annual qualitative biological survey, documenting native and non-native plant species, wildlife species detected, overall site performance, erosion and sedimentation issues, hydrology and water quality issues, trash, illegal dumping, unauthorized human use, signage and fencing damage, and assess the need for remedial measures. ▪ Installed bait traps for shot-hole borer. ▪ Monitored for thread-leaved brodiaea (*Brodiaea filifolia*) and Orcutt's brodiaea (*Brodiaea orcuttii*).

Summary of HMP Management and Monitoring Activities, Nov 2021–Oct 2022
continued

Preserve Area	Management Entity	Management and Monitoring Activities
		▪ Conducted invasive non-native plant control for artichoke thistle, black mustard, bristly ox-tongue, brome grass (*Bromus* spp.), burclover (*Medicago polymorpha*), creeping myoporum (*Myoporum parvifolium*), sow thistle (*Sonchus oleraceus*), sweet fennel, tocalote, and crown daisy.
Southern Preserve	**Urban Corps of San Diego County**	▪ Performed biannual biological monitoring to assess condition of non-native grassland and Diegan coastal sage scrub habitats, identify invasive non-native species, document sensitive species observations, and conduct photo monitoring. ▪ Conducted coastal California gnatcatcher surveys as part of the city-wide survey effort – 1 adult pair detected. ▪ Monitored sensitive plant populations (San Diego goldenstar [*Bloomeria clevelandii*] and California adolphia). ▪ Conducted quarterly monitoring of wildlife movement. ▪ Performed monthly site patrols to monitor and remove trash, report any OHC activity, check on and repair signs/fencing, and enforce rules such as staying on designated trails and keeping dogs on a leash. ▪ Removed non-native plant material, primarily artichoke thistle and sweet fennel, on a quarterly basis ▪ Removed trash on a quarterly basis, as needed. ▪ Coordinated with HOA on quarterly basis. ▪ Completed annual report.
Multiple areas	**Preserve Calavera**	▪ Monitored status of four nominations for Heritage Tree designation from prior years. ▪ Supported community education on native plants, wildlife, and preserve management issues at various fairs and outreach events. ▪ Continued several Citizen Scientist projects, including roadkill monitoring, water quality testing, grunion reporting, and King tide events.
Throughout the HMP Preserve system	**City Parks and Recreation Department**	▪ Conducted trail clean up and maintenance – Maintenance staff monitored and maintained trails through the year. Conducted 8 volunteer events throughout the 2022 calendar year. Enhanced habitats by planting ntive plants and trees next to the trails edge in the habitats at Lake Calavera and Village H North preserves managed by the Center for Natural Lands Management. ▪ Hosted quarterly trail volunteer meetings. ▪ Hosted 3 public outreach events with volunteers, Arbor Day at Rancho Carrillo Trail, National Trails Day at Hosp Grove, and National Public Lands Day at Lake Calavera.

Appendix C
City of Carlsbad 2022 Coastal California Gnatcatcher Survey Results

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City of Carlsbad 2022 Coastal California Gnatcatcher Survey Results

Compiled by Kathleen Balazs, Center for Natural Lands Management
On behalf of the City of Carlsbad
October, 2022

Introduction

The City of Carlsbad's (city) Habitat Management Program (HMP) and resulting preserve system was designed to protect sensitive habitat and plant and animal species. One of the HMP requirements is to regularly assess the status of "covered" species to determine if the populations are stable, increasing, or decreasing. The coastal California gnatcatcher (CAGN, *Polioptila californica californica*) is one of the high-priority HMP covered species which the city is required to monitor and manage pursuant to the conditions of coverage for the HCP/NCCP incidental take permits.

Prior to HMP implementation, actively managed preserves were required to have annual CAGN surveys; however, a total count of CAGN territories across the entire city in one breeding season had not been conducted in a coordinated manner. In 2010, the city and its management partners, with Wildlife Agencies approval, developed a breeding season survey protocol, which established the citywide monitoring frequency to every three years. Although not designed as a statistically rigorous study, the purpose of the coordinated citywide effort was to determine the general abundance, status (i.e., pair or single male), and distribution of CAGN across the city, including some of the unmanaged preserves. The inaugural citywide survey was conducted in 2010 across much of the suitable CAGN habitat within the city. Citywide surveys were conducted again in 2013. In 2010, 85 pairs and 42 male CAGN were reported and in 2013, 117 pairs and 33 single males were reported. These results indicated that the CAGN population was stable and potentially increasing across the city; therefore, the city elected to reduce the monitoring frequency to every 9 years (with approval from the Wildlife Agencies), with surveys resuming in 2022. This trend in CAGN population stability is supported by regional studies conducted for the species (Kus et al. 2017, SDMMP 2016, Vandergast et al. 2014), as well as land manager observations in Carlsbad over the course of many years. The advantage of reducing the survey frequency is to allow these management funds to be redirected towards more pressing management needs, such as invasive species removal.

This report summarizes the results of the 2022 surveys, and compares it to the 2010 and 2013 results. The full survey reports for previous citywide surveys can be found on the city's website https://www.carlsbadca.gov/departments/environmental-sustainability/habitat-protection/hmp-reports-studies.

Monitoring Objective

Objective 1: Determine current status, distribution and abundance of coastal California gnatcatcher (*Polioptila californica californica*) in the City of Carlsbad (city)

Methods

All surveys throughout the City of Carlsbad were conducted at approximately the same time (March and April of 2022) to reduce variability due to behavioral changes (e.g., reduced calling frequency). In 2022, the first survey at each location was conducted within the first two to four weeks of March when possible so that black-capped males could be observed when they were the most vocal, and before eggs were laid or chicks hatched. The remaining surveys were conducted by late March to mid-April. An effort was made keep each survey separated by 7-10 days, if possible.

In general, a minimum of 2 site visits were conducted at each location; however, this number could be revised to 1 or 3 visits, depending on the experience of the surveyor, confirmed presence from other management site visits, and/or the field conditions on site (i.e., steep or near noisy areas). If, after two visits to an area, the number of pairs/individuals was unclear, a 3rd or 4th visit was warranted. Surveyors visited a site 3 or 4 times if there was a large discrepancy in observations between visits.

Observers made an additional effort to spend adequate time determining pair status. In past years, a large number of males have been reported that may have been part of a pair.

All other aspects of the survey protocol can be found in the updated Citywide Survey Protocol (CNLM 2013, updated 2022).

Areas Surveyed

Preserves that were surveyed as part of the citywide surveys are depicted in Table 1 along with Figures 1-3. Surveyed acreage remained relatively similar with small increases from approximately 1,805 acres in 2010 to approximately 1,985 acres in 2013 and approximately 2,060 acres in 2022. New areas surveyed in 2013 included La Costa Glen, Shorepointe, and Copper Creek (County of San Diego). New areas surveyed in 2022 include Aura Circle, Fox Miller, Quarry Creek, Poinsettia Place, and Southern Preserve.

Areas with suitable habitat that were not surveyed were generally preserves that lacked a management entity (except for Aviara) or areas where the terrain was too steep (see Table 1). CNLM did not survey the steep areas of Box Canyon, for example. Other notable areas not surveyed are the U.C. Dawson-Los Monos Preserve and Bressi Ranch Preserve, which were also not surveyed in 2010 or 2013.

Survey Results

A total of 134 pairs and 41 single males (175 territories) were observed in 2022 as compared to 122 pairs and 33 single males (155 territories) and 85 pairs and 42 males (127 total territories) in 2013 and 2010, respectively (**Figure 1, Figure 2, Figure 3** and **Table 1**). Surveyors concluded that nearly all males were single males. There was an increase of 28 territories between 2010 and 2013 and an additional increase of 22 territories between 2013 and 2022 despite little change in survey acreage.

CAGN were observed in most areas that were surveyed across the city in 2022. While many areas maintained a similar number of territories observed, Carlsbad Oaks North and Lake Calavera had a notable increase in 2022 (from 3 pairs to 13 pairs and 2 pairs to 5 pairs, respectively). There were also CAGN mapped in in 2022 within some preserves where they had not previously been found such as Poinsettia Place, Poinsettia Park, and Parcel H North of Aviara Conservation Area. Since the number of pairs and total territories continue to be stable and/or increasing, the change in the number of territories between preserves likely does not reflect a change in suitable habitat, but rather temporal shifts in distribution.

Discussion

Although the citywide CAGN surveys do not follow a statistically rigorous study design, the 2010, 2013, and 2022 survey results provide a useful snapshot of CAGN abundance, status, and distribution in the city within managed and some unmanaged preserves. CAGN are observed across the HMP preserve system and in all unit and vegetation patch sizes. Therefore, continued management of all unit and vegetation patch sizes is considered important for the preservation of this species. Small habitat patches will continue to provide refugia and means of dispersal and recolonization within the city, especially during and after catastrophic events, such as fires occurring within larger patches of coastal sage scrub (e.g., in La Costa Villages and Calavera).

List of Abbreviations

CAGN – Coastal California Gnatcatcher
CDFW – California Department of Fish and Wildlife
CNLM – Center for Natural Lands Management
ESA – Environmental Science Associates
HMP - Habitat Management Program
HCP - Habitat Conservation Plan
NCCP - Natural Community Conservation Plan
SDHC – San Diego Habitat Conservancy

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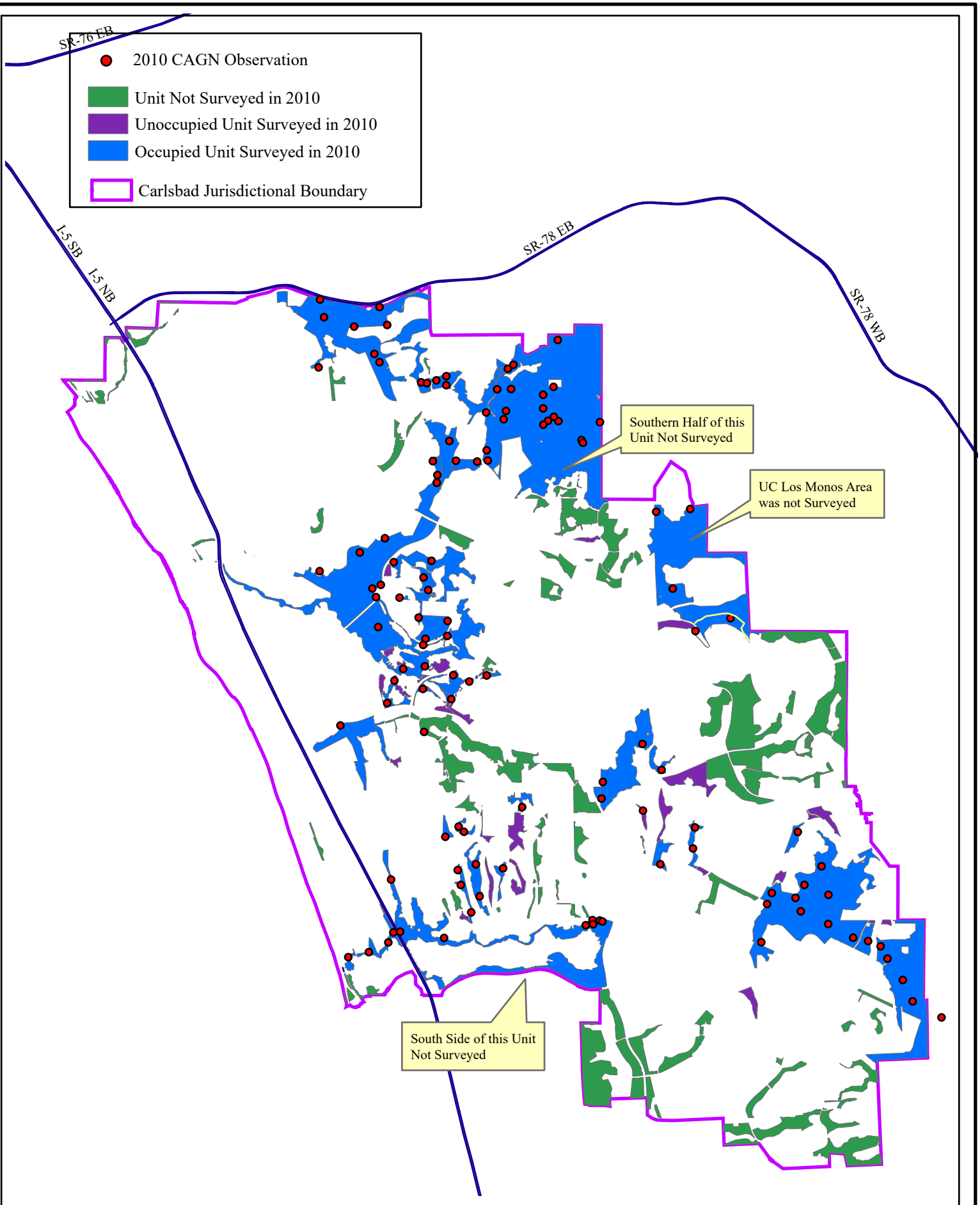

Figure 1
2010 CAGN Observations
Carlsbad, California

2,100 1,050 0 2,100 Feet

Center for Natural Lands Management

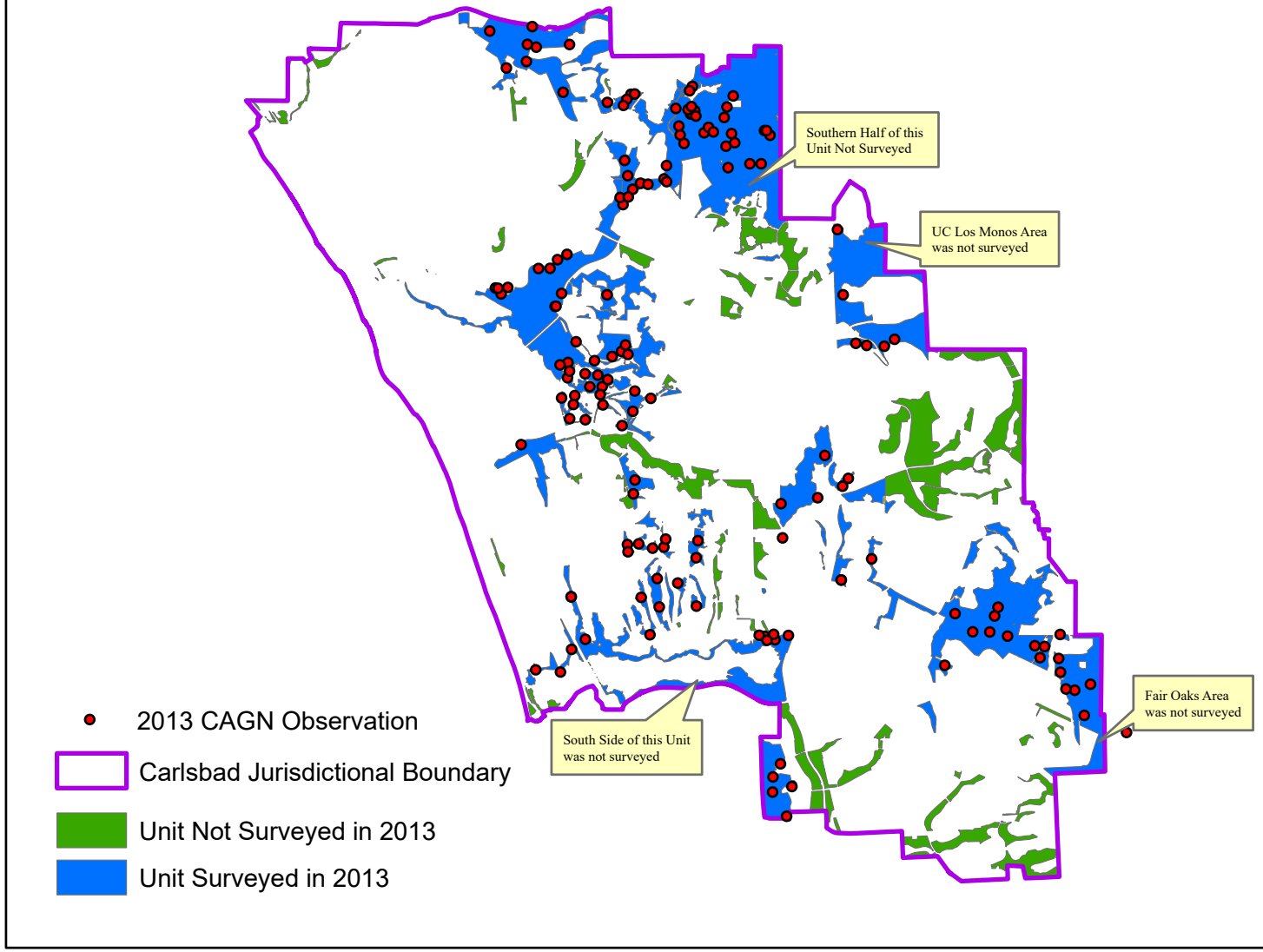

Figure 2. 2013 CAGN Observations

Carlsbad, California

1,600 800 0 1,600 Meters

Center for Natural Lands Management

N

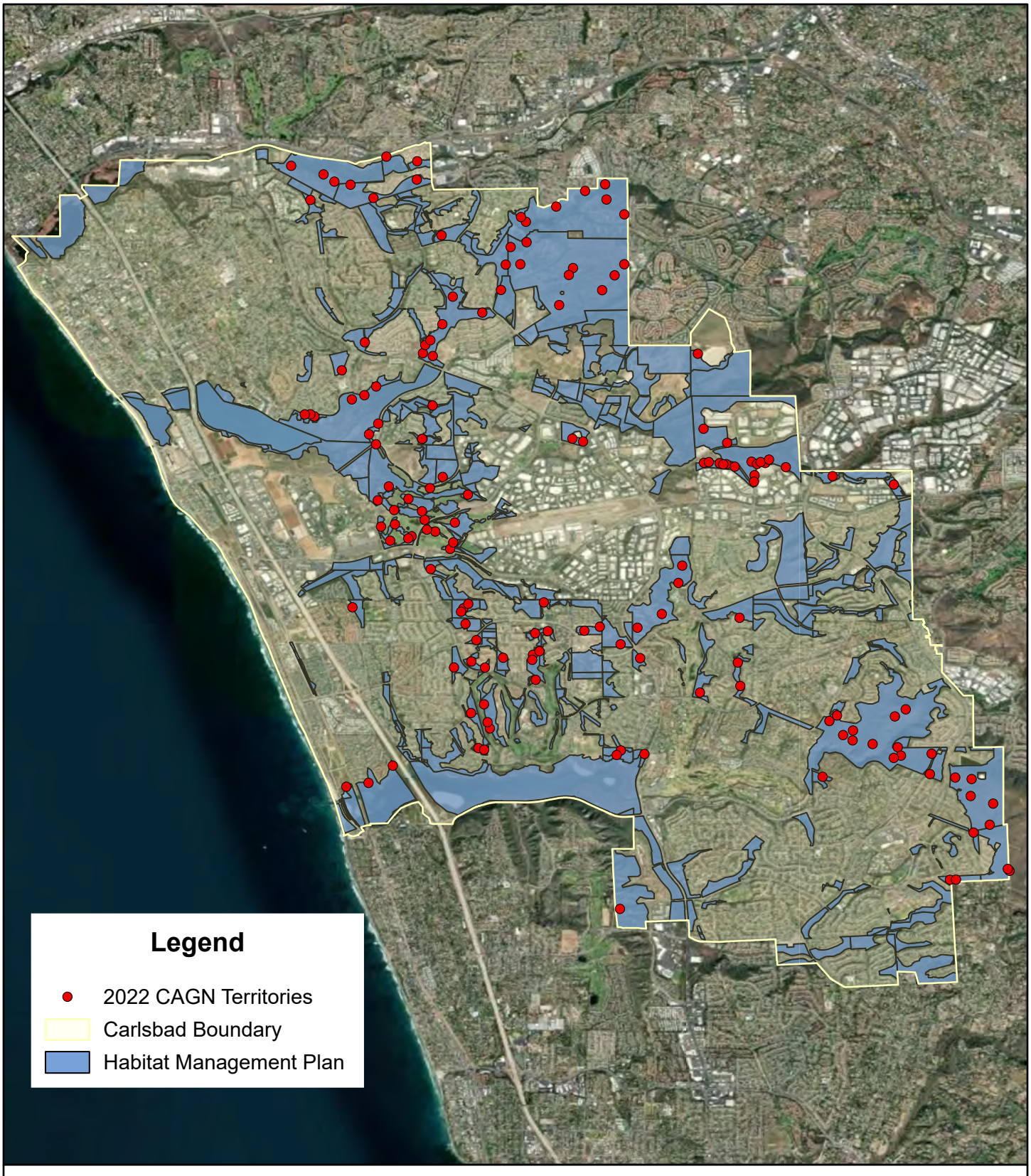

Figure 3. 2022 CAGN Observations from Carlsbad City-Wide Survey

0 1,250 2,500 5,000
Meters

N

Center for Natural Lands Management

Table 1. CAGN Survey Results from 2010, 2013, and 2022, City of Carlsbad

Preserve or Area Name	Manager	Surveyors (2022)	Acres of CSS Surveyed	Most recent survey	2022 Survey results	2012/2013 Survey Results	2010 Survey Results
Agua Hedionda Lagoon Ecol. Reserve	CDFW	CDFW	24	2022	4 pair, 3 single male	7 pair, 3 single males	3 pair and 1 single male
Alemere-County off-site	CNLM	CNLM	60	2022	1 pair	1 pair	1 pair
La Costa Valley	None				NS	NS	NS
Aura Circle	City-CNLM	CNLM	15.1	2022	1 pair		
Aviara Conservation Area	HOA	ESA	Parcel A: 7.8	2022	1 pair	2 pair	1 pair
		ESA	Parcel B: 17.5		2 pair, 1 single male	2 pair,	1 pair, 2 single male
		ESA	Parcel C: 30.1		2 pair, 1 single male	2 pair	2 single male
		ESA	Parcel D: 4.0		0	1 pair	1 pair
		ESA	Parcel E: 8.0		0	1 male	0
		ESA	Parcel F: 10.5		2 pair	2 male	2 single male
		ESA on behalf of SDHC	Parcel G/Muroya: 3.3		recorded below (Muroya)	1 pair, 1 male	0
		ESA	Parcel H North*: 7.0		1 pair, 1 male	0	
		ESA	Parcel H: 26.4		4 pair	1 male, 1 pair	1 single male
		ESA	Parcel I: 20.9		3 pair, 1 single male	1 pair, 1 s male	N/S
Aviara Park	City-CNLM	CNLM	5.6		1 pair		
Batiquitos Drive	City-CNLM	CNLM	2.6	2022	0	1 pair	1 juvenile out of breeding season
Batiquitos Lagoon Parcel					NS	NS	NS
Batiquitos Lagoon Ecological Reserve	CDFW	CDFW	East: 16	2022	2 pair, 1 single male	5 pair, 2 single male	4 pair, 3 single male
			West: 14		2 pair, 1 single male	3 pair, 1 single male	1 pair, 3 single male
Bressi Ranch	SDHC				NS	NS	NS

Preserve or Area Name	Manager	Surveyors (2022)	Acres of CSS Surveyed	Most recent survey	2022 Survey results	2012/2013 Survey Results	2010 Survey Results
Buena Vista Creek Ecological Reserve	CNLM-CDFW	CNLM-CDFW	12	2022	3 pair	3 pair, 2 single males (1 additional individual heard off-site)	3 pair heard on adjacent land, one of these pair observed anecdotally on Reserve in June. 2 SM heard incidentally
Buena Vista Lagoon Ecological Reserve	CDFW			2022	0		
Calavera Hills Phase II Habitat Consv. Area (aka Calavera West of Calavera Heights) & Robertson Ranch	CNLM	CNLM	Village K	2022	1 pair	4 pair, 1 single male	5 pair
			Village H		0	1 single male	1 pair and 1 single male
			Village U/W		1 pair (recorded as single male by CNLM, then pair by CDFW)	2 pair	1 pair
			Village X		1 single male	2 pair	1 single male
			Robertson Ranch West (Reveg in progress, < 1 acre pre-existing)		6 pair	1 pair	3 pair
			Robertson Ranch East (28 + 10 ac. css reveg)		2 pair	6 pair, 1 single male	3 pair, 2 single males
			Total 210 acres				
Cantarini/Holly Springs	None		?	2011 (Helix)	NS	1 individual	NS
Cassia	CNLM	CNLM	No CSS, but some suitable habitat	2022	0	None	None
Carlsbad Highlands ER	CDFW	CDFW	East Side: 124	2022	4 pair, 1 single male	1 pair, 3 single male, 1 unk	2 pair and 6 single male
			West Side: 115		2 pair, 2 single male (one pair was in CNLM preserve)	3 pair and 1 single male	
Carlsbad Oaks North	CNLM	CNLM	73	2022	13 pair, 1 single male, 1 unk	5 pair	3 pair

Preserve or Area Name	Manager	Surveyors (2022)	Acres of CSS Surveyed	Most recent survey	2022 Survey results	2012/2013 Survey Results	2010 Survey Results
Carlsbad Raceway	SDHC	SDHC	46.25	2022	1 pair, 1 unk	1 individual in restoration area (not a complete survey)	(with 3 nestlings)
Carlsbad Village	City-CNLM	CNLM	5.8	2022	1 pair	1 single male	1 pair
City Ventures/La Costa Collection	Urban Corps	Urban Corps	Approximately 5	2022	1 pair	1 pair	NS
Copper Creek-County Off-site purchase by City of Carlsbad	CNLM	CNLM	Approximately 125	2022	4 pair, 1 unk	1 pair	NS
Daybreak Community Church*	SDHC	ESA on behalf of SDHC		2022	See "Aviara Parcel H North", which includes Daybreak	NS	NS
Emerald Pointe Estates	SDHC	ESA	10.1	2022	1 pair	1 pair (and 1 fledgling)	1 pair
Encinas Creek/N. County Habitat Bank	CNLM	CNLM-presence/absence	1	2022	0	1 male	1 pair
Fox Miller	Helix	Helix	5.3	2022	1 pair, 1 single male		
Kelly-JRM	None				NS	NS	NS
Kelly Ranch HCA	CNLM	CNLM	49	2022	2 pair, 2 unk	2 pair	5 pair and 3 single male
La Costa Canyon Park	City-CNLM	CNLM	6.9	2022	1 pair	1 pair	0
La Costa Glen	CNLM	CNLM	21	2022	1 single male	5 pair, birds using site + adjacent areas.	NS
La Costa /Romeria	City-CNLM	CNLM	3.3	2022	0	0	0
Lake Calavera	City-CNLM	CNLM	70	2022	5 pair and 1 single male	2 pair and 2 single males	2 pair and 1 single male
Laurel Tree Lane	SDHC	SDHC			NS	NS	NS
Los Monos	City-CNLM	CNLM	18.9	2022	1 pair	1 pair	2 males
U.C. Dawson-Los Monos	UC	UC			NS	NS	NS
Macario Canyon	City-CNLM	CNLM	14.4	2022	1 single male	0	2 pair
Manzanita Partners	Dudek/HRS	ESA		2022	1 pair		
Morning Ridge	Urban Corps	ESA		2022	0	NS	NS

Preserve or Area Name	Manager	Surveyors (2022)	Acres of CSS Surveyed	Most recent survey	2022 Survey results	2012/2013 Survey Results	2010 Survey Results
Municipal Golf Course	City-CNLM	CNLM	121	2022	12 pair, 7 single male	23 pair	13 pair
Muroya	SDHC	SDHC	8.5	2022	1 pair		
New Crest	Urban Corps				NS		
N. Coast Calvary Chapel	Helix	Helix	8.4	2022	1 pair, (2 pair off-site (ESA))	2 pair	NS
Palomar Pointe	None				NS	NS	NS
Paseo Del Norte	Urban Corps				NS		
Poinsettia Park	City-CNLM	CNLM	5.6	2022	1 single male	0	0
Poinsettia Place	Urban Corps	Urban Corps	0 (none is mapped, but could have patchy CSS)	2022	2 pair	0	NS
Poinsettia Station	City-Dudek	ESA	3				
Quarry Creek	SDHC	SDHC	1	2022	5 pair		
Rancho La Costa (La Costa Villages) ~650 acres	CNLM	CNLM	Choumas-P-County	2022	15 pair, 1 single male	9 pair	7 pair and 1 single male
			Greens		7 pair, 1 single male	5 pair 2 single males	8 pair
			Ridgeline-West		7 pair, 1 unk	5 pair	5 pair and 4 single male
			Ridgeline-East		2 pair, 2 single male	4 pair	3 pair
			Denk Mountain		4 pair, 4 single male (1 pair, 1 single male in wildlife corridor)	7 pair	3 pair
			Nelson-County		0	1 pair	0
Sage Creek	SDHC				NS		
Sonata	SDHC				NS		
Southern	Urban Corps	Urban Corps	Less than 55 acres (whole preserve is 55 acres and was surveyed in 2020)	2022	1 pair	NS	NS
Summit	CDFW		Less than 2 acres	2013	NS	0	0
Veterans Preserve	City-CNLM	CNLM	14.9	2022	0	3 pair	1 pair

* The area labeled “Aviara Parcel H North” consists of the following three adjacent preserves: (1) Daybreak Community Church, (2) Encantada, and (3) Aviara Premier Collection.

Appendix D

HMP Unmanaged Preserves Site Inspection Program 2021-2022 Summary Report

ESA

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esassoc.com

memorandum

date	January 18, 2023
to	Rosanne Humphrey, City of Carlsbad
cc	Terah Donovan, Environmental Science Associates
from	Adrienne Lee, Environmental Science Associates Brenda McMillan, Environmental Science Associates
subject	HMP Unmanaged Preserves Site Inspection Program 2021–2022 Summary

Introduction

The City of Carlsbad (city) adopted the Habitat Management Plan (HMP) in November 2004 as a commitment to conserve the full range of native habitats and species throughout the city and maintain functional wildlife corridors through its implementation. Most of the city's current HMP preserve system (70 percent) is under long-term management through various land managers (i.e., city, California Department of Fish and Wildlife [CDFW], Center for Natural Lands Management, San Diego Habitat Conservancy, Urban Corps of San Diego, Dudek/Habitat Restoration Sciences, Inc., and HELIX Environmental, Inc.). The remaining preserves receive minimal or no management and are referred to as "unmanaged preserves" (**Figure 1**; see figures in **Attachment A**). Typically, the unmanaged preserves were (1) established prior to the final adoption of the HMP in 2004 and were not required to have a funded land manager, or (2) established during the transition period of 2004–2005 that allowed for reduced funding requirements. The city has no obligation to dedicate resources to monitor or manage for the unmanaged preserves per the HMP Implementing Agreement. With the HMP preserve system almost fully built out, the city wanted to evaluate the status of unmanaged preserves and determine management priorities and implementation feasibility with the resources available.

The prioritization of unmanaged preserves resulted in the development of the site inspection program by the city and Environmental Science Associates (ESA). The site inspection program addresses the lack of monitoring and management on the unmanaged preserves. The city and ESA conduct rapid assessments with the goals of establishing a presence on unmanaged preserves, documenting baseline status of species and habitats, and prioritizing management actions based on available funding and implementation resources. This memorandum describes the site inspection program methodology, results, and next steps.

Methodology

The site inspection program methodology included four steps: desktop analysis, field form development, site inspections, and post-field processing. Each of these steps is described in detail as follows.

1. **Desktop analysis.** A desktop analysis was conducted for all unmanaged preserves within the HMP preserve system to determine which should be prioritized for in-person site inspections. Priority criteria identified for the desktop analysis consisted of on-site biological resources and potential threats (**Table 1**). Based on available sensitive species data and associated habitat requirements from the Multiple Habitat Conservation Plan (AMEC Earth & Environmental, Inc. & Conservation Biology Institute 2003), HMP (City of Carlsbad 2004), and CDFW's California Natural Diversity Database (CDFW 2021), each priority criterion was assigned a number representing its assumed presence or absence on the preserve (Table 1). Once all priority criteria were assessed, a total score was calculated for each preserve. The higher the resulting score, the higher the priority that preserve was to be inspected in-person. High-priority sites were advanced for site inspections.

TABLE 1
PRIORITY CRITERIA RANKING

Priorities	Points		Comments
	Total Possible	Score	
Biological Resources			
High-priority plant/animal population	1/pop[1]		
Priority habitat 1	2		
Priority habitat 2	1		
Potential or confirmed wildlife movement corridor	1/per		
Threats			
Adjacent to development	1		
Trail	1		
Unauthorized access into preserve[2]	1		
Other threats – specify[3]	1/threat		
Access			
Sites for which access has been granted	1		
TOTAL SCORE			

[1] One point given for each species or distinct population/occurrence. For very large preserves such as Rancho Carrillo, each distinct area can be scored separately.

[2] If there is more than one significant unauthorized access issue, one point was given per issue

[3] One point given per "other" threat (e.g., post-fire, high-priority invasive non-native species [gold-spotted oak borer, shothole borer, Ward's weed, Italian white snail], homeless encampments, known off-leash dog issues, unauthorized mountain bike usage).

2. **Field form development**. Electronic field forms supported by mobile data collection applications ArcGIS Field Maps and Survey123 were developed for use during in-person site inspections.
   - **ArcGIS Field Map**. An ArcGIS Field Map was developed using the HMP preserve system boundaries, unmanaged preserve boundaries, Poinsettia Fire burn boundary, known HMP wildlife linkages and pinchpoints, and known Ward's weed populations. Data collection options included

color-coded points, lines, and polygons. A color code was assigned to biological resources, threats, and adaptive management or restoration opportunities. A geo-tagging feature allowed photos to be associated with a geo-tagged point, line, or polygon.

- **Survey123 form**. A Survey123 form was developed to (1) document the overall condition of the unmanaged preserve, including the status of plant populations or other sensitive resources, status of fencing and signage, and presence/sign of wildlife movement corridors, and (2) determine the urgency and potential opportunities for adaptive management or restoration.

3. **Site inspections**. Site inspections were conducted generally from south to north for prioritized unmanaged preserves. Maps, aerial imagery, and sensitive species information (e.g., San Diego Management and Monitoring Program database, regional Multiple Species Habitat Conservation Plans, and California Natural Diversity Database) were reviewed prior to conducting in-person site inspections. Preserves with the potential to support listed or sensitive species were given priority during months with the best opportunity for detection. Inspections were conducted in good weather, on foot, during daylight hours, keeping to authorized trails as much as possible. In areas that were difficult to access, binoculars were used to aid in surveying. The Survey123 field form was completed, and management data features were collected on the ArcGIS Field Map. Data collection requirements were as follows.

   - **Baseline Assessment**. The ArcGIS Field Map color-coded features were used to record and differentiate between biological resources, threats, and adaptive management or restoration opportunities. Photos taken during the site inspection were associated with a geo-tagged point, line, or polygon.
   - **Threats Assessment**. Five priority threats were assessed and documented to determine preserve condition using the Survey123 form and the ArcGIS Field Map.
     - Unauthorized access. Any activities outside of the allowed uses in the HMP are considered unauthorized access. This could include mountain bike users building bike jumps within conserved habitat, homeless encampments, and other types of activities resulting in habitat damage.
     - Trail encroachment. Authorized city trails are present in many unmanaged preserves; however, new trails off-shooting from authorized trails, such as from private residences, through or around fenced areas, or shortcuts between segments of authorized trails are considered unauthorized trail encroachment.
     - Trash or dumping. Trash or dumping are not allowed within the HMP preserve system and can include discarded landscape materials, dumping of large objects, litter left behind from homeless encampments, household trash, food wrappers, and bottles.
     - Invasive non-native plants. Detected species identified by the California Invasive Plant Council (Cal-IPC) as invasive, or species known to be a local or regional threat to native flora and vegetation communities were documented. Detections consist of dense stands or a significant population.
     - Erosion. Soil erosion could include surface areas on trails , steep slopes, and open soil areas within scrub communities, where soil material is transported away during rain events, resulting in cracks, crevices, and gullies.
   - **Opportunity Assessment**. Five criteria were assessed and documented to determine adaptive management urgency and opportunities using the Survey123 form.
     - Adaptive management opportunities. Adaptive management opportunities assessed include enhancement, restoration, invasive non-native species control, trash removal, trail repair, erosion control, improving fencing and signage, and increasing public awareness and

education. Opportunities were ranked from 0 to 3, from *no opportunity* to *opportunity present and implementation recommended*.

- Adaptive management urgency. For identified adaptive management opportunities, urgency of implementation was ranked from 0 to 3, from *no urgency* to *urgent.*
- Restoration potential. Areas that could benefit from restoration to support priority habitat or species were mapped on the ArcGIS Field Map and ranked from 0 to 3, from *no opportunity* to *high restoration potential*.
- Grant opportunity. For adaptive management opportunities and restoration potential areas identified, a grant opportunity ranking was assigned 0 or 1, *no opportunity* or *opportunity*.
- Volunteer opportunity. For identified adaptive management opportunities and restoration potential areas, a volunteer opportunity ranking was assigned 0 or 1, *no opportunity* or *opportunity*.

4. **Post-field processing**. Photos and data collected on the ArcGIS Field Map were reviewed for accuracy and the Survey123 data forms were exported and saved onto the Microsoft Teams channel shared between ESA and the city. Adaptive management opportunities and urgency rankings were entered into the *HMP Unmanaged Preserves Matrix* (matrix) on the Microsoft Teams channel shared between ESA and the city. The matrix is a live file where changes can be viewed in real time by all team members.

Results and Discussion

ESA biologists conducted site inspections for 11 unmanaged preserves totaling approximately 667 acres (**Figure 2**). Site inspections occurred from September 30, 2021, to June 8, 2022, across eight site inspection survey days. Examining threats and opportunities, the highest ranked were Santa Fe Trails, La Costa Valley, The Ranch, La Cresta, and Aviara Master Association.

Threats. Four preserves were ranked with urgent adaptive management needs: Santa Fe Trails, La Costa Valley, The Ranch, and La Cresta. These preserves were found to support dense populations and high numbers of invasive non-native species and trash accumulation as well as supporting suitable habitat for sensitive species such as thread-leaved brodiaea (*Brodiaea filifolia*; federally threatened, state endangered). Targeted removal of invasive non-native and competitive species in suitable habitat areas and seeding with native species can establish areas that can help resist invasion from non-native species. Unauthorized access, including trail encroachment, was noted in seven preserves where signage and fencing would help deter unauthorized usages. Detected priority threats are depicted in **Figure 3**.

Opportunities. Ten preserves had three or more adaptive management opportunities. The highest ranked are the four named above, plus Aviara Master Association. Enhancement and restoration opportunities in sensitive vegetation communities such as grasslands that support native grasses and forbs and chaparral that supports Nuttall's scrub oak (*Quercus dumosa*) and Del Mar Manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*) are identified in **Figure 4**. Thatch removal and targeted invasive non-native species control in non-native grasslands not only provides resources for native wildflowers and sensitive species but also reduces the fire fuel load in areas adjacent to neighborhoods.

Threats and opportunities identified across all the preserves are as follows.

Threats

Priority threats were detected on all unmanaged preserves. The priority threats are unauthorized access, trail encroachment, trash or dumping, invasive non-native plants, and erosion. Ten preserves had three or more of the five priority threats, and the remaining preserve had one (**Table 2**).

- Unauthorized access. Three unmanaged preserves had unauthorized experienced access, including illegal mountain bike trails and mountain bike ramps installed in native habitat. The Ranch, Santa Fe Trails, and La Costa Valley were ranked as urgent for adaptive management implementation.
- Trail encroachment. Many unmanaged preserves had well-used authorized trails in good condition. Eight had established unauthorized trails through fenced areas, off-shoot trails from authorized trails, or access trails from neighboring communities. Of the eight unmanaged preserves, four, La Cresta, La Costa Valley, Santa Fe Trails, and The Ranch, were ranked as urgent for adaptive management implementation.
- Trash or dumping. Eight unmanaged preserves had trash or dumping present. Trash or dumping observed consisted predominantly of discarded landscape materials, food wrappers, and bottles. Of the eight unmanaged preserves, three, Santa Fe Trails, La Costa Valley, and La Cresta, were ranked as urgent for adaptive management implementation. Trash accumulation invites unwanted pests and is unsightly, and many of the preserves have downstream connections to sewers and the Pacific Ocean; trash removal will benefit the preserve and neighboring communities.
- Invasive non-native plants. All 11 unmanaged preserves had invasive non-native plant species present. Twenty-two Cal-IPC priority species were documented—five high priority, four moderate-alert, seven moderate priority, and one watch priority. Four additional non-native species were documented due to their proximity to sensitive resources despite not having a Cal-IPC ranking. **Table 3** provides a summary of the invasive non-native plant species detected during site inspections. Invasive species such as purple false brome (*Brachypodium distachyon*), artichoke thistle (*Cynara cardunculus*), and pampas grass (*Cortaderia selloana*) not only impact native species abundance and composition, they also increase fire fuel loads and should be prioritized for targeted removal and control.
- Erosion. Six of the unmanaged preserves had areas of noticeable erosion. Erosion was usually associated with landscape irrigation and areas where unauthorized activities were occurring, such as unauthorized mountain bike trails. Of the six unmanaged preserves, three, The Ranch, Ranch Carrillo Master Association, and La Costa Valley, were ranked as urgent for adaptive management implementation. Erosion control measures provide trail protection and help keep native soil and seeds on-site.

TABLE 2
SITE INSPECTION THREATS AND URGENCY SUMMARY

Threats	Rancho Carrillo Master Assoc.	The Ranch	Santa Fe Trails	La Costa Valley	Continuing Life Communities	Aviara Master Assoc.	La Cresta	Fourth Quarter Properties	Continental Residential	Batiquitos Land LLC	Blackmore Signal
Unauthorized access	1	0	3	3	0	0	0	0	0	0	0
Trail encroachment	1	2	3	2	1	2	0	1	0	0	1
Trash or dumping	1	0	2	3	0	1	2	1	1	0	1
Invasive non-native plants	3	3	3	3	3	3	3	1	2	1	1
Erosion	2	2	1	3	0	1	0	0	0	0	1

Threats Ranking:

0 = No threats detected during site inspection; native species and habitats presumed to be in good condition.
1 = Low priority threats detected during site inspection; native species and habitats are presumed to be in good condition still.
2 = Moderate priority threats detected during site inspection; native species and habitats would benefit from adaptive management.
3 = High priority threats detected during site inspection; native species and habitats require immediate adaptive management.

TABLE 3
INVASIVE NON-NATIVE PLANT SPECIES DETECTED

Common Name	Scientific Name	Cal-IPC Rating[1]	No. of Preserves Species Observed
Arundo	*Arundo donax*	High	3
Red Brome	*Bromus rubens*	High	3
Iceplant	*Carpobrotus edulis*	High	5
Pampas Grass	*Cortaderia sellonana*	High	7
Sweet Fennel	*Foeniculum vulgare*	High	3
Algerian Ivy	*Hedera canariensis*	High	2
Tamarisk	*Tamarix ramosissima*	High	4
Purple false brome	*Brachypodium distachyon*	Moderate - Alert	2
Stinkwort	*Dittrichia graveolens*	Moderate - Alert	2
Treasure Flower	*Gazania linearis*	Moderate - Alert	1
Brazilian pepper tree	*Schinus terebinthifolia*	Moderate - Alert	4
Black Mustard	*Brassica nigra*	Moderate	2
Ripgut Grass	*Bromus diandrus*	Moderate	3
Tocalote	*Centaurea melitensis*	Moderate	1
Artichoke Thistle	*Cynara cardunculus*	Moderate	4
Shortpod mustard	*Hirschfeldia incana*	Moderate	4
Tree Tobacco	*Nicotiana glauca*	Moderate	2
Mexican Fan Palm	*Washingtonia robusta*	Moderate	4
Soft Chess	*Bromus hordaceus*	Limited	4
Veldt Grass	*Ehrharta longiflora*	Limited	1
Canary Island Date palm	*Phoenix canariensis*	Limited	5
Russian thistle	*Salsola tragus*	Limited	3
Peruvian Pepper Tree	*Schinus molle*	Limited	3
Sydney Golden Wattle	*Acacia longifolia*	Watch	6
Eucalyptus	*Eucalyptus* spp.	Watch	5

[1] Cal-IPC Rating:

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

Opportunities

Adaptive management, enhancement, restoration, and volunteer opportunities exist across the unmanaged preserves (**Table 4**). Adaptive management recommendations to address priority threats were discussed in the Threats section above. Additional adaptive management recommendations to improve overall preserve condition are described below:

- Enhancement. Thatch removal, non-native tree removal, trail repair, erosion control, and signage and fencing to control unauthorized access and activities. Signage and public education could increase public awareness such that preserve users value onsite natural resources and deter them from engaging in unauthorized activities such as constructing bike jumps and creating new unauthorized trails at The Ranch, Santa Fe Trails, La Cresta, La Costa Valley, and Aviara Master Association.
- Restoration. Thatch removal, non-native species removal in areas with the potential to support sensitive species, trail repair, planting and seeding with native and sensitive species. Signage and public education would be beneficial at The Ranch, La Cresta, La Costa Valley, and Santa Fe Trails with urgent needs as well as Aviara Master Association where it is located next to Batiquitos Lagoon.
- Volunteer opportunities. Trail repair, non-native species removal, trash and landscape material removal, and signage and public education. Volunteer opportunities were observed in the 11 preserves listed in Table 4 and would help with preserve management and serve as a means for public outreach through homeowners associations (HOAs).
- Grant opportunities. Grant opportunities exist for preserve management and can include non-native grass and forb removal and control for sensitive species restoration and enhancement (e.g., San Diego thornmint [*Acanthomintha ilicifolia*], thread-leaved brodiaea, native grasslands). Non-native grass removal helps reduce fuel loads for fires and creates open areas for native species recruitment, which is an important component to native habitat management. In riparian areas, removal of non-native trees and invasive non-native arundo (*Arundo donax*) provides opportunities for nesting birds, invertebrates, and native plants to become established. Grants can help provide funds for trash removal, trail repair, and public (HOA) outreach and education.

Next Steps

The unmanaged preserves connect native habitats, support sensitive resources, and provide recreational opportunities to residents. These preserves offer a rich diversity of species and habitats that need adaptive management to maintain ecological function and prevent them from becoming a source of invasive non-native species as well as from preventing unauthorized activities that can impact native species. Seeking out grants and engaging volunteers are essential for the long-term management of the preserves. Invasive non-native species control, unauthorized trail repair, and trash removal are the priority actions recommended for the high-urgency ranked preserves: Santa Fe Trails, La Costa Valley, The Ranch, La Cresta, and Aviara Master Association. These actions, in addition to increased signage, can be implemented with volunteers to increase public awareness and outreach to engage users in preserve stewardship.

TABLE 4
SITE INSPECTION ADAPTIVE MANAGEMENT OPPORTUNITIES SUMMARY

Opportunities	Rancho Carrillo Master Assoc.	The Ranch	Santa Fe Trails	La Costa Valley	Continuing Life Communities	Aviara Master Assoc.	La Cresta	Fourth Quarter Properties	Continental Residential	Batiquitos Land LLC	Blackmore Signal
Enhancement /Restoration	3	3	3	2	3	3	3	2	2	1	2
Volunteer Opportunities	1	1	1	1	1	1	1	0	1	1	0
Grant Opportunities	1	1	1	1	1	1	1	1	1	0	0
Urgency	2	3	3	3	1	2	3	2	2	1	1

Adaptive Management Opportunities Ranking:

Adaptive management = 0–3, from *no opportunity* to *opportunity present and implementation recommended*
Adaptive management urgency = 0–3, from *no urgency* to *urgent*
Restoration potential = 0–3, from *no opportunity* to *high restoration potential*
Grant opportunity = 0 or 1, *no opportunity* or *opportunity*
Volunteer opportunity = 0 or 1, *no opportunity* or *opportunity*

ESA will continue to conduct site inspections of the remaining prioritized unmanaged preserves in 2023 to assess baseline conditions, threats, and opportunities. The results will be used to prioritize preserves for adaptive management when resources and funding are available. Future site inspections will prioritize preserves that currently or historically have supported sensitive natural resources, are adjacent to other conserved open spaces, and/or are known or have the potential to support highly invasive non-native species such as Ward's weed (*Carrichtera annua),* arundo, and purple false brome. As Preserve Steward, ESA will continue coordinate with the city and use the monitoring results to inform and make directed recommendations regarding high-priority threats and the associated adaptive management decisions needed to maintain a healthy HMP preserve system.

References

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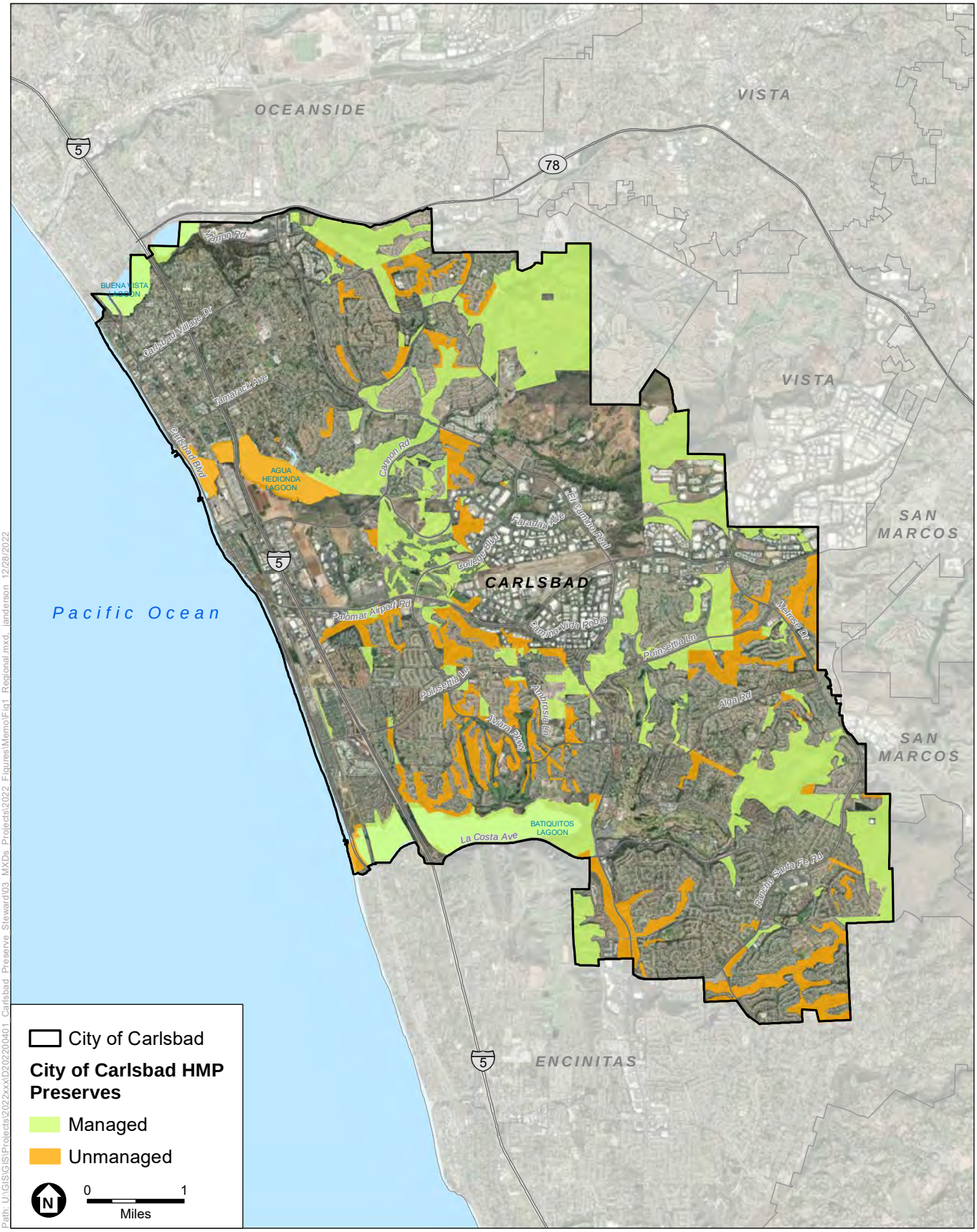
Attachment A
Figures

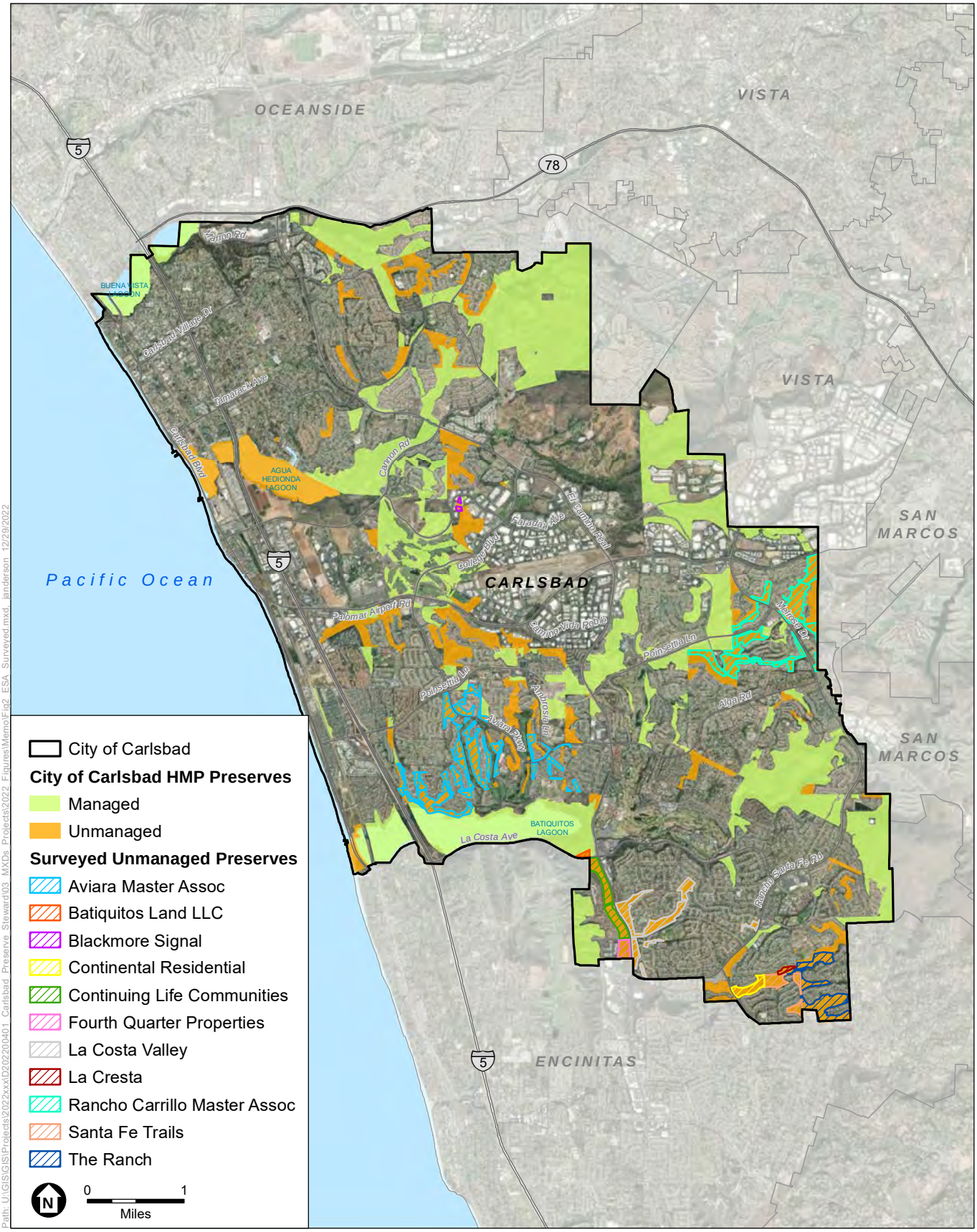


SOURCE: SanGIS, 2022; City of Carlsbad, 2021.

HMP Unmanaged Preserves Site Inspection Program 2021–2022 Summary

Figure 1
Managed and Unmanaged Preserves in City of Carlsbad

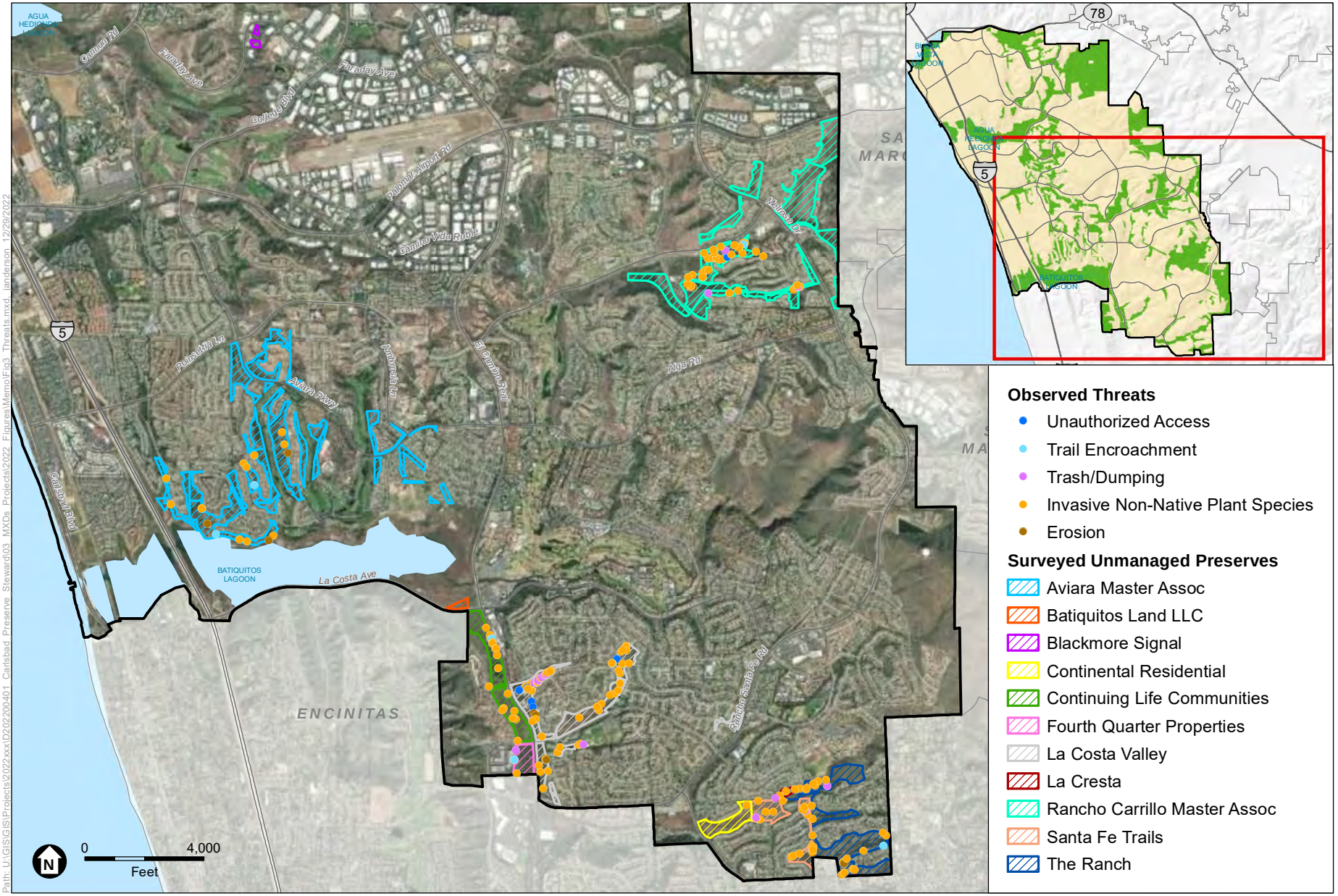
ESA



SOURCE: ESRI; SanGIS, 2022; City of Carlsbad, 2021.

Figure 2
Surveyed Preserves

ESA

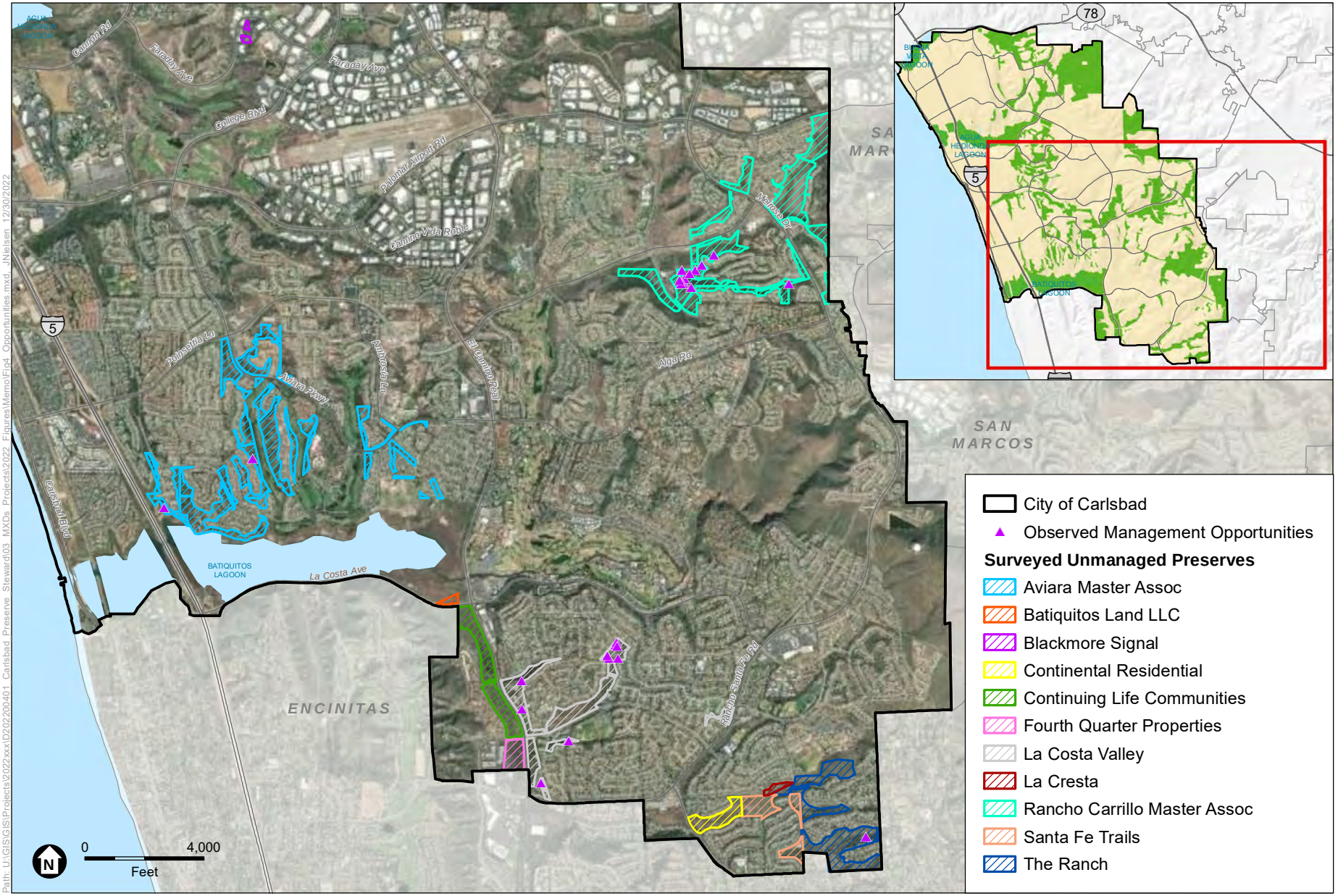


SOURCE: ESRI; SanGIS, 2022; City of Carlsbad, 2021; ESA, 2022.

HMP Unmanaged Preserves Site Inspection Program 2021–2022 Summary

Figure 3
Observed Threats

ESA



SOURCE: ESRI; SanGIS, 2022; City of Carlsbad, 2021; ESA, 2022.

HMP Unmanaged Preserves Site Inspection Program 2021–2022 Summary

Figure 4
Observed Opportunities

ESA

Appendix E

Village H Wildlife Movement Monitoring Survey Report, 2022

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memorandum

date	February 16, 2023
to	Rosanne Humphrey, City of Carlsbad
cc	Terah Donovan, Environmental Science Associates
from	Adrienne Lee, Environmental Science Associates Karla Alcaraz, Environmental Science Associates
subject	City of Carlsbad Village H Wildlife Movement Study Summary

This memorandum summarizes wildlife movement monitoring studies conducted at Village H from June 28, 2019, to December 13, 2022, capturing changes in allowable uses from specific events such as the trail opening to the public on August 1, 2019, and trail closure during the COVID-19 pandemic from March 23, 2020, to May 4, 2020. Wildlife movement monitoring studies included remote wildlife cameras, roadkill monitoring along streets bordering Village H, and dog waste studies.

Introduction

An undeveloped property known as "Village H" was acquired by the City of Carlsbad (city) as part of a 2013 legal settlement. The property was deeded to the city by Presidio Cornerstone QC, LLC, and was formally accepted by Carlsbad City Council in January 2019. The property is bisected by Carlsbad Village Drive, which divides the property into a 36.1-acre area to the north and a 24.8-acre area to the south. The northern area is an existing hardline within the Carlsbad Habitat Management Plan (HMP) preserve, set aside and protected in perpetuity by a conservation easement in 2006. It is under long-term management by the Center for Natural Lands Management. The 23.9-acre southern section of Village H consists of a 2.8-acre recreational vehicle storage area, 11.1 acres of undeveloped open space (including an area previously designated for a community facility), and two HMP hardline preserve areas (a 4.2-acre area to the southwest and a 4.4-acre area to the southeast, **Figure 1, Study Area Location**; see figures at the end of this memorandum). For the purpose of this memorandum, *study area* refers to southern section of Village H.

The Village H area is part of an important wildlife movement linkage (Link B) between core habitat areas (Core #2 and Core #4) identified during the planning phase of the HMP (City of Carlsbad 2004). Village H was identified as an important wildlife movement corridor (M1) in a citywide wildlife movement study conducted in 2015 (City of Carlsbad et al. 2015). The corridor connects the Buena Vista Creek Ecological Reserve southward through Robertson Ranch West to Agua Hedionda Lagoon, and potentially eastward to Robertson Ranch East and the Carlsbad Highlands Ecological Reserve/Lake Calavera area, as shown in **Figure 2, Carlsbad HMP Linkages**. Four "pinchpoints" were identified in the immediate vicinity of Village H (ESA 2019) (**Figure 3,**

Pinchpoints and Potential Wildlife Movement Corridors). Pinchpoints are areas where animal movement becomes funneled into specific locations within linkages due to the lack of alternative movement routes. Channels and natural drainages function as natural wildlife corridors, but when these areas intersect with roadways, with or without underpasses and culverts, movement along these areas enters a pinchpoint. Pinchpoint M1-1 has a small (2-foot-wide) culvert underneath the road, from the north side of Carlsbad Village Drive. The culvert does not go directly south into the Village H property, resulting in an at-grade crossing. M1-2 to the east has a large (12- to 15-foot-wide) culvert under Tamarack Avenue, which was gated on both sides at the time of this study, resulting in an at-grade crossing. M1-3, further east, is an at-grade crossing over Glasgow Drive. M1-4, south of Village H, has a 4-foot-wide culvert under Tamarack Avenue connecting a small drainage area south to Robertson Ranch Preserve. An additional (3-foot-wide) culvert (not identified as a pinchpoint in the 2015 wildlife movement study) is located under Pontiac Drive, just east of M1-4.

When the study area was privately owned, it was used by local residents with off-leash dogs. When the city took ownership of the property, the historic on-site trail was formalized and opened to the public on August 1, 2019. Off-leash dog use was no longer allowed because the city does not allow off-leash dogs on city trails or within HMP hardline areas, as HMP hardline areas are managed for habitat and native wildlife. Several residents expressed a desire to continue to use this area for off-leash dogs. The presence of humans and domestic dogs deters wildlife and shifts their distribution to avoid human activity (Frid and Dill 2002). Wildlife adjust their time of use to be more active in the night to avoid human daytime activities (Gaynoret al. 2018). This can interfere with their ability to forage and breed.

The purpose of wildlife movement monitoring studies at Village H was to (1) collect quantitative data on wildlife presence, humans, and domestic dogs on Village H, (2) determine if wildlife are being killed on the road while moving into or out of the site, (3) qualitatively evaluate wildlife movement patterns, and (4) assess the amount and location of dog waste left on-site, which can deter wildlife from using the site, and (5) assess the amount of dog waste left off trail as a proxy for off-leash dog use within Village H. This information will help the city evaluate the current use by wildlife and changes in wildlife behavior potentially caused by changes in the allowable uses of the Village H site.

Data collection spanned from June 28, 2019, to December 13, 2022, capturing changes in allowable uses from specific events such as the trail opening to the public on August 1, 2019, and trail closure during the COVID-19 pandemic from March 23, 2020, to May 4, 2020. Memorandums discussing the trail opening to the public and the trail closure during the COVID-19 pandemic and their effects on wildlife movement within Village H were previously prepared for the City of Carlsbad (ESA 2019, 2020). The purpose of this memorandum is to present all wildlife movement studies conducted on Village H to date, summarize trends detected, and provide management recommendations.

Methodology

Remote Wildlife Cameras

A total of 22 remote wildlife cameras were installed at Village H over the course of the study period to monitor the diversity of wildlife species using the site and determine potential wildlife movement patterns. The first wildlife camera was installed on June 25, 2019, and the last wildlife camera was removed on November 17, 2022. The duration of monitoring for each wildlife camera varied as some cameras were vandalized or stolen and some

camera locations did not detect wildlife and were moved to new locations. Specific data on the location and duration of monitoring at each remote wildlife camera are provided in **Table 1** and locations are depicted in **Figure 4, Remote Wildlife Camera Locations**. Target species for this study were coyotes and bobcats. These are wider-ranging species than smaller mammals. Movement of these species on a broad scale could help the city evaluate the wildlife movement functionality of the preserve system.

TABLE 1
REMOTE WILDLIFE CAMERA LOCATIONS

Camera	Deployment Date	Monitoring Duration	Location
VH1	6/25/2019–11/8/2019	136 days	Lat: 33.16580357° Long: -117.30507829°
VH2	6/25/2019–8/10/2019	42 days	Lat: 33.16459953° Long: -117.30472425°
VH3	6/25/2019–8/10/2019	44 days	Lat: 33.16199145° Long: -117.30468584°
VH4	6/25/2019–8/10/2019	11 days	Lat: 33.16354744° Long: -117.30476386°
VH5a	6/25/2019–12/19/19	177 days	Lat: 33.16635432° Long: -117.30534393°
VH5b	6/30/21–11/17/2022	505 days	Lat: 33.163276° Long: -117.303591°
VH6	6/25/2019–10/2/2019	99 days	Lat: 33.16466320° Long: -117.30068579°
VH7	6/25/2019–12/13/2019	174 days	Lat: 33.16436649° Long: -117.30207108°
VH8a	6/25/2019–11/8/2019	136 days	Lat: 33.15654051° Long: -117.30705798°
VH8b	11/8/2019–7/3/2020	62 days	Lat: 33.156719° Long: -117.306682°
VH9	7/25/2019–11/8/2019	106 days	Lat: 33.166116° Long: -117.304649°
VH10	7/25/2019–8/10/2019	14 days	Lat: 33.164600° Long: -117.304724°
VH11	8/23/2019–8/28/2019	5 days	Lat: 33.161924° Long: -117.304864°
VH12	8/23/2019–8/28/2019	5 days	Lat: 33.161811° Long: -117.304715°
VH13	9/12/2019–12/19/2019	98 days	Lat: 33.165786° Long: -117.304340°
VH14	9/12/2019–10/2/2019	20 days	Lat: 33.1564289° Long: -117.304627°
VH15	9/19/2019–1/17/2020	112 days	Lat: 33.164716° Long: -117.300571°
VH16	9/19/2019–1/17/2020	112 days	Lat: 33.164437° Long: -117.300078°
VH17a	11/8/2019–4/30/2020	112 days	Lat: 33.161395° Long: -117.303399°
VH17b	5/28/2021–11/17/2022	538 days	Lat: 33.161395° Long: -117.303399°
VH18	12/13/2019–5/21/2020	49 days	Lat: 33.165401° Long: -117.305199°
VH19	12/13/2019–12/30/2019	16 days	Lat: 33.165195° Long: -117.304995°
VH20	12/13/2019–7/3/2020	49 days	Lat: 33.165137° Long: -117.304918°
VH21a	11/8/2019–12/13/2019	34 days	Lat: 33.164612° Long: -117.304370°
VH21b	7/9/2020–1/6/2021	181 days	Lat: 33.163550° Long: -117.304069°
VH21c	1/6/2021–11/17/2022	680 days	Lat: 33.163240° Long: -117.303070°

All cameras were positioned approximately 1 to 3 feet off the ground to best record all potential wildlife species and signs of movement on and off the property. Cameras were set to have “low sensitivity” to movement such that anything from a small bird to a large coyote would likely trigger the cameras to start taking videos or photographs, but vegetation moving in the wind would not. To prevent vandalism and theft, each camera was locked inside specialized security boxes and the words “City of Carlsbad” and “wildlife movement study” were written on the boxes to further deter theft and inform the public. Wildlife cameras were either bolted to 4-foot-tall

steel posts dug into the ground, cabled to a chain-link fence and angled toward a culvert, or cabled onto a tree. The cameras were oriented away from the sun (to the extent practical) to protect the lens from over-exposure and positioned to capture videos or photographs of wildlife walking along a trail, headed either toward or away from the wildlife camera.

Once installed, all wildlife cameras were turned on to record and capture videos or photographs continuously (24 hours), once triggered. Each motion trigger would result in one photograph or a 10-second video. Unique camera detections were defined as a photograph or video triggered at least 30 minutes apart. The wildlife cameras within the study area were checked at least once a week by city staff and then reduced to once a month by Environmental Science Associates (ESA) staff to confirm that each camera was still in place and in working order and memory cards and batteries were switched out as necessary. Videos and photographs were then reviewed and categorized based on the species detected. Videos and photographs of human activity and/or dogs were categorized as well to make general assumptions regarding the amount of human and/or dog traffic within the study area. Wildlife camera data from June 25, 2019, to November 17, 2022, were analyzed; a summary of the results can be found in **Attachment A**.

Roadkill Monitoring

Roadkill was studied to determine if animals were being hit by cars while traveling over a road to enter or leave the site. To ensure all four pinchpoints were monitored, portions of Tamarack Avenue, Carlsbad Village Drive, and Glasgow Avenue that border Village H were included in the study area (**Figure 5, Roadkill Monitoring Results**). Roadkill monitoring began July 25, 2019, and ended on July 25, 2020, with a minimum of three surveys completed per week. For the full list of survey dates, see **Attachment B**.

ESA biologists, volunteers, and a city staff member conducted the monitoring. The survey area was monitored by walking or driving the roadkill monitoring survey area slowly and scanning the entire roadway for roadkill. If something was not identifiable from the car, the surveyor wore a safety vest and walked the survey area using binoculars to scan the road. If roadkill was detected, the surveyor would take a photo when road conditions were safe and upload the photo onto the citizen scientist mobile application iNaturalist[1] to create an "observation" within the University of California, Davis California Roadkill Observation System (CROS) Project (iNaturalist 2022). Once the observation was recorded, the surveyor called the city's Public Works department for animal disposal pickup.

Dog Waste Study

The purpose of this study was to determine how much dog waste is being left behind each week (number and weight) and where (e.g., native habitat, on or near the trail). Dog waste stations were installed as part of the trail improvements, so this study captures dog waste left by dog owners along a leash-only trail and surrounding area that is off-limits to dogs. Surveyors walked meandering transects throughout the Village H site (western parcel only) in areas that were open enough to walk through. When dog waste, coyote scat, or tennis balls (i.e., dog toys) were encountered, these locations were recorded using the ArcGIS Collector (Collector app) mobile application. Dog waste, coyote scat, tennis balls, and any litter found were then collected to be thrown away at the end of each

1 iNaturalist. Available from https://www.inaturalist.org.

survey. Collected dog waste was weighed at the end of each collection period. Coyote scat was distinguished from dog waste by the presence of berries, animal bones, and/or large amounts of fur.

Surveys were conducted approximately every other week from August 28, 2019, to October 23, 2019, and then reduced to once a month in response to the COVID-19 pandemic, through December 13, 2022. Note that the initial survey on August 28, 2019, includes all previously uncollected waste from the site; therefore, only subsequent collections were used to determine weekly and monthly coyote scat and waste left by dog owners.

Results

Remote Wildlife Cameras

The wildlife cameras captured data spanning a period of 844 days. Species detected at the 22 wildlife camera locations included coyote (*Canis latrans*), bobcat (*Lynx rufus*), skunk (*Mephitis mephitis*), rabbit (*Sylvilagus spp.*), California ground squirrel (*Otospermophilus beecheyi*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), various bird species, various rodent species, off-leash dogs, on-leash dogs, and humans. The most common wildlife species detected at Village H were coyotes, small mammals (rodents/rabbits/raccoons), and birds. Based on wildlife camera data, updated presumed wildlife movement patterns within Village H are depicted in **Figure 6, Updated Wildlife Movement Corridors**. Representative photographs of wildlife species detected are included in **Attachment C**.

Roadkill Monitoring

A total of 15 roadkill occurrences were detected during the 129 survey dates from July 25, 2019, to July 25, 2020. All roadkill observations ranged from birds to small mammals. All roadkill observations and their associated survey dates and surveyor information are listed in **Table 2**, and locations of all roadkill observations are displayed in Figure 5.

TABLE 2
VILLAGE H ROADKILL DETECTIONS

Date	Surveyor	Species
8/28/2019	A. Sullivan	Opossum
9/19/2019	H. Swarthout	Opossum
10/23/2019	A. Sullivan	Rabbit
12/5/2019	A. Sullivan	Rabbit and Bird
12/13/2019	H. Swarthout	Hawk
12/15/2019	K. Merrill	Barn Owl
12/18/2019	A. Lee	Barn Owl
12/26/2019	A. Sullivan	Skunk
12/27/2019	H. Swarthout	Rabbit
12/31/2019	A. Sullivan	Bird
1/24/2020	H. Swarthout	Hawk
2/9/2020	K. Merrill	California Quail
3/8/2020	K. Merrill	Rabbit
3/12/2020	H. Swarthout	Squirrel
7/25/2020	K. Merrill	Rabbit

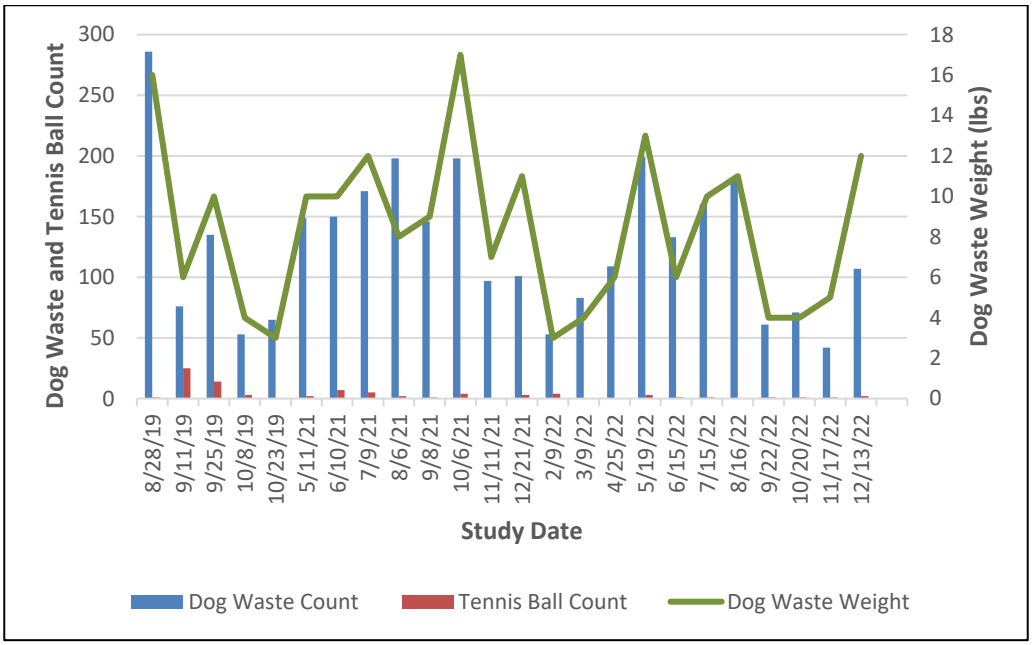
Dog Waste Study

A total of 22 dog waste monitoring visits have been conducted within the study area at the time of this memo. Apart from the general decline since the initial collection date, the total number of dog waste piles and the weight of dog waste has fluctuated between collection days. **Table 3** and **Graphs 1** and **2** detail the total number of dog waste piles, weight of dog waste in pounds, coyote scat, and tennis balls detected during each study. Locations of dog waste, coyote scat, and tennis balls observed during all monitoring visits are depicted in **Figure 7, Dog Waste Study Results**. Representative photographs of dog waste study collections are included in **Attachment D**.

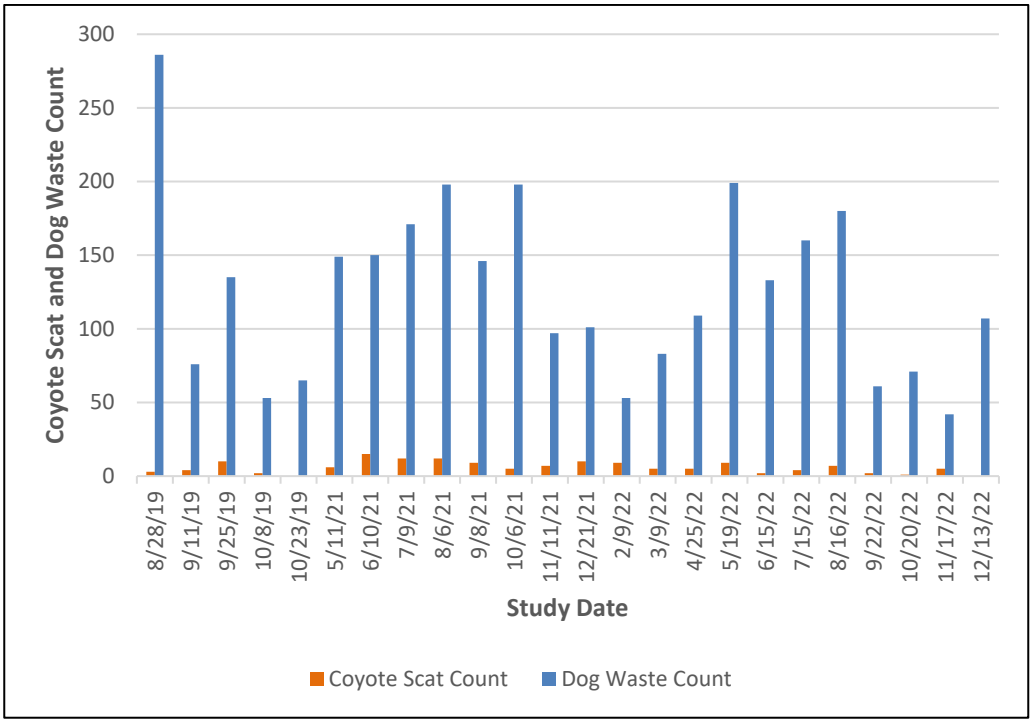
TABLE 3
VILLAGE H DOG WASTE STUDY RESULTS

Date	Pounds of Dog Waste	Dog Waste Count	Coyote Scat Count	Tennis Ball Count
8/28/2019	16	286	3	1
9/11/2019	6	76	4	25
9/25/2019	10	135	10	14
10/8/2019	4	53	2	3
10/23/2019	3	65	0	3
5/11/2021	10	149	6	2
6/10/2021	10	150	15	7
7/9/2021	12	171	12	5
8/6/2021	8	198	12	2
9/8/2021	9	146	9	1
10/6/2021	17	198	5	4
11/11/2021	7	97	7	0
12/21/2021	11	101	10	3
2/9/2022	3	53	9	4
3/9/2022	4	83	5	0
4/25/2022	6	109	5	0
5/19/2022	13	199	9	3
6/15/2022	6	133	2	1
7/15/2022	10	160	4	1
8/16/2022	11	180	7	0
9/22/2022	4	61	2	1
10/20/2022	4	71	1	1
11/17/2022	5	42	5	1
12/13/2022	12	107	0	2
Total	**201**	**3,023**	**144**	**81**

GRAPH 1
VILLAGE H DOG WASTE STUDY RESULTS



GRAPH 2
VILLAGE H DOG WASTE STUDY RESULTS: COYOTE SCAT VERSUS DOG WASTE



Discussion

Wildlife monitoring studies at Village H ran from June 28, 2019, to December 13, 2022, for a total of 1,265 days. Using a subset of the data, previous memorandums summarized wildlife monitoring results related to specific changes in public use – trail opening to the public in August 2019 and trail closure from March 23, 2020, to May 4, 2020, during the COVID-19 pandemic (ESA 2019, 2020). Relevant results from these memorandums are referenced below to provide a holistic discussion on wildlife presence and movement patterns at Village H. Results from the three wildlife monitoring studies provide a baseline for the types of wildlife and their movement patterns at Village H.

Remote Wildlife Cameras

Remote wildlife cameras were installed to identify wildlife species utilizing Village H and general movement patterns, such as frequently used pathways and time of usage. Previous memorandums concluded that wildlife detections decreased after Village H reopened to the public and also during the 30-day trail closure during the COVID-19 pandemic (ESA 2019, 2020), suggesting that wildlife species', particularly mammals, use of Village H was negatively impacted by public use. The detection times for all wildlife species, other than birds, were predominantly at night (see individual camera graphs provided in Attachment A), suggesting that wildlife species movement patterns may be responding to increased daytime preserve use by humans and associated on-leash dogs. This result was further supported by the fact that detections for all wildlife species at Camera 18 (located on the Village H trail) shifted from both daytime and nighttime prior to the trail closure to predominantly daytime during the trail closure due to reduced human and domestic dog use during the COVID-19 pandemic and stay-at-home order (ESA 2020). This finding is consistent with the 2018 Gaynor et al. global meta-analysis that concluded humans have a strong effect on the daily patterns of wildlife activity by influencing animals to become more nocturnal to avoid human activity (Gaynor et al. 2018). Note that wildlife movement studies were not conducted prior to city ownership; therefore, these results cannot be compared to previous conditions onsite before the trail was established. However, the site had been heavily used by people and off-leash dogs prior to city ownership.

Wildlife cameras also confirmed and provided additional local movement patterns within Village H (Figure 6). Coyotes were the most common wildlife species detected and were documented traveling into and out of the Village H property under the wrought-iron gate on the northern boundary of the site adjacent to Carlsbad Village Drive, close to Victoria Avenue. East-west movement between pinchpoints M1-1 and M1-3, through the two east-west movement pathways on Figure 6, seems to be well established based on camera data. Bobcats and smaller mammals (mainly skunks) were documented using the undercrossing at pinchpoint M1-2. Coyotes, bobcats, and smaller mammals (mainly raccoons, opossums, and skunks) were documented using the brow ditch between the chain-link fencing associated with the RV storage area and Carlsbad Municipal Water District (CMWD) property. This movement pathway is likely the main pathway wildlife are using to move between the two HMP hardline preserve areas. Very little wildlife was captured at the M1-4 pinchpoint located at the southern end of the off-site preserve.

Roadkill Monitoring

Tamarack Avenue and Carlsbad Village Drive are high-use vehicular roads. Tamarack is a four-lane road with a speed limit of 35 miles per hour and Carlsbad Village Drive is a four-lane road with a speed limit of 40 miles per hour; therefore, these roads are expected to be a barrier for wildlife movement through direct mortality from

vehicle collisions. Roadkill monitoring was conducted along portions of Tamarack Avenue, Carlsbad Village Drive, and Glasgow Avenue that border Village H to determine if these areas were a pinchpoint for medium to large mammal species, as these species demonstrate longer-range wildlife movement patterns and are likely more threatened by habitat fragmentation from roads (Ng et al. 2004). All roadkill observations detected during the roadkill monitoring period were small mammals or birds, suggesting that medium to large mammal species, such as coyote, may be able to cross pinchpoint M1-1 across Carlsbad Village Drive at street level relatively successfully, as documented on remote wildlife cameras.

Dog Waste Studies

As the study area was historically used by local residents and off-leash dogs, dog waste studies were initiated to gather data on how reopening Village H to the public impacted on-the-ground conditions in the form of dog waste left along trails and within adjacent open space areas. Once the city trail was opened to the public, a dog waste station was installed and on-leash dogs were allowed only on the authorized trail within Village H. A significant amount of dog waste has been picked up during the entire study period, suggesting that many dog owners using Village H are not picking up after their dogs. Most dog waste was documented either on or within 3 feet of the city trail, suggesting that, in general, dogs are likely leashed and not entering the adjacent open space and HMP hardline preserve areas. An exception to this is the grassy area just south of Carlsbad Village Drive, between the trailhead and residences to the east. A high number of dog waste piles were consistently observed between the city trail and residences to the east, and numerous tennis balls (i.e., dog toys) were found in the western half of the same grassy area by the trailhead, indicating that unauthorized off-leash dogs are still an issue on-site and a threat to the adjacent coastal sage scrub habitat. If the total number of dog waste detections is used as a proxy for public usage, these results suggest that public use within Village H varies across months, assuming dog owners who do not pick up dog waste never pick up dog waste. Higher amounts of dog waste were present during the summer months (June, July, and August) versus lower amounts of dog waste collected during the fall months (September, October, and November). There is a general decline in dog waste since the first collection date which included all previously uncollected dog waste from the site. It should be noted that some dog waste might remain on-site as it is likely covered by the dense layer of leaf litter in addition to older waste that has likely degraded, and these exceptions are not represented in the results.

ESA and volunteers continue to conduct dog waste studies within the study area, with the next survey date planned for February 28, 2023.

Recommendations

Based on the trends detected from the results presented above, we recommend the following:

- Install additional dog waste stations: Dog waste continues to be detected during monthly dog waste studies. Installing additional dog waste stations along the city trail could increase accessibility for dog owners and may help decrease the overall amount of dog waste present on Village H.
- Install additional signage: Installing signage at the start of the city trail stating allowed public uses, signage reminding dog owners to pick up after their dogs, and signage along the boundary of the adjacent open space and HMP hardline preserve areas could help deter dog owners from allowing their dogs to be off-leash, encourage them to pick up after their dogs, and define areas that are off-limits to the general public and their pets, respectively.

- Maintain wildlife movement corridors: Wildlife camera data confirmed wildlife movement patterns on Village H. These movement corridors should be maintained to ensure wildlife can continue to enter, utilize, and leave the site effectively.
- Increase public engagement: Engaging the public and educating them on the HMP preserve system, Village H, and the wildlife that use it may help spread awareness of why and how to properly dispose of dog waste in an effort to promote accountability and stewardship of Village H.

References

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Gaynor, K.M., C.E. Hojnowski, N.H, Carter, and J.S. Brashares. 2018. *The influence of human disturbance on wildlife nocturnality*. Science 360: 1232-1235.

iNaturalist. 2022. California Roadkill Observation System (CROS). Available from: https://www.inaturalist.org/projects/california-state-roadkill

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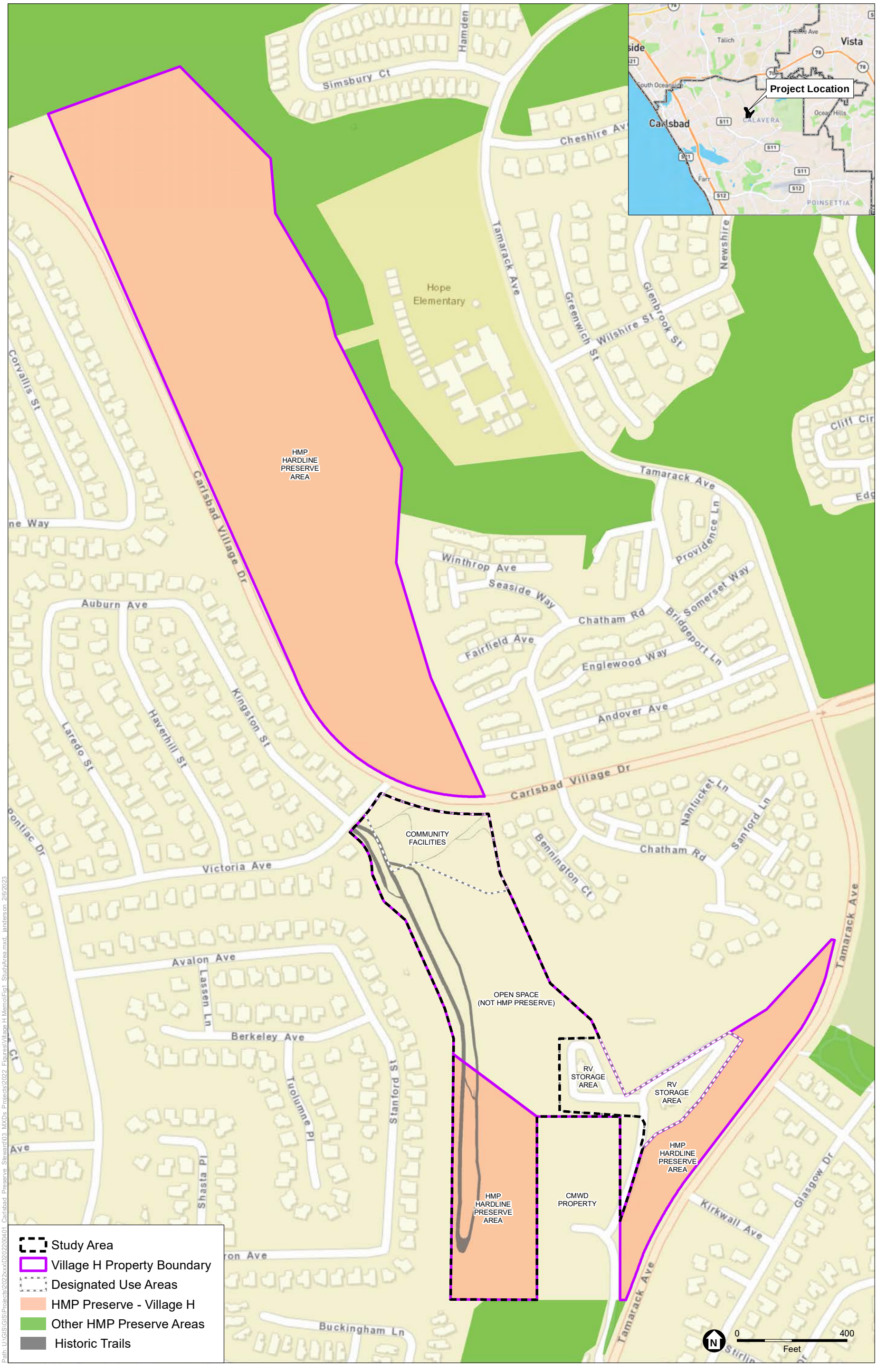
Figures

Figure 1 – Study Area Location
Figure 2 – Carlsbad HMP Linkages
Figure 3 – Pinchpoints and Potential Wildlife Movement Corridors
Figure 4 – Remote Wildlife Camera Locations
Figure 5 – Roadkill Monitoring Results
Figure 6 – Updated Wildlife Movement Corridors
Figure 7 – Dog Waste Study Results

Attachments

A – Village H Remote Wildlife Camera Full Results
B – Village H Roadkill Survey Dates and Results
C – Village H Representative Photographs of Wildlife Detected on Remote Wildlife Cameras
D – Village H Dog Waste Studies Representative Photographs



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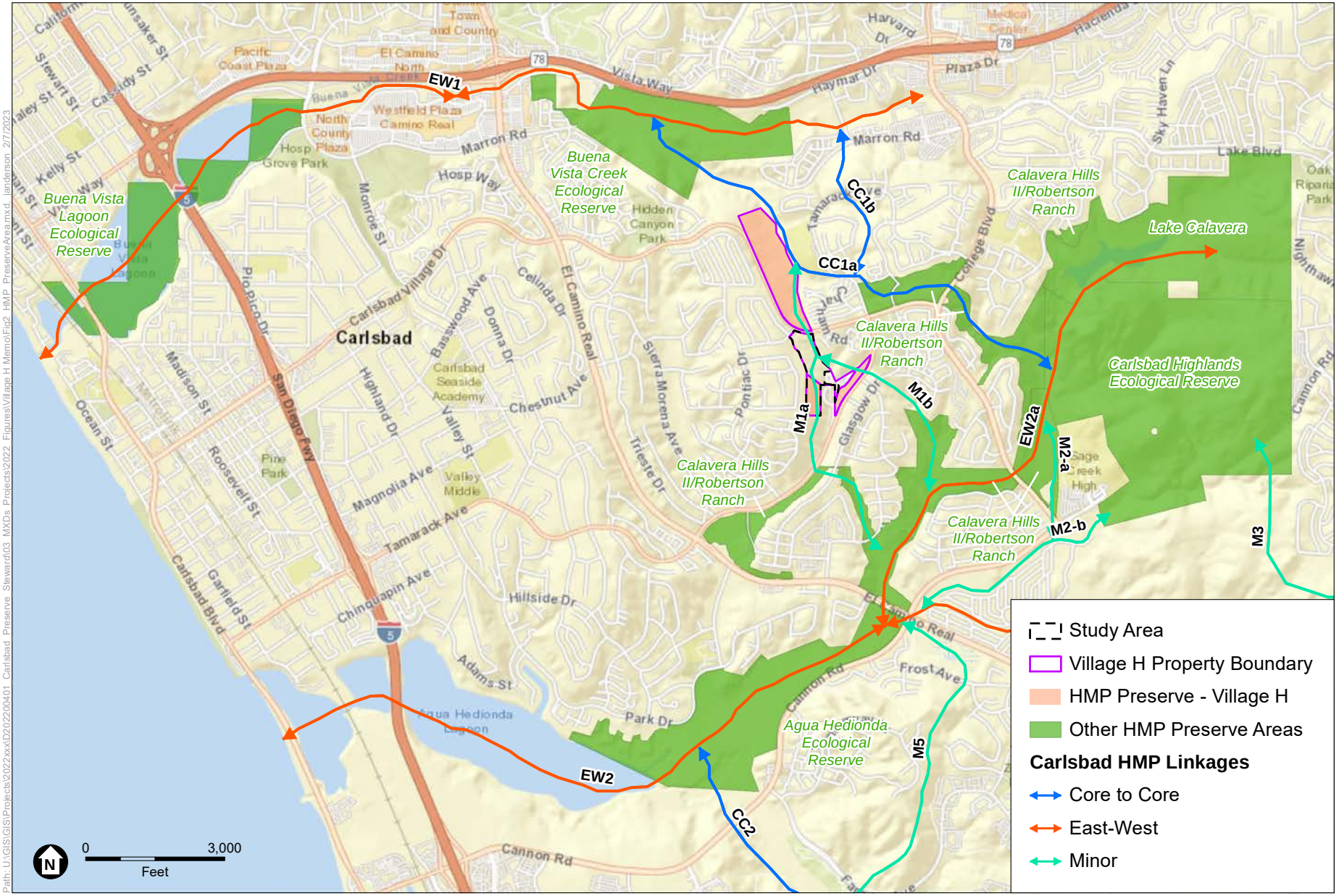
SOURCE: ESRI

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 1
Study Area Location

ESA

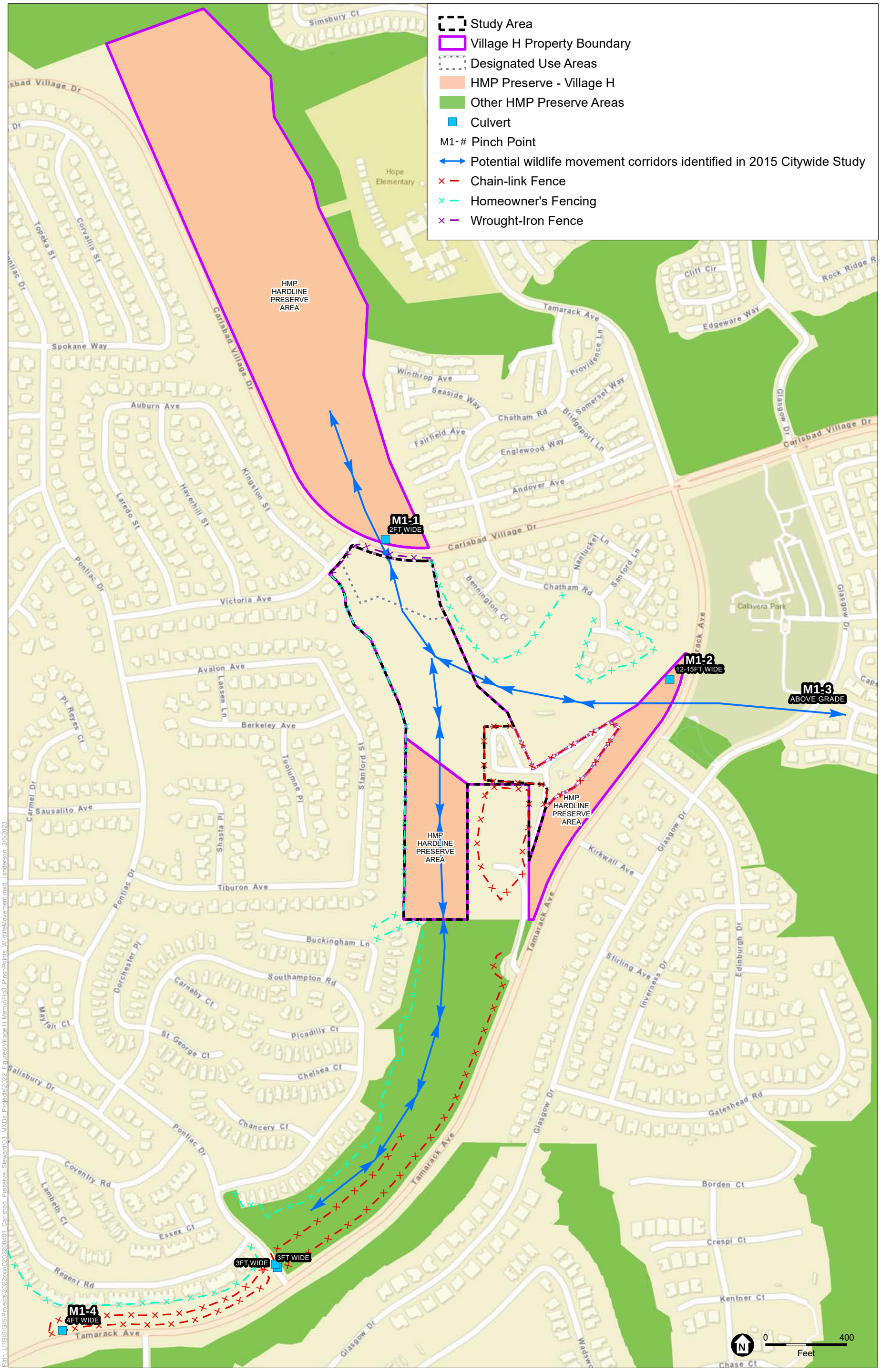


SOURCE: ESRI; City of Carlsbad, Environmental Science Associates and Center for Natural Lands Management. 2015.

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 2
Carlsbad HMP Linkages

ESA

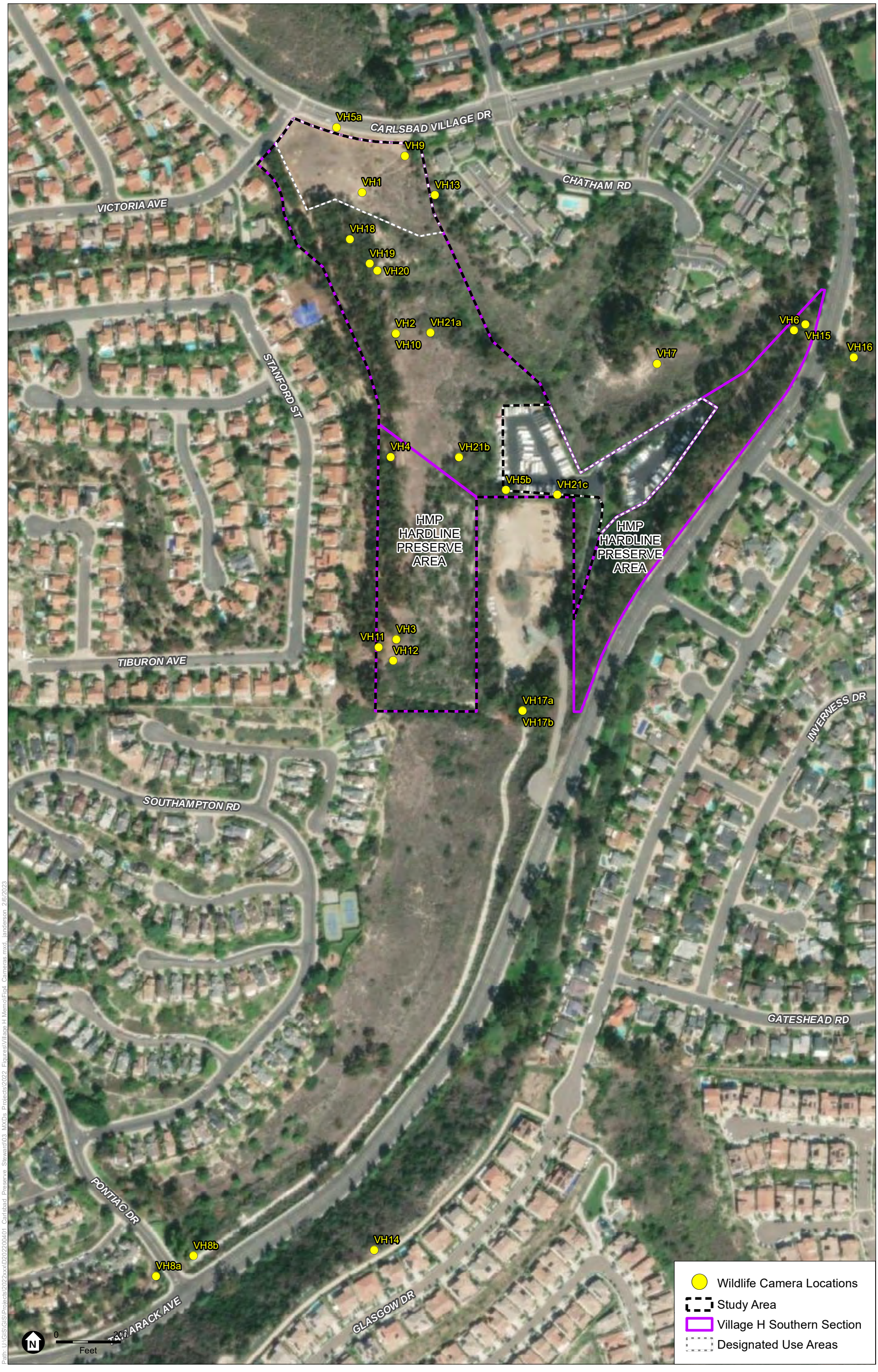


SOURCE: ESRI; City of Carlsbad, Environmental Science Associates and Center for Natural Lands Management. 2015.

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 3
Pinchpoints and Potential Wildlife Movement Corridors

ESA

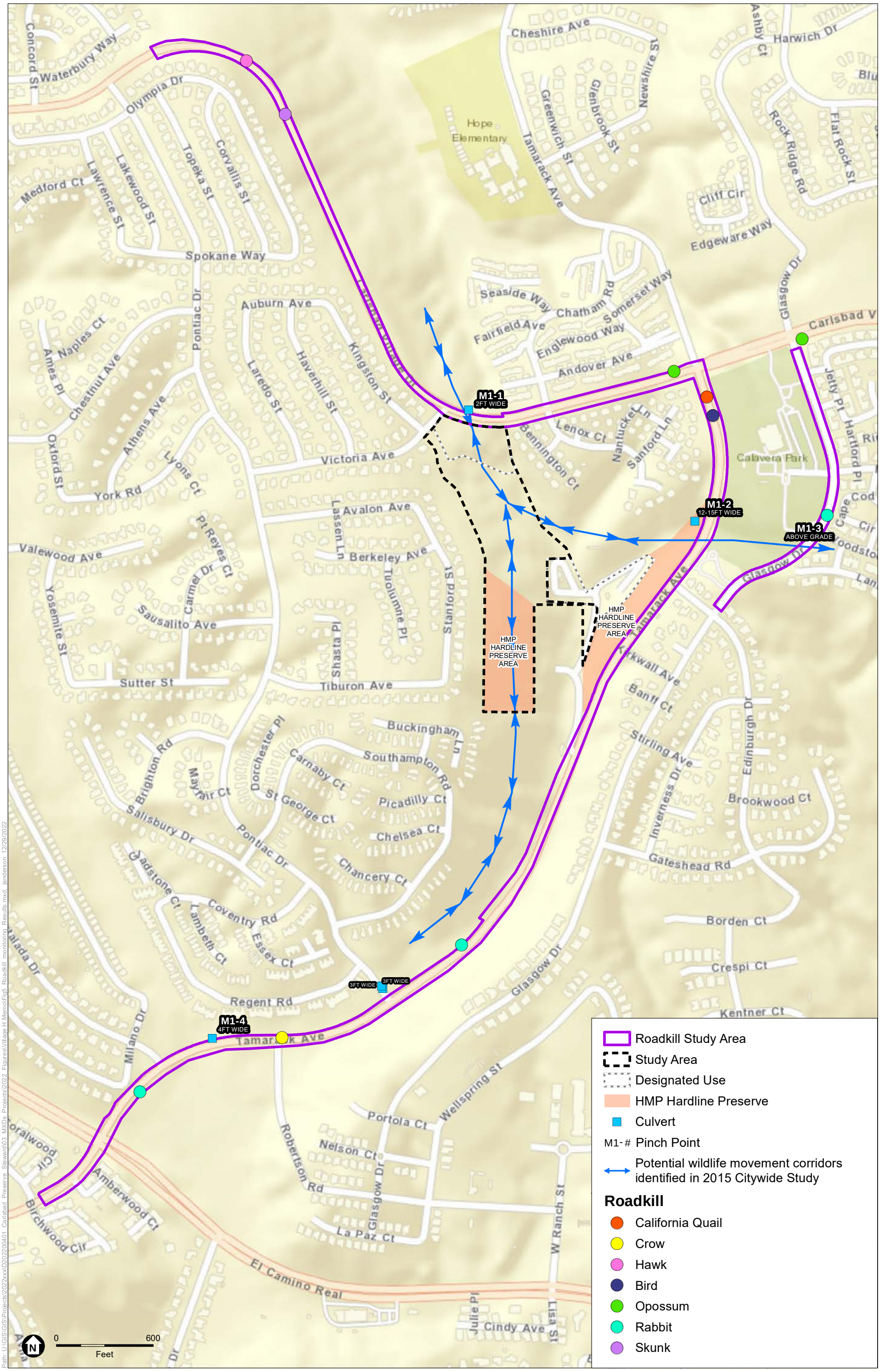


SOURCE: ESRI

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 4
Remote Wildlife Camera Locations

ESA



SOURCE: ESRI; City of Carlsbad, Environmental Science Associates and Center for Natural Lands Management. 2015.

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 5
Roadkill Monitoring Results

ESA

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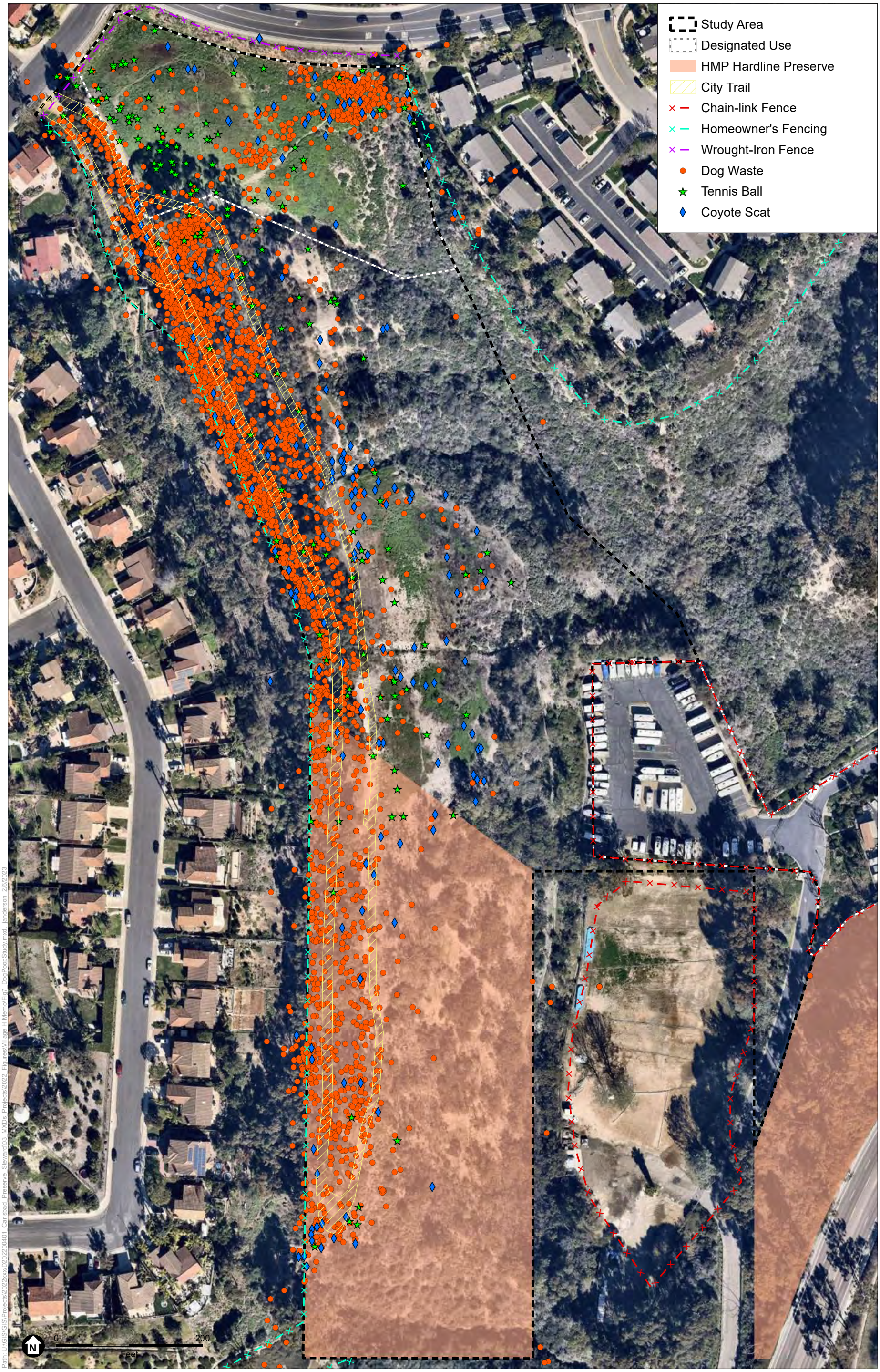
SOURCE: ESRI; City of Carlsbad, Environmental Science Associates and Center for Natural Lands Management. 2015.

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 6
Updated Wildlife Movement Corridors

ESA



SOURCE: ESRI; City of Carlsbad

City of Carlsbad Village H Wildlife Movement Study Summary

Figure 7
Dog Waste Study Results

ESA

Attachment A

Village H Remote Wildlife Camera Full Results

TABLE 1
VILLAGE H REMOTE WILDLIFE CAMERA DETECTIONS – FULL RESULTS FROM JUNE 25, 2019, THROUGH NOVEMBER 17, 2022
(NUMBER OF INDIVIDUALS DETECTED)

Wildlife Camera Location		Coyote		Bobcat		Skunk		Rodents, Rabbits, Raccoons		Bird		Off-leash Dog		On-leash Dog		Human	
Time Period[1]	Number of Days Active	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N
VH1	136	64	281	1	12	0	11	16	5	28	6	407	10	26	0	286	4
VH2[2]	42	1	23	0	0	0	0	5	8	0	0	72	4	31	2	149	4
VH3[2]	44	2	4	0	0	0	0	0	0	1	1	264	1	127	4	634	6
VH4[2]	11	0	1	0	0	0	0	0	0	0	0	105	6	84	3	283	9
VH5a	177	0	2	0	0	0	0	0	2	0	1	0	0	0	0	1	0
VH5b	505	8	101	4	26	0	3	0	9	6	1	0	0	0	0	0	0
VH6[3]	99	7	0	1	9	0	7	7	4	3	1	0	0	0	0	1	0
VH7	174	16	141	3	8	0	16	0	5	2	0	0	0	0	0	1	0
VH8a	136	0	0	0	0	0	0	0	0	0	0	0	1	0	0	8	3
VH8b	62	4	20	6	22	0	4	4	103	14	0	2	1	1	0	166	60
VH9[4]	106	8	76	1	13	0	2	4	7	1	0	160	0	6	0	104	0
VH10[2,4]	14	0	1	0	0	0	0	0	0	1	0	2	0	0	0	5	0
VH11[5]	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VH12[5]	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VH13[6]	98	4	141	2	21	0	7	5	17	22	0	210	5	1	0	75	1
VH14[3,6]	20	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
VH15[7]	112	0	5	9	27	0	82	4	32	10	0	0	0	0	0	17	4
VH16[7]	112	0	1	11	38	2	122	17	66	10	0	1	0	2	0	0	0
VH17a	112	11	27	8	15	0	21	2	50	23	2	1	0	0	0	76	0
VH17b	538	37	55	12	40	0	1	62	26	116	1	1	0	0	0	1	0
VH18	49	12	43	0	0	0	0	0	0	0	1	579	32	619	27	1848	60
VH19	16	0	6	0	1	0	1	0	0	0	0	8	0	1	0	12	0
VH20[8]	49	7	13	0	0	0	0	1	6	5	0	85	2	6	0	90	2

TABLE 1
VILLAGE H REMOTE WILDLIFE CAMERA DETECTIONS – FULL RESULTS FROM JUNE 25, 2019, THROUGH NOVEMBER 17, 2022
(NUMBER OF INDIVIDUALS DETECTED)

Wildlife Camera Location		Coyote		Bobcat		Skunk		Rodents, Rabbits, Raccoons		Bird		Off-leash Dog		On-leash Dog		Human	
Time Period[1]	Number of Days Active	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N
VH21a	34	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
VH21b	181	15	172	2	9	0	0	0	1	17	1	0	0	0	0	2	0
VH21c	680	50	283	8	25	0	5	4	41	198	3	0	0	0	0	2	0
	Total	***248***	***1397***	***68***	***266***	***2***	***282***	***131***	***382***	***457***	***18***	***1899***	***62***	***904***	***36***	***3813***	***162***

NOTES:

[1] Time Period D: Day defined as when it is light out; not defined by time.
Time Period N: Night defined as when it is dark out; not defined by time.

[2] Cameras VH2, VH3, VH4, and VH10 were pulled from the ground on August 10, 2019, and were not reinstalled due to potential for additional vandalism. No video data was collected at these locations after August 10, 2019.

[3] Cameras VH6 and VH14 were pulled from the ground on October 2, 2019 and were not reinstalled due to potential for additional vandalism. No video data was collected this location after October 2, 2019.

[4] Cameras VH9 and VH10 were installed on July 25, 2019.

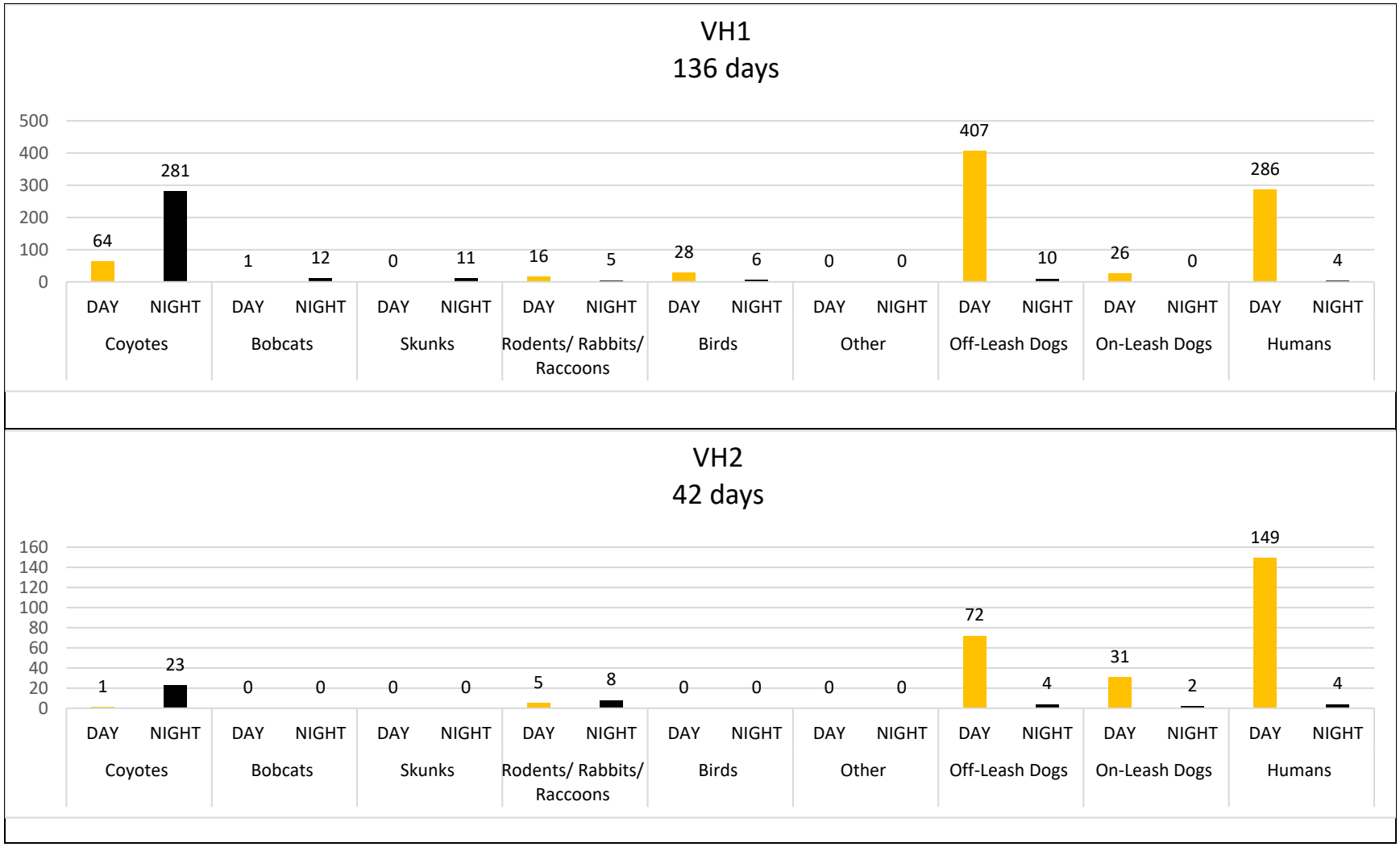
[5] Cameras VH11 and VH12 were installed on August 23, 2019, and were stolen a few days later. No video data was collected from this location after August 23, 2019.

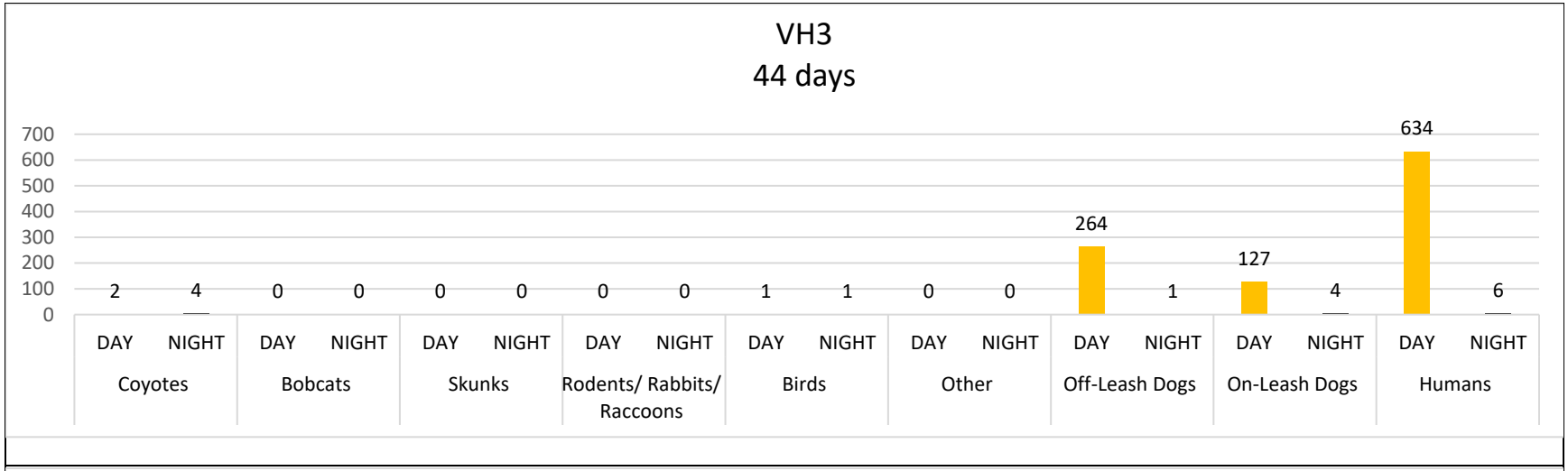
[6] Cameras VH13 and VH14 were installed on September 12, 2019.

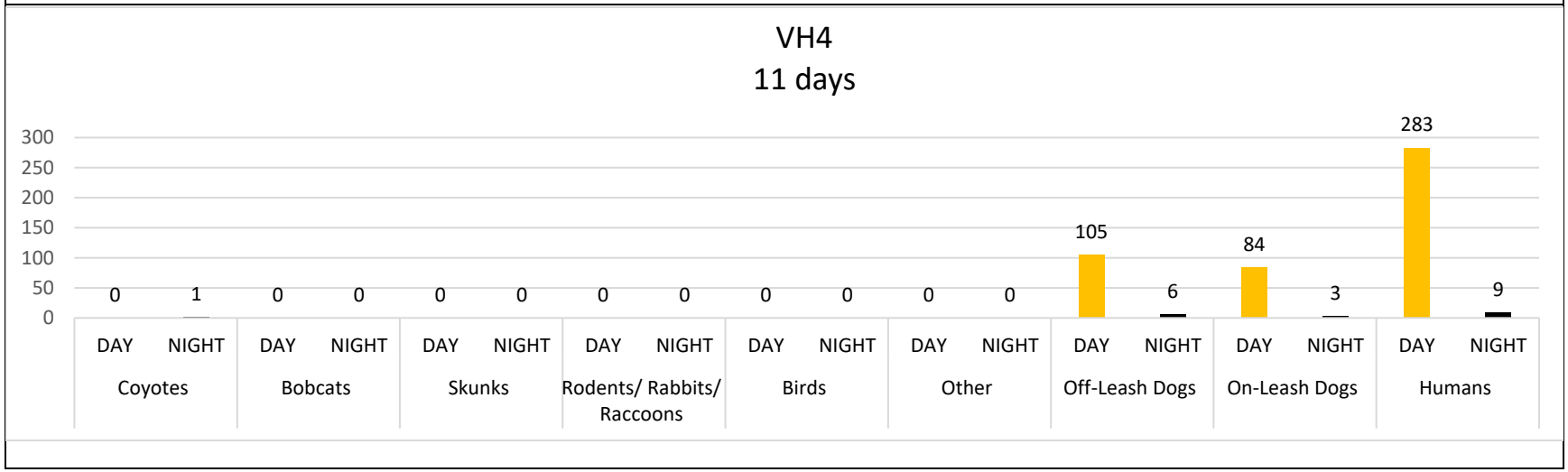
[7] Cameras VH15 and VH16 were installed on September 19, 2019.

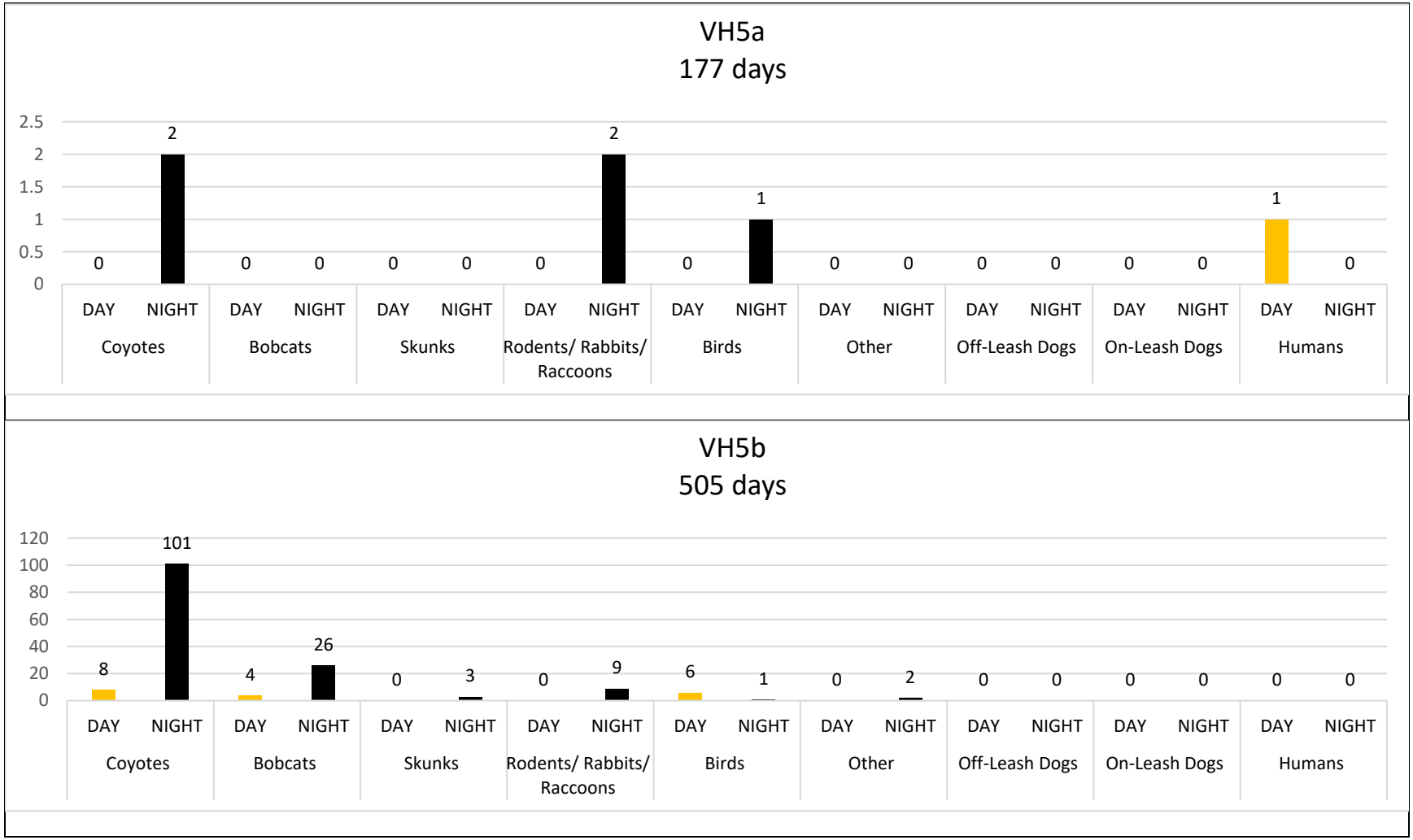
[8] Camera VH20 is a CNLM-installed and maintained camera. Data for this camera runs from July 3, 2019, to September 3, 2019.

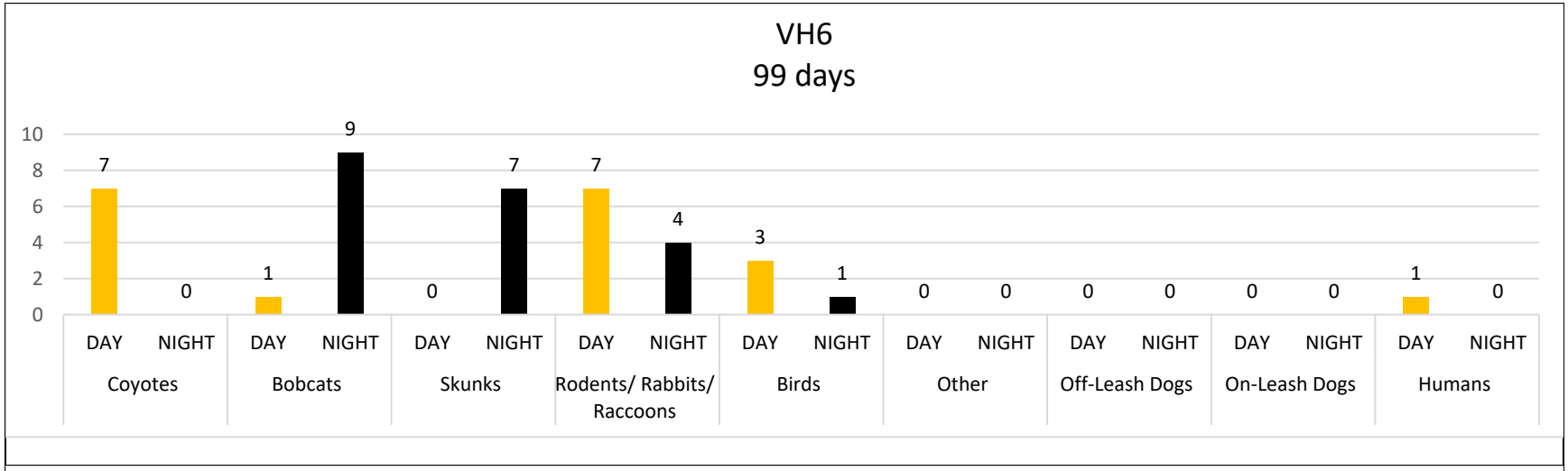
Village H Remote Wildlife Camera Detections – Relative Number of Wildlife, Humans, and Dogs at Selected Locations

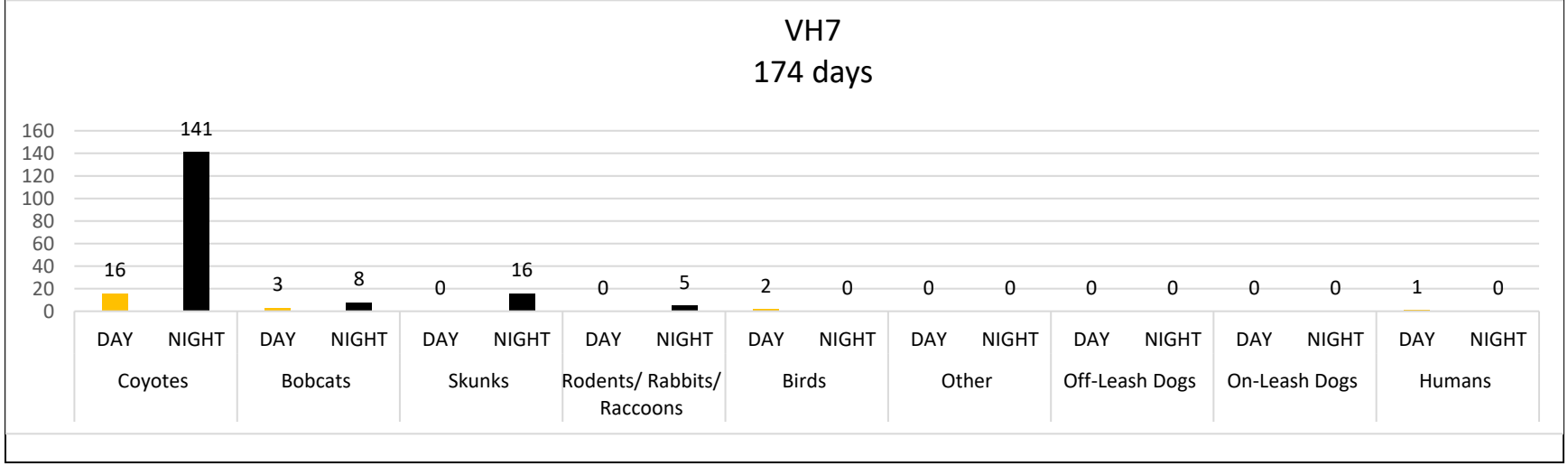


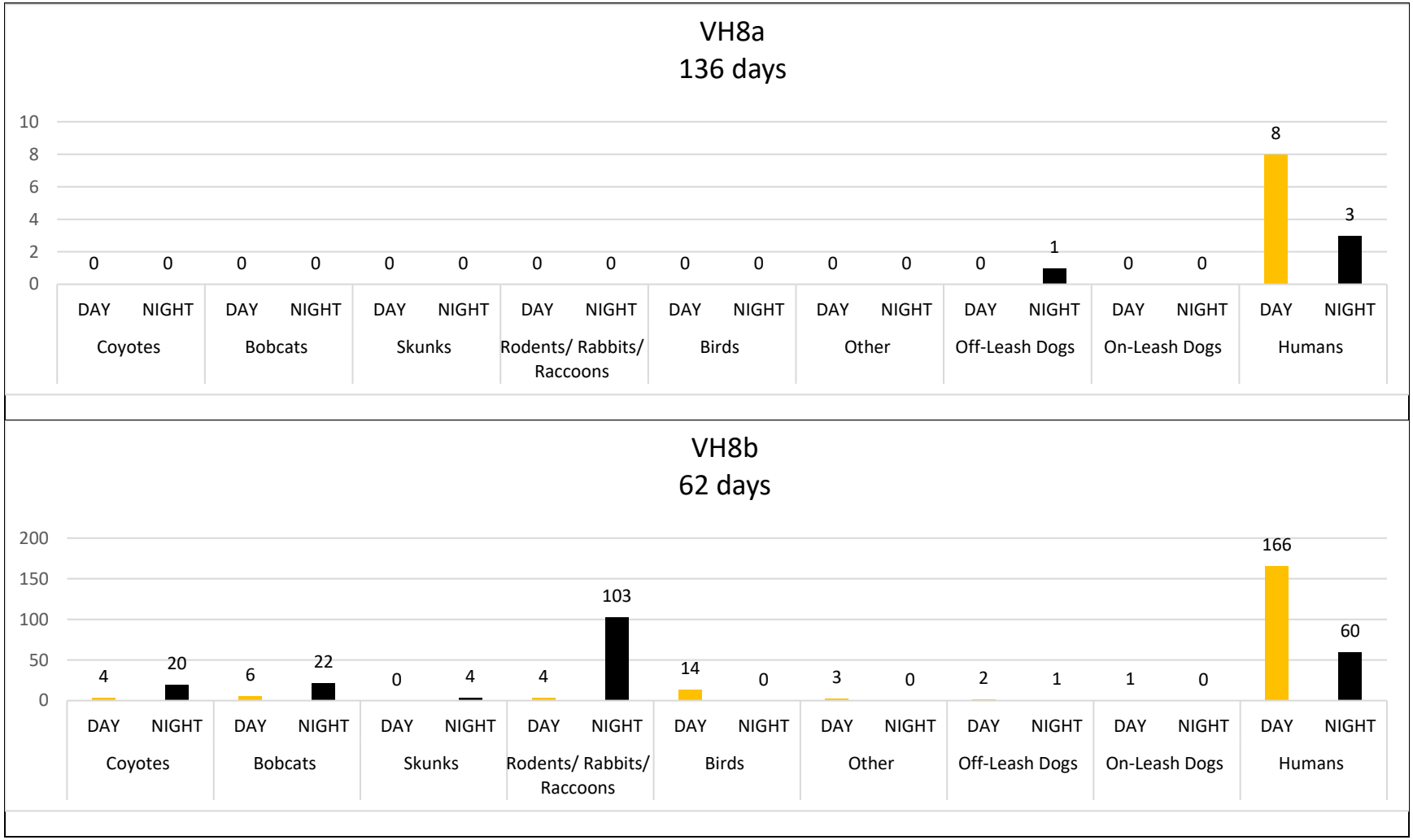

VH3
44 days
700
600
500
400
300
200
100
0
2
4
0
0
0
0
0
0
1
1
0
0
264
1
127
4
634
6
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

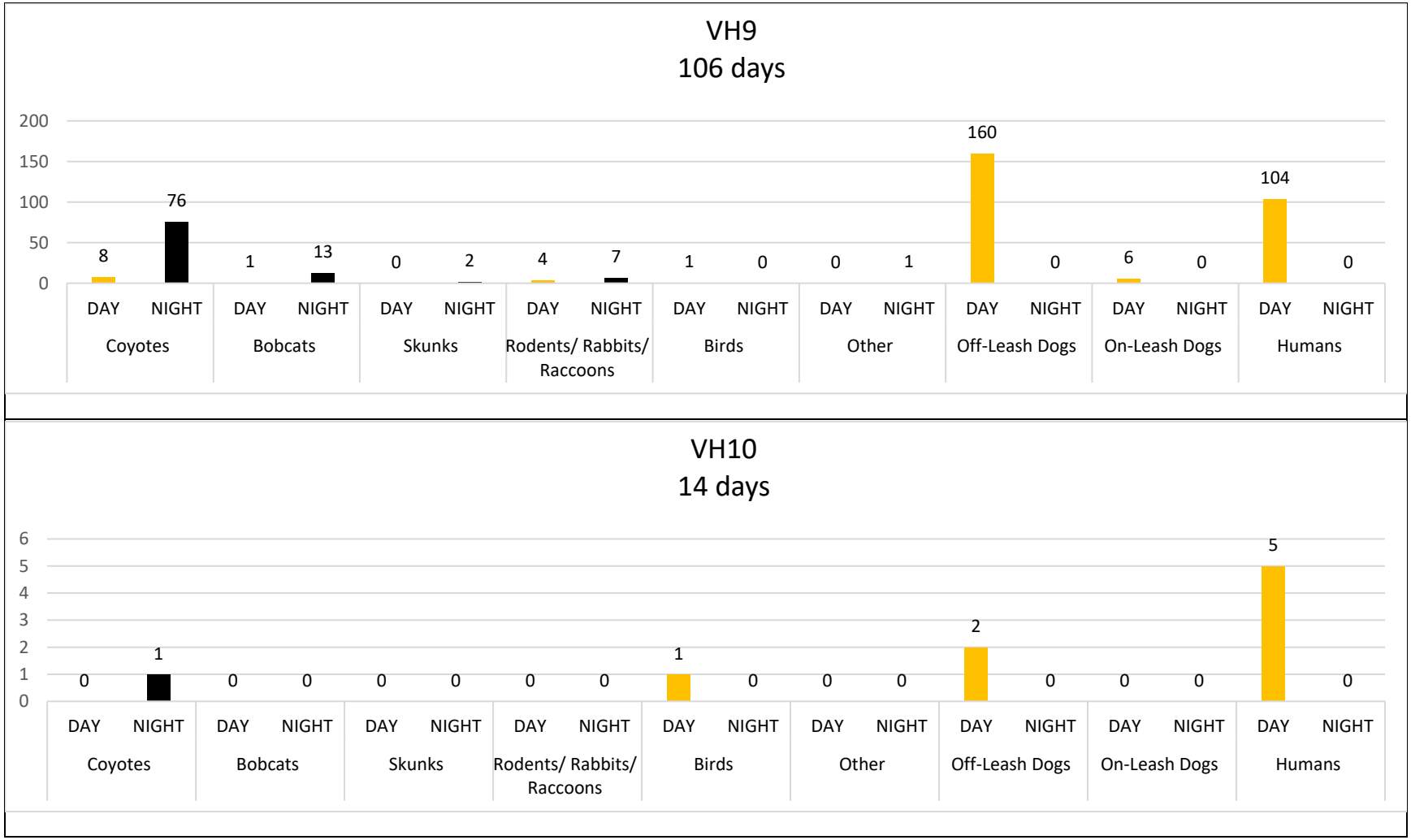

VH4
11 days
300
250
200
150
100
50
0
0
1
0
0
0
0
0
0
0
0
0
0
105
6
84
3
283
9
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

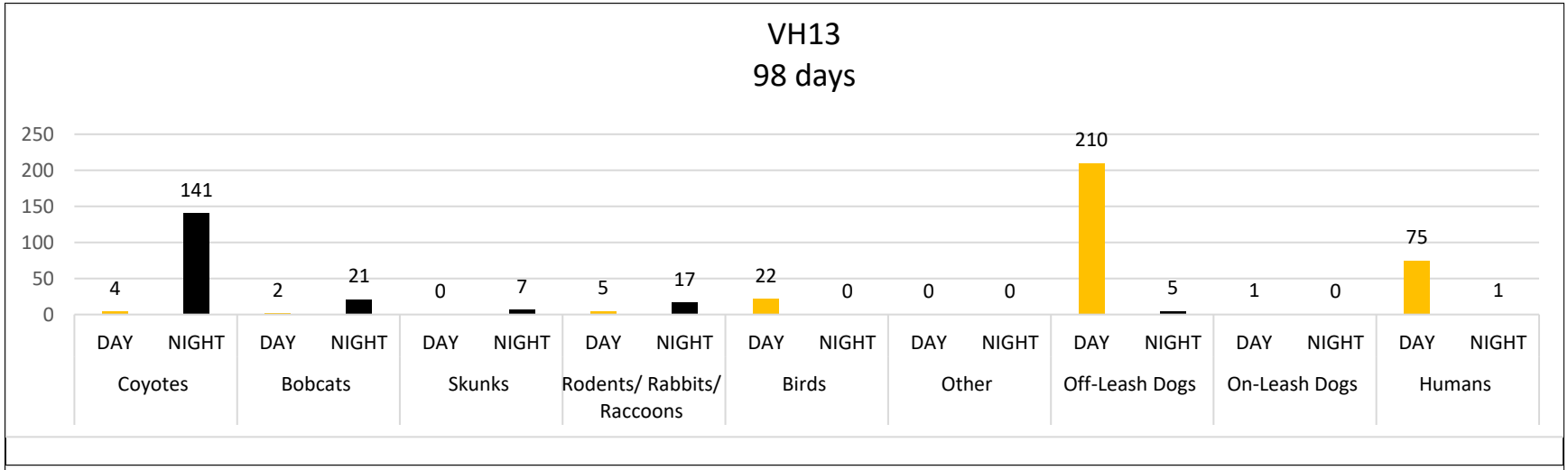

VH5a
177 days
2.5
2
1.5
1
0.5
0
0
2
0
0
0
0
0
2
0
1
0
0
0
0
0
0
1
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans
VH5b
505 days
120
100
80
60
40
20
0
8
101
4
26
0
3
0
9
6
1
0
2
0
0
0
0
0
0
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

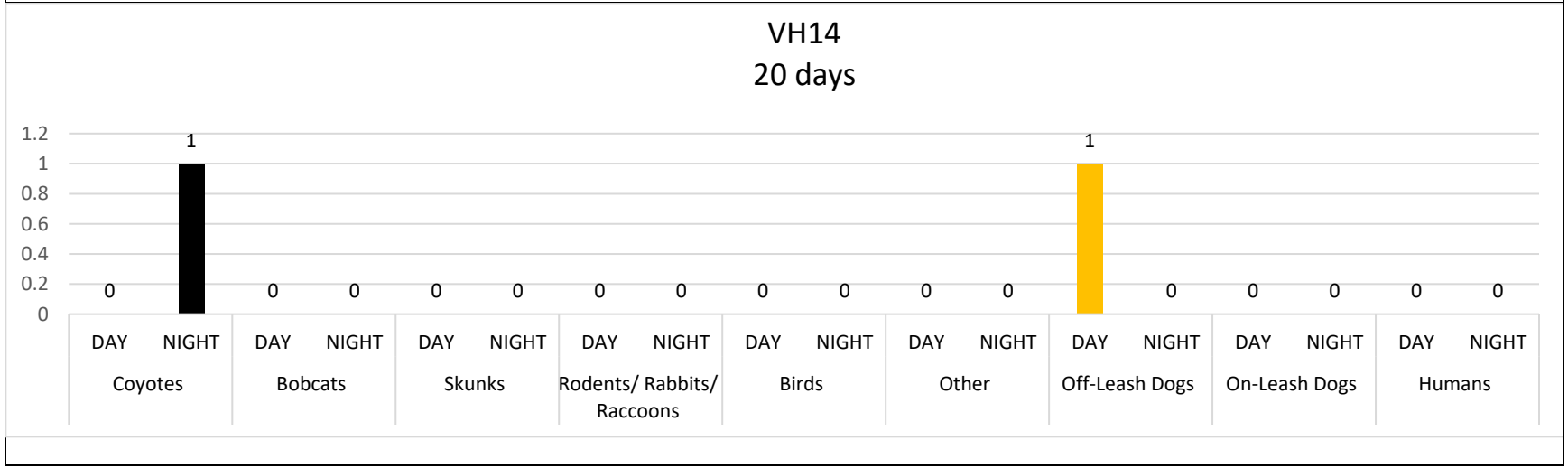

VH6
99 days
10
8
6
4
2
0
7
0
1
9
0
7
7
4
3
1
0
0
0
0
0
0
1
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

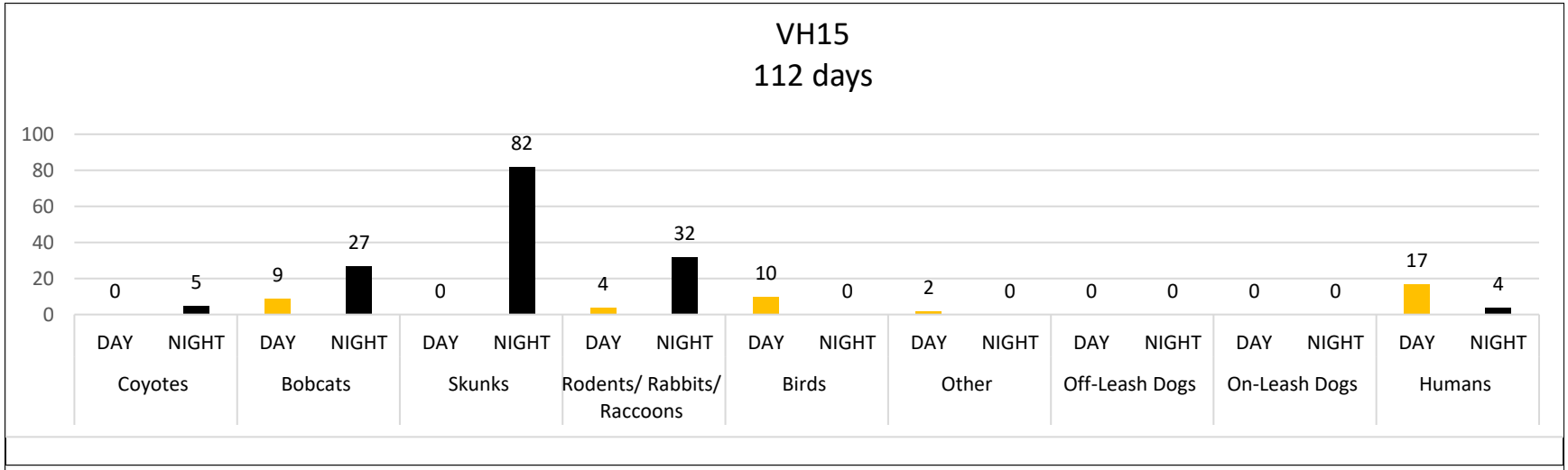

VH7
174 days
160
140
120
100
80
60
40
20
0
16
141
3
8
0
16
0
5
2
0
0
0
0
0
0
0
0
1
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

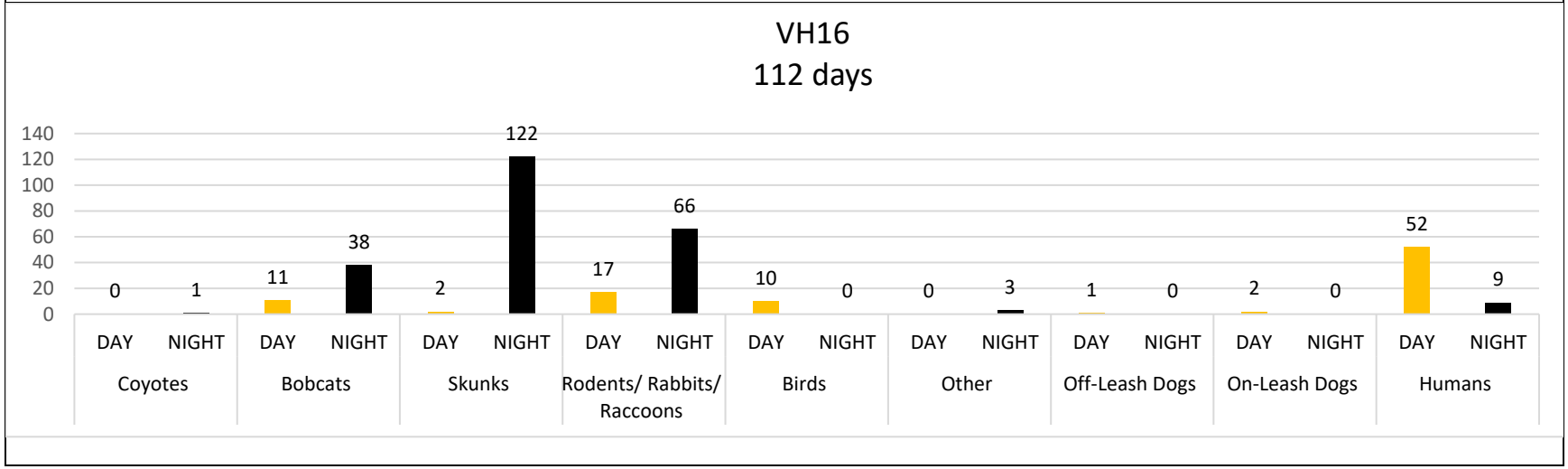

VH8a
136 days
10
8
6
4
2
0
0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 8 3
DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans
VH8b
62 days
200
150
100
50
0
4 20 6 22 0 4 4 103 14 0 3 0 2 1 1 0 166 60
DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

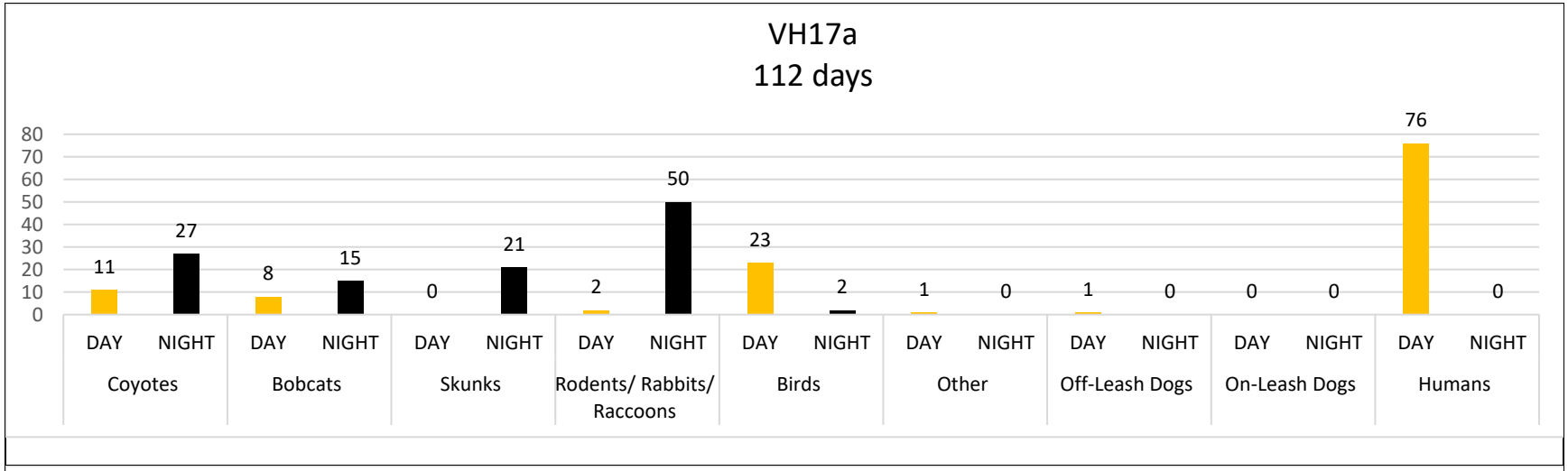

VH9
106 days
200
150
100
50
0
8
76
1
13
0
2
4
7
1
0
0
1
160
0
6
0
104
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans
VH10
14 days
6
5
4
3
2
1
0
0
1
0
0
0
0
0
0
1
0
0
0
2
0
0
0
5
0

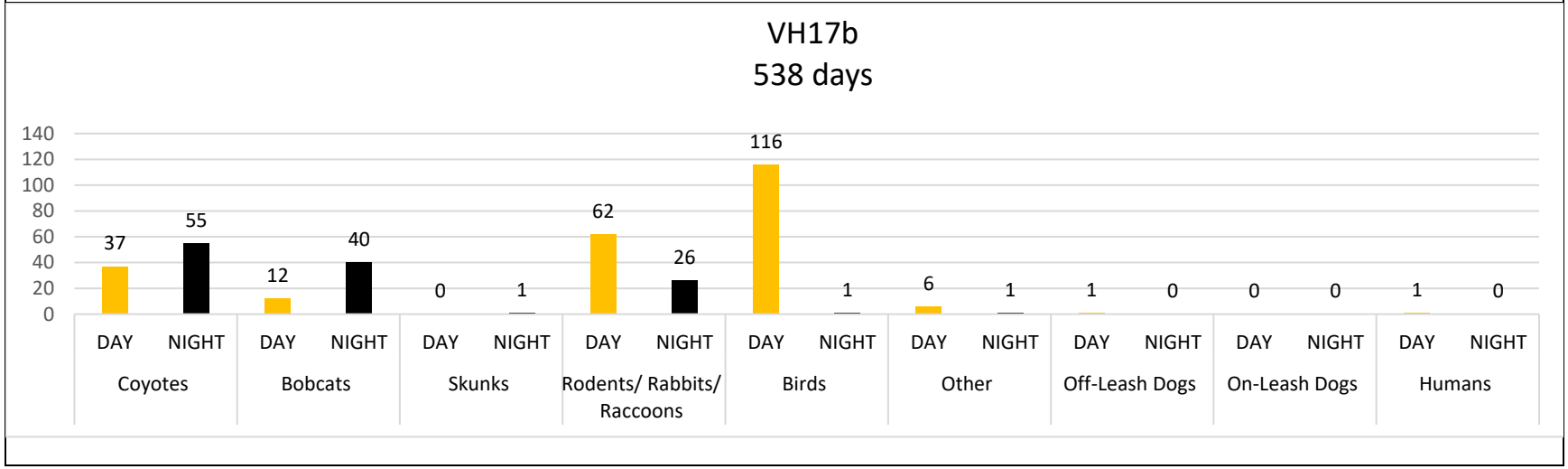

VH13
98 days
250
200
150
100
50
0
4
141
2
21
0
7
5
17
22
0
0
0
210
5
1
0
75
1
DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

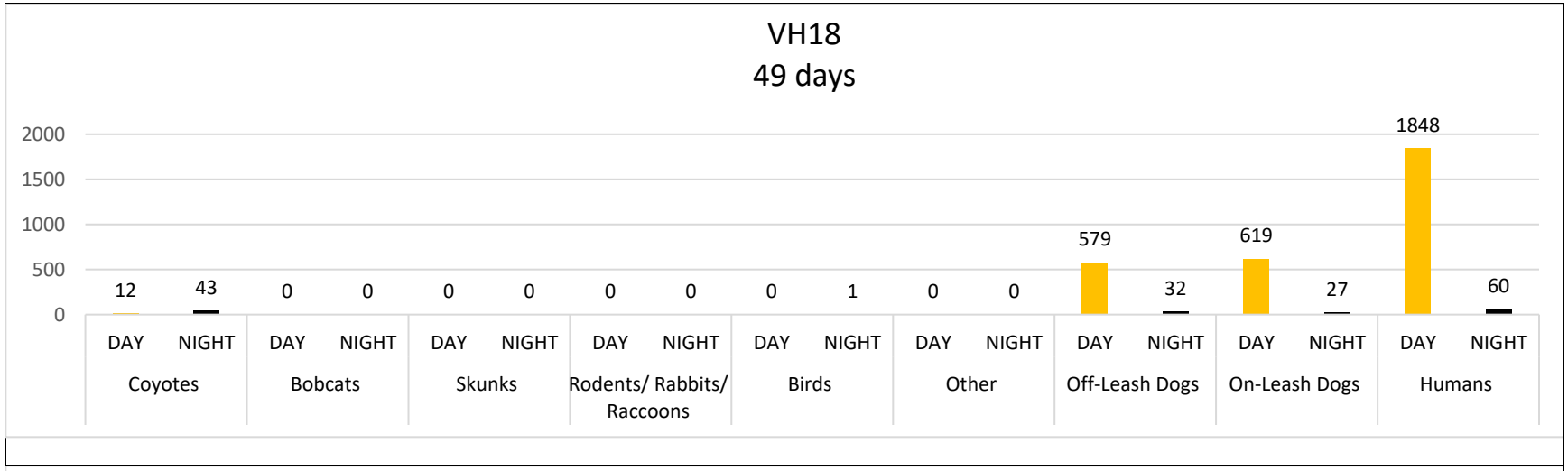

VH14
20 days
1.2
1
0.8
0.6
0.4
0.2
0
0
1
0
0
0
0
0
0
0
0
0
0
1
0
0
0
0
0
DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

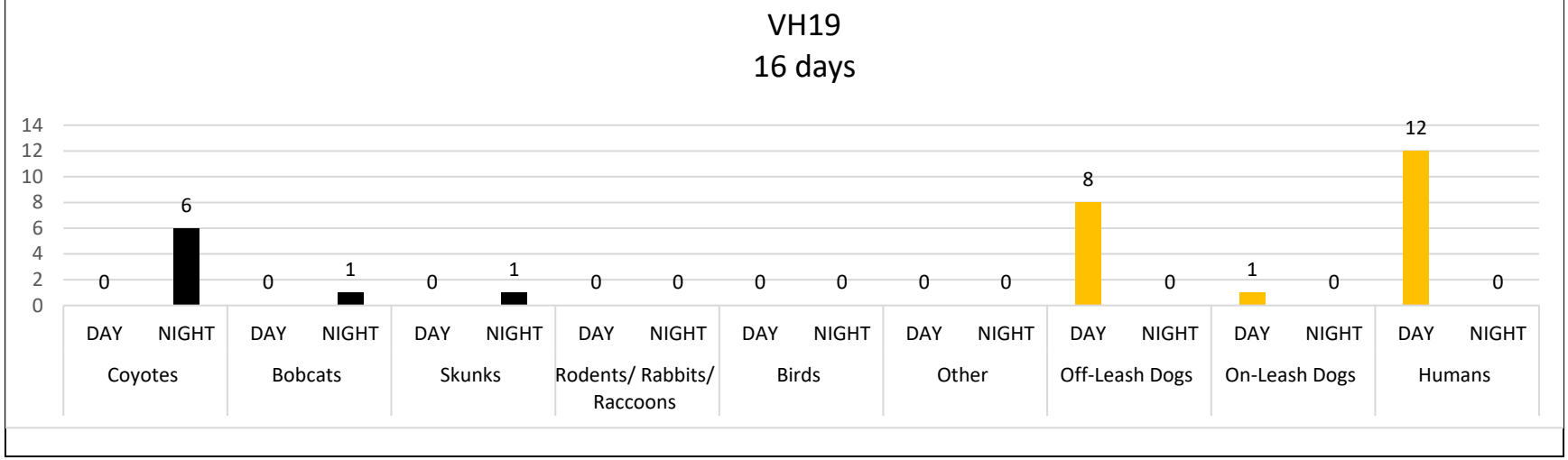

VH15
112 days
100
80
60
40
20
0
0
5
9
27
0
82
4
32
10
0
2
0
0
0
0
0
17
4
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

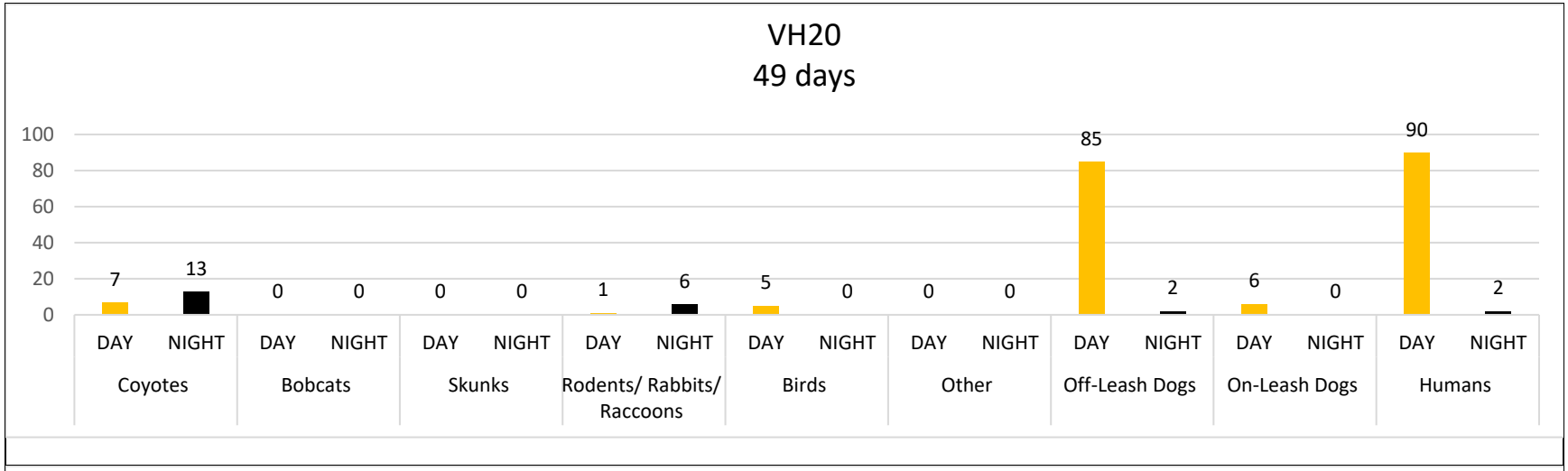

VH16
112 days
140
120
100
80
60
40
20
0
0
1
11
38
2
122
17
66
10
0
0
3
1
0
2
0
52
9
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

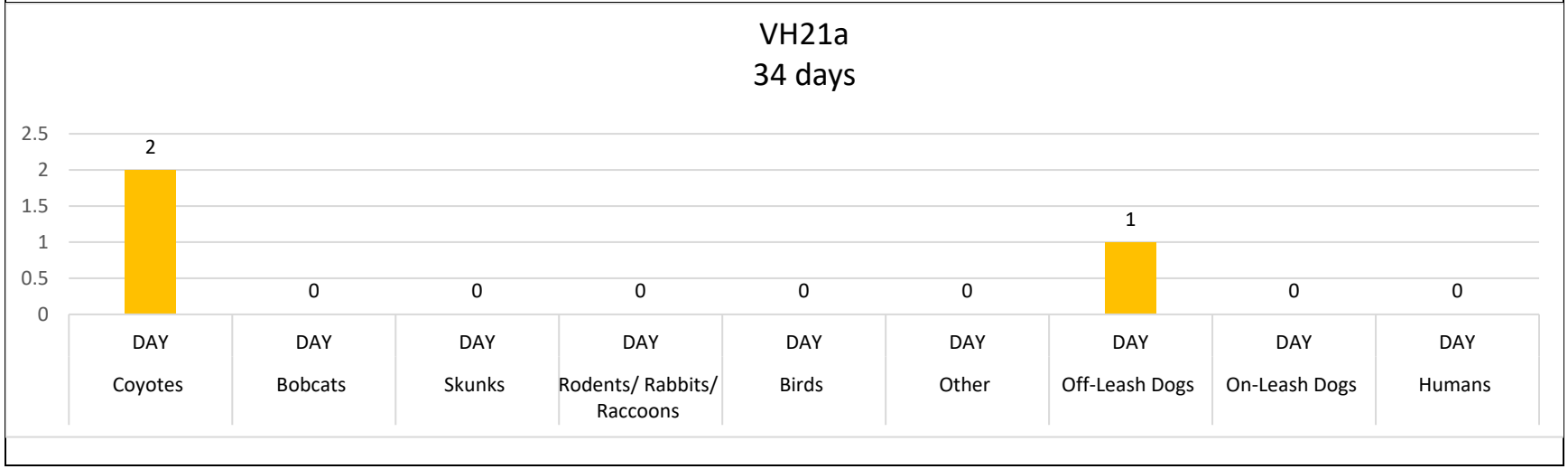

VH17a
112 days
80
70
60
50
40
30
20
10
0
11
27
8
15
0
21
2
50
23
2
1
0
1
0
0
0
76
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans

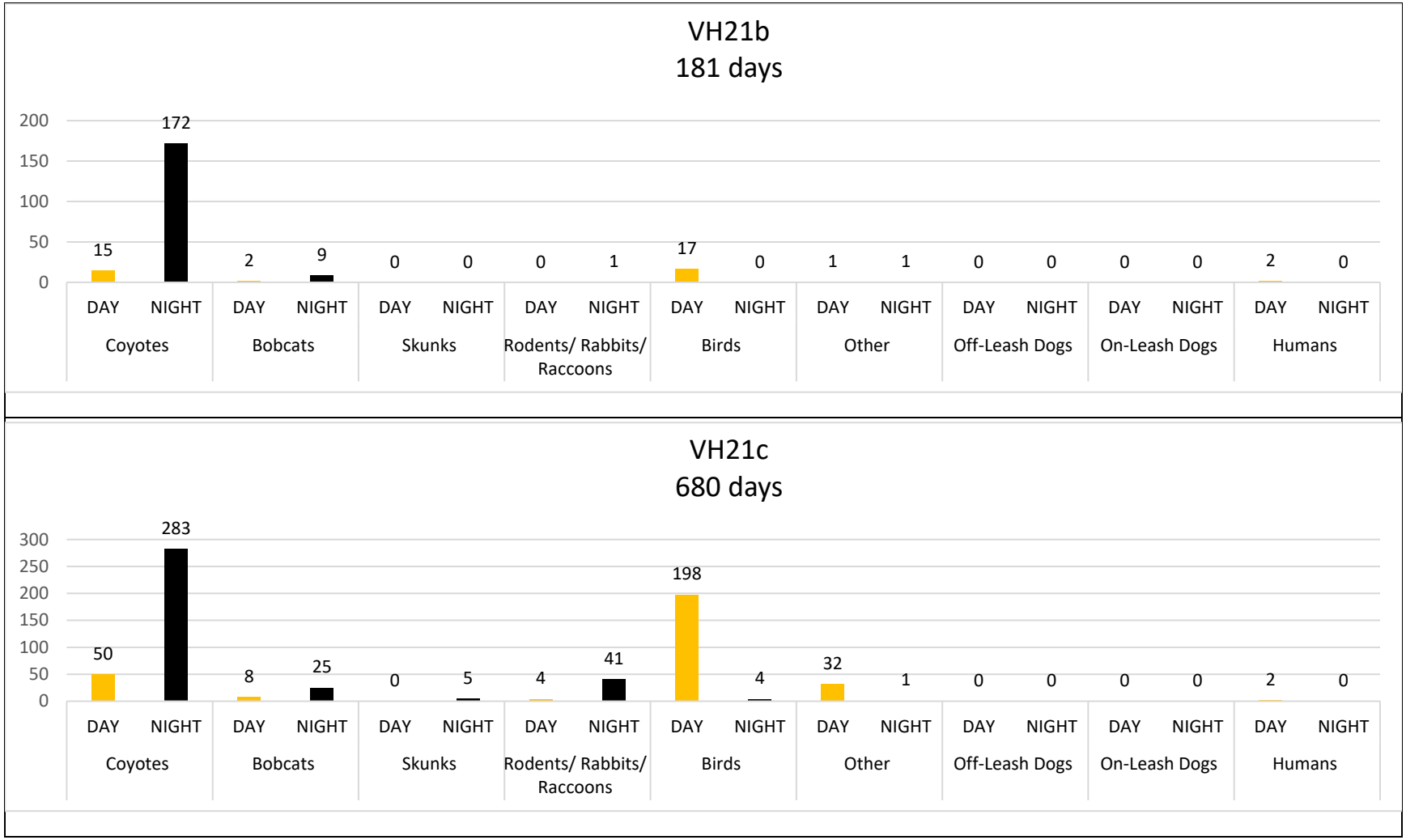

VH17b
538 days
140
120
100
80
60
40
20
0
37
55
12
40
0
1
62
26
116
1
6
1
1
0
0
0
1
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans


VH18
49 days
2000
1500
1000
500
0
12
43
0
0
0
0
0
0
0
1
0
0
579
32
619
27
1848
60
DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans


VH19
16 days
14
12
10
8
6
4
2
0
0
6
0
1
0
1
0
0
0
0
0
0
8
0
1
0
12
0
DAY NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans


VH20
49 days
100
80
60
40
20
0
7
13
0
0
0
0
1
6
5
0
0
0
85
2
6
0
90
2
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans


VH21a
34 days
2.5
2
1.5
1
0.5
0
2
0
0
0
0
0
1
0
0
DAY
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans


VH21b
181 days
200
150
100
50
0
15
172
2
9
0
0
0
1
17
0
1
1
0
0
0
0
2
0
DAY
NIGHT
Coyotes
Bobcats
Skunks
Rodents/ Rabbits/ Raccoons
Birds
Other
Off-Leash Dogs
On-Leash Dogs
Humans
VH21c
680 days
300
250
200
150
100
50
0
50
283
8
25
0
5
4
41
198
4
32
1
0
0
0
0
2
0

Attachment B

Village H Roadkill Survey Dates and Results

TABLE 1
VILLAGE H ROADKILL SURVEY DATES AND RESULTS

Date	Time (start-end)	Surveyor	Location	Species
7/25/19	11:20-11:30 am	Team	Village H	None
7/30/19	2:20-2:30 pm	H. Swarthout	Village H	None
8/1/19	12:45-1:00 pm	A. Sullivan	Village H	None
8/4/19	8:35-8:50 am	K. Merrill	Village H	None
8/6/19	12:50-1:10 pm	H. Swarthout	Village H	None
8/7/19	10:00-10:15 am	A. Lee	Village H	None
8/9/19	2:35-2:50 pm	H. Swarthout	Village H	None
8/10/19	6:55-7:10 am	K. Merrill	Village H	None
8/14/19	10:40-10:55 am	A. Lee	Village H	None
8/16/19	2:45-2:55 pm	H. Swarthout	Village H	None
8/17/19	9:10-9:25 am	K. Merrill	Village H	None
8/18/19	12:40 pm	K. Merrill	Village H	None
8/21/19	11:20-11:35 am	A. Lee	Village H	None
8/23/19	3:28-3:40 pm	H. Swarthout	Village H	None
8/25/19	10:07-10:15 am	K. Merrill	Village H	None
8/28/19	12:15-12:30 pm	A. Sullivan	Village H	Opossum
8/30/10	1:25-1:35 pm	H. Swarthout	Village H	None
8/31/19	9:50-10:00 am	K. Merrill	Village H	None
9/4/19	9:35-9:50 am	A. Lee	Village H	None
9/6/19	10:20-10:35 am	H. Swarthout	Village H	None
9/8/19	9:18-9:28 am	K. Merrill	Village H	None
9/11/19	10:40-11:00 am	A. Lee	Village H	None
9/12/19	10:05-10:17 am	H. Swarthout	Village H	None
9/14/19	8:35-8:45 am	K. Merrill	Village H	None
9/18/19	9:20-9:35 am	A. Lee	Village H	None
9/19/19	9:28-9:46 am	H. Swarthout	Village H	Opossum
9/21/19	9:25-9:36 am	K. Merrill	Village H	None
9/25/19	10:30-10:45 am	A. Sullivan	Village H	None
9/26/19	10:13-10:21 am	H. Swarthout	Village H	None
9/28/19	11:21-11:31 am	K. Merrill	Village H	None
10/2/19	3:30-3:45 pm	A. Sullivan	Village H	None
10/4/19	1:35-1:43 pm	H. Swarthout	Village H	None
10/5/19	8:35-8:45 am	K. Merrill	Village H	None
10/8/19	9:30-9:45 am	A. Sullivan	Village H	None
10/11/19	1:24-1:32 pm	H. Swarthout	Village H	None
10/16/19	11:30-11:39 am	H. Swarthout	Village H	None
10/19/19	9:06-9:13 am	K. Merrill	Village H	None

Date	Time (start-end)	Surveyor	Location	Species
10/23/19	9:30-9:45 am	A. Sullivan	Village H	Rabbit
10/27/19	9:15-9:25 am	K. Merrill	Village H	None
10/30/19	10:00-10:15 am	A. Sullivan	Village H	None
11/2/19	11:09-11:20 am	K. Merrill	Village H	None
11/6/19	9:45-10:00 am	A. Lee	Village H	None
11/8/19	11:06-11:16 am	H. Swarthout	Village H	None
11/9/19	8:27-8:33 am	K. Merrill	Village H	None
11/13/19	1:00-1:15 pm	A. Sullivan	Village H	None
11/15/19	10:19-10:30 am	H. Swarthout	Village H	None
11/16/19	8:32-8:41 am	K. Merrill	Village H	None
11/21/19	11:00-11:15 am	A. Sullivan	Village H	None
11/22/19	3:13-3:27 pm	H. Swarthout	Village H	None
11/23/19	10:04-10:14 am	K. Merrill	Village H	None
11/30/19	12:53-1:03 pm	K. Merrill	Village H	None
12/4/19	12:23-12:33 pm	H. Swarthout	Village H	None
12/5/19	12:45-1:00 pm	A. Sullivan	Village H	Rabbit and Bird
12/6/19	10:28-10:38 am	H. Swarthout	Village H	None
12/8/19	8:45-8:55 am	K. Merrill	Village H	None
12/11/19	3:31-3:42 pm	H. Swarthout	Village H	None
12/13/19	4:15-4:27 pm	H. Swarthout	Village H	Hawk
12/15/19	10:00-10:15 am	K. Merrill	Village H	Barn Owl
12/18/19	10:25-10:35 am	A. Lee	Village H	Barn Owl (same as above)
12/20/19	1:28-1:39 pm	H. Swarthout	Village H	None
12/21/19	9:06-9:13 am	K. Merrill	Village H	None
12/26/19	9:15-9:30 am	A. Sullivan	Village H	Skunk
12/27/19	11:34-11:48 am	H. Swarthout	Village H	Rabbit
12/28/19	8:57-9:07 am	K. Merrill	Village H	None
12/30/19	4:21-4:32 pm	H. Swarthout	Village H	None
12/31/19	11:30-11:45 am	A. Sullivan	Village H	Bird
1/5/20	8:40-8:50 am	K. Merrill	Village H	None
1/8/20	11:00-11:15 am	A. Sullivan	Village H	None
1/10/20	12:16-12:27 pm	H. Swarthout	Village H	None
1/12/20	10:27-10:37 am	K. Merrill	Village H	None
1/13/20	3:30-3:45 pm	A. Sullivan	Village H	None
1/15/20	9:30-9:40 am	A. Sullivan	Village H	None
1/17/20	12:31-12:42 pm	H. Swarthout	Village H	None
1/18/20	10:14-10:23 am	K. Merrill	Village H	None
1/22/20	12:10-12:20 pm	A. Lee	Village H	None

Date	Time (start-end)	Surveyor	Location	Species
1/24/20	12:39-12:50 pm	H. Swarthout	Village H	Hawk
1/26/20	10:14-10:22 am	K. Merrill	Village H	None
1/30/20	10:16-10:25 am	H. Swarthout	Village H	None
2/1/20	8:30-8:40 am	K. Merrill	Village H	None
2/7/20	11:41-11:51 am	H. Swarthout	Village H	None
2/9/20	8:32-8:44 am	K. Merrill	Village H	California Quail
2/13/20	10:14-10:25 am	H. Swarthout	Village H	None
2/16/20	9:05-9:15 am	K. Merrill	Village H	None
2/20/20	11:00-11:09 am	H. Swarthout	Village H	None
2/22/20	8:58-9:06 am	K. Merrill	Village H	None
2/26/20	11:50-12:03 pm	H. Swarthout	Village H	None
3/1/20	10:28-10:37 am	K. Merrill	Village H	None
3/5/20	9:54-10:05 am	H. Swarthout	Village H	None
3/8/20	10:26-10:38 am	K. Merrill	Village H	Rabbit
3/12/20	9:53-10:02 am	H. Swarthout	Village H	Squirrel
3/14/20	9:37-9:47 am	K. Merrill	Village H	None
3/19/20	1:37-1:50 pm	H. Swarthout	Village H	None
3/21/20	10:38-10:48 am	K. Merrill	Village H	None
3/26/20	9:40-9:50 am	H. Swarthout	Village H	None
3/28/20	10:00-10:11 am	K. Merrill	Village H	None
4/2/20	10:39-10:49 am	H. Swarthout	Village H	None
4/4/20	11:07-11:16 am	K. Merrill	Village H	None
4/9/20	9:23-9:33 am	H. Swarthout	Village H	None
4/11/20	9:01-9:09 am	K. Merrill	Village H	None
4/16/20	10:28-10:37 am	H. Swarthout	Village H	None
4/18/20	9:36-9:44 am	K. Merrill	Village H	None
4/23/20	10:16-10:27 am	H. Swarthout	Village H	None
4/25/20	10:22-10:31 am	K. Merrill	Village H	None
4/30/20	9:56-10:07 am	H. Swarthout	Village H	None
5/2/20	11:54 am-12:04 pm	K. Merrill	Village H	None
5/7/20	10:40-10:52 am	H. Swarthout	Village H	None
5/9/20	9:52-9:59 am	K. Merrill	Village H	None
5/14/20	10:04-10:17 am	H. Swarthout	Village H	None
5/16/20	8:11-8:21 am	K. Merrill	Village H	None
5/21/20	11:31-11:43 am	H. Swarthout	Village H	None
5/23/20	9:03-9:12 am	K. Merrill	Village H	None
5/28/20	11:20-11:32 am	H. Swarthout	Village H	None
5/30/20	9:29-9:35 am	K. Merrill	Village H	None
6/4/20	10:14-10:25 am	H. Swarthout	Village H	None

Date	Time (start-end)	Surveyor	Location	Species
6/6/20	9:12-9:21 am	K. Merrill	Village H	None
6/11/20	9:40-9:50 am	H. Swarthout	Village H	None
6/14/20	8:16-8:26 am	K. Merrill	Village H	None
6/18/20	9:56-10:02 am	H. Swarthout	Village H	None
6/20/20	9:31-9:40 am	K. Merrill	Village H	None
6/27/20	9:48-9:58 am	K. Merrill	Village H	None
7/2/20	2:39-2:48 pm	H. Swarthout	Village H	None
7/5/20	9:10-9:20 am	K. Merrill	Village H	None
7/9/20	10:28-10:38 am	H. Swarthout	Village H	None
7/11/20	9:56–10:07 am	K. Merrill	Village H	None
7/16/20	1:35-1:43 pm	H. Swarthout	Village H	None
7/18/20	9:43-9:53 am	K. Merrill	Village H	None
7/23/20	10:00-10:11 am	H. Swarthout	Village H	None
7/25/20	8:56-9:07 am	K. Merrill	Village H	Rabbit

Attachment C

Village H Representative Photographs of Wildlife Detected on Remote Wildlife Cameras

Opossum detected at VH5 Camera.

Bobcat detected at VH5 Camera.

Coyote detected at VH5 Camera.

Raccoon detected at VH5 Camera.

California ground squirrel detected at VH17 Camera.

Coyote detected at VH17 Camera.

Bobcat detected at VH17 Camera.

California quail detected at VH17 Camera.

California scrub jay detected at VH21 Camera.

Coyote detected at VH21 Camera.

Bobcat detected at VH21 Camera.

Raccoon detected at VH21 Camera.

Attachment D

Village H Dog Waste Studies
Representative Photographs

Collection from dog waste study on September 25, 2019.

Collection from dog waste study on October 8, 2019.

Collection from dog waste study on May 11, 2021.

Collection from dog waste study on June 10, 2021.

Collection from dog waste study on July 9, 2021.

Collection from dog waste study on August 6, 2021.

Collection from dog waste study on September 8, 2021.

Collection from dog waste study on October 6, 2021.

Collection from dog waste study on November 11, 2021.

Collection from dog waste study on December 21, 2021.

Collection from dog waste study on February 9, 2022.

Collection from dog waste study on March 9, 2022.

Collection from dog waste study on April 25, 2022.

Collection from dog waste study on May 19, 2022.

Collection from dog waste study on June 15, 2022.

Collection from dog waste study on July 15, 2022.

Collection from dog waste study on August 16, 2022.

Collection from dog waste study on September 22, 2022.

Collection from dog waste study on October 20, 2022.

Collection from dog waste study on November 17, 2022.

Collection from dog waste study on December 13, 2022.