City of Carlsbad Habitat Management Plan
Annual Report and Monitoring Summary

Year 7, Nov. 2010 – October 2011

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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. The latest three-year report was prepared as part of the 2007/2008 HMP annual report.

ASMD – Area Specific Management Directive.

BLF – Batiquitos Lagoon Foundation

California 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.

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

City – City of Carlsbad.

CDFG – California Department of Fish and Game.

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

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 (IA) 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 Multiple Habitat Conservation Program (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.

Habitrak – A GIS-based tool that was developed and is maintained by CDFG 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.

HOA – Home Owners' Association

IA – Implementing Agreement. The legal agreement between the City of Carlsbad, CDFG, and USFWS that ensures implementation of the Carlsbad Habitat Management Plan (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.

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 of the City of Carlsbad used for planning and financing infrastructure improvements and other city services and facilities concurrent with development.

Major Population – 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 metapopulation stability of the species (especially for animals). Also includes smaller populations that are considered important to long-term species survival.

Management Unit – Groupings of adjacent or nearby preserve parcels that have similar management needs.

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.

NCCP – Natural Community Conservation Planning Program – a program of CDFG 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 set up costs and management/monitoring of a preserve in perpetuity through investment returns. The endowment is designed to increase in value over time in order 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 – Area-specific Preserve Management Plan, the permanent management plan developed for a particular preserve within the Preserve System. The City has contracted Center for Natural

Lands Management to develop a master PMP for all City-owned preserves which addresses each preserve individually.

Preserve – Land conserved with a conservation easement, restrictive covenant, deed restriction, or transfer of fee title to the City or California Department of Fish and Game 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, CDFG, CNLM, or private Homeowner's Associations (HOAs). Pursuant to State due-diligence legislation that took effect January of 2007, preserve managers must be certified by either the City or CDFG 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.

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.

SDHC – San Diego Habitat Conservancy; a non-profit organization that provides management and biological monitoring of mitigation and conservation lands in perpetuity. Prior to February of 2009, SDHC was called Helix Community Conservancy.

SDMMP – San Diego Management and Monitoring Program; The SDMMP is a science based program seeking to provide 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, the Multiple Habitats Conservation Program, the 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.

TET – The Environmental Trust. TET was a habitat management company that owned and managed several preserves in Carlsbad until declaring bankruptcy in 2005. Their properties were unmanaged until CDFG acquired title and management responsibility in early 2010.

TransNet - the San Diego County half-cent sales tax for transportation improvements first approved by voters in 1988 and extended in 2004. The Environmental Mitigation Program (EMP) is a component of TransNet that funds habitat related environmental mitigation activities required to implement projects identified in SANDAG's Regional Transportation Plan, including a funding allocation for habitat acquisition, management, and monitoring activities as needed to help implement the Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP).

USACOE – U.S. Army Corps of Engineers

USFWS – U.S. Fish and Wildlife Service

Wildlife Agencies – Term used collectively for the California Department of Fish and Game and U.S. Fish and Wildlife Service.

Executive Summary

This is the seventh annual HMP summary report, covering the period of November 1, 2010 to October 31, 2011. This report summarizes the preserve status, implementation activities, and preserve gains and losses that have occurred during the current reporting period. Highlights of 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 Game (CDFG) 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, if applicable. Several future preserves made progress towards full management and monitoring during the reporting period, namely: Cantarini, Carlsbad Raceway, Dos Colinas, Manzanita Apartments, Muroya, Poinsettia Place, and Quarry Creek. Descriptions of the different categories of preserves and details of the progress towards preserve establishment during the reporting period are contained in Section 1.3.

City Mitigation Parcel (Lake Calavera Preserve)

A total of 1.7 acres were debited during the reporting period; cumulative debits to date are 84.5 acres. A total of 171.5 acres (credits) remain.

Carlsbad Gnatcatcher Core Area Obligation

At the start of the reporting period, the remaining Core Area obligation consisted of (1) acquisition of 43.02 acres of occupied coastal sage scrub habitat, and (2) reimbursement for 50.13 acres Core Area habitat previously purchased by Lennar Corporation (and currently managed). There were two highlights during this reporting period: (1) the City met its first funding obligation of a four-year agreement to fund an endowment on the Perkins property, owned by Center for Natural Lands Management, bringing the remaining Core Area obligation to 35.49 acres, and (2) the City purchased the 50.13 acres of conservation credit from Lennar.

Land Acquisitions

There were no land acquisitions inside of the HMP Planning Area during the reporting period.

Habitat Gains and Losses

There were no habitat gains or losses inside of the preserve system during the current reporting period.

Rough Step Preserve Assembly

The rough step policy states that during preserve assembly, development (losses) must occur in "rough step" with land conservation (gains). Although a precise definition of "rough step" was not included in the MHCP or HMP, it is generally understood by the Wildlife Agencies that losses should be no more than 10% greater than gains (C. Beck, CDFG, pers. comm. 2007). This policy was developed for NCCP plans to ensure that development does not greatly outpace land preservation. To date, 1,486.58 acres have been lost in Carlsbad since inception of the HMP, and therefore, no less than 1,337.92 acres (1,486.58 - 148.66) must be preserved. A cumulative total of 5,820.90 acres have been gained in the preserve system, which greatly exceeds the minimum required by the rough step policy. The rough step policy will continue to be followed for all new development projects (e.g., in Standards Areas) because the City requires that native habitat be conserved (impact mitigation/habitat gain) prior to issuing a grading permit (habitat impact/habitat loss).

Regulatory Compliance

The City is in compliance with the terms and conditions of the Implementing Agreement, NCCP take authorization/permit, and federal ESA section 10(a)(1)(B) take authorization/permit, and HMP zone-specific standards, as summarized in Tables 6 – 9 in the body of the report. Four HMP permits were approved, and one minor amendment (a Consistency Finding) was processed during the current reporting period.

Management and Monitoring

Key management activities in HMP preserves conducted this year included invasive species removal, installation and maintenance of fences and signage, and public outreach activities.

This report includes the triennial monitoring summary required by the HMP. Long-term monitoring data to date are summarized for habitat and priority species. Overall, the majority of priority species on actively preserved lands appear to be stable and well-protected. However, several lagoon bird species have experienced at least one population crash (not all in the same year) both statewide and within the City during the last five years. Some species (e.g., Belding's savannah sparrow and light-footed clapper rail) have rebounded well overall; however, others, (e.g., the snowy plover and California least tern) had not fully rebounded by 2010, and whose continued recovery may have been hindered by the inability of CDFG to contract for personal services, including predator control.

Enforcement

The Property and Environmental Management Department continues to coordinate with CNLM, Carlsbad Parks and Recreation Department, CDFG, and the Carlsbad and Oceanside Police Departments on a multi-pronged approach to enforcement within the preserve system. In addition, the City has requested assistance from SANDAG's EMP regional enforcement program with California Department of Fish and Game wardens once the 2012 program begins.

Financial Summary

In-lieu Mitigation Fee Program. A total of $101,027.58 of *in-lieu* mitigation fees were collected, $539.71 in interest accrued, and $1,570,580.50 was expended during the reporting period. One of the expenditures, totaling $1,353,510.00, was made in January 2011 to reimburse 50.13 acres of habitat credit for the Gnatcatcher Core Area obligation. The other expenditure, totaling $217,070.50, was made in October 2011 to purchase 7.53 acres of habitat for the Gnatcatcher Core Area obligation. As of October 31, 2011, the account had a negative balance of $357,533.71. This shortfall will be reimbursed with future *in-lieu* mitigation fees.

Preserve Management Endowments. During the reporting period, a total of $285,033 was used by CNLM, SDHC and Helix Environmental for management and monitoring activities on nine preserves. Endowment funds for these properties totaled $7,676,096 as of October 31, 2011.

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1.0 Implementation and Plan Administration

1.1 Introduction

The purpose of this document is to provide an update on the status of the Habitat Management Plan (HMP) preserve system, and implementation activities that have occurred during the current reporting period (November 1, 2010 – October 31, 2011). In addition, this report summarizes the results of biological monitoring that has been conducted within the preserve system to date, which is required every 3 years. The information in this report will be used in compliance monitoring to determine if the HMP is being properly implemented pursuant to relevant regulations and permit conditions. Annual tracking and reporting of the HMP Preserve's gains, losses, management, and monitoring is required by Sections 12.1 and 12.2 of the Implementing Agreement (IA), dated November 12, 2004; the Federal Fish and Wildlife 10(a)(1)(B) Permit No. TE022606-0, dated November 12, 2004; and the NCCP Permit No. 2835-2004-001-05, dated November 15, 2004. This annual report covers year seven of the 50-year HMP implementation permits.

1.2 HMP Compliance Monitoring and Effectiveness Monitoring

1.2.1 HMP Conservation Goals

In order to evaluate the City's *compliance* with the HMP, and the *effectiveness* of the MHCP/HMP 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 (ESA)-related mitigation and HMP implementation.

1.2.2 Compliance Monitoring

Compliance monitoring, also known as implementation or regulatory monitoring, is required pursuant to the City's HMP Implementing Agreement (permit) with the Wildlife Agencies (CDFG and USFWS) to ensure that the City is performing the conservation and implementation actions described in the Implementing Agreement. Compliance monitoring tracks whether 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 conducting compliance monitoring and reporting for agency review. Habitat tracking results are provided in Section 1.4; regulatory compliance is discussed in Section 1.5; and management and monitoring activities are summarized in Section 2.0.

1.2.3 Effectiveness Monitoring

Effectiveness monitoring, also known as biological, ecological or validation monitoring, determines the effectiveness of the conservation program. Effectiveness monitoring evaluates how well the conservation and management actions are achieving the biological goals stated in the MHCP and HMP within the City and across the MHCP planning area as a whole. The preserve-level monitoring program is used to evaluate the effectiveness of management actions at specific preserve areas (MHCP Vol. III). At the subregional (MHCP-wide) level, effectiveness monitoring involves assessing 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). The City is responsible for biological monitoring on City-owned properties and for reporting monitoring results from other properties within the HMP. The Wildlife Agencies are responsible for monitoring on their own properties (i.e., reserves owned by CDFG or lands within Batiquitos Lagoon owned by the California State Lands Commission) and for conducting subregional monitoring and analysis.

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 (upwards of ten) years before trends in species populations and habitat conditions are detectable. Species and habitat monitoring is conducted by the Preserve Managers. The City, Preserve Steward, Preserve Managers, and Wildlife Agencies are currently working together to develop a functional City-wide monitoring program that will help answer questions about population trends and wildlife movement. In addition, the City is coordinating with the San Diego Management and Monitoring Program (SDMMP), which is developing regional and preserve-level monitoring and management protocols for use throughout San Diego County.

1.3 Current Status of Preserves

This section contains a description of the different types of lands within the HMP preserve, summary of preserve assembly activities, accounting of the mitigation credits at the City's Lake Calavera Mitigation Parcel, and the status of the City's Gnatcatcher Core Area preservation obligation.

1.3.1 Categories of HMP Preserves

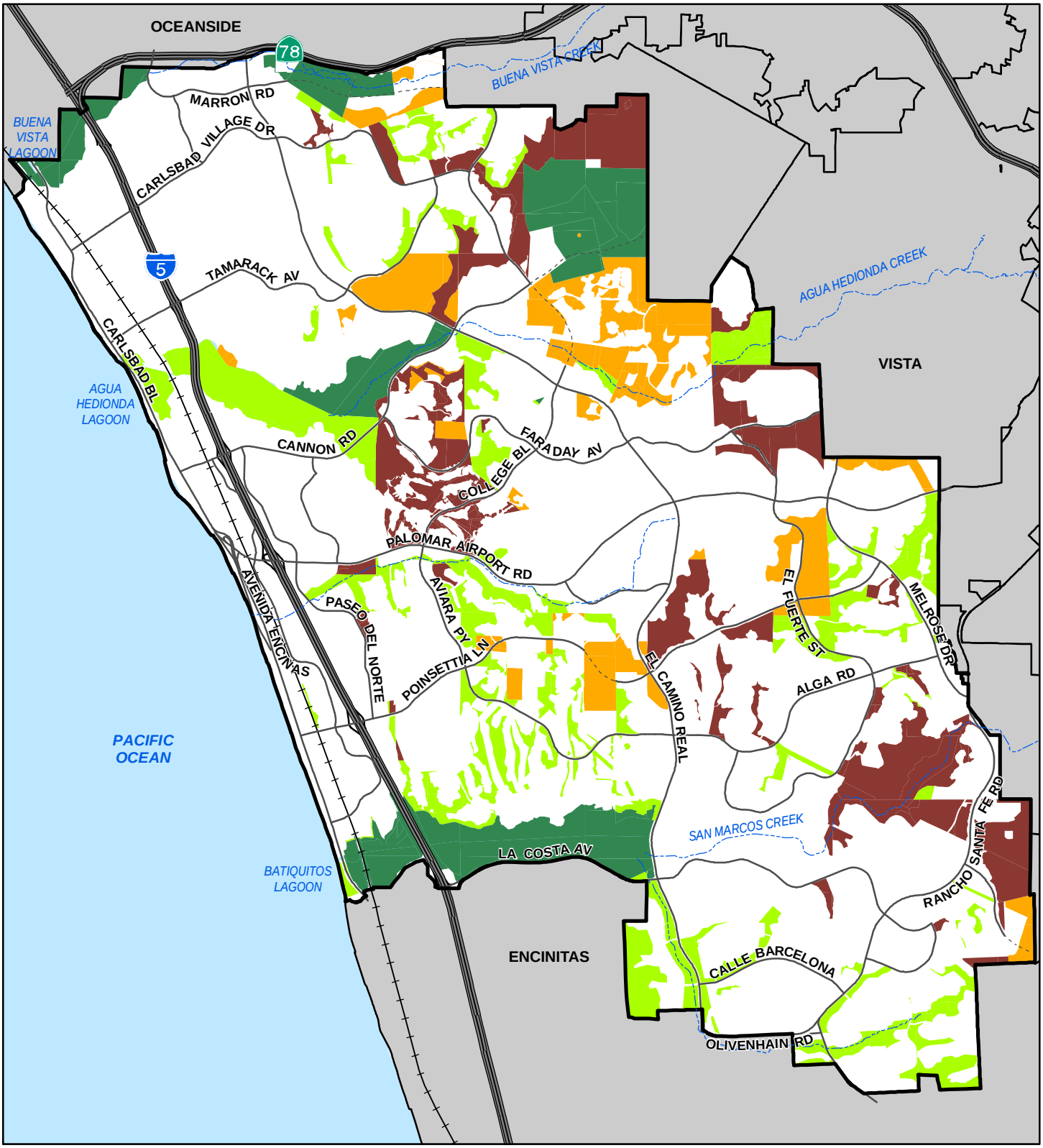
Lands within the HMP preserve system can be grouped into four categories: (1) established private and City-owned Hardline Preserves; (2) California Department of Fish and Game Ecological Reserves; (3) pre-existing natural open space preserves; and (4) future preserves (Proposed Hardline Preserves and 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

These Hardline Preserves were established during or after the adoption of the HMP. They have approved Preserve Management Plans implemented by Preserve Managers and funded through non-wasting endowments or, in the case of the City-owned preserves, through annual budget appropriations. The City receives annual reports for all of these preserves. The underlying property owners for these preserves are a preserve management entity, homeowner's association, or the City. Except for the City-owned properties, all of these Hardline Preserves are protected by a recorded Conservation Easement. Examples of these preserves include Villages of La Costa, Carlsbad Oaks North, Kelly Ranch, Lake Calavera, and the Crossings Golf Course.

California Department of Fish and Game Ecological Reserves

These Hardline Preserves 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 CDFG preserves is based upon the available State funding and resources. Currently there are no finalized Reserve Management Plans for the CDFG ecological reserves in Carlsbad, but management follows draft plans. CDFG obtains State Wildlife Grant funding annually for management and monitoring activities on preserves. Management accounts are established for Carlsbad Highlands Ecological Reserve and Agua Hedionda Lagoon Ecological Reserve. The Batiquitos Lagoon Ecological Reserve is managed and monitored by CDFG and funded through a mitigation account established by the Port of Los Angeles and held by CDFG. The Buena Vista Creek Ecological Reserve is managed by Center for Natural Lands Management (CNLM), a non-profit management entity, through a contract and funded by an endowment held by CNLM. The City receives some CDFG monitoring data



Legend

- Established Private and City-owned Preserve
- California Department of Fish and Game Ecological Reserve
- Pre-existing Natural Open Space Preserve
- Future Preserve

N

0 Feet 6,400

CITY OF CARLSBAD

City of Carlsbad
Categories of HMP Preserves

Figure 1

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Date: 1/4/2012

for the lagoon preserves and a CNLM prepared annual report for the Buena Vista Creek Reserve.

Pre-existing Natural Open Space Preserves

These Hardline Preserves predated the adoption of the HMP and are composed of natural open space areas within subdivisions or master plan communities (owned by the respective homeowner's association), the University of California's Dawson-Los Monos Reserve, and areas owned by Cabrillo Power, San Diego Gas and Electric, 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 consists of trash pick-up and fence maintenance. The HMP envisioned that future management and monitoring of these lands would be financed through a regional funding source. All of the preserves owned by homeowner's associations 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 homeowner's association owned preserves include Calavera Hills Phase I, Aviara, and Arroyo La Costa.

Future Preserves (Proposed Hardline Preserves and Standards Areas)

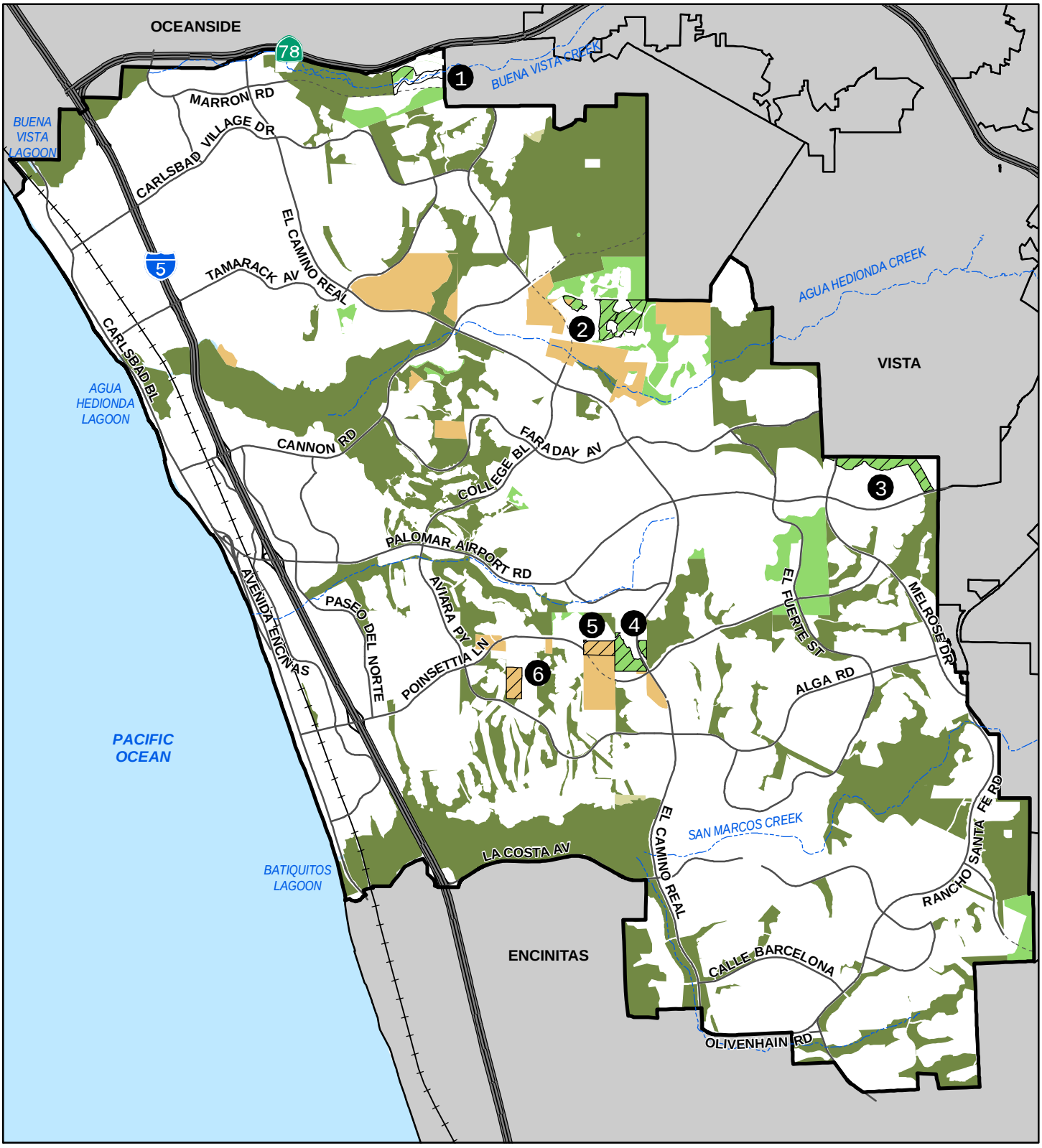
These preserves are identified in the HMP and are associated with developable lands but have yet to begin management and monitoring. As a condition of approval for any development on the property, the developer is obligated to establish the preserve by gaining approval of a Preserve Management Plan, contracting with a management entity, depositing a non-wasting endowment or other secure financing mechanism, and recording a Conservation Easement. An Equivalency Finding, approved by the City and Wildlife Agencies, is required for any alterations to the Proposed Hardline Preserve and the final preserve design for Standards Areas must be approved by the City and Wildlife Agencies through a Consistency Finding. Examples of these future preserves include Mandana, Kato, and Levatino.

1.3.2 Summary of Preserve Assembly Activities

Several Proposed Hardline Preserves and Standards Areas made progress towards becoming established Hardline Preserves during the reporting period. These preserves are shown on Figure 2, and described below.

Cantarini Ranch – Proposed Hardline Preserve

- Preserve Management Plan, dated September 18, 2011, approved
- Funding will be secured prior to grading permit



Legend

- Existing Hardline
- Proposed Hardline
- Outside-Conserved
- Standards Area
- Future Preserve in Progress

1 - Quarry Creek Reclamation
2 - Cantarini Ranch
3 - Carlsbad Raceway
4 - Manzanita Apartments
5 - Poinsettia Place
6 - Muroya

N

0 Feet 6,400

CITY OF CARLSBAD

City of Carlsbad
2011 Preserve Assembly Activities

Figure 2

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Date: 5/22/2012

- In negotiations with future preserve manager
- Conservation Easement to be recorded prior to grading permit

Carlsbad Raceway – Proposed Hardline Preserve

- Preserve Management Plan under review
- Funding mechanism being established
- In negotiations with future preserve manager (SDHC)
- Conservation Easement already recorded on August 7, 2008

Manzanita Apartments – Proposed Hardline Preserve

- Preserve Management Plan, dated June 2011, approved
- Funding mechanism being established
- In negotiations with future preserve manager (HRS)
- Conservation Easement already recorded on October 24, 2003

Muroya – Standards Area

- Preserve Management Plan, dated November 2011, approved
- Funding through endowment being secured
- Contract with San Diego Habitat Conservancy as Preserve Manager in preparation
- Conservation Easement in recordation process

Poinsettia Place – Standards Area

- Preserve Management Plan, dated March 21, 2011 approved
- Funding secured through endowment with San Diego Foundation on September 22, 2011
- Contracted with San Diego Urban Corps Habitat Services as Preserve Manager
- Conservation Easement recorded on November 30, 2011 (outside of current reporting period)

Quarry Creek Reclamation – Proposed Hardline Preserve

- Preserve Management Plan, dated June 16, 2011, approved
- Funding mechanism being established
- In negotiations with future preserve manager
- Conservation Easement under review by US Army Corps of Engineers

1.3.3 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. Table 1 shows total debits to date. A total of 1.7 acres from three City projects were debited from the mitigation parcel during the reporting period.

Table 1. Mitigation Acreage Provided at Lake Calavera Mitigation Parcel

Credits and Debits	Acres[1]
INITIAL CREDITS	***256.0***
Total Debits as of October 31, 2010	82.8
Year 7 Project-Related Deductions (Nov 2010 – Oct 2011)	
1. Encinas Creek Bridge	0.3
2. Agua Hedionda Sewer Lift Station	1.2
3. Beech Avenue Sewer Replacement	0.2
Subtotal Year 7 debits	***1.7***
Total Debits	***84.5***
TOTAL ACRES AVAILABLE AS OF OCTOBER 31, 2011	**171.5**

[1] Rounded to the nearest tenth of an acre.

1.3.4 Gnatcatcher Core Area Preservation Obligation Acreage

As of the final approval of the HMP in 2004, 264.5 acres of the 307.6 acre Gnatcatcher Core Area preservation obligation had been met through project related mitigation in the Core Area and additional onsite restoration within the HMP Plan Area. The remaining obligation consisted of acquisition of 43.02 acres of occupied coastal sage scrub habitat and reimbursement for 50.13 acres of land that was acquired by a private developer in anticipation of the HMP Core Area requirements. The history of the Gnatcatcher Core Area, including how the previous obligations were met, is detailed in earlier annual reports.

During the current reporting period, the City made significant progress in Core Area preservation. On January 25, 2011, the Carlsbad City Council authorized the execution of a Purchase Agreement with Lennar Homes (dba Estates Seven, LLC) for the 50.13 acres of credit on the Alemir property. The sale of credits was completed on April 26, 2011, and confirmation of conservation credit was received from the Wildlife Agencies on May 9, 2011.

On July 26, 2011, the City, Wildlife Agencies, and the Conservation Fund, a non-profit organization, executed an agreement for Core Area conservation credits associated with the Perkins property within the Gnatcatcher Core Area. The Agreement Regarding Conservation

Credits re: City of Carlsbad HMP Offsite Core Area states that the City will receive 30.09 acres of conservation credit for contributing funds annually over a 4-year period. The conservation credits will be earned incrementally, with the first increment earned as of October 24, 2011. Table 2 shows the current status of Core Area conservation credits.

Table 2. Status of Carlsbad HMP Gnatcatcher Core Area Obligation

Core Area Components	Acres	
	Components	Total
TOTAL CORE AREA CONSERVATION REQUIREMENT		**307.6**
1. Acquisition by the City		
Alemir Property – land in excess of mitigation requirements.	*50.13*	
Perkins Property – 30.09 acres of conservation credit for endowing long-term management on portion of property. October 24,2011	*7.53*	
Subtotal Up-front Acquisition	***57.66***	**57.66**
2. Project-Related Mitigation		**150.26**
3. Onsite Conservation Restoration Credits		**64.19**
Total Acres Conserved		**272.11**
REMAINING ACQUISITION REQUIREMENT		**35.49**

1.3.5 *In-lieu* Mitigation Fee Program

Under certain circumstances, project impacts to non-sensitive upland habitats that occur outside of the HMP preserve may be mitigated through a fee rather than onsite or offsite conservation. These funds can only be used to offset the cost of Gnatcatcher Core Area conservation. A total of $101,027.58 of *in-lieu* mitigation fees were collected during the reporting period. A detailed accounting of the *in-lieu* mitigation fees and expenditures is given in Section 3 (Financial Summary).

1.4 Habitat Gains and Losses

Pursuant to the HMP and IA, 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 (a) the HMP Preserve is being assembled as anticipated; (b) the habitat conservation goals of the HMP are being achieved; and (c) 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. It 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

Habitrak is used by the City to calculate the number of acres added to the HMP Preserve every year (although it does not calculate gains within the Gnatcatcher Core Area which is outside of the City limits). 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 3. HMP Target Conservation of Habitats
(Comparison of Habitat Categories in HMP and Habitrak)

HMP Table 8		Habitrak	
Habitat Type	**Target Acres**	**Habitat type**	**Target Acres**
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 within Carlsbad	**6,478**	**Total Target within Carlsbad**	**6,478**
CAGN Core Area contribution	308[1]	Not tracked in Habitrak	N/A
Total Target Conservation	**6,786**		

[1] Rounded to the nearest acre.

1.4.2 Land Acquisitions

There were no land acquisitions inside of the HMP planning area during the reporting period.

1.4.3 Habitat Gains and Losses

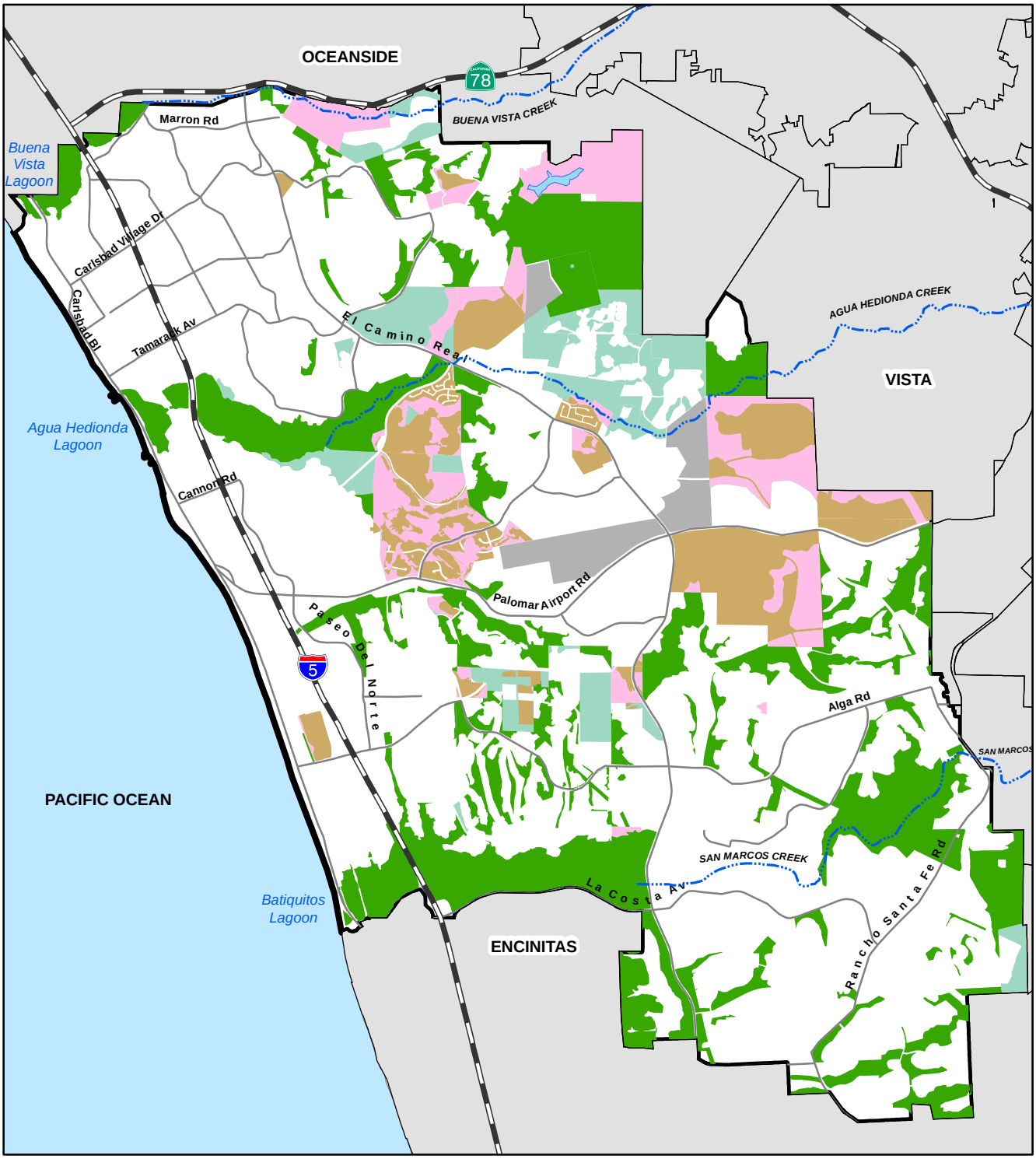
There were no habitat gains or losses during the current reporting period. To date, cumulative habitat gains and losses inside the Preserve are 5,821 acres and 169 acres, respectively (Table 4; Figure 3). This represents 90% (5,821/6,478 acres) of the target acreage for the HMP Preserve, not counting the Gnatcatcher Core Area.

1.4.4 Rough-Step Preserve Assembly

As stated in the IA (12.1 Record Keeping) "Habitat conservation under the HMP must proceed concurrently and in rough step with development." Although 'rough step' has not been defined in the HMP or MHCP, the general standard adopted by the Wildlife Agencies is that acres of habitat gain must be within approximately 10% of habitat losses (Christine Beck, CDFG, pers. comm. 2007). This policy was developed for NCCP plans to ensure that development does not greatly outpace land preservation. To date, 1,486.58 acres have been lost in Carlsbad since inception of the HMP, and therefore, no less than 1,337.92 acres (1,486.58 - 148.66) must be preserved. A cumulative total of 5,820.90 acres have been gained in the preserve system, which greatly exceeds the minimum required by the rough step policy. The rough step policy will continue to be followed for all new development projects (e.g., in Standards Areas) because the City requires that native habitat be conserved (impact mitigation/habitat gain) prior to issuing a grading permit (project impact/habitat loss) pursuant to the mitigation ratios described in the HMP. Measures required to be in place prior to permit issuance include: management cost analysis, non-wasting endowment for perpetual management, conservation easement, preserve management plan, and a contract with an approved preserve manager. Some projects that were approved prior to final HMP approval were issued grading permits before all of these elements were put in place. The City continues to work towards ensuring permanent management for these properties, either in concert with Wildlife Agency sign-off of project mitigation sites or assisting USACOE and USFWS in enforcing the provisions of the project Biological Opinion. Habitat impacted *outside* of the HMP is mitigated through an *in-lieu* mitigation fee.

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



Technology Associates International Corporation

City of Carlsbad
Project Gains and Losses By Reporting Year

Figure 3

File: T:\projects\carlsbad_ps\plots\figures\2011AnnualReport\Habitrak Gain Loss Year 7.mxd

Date: 12/16/2011

Summary of Habitat Losses and Gains

Year 7

Plan: MHCP West San Diego County
Date Range: 11/1/2010 - 10/31/2011

Project Gain Status: Gain
Project Loss Status: Loss

City of Carlsbad

		Acres Inside the Habitat Preserve Planning Area					Acres Outside the Habitat Preserve				Total Acres			
		Habitat Loss		Habitat Gain			Habitat Loss		Habitat Gain		Habitat Loss		Habitat Gain	
Habitat Type	Target Cons.	Current Period	Cummulative	Current Period	Cummulative	Cons. to Date %	Current Period	Cummulative	Current Period	Cummulative	Current Period	Cummulative	Current Period	Cummulative
Southern Coastal Bluff Scrub	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maritime Succulent Scrub	29	0.0	1.6	0.0	25.5	88.0 %	0.0	0.0	0.0	5.5	0.0	1.6	0.0	31.1
Coastal Sage Scrub	2,003	0.0	11.4	0.0	1,610.5	80.4 %	0.0	159.7	0.0	5.5	0.0	171.1	0.0	1,616.0
Chaparral	676	0.0	0.5	0.0	605.1	89.5 %	0.0	65.7	0.0	0.0	0.0	66.2	0.0	605.2
Southern Maritime Chaparral	342	0.0	0.0	0.0	331.7	97.0 %	0.0	16.2	0.0	1.5	0.0	16.2	0.0	333.1
Coastal Sage-Chaparral Scrub	107	0.0	0.0	0.0	112.4	105.1 %	0.0	153.5	0.0	0.0	0.0	153.5	0.0	112.4
Grassland	707	0.0	21.8	0.0	635.8	89.9 %	0.0	218.8	0.0	1.5	0.0	240.6	0.0	637.3
Southern Coastal Salt Marsh	143	0.0	0.0	0.0	127.8	89.4 %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	127.8
Alkali Marsh	9	0.0	0.0	0.0	0.0	0.0 %	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Freshwater Marsh	165	0.0	0.0	0.0	138.1	83.7 %	0.0	0.9	0.0	0.3	0.0	0.9	0.0	138.3
Riparian Forest	82	0.0	0.9	0.0	62.8	76.6 %	0.0	1.3	0.0	0.4	0.0	2.2	0.0	63.3
Riparian Woodland	17	0.0	1.3	0.0	11.7	68.6 %	0.0	0.0	0.0	0.0	0.0	1.3	0.0	11.7
Riparian Scrub	395	0.0	0.1	0.0	369.7	93.6 %	0.0	9.8	0.0	0.6	0.0	9.8	0.0	370.2
Englemann Oak Woodland	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coast Live Oak	20	0.0	0.0	0.0	7.7	38.3 %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7
Other Oak Woodland	4	0.0	0.0	0.0	4.8	120.5 %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8
Freshwater	53	0.0	0.0	0.0	51.2	96.6 %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.2
Estuarine	789	0.0	0.0	0.0	776.5	98.4 %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	776.5
Disturbed Wetland	93	0.0	0.0	0.0	88.6	95.3 %	0.0	11.7	0.0	0.0	0.0	11.7	0.0	88.6
Natural Floodchannel	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beach	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saltpan/Mudflats	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	185	0.0	117.0	0.0	222.0	120.0 %	0.0	462.2	0.0	3.2	0.0	579.2	0.0	225.2
Eucalyptus Woodland	99	0.0	1.3	0.0	94.9	95.9 %	0.0	0.5	0.0	0.0	0.0	1.8	0.0	94.9
Disturbed Land	244	0.0	0.0	0.0	237.1	97.2 %	0.0	174.9	0.0	4.5	0.0	174.9	0.0	241.6
Urban/Developed	0	0.0	13.0	0.0	307.0		0.0	42.3	0.0	0.9	0.0	55.4	0.0	307.9
Southern Foredunes	0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency Total:		**0.0**	**169.1**	**0.0**	**5,820.9**		**0.0**	**1,317.5**	**0.0**	**23.9**	**0.0**	**1,486.6**	**0.0**	**5,844.8**

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 IA, and State NCCP and Federal Fish and Wildlife permits.

1.5.1 HMP-related Permits and Amendments

During the current reporting period, four HMP permits for private and public development projects were approved by the City, and one permit was recommended for approval. Table 5 also includes a status update for HMP permits that have been submitted, but are currently pending or incomplete. No incidental take permits were issued this reporting period.

Table 5. HMP Permits in Process during Year 6

HMP Permit No.	Project Name	Date	Status
HMP 07005	Villagio – Kelly Ranch	05/14/2007	Pending
HMP 07006	S. Coast Materials Quarry	11/09/2010	Approved
HMP 09001	Rancho Milagro	01/16/2009	Pending*
HMP 09002	Dos Colinas	10/19/2011	Approved
HMP 10002	Poinsettia Place Borrow Site	07/28/2011	Approved
HMP 10003	Agua Hedionda Sewer Lift Station	10/05/2011	Recommended for Approval
HMP 11001	La Posada Guadalupe de Carlsbad	08/03/2011	Approved
HMP 11002	Home Plant Lift Station	05/02/2011	Pending
HMP 11003	Robertson Ranch West Village	05/06/2011	Incomplete
HMP 11004	El Camino Real Southbound Widening	05/20/2011	Pending
HMP 11005	Fairfield Carlsbad	09/21/2011	Pending
HMP 11006	Fairfield Carlsbad	09/21/2011	Pending
HMP 11007	Quarry Creek	10/21/2011	Pending

* See Consistency Finding below

One Minor Amendment was processed during the reporting period as 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.** The Rancho Milagro residential subdivision, which is within a Standards Area in LFMZ 15, was processed as a Consistency Finding and received Wildlife Agency concurrence on September 27, 2011.
2. **Equivalency Finding.** No equivalency findings were processed during the reporting period.
3. **Other Minor Amendments (pursuant to Section 20.1 of the Implementing Agreement).** No other minor amendments were processed during the reporting period.

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 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 6-9. In cases where a particular condition is worded the same in more than one document, a reference is made to a previous table in which compliance is described, to avoid redundancy.

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Table 6. Summary of City Compliance with HMP Requirements Outlined in the Implementing Agreement (IA)

IA Section	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 § 21.210), which includes a section on enforcement (§21.210.19) for violations of the HMP. ▪ The City is developing a coordinated multi-departmental trail enforcement program (Section 2.1.6) and continues to work with local preserve managers for enforcement activities. ▪ 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 5,821 acres of habitat within the HMP planning area (90% of target acreage). See Section 1.4.3 for more details.
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 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 § 21.53.230 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. Submitted to California Coastal Commission on April 3, 2006 – application is under review. D. A new chapter (§ 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. Approved by the City Council in March 2006. Submitted to California Coastal Commission on April 3, 2006 – application is under review. 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). Approved by the City Council July 2005. F. New subsections (§21.210.040 D.5 and §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). Approved by the City Council in March 2006. Submitted to California Coastal Commission on April 3, 2006 – application is under review. Compliance is enforced on a project-by-project basis during environmental review and in conjunction with other wetland permitting agencies such as California Coastal Commission, CDFG and USACOE.

Table 6. Summary of City Compliance with HMP Requirements *continued*

IA Section	Obligation	City Compliance
11.4	**Additional Implementation Measures:** To implement measures included in MHCP.	▪ The MHCP, HMP, and OSMP conservation measures are currently being implemented during the approval process for all development projects and preserve management activities. ▪ See Section 1.6 for details about additional implementation measures.
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 264.39 acres of its coastal sage scrub conservation obligation through up-front acquisition (50.13 acres), project mitigation (150.26 acres), and habitat enhancement credit (64 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 four years. The City made the first payment on October 24, 2011 and received 7.53 acres of credit.. ▪ The Core Area properties are protected under a Conservation Easement, and are being monitored and managed by the Center for Natural Lands Management (CNLM).
11.6	**Cooperative Regional Implementation:** To participate in MHCP Elected Officials Committee.	▪ To date, The city of Carlsbad 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; and 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 (See Section 1.4.4 for details.) ▪ Currently the City is working with the Preserve Steward, preserve managers, City GIS staff, and the regional monitoring coordinator for San Diego County to determine the best approach to develop and manage monitoring data. ▪ Protocols and standards will be 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.

Table 6. Summary of City Compliance with HMP Requirements *continued*

IA Section	Obligation	City Compliance
12.3	**Preserve Management and Monitoring Plan:** To prepare a preserve management and monitoring plan that will detail recommendations in HMP Section F.	The Open Space Management Plan (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. Currently the OSMP is being reviewed by the California Coastal Commission as part of the HMP Local Coastal Program Implementation Plan; the City is implementing OSMP policies Citywide.
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. ▪ The City is coordinating with the regional adaptive management and monitoring program in San Diego County. ▪ The City has developed a compliance checklist for the preserve managers; the checklist includes a section on adaptive management activities (pilot study design, methods, results, etc.).
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 272.11 acres of its 307.6-acre coastal sage scrub conservation obligation. The City must cause conservation of an additional 35.49 acres; this obligation will be funded through *in-lieu* 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 CDFG. 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 CDFG, private HOAs, University of California, SDG&E, Cabrillo Power, and SDUHS. 14.6 The HMP program is being overseen by Michael Grim (City Property and Environmental Management). In addition, the City has contracted with Technology Associates (TAIC) 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 an *in-lieu*-mitigation fee program for new development that will fund the City's remaining Gnatcatcher Core Area obligations.

Table 7. Summary of City Compliance with Terms and Conditions of the NCCP Take Authorization/Permit

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 IA, Section 11.3 (See Table 12). They are summarized below. A. Urgency Ordinance –interim HMP enforcement. B. Amend OSC 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 9, 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 is subject to these requirements as a condition of approval.
H. Coverage for thread-leaved brodiaea and approval of the Fox-Miller Project. The conditions are as described in the USFWS 10(a) Permit Condition 7 (Table 12).	See Table 11, 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 8. Summary of City Compliance with the Terms and Conditions of the Federal ESA Section 10(a)(1)(B) Take Authorization/Permit

FESA 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 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 10 and 11.
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.	See next page.

Table 8. Summary of City Compliance with Terms and Conditions of Federal ESA Section 10(a)(1)(B) Take Authorization/Permit *continued*

FESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
3. *continued* 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 clapper rail *Sterna antillarum browni* – California least tern *Charadrius alexandrinus nivosus* – Western snowy plover *Sterna elegans* – Elegant tern	Table 1 (a). No take of these species has been authorized by the City.
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 **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 *Cnemidophorus hyperythrus beldingi* – Orange-throated whiptail	Table 1 (b). The City did not authorize take for any of these species during the current reporting period.
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 therefore take of 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. 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.

Table 8. Summary of City Compliance with Terms and Conditions of Federal ESA Section 10(a) Take Authorization/Permit *continued*

FESA 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	The City has not taken legal control of the Poinsettia Lane Vernal Pools and has not requested take for vernal pool species. 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.
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; and (d) If all conditions are met, the Fox-Miller project can be permitted under the HMP through the HMP amendment process	(a) The boundary for the brodiaea population has been established. (b) The boundary was expanded. (c) The Wildlife Agencies have approved the Fox-Miller project. The restoration and non-restoration areas are currently under management and monitoring by Helix via annual contract with the landowner. Long term management of the property will be provided by SDHC when the 5-year restoration areas are signed off by the Wildlife Agencies. (d) Brodiaea coverage was granted by the Wildlife Agencies through a minor amendment December 2, 2005.

Table 8. Summary of City Compliance with Terms and Conditions of Federal ESA Section 10(a) Take Authorization/Permit *continued*

FESA 10(a) Permit Terms and Conditions (T&C)	Description of City Compliance
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, and (b) If the driving range adjacent to the Kelly/Bartman property is proposed for a different use, the City will ensure that an on-site 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 CDFG 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.

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 12). 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 are consistent with the HMP. A total of 182.6 acres of coastal sage scrub occurs within Standards Areas throughout the HMP. To date, 11.4 acres have been lost (6.2%), and 49.4 acres have been conserved (27.0%). Zone-wide standards require at least 67% (122.3 acres) of the coastal sage scrub to be conserved. Therefore, the City must conserve at least 72.0 more acres of coastal sage scrub within the Standards Areas at build-out. Table 12 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 9. Compliance with Zone-Wide Standards through Year 7

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.	Total coastal sage scrub habitat within Standards Areas: 182.6 acres. Coastal sage scrub loss = 11.4 acres (6.2%). Coastal sage scrub gains = 49.4 acres (27.0%). An additional 72.0 acres must be conserved to meet 67% conservation in the Standards Areas. 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 north shore of Agua Hedionda: no projects have been finalized for these parcels. In-fill parcel: Aura Circle property was changed to a Proposed Hardline preserve in the HMP mapping during Coastal Commission processing; however, the HMP text was not corrected.
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.	The Kelly-Bartman property, aka Summit, is an Existing Hardline preserve that was approved with 50% conservation including an open space corridor, from the SE to the northern site boundary. The Spyglass property has been developed and grassland impacts were mitigated at a 2:1 ratio through restoration at Carlsbad Highlands Mitigation Bank. This project was compliant with all other standards.
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: the property was 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.	Projects: Robertson Ranch East was approved by the City and Wildlife Agencies in 2007. Out of a total of 197.3 acres of coastal sage scrub in Zone 14, 11.3 acres (5.7%) has been impacted. A total of 154.0 acres (78%) of the coastal sage scrub has already been conserved.
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 occurs within Core Area 5 in the southern portion of Zone 15. No net loss of coastal sage scrub has occurred. No other projects have final City/Wildlife Agency approval.
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 and North Coast Calvary Chapel. Both 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.	The Manzanita project was a Proposed Hardline preserve area in the HMP, and it was approved by the City and Wildlife Agencies. It provides east-west connectivity from El Camino Real to the project 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.

1.6 Open Space Management Plan Revisions

Since the adoption of the HMP, the City and Wildlife Agencies have consulted on implementation issues such as the process for evaluating HMP consistency and requesting Minor Amendments, the annual reporting schedule, and the role of the Preserve Steward. Some of these consultations have resulted in a minor adjustment to the implementation described in the OSMP. For example, City staff, Preserve Steward, and Wildlife Agencies meet on a bimonthly basis to discuss general HMP implementation topics and specific development projects with HMP related issues. Also, the Preserve Steward, City staff, and Preserve Managers are in frequent contact about preserve management issues and hold a quarterly coordination meeting. Due to this frequent communication and coordination, the monthly status memos from the preserve managers to the Preserve Steward and the quarterly status memos from the Preserve Steward to the City and Wildlife Agencies listed in Section 1.1.5 are not required.

Early in the HMP implementation, the City and Wildlife Agencies agreed that the annual reporting cycle shown in the OSMP did not afford enough time after receipt of the preserve specific annual reports to prepare the Citywide annual report and distribute the report for review and comment by the Wildlife Agencies and other interested parties. Therefore, the cycle was revised to allow the City to submit the annual report to the Wildlife Agencies later in the reporting cycle.

Due to City realignment in 2009, the newly created Property and Environmental Management (PEM) Department assumed responsibility of managing the Preserve Steward contract and took the lead on communication between the Preserve Steward and other City departments. Figure 4 is a revision to Figure 1-1 in the OSMP reflecting the central role of PEM and noting the other City departments (namely Planning and Fire Department) that are involved in HMP implementation.

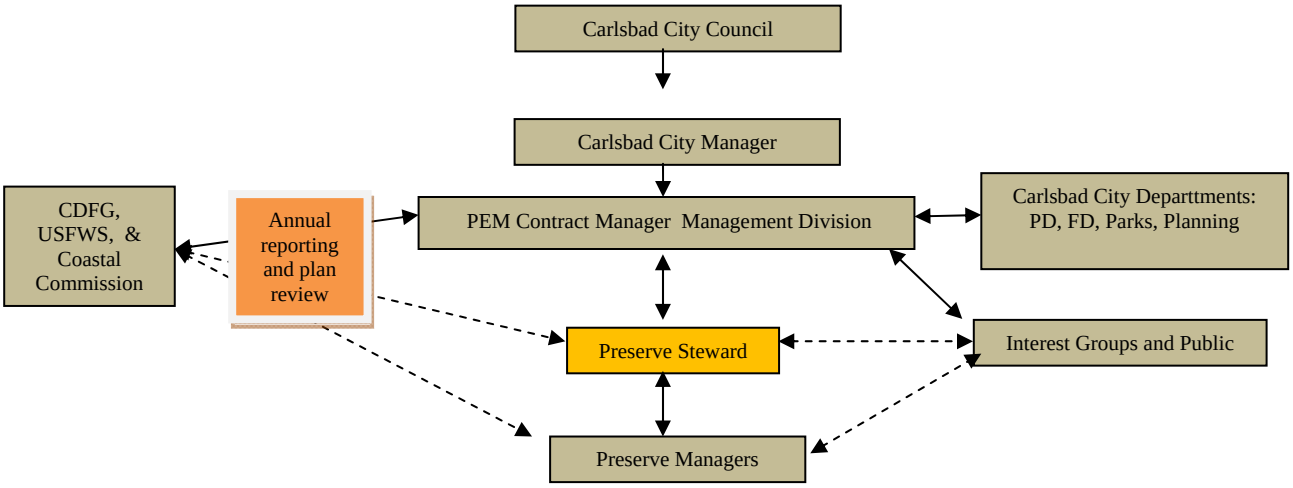


Figure 4. Chain of Command and Communication Flow for HMP implementation

2.0 Management and Monitoring

2.1 Key Management Activities

2.1.1 City-Owned Preserves

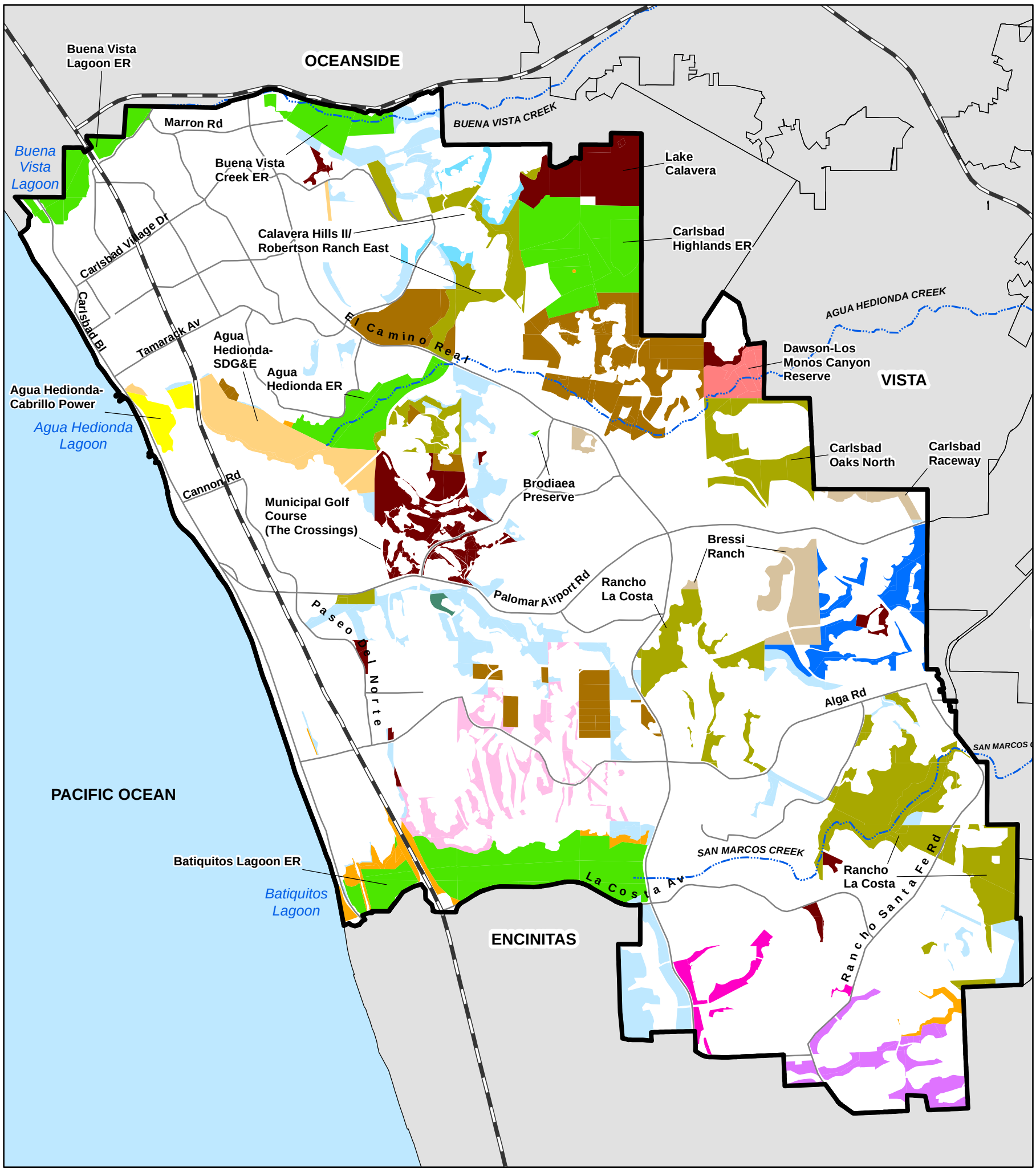
All City-owned preserves have been actively managed by CNLM since December, 2008. The City preserves consist of 13 properties scattered throughout Carlsbad totaling 600.6 acres (Figure 5). Management activities this year included evaluation, assessment, and treatment of medium and zero tolerance invasive non-native plant species, enforcement patrols, installation of signs and kiosks, public education/outreach, participation in volunteer events, and coordination with police and fire departments on enforcement issues. Monitoring during the current reporting period included surveys for thread-leaved brodiaea (*Brodiaea filifolia*), coastal California gnatcatcher, least Bell's vireo (*Vireo bellii pusillus*), and southwestern willow flycatcher (*Empidonax traillii extimus*).

2.1.2 Other Actively Managed Preserves

Areas conserved since approval of the HMP are actively managed and monitored as required by the HMP and MHCP (Level 3, as defined in the MHCP). The majority of preserves in this category are managed by CNLM and CDFG. Currently, the only other preserve manager for actively managed preserves is San Diego Habitat Conservancy, which manages the Emerald Pointe Estates Preserve. Ongoing management and monitoring activities on preserves throughout the HMP consist of invasive species removal, patrolling, vegetation mapping, species and habitat monitoring, installation and maintenance of fences, signs, and kiosks, and public outreach. These activities are summarized in Appendix A. A more detailed preserve-specific account of these activities is available in the preserve-specific annual reports submitted by Preserve Managers, which are available upon request.

2.1.3 Pre-Existing Natural Open Space Preserves

Pre-existing natural open space preserves (i.e., areas that were already conserved at the time the HMP was approved) will be managed according to pre-existing management funding and arrangements. The majority of these preserves are managed by various HOAs. Other landowners responsible for management include University of California San Diego (Natural Reserve System), SDG&E, Cabrillo Power, North County Transit District (NCTD) and San Dieguito Union High School District. Pre-existing natural open space preserves are managed at a property maintenance level, which generally consists of fence maintenance and trash removal.



Legend

City of Carlsbad

City Preserves*
- Batiquitos Drive
- Carlsbad Village
- Carrillo Ranch
- La Costa Canyon Park
- La Costa/Romero
- Lagoon Lane
- Lake Calavera
- Los Monos
- Macario Canyon
- Municipal Golf Course
- Poinsettia Park
- Research Center
- Veteran's Memorial Park

Other Public/Semi-Public

Cabrillo Power

San Diego Gas and Electric

Other Public Agencies
- Caltrans
- Carlsbad Municipal Water District
- North San Diego County Transit
- San Dieguito Union High School
- State of California

Wildlife Agencies

California Department of Fish and Game
- Agua Hedionda Lagoon Ecological Reserve (ER)
- Batiquitos Lagoon ER
- Buena Vista Creek ER*
- Buena Vista Lagoon ER
- Carlsbad Highlands ER
- Brodiaea Preserve

Non-Profit Management Entity

Center for Natural Lands Management (CNLM)
- Calavera Hills/Robertson Ranch
- Carlsbad Oaks North
- Encinitas Creek/NCHB
- Kelly Ranch
- Rancho La Costa
- Robertson Ranch East Village
- Robertson Ranch West

San Diego Habitat Conservancy
- Emerald Pointe Estates

University of California Reserve System

University of California Reserve System
- Dawson-Los Monos Canyon Reserve

Private

Aviara HOAs

Calavera Hills HOAs

Encinitas Creek HOAs

La Costa Valley HOA

Rancho Carrillo Master HOA

Other HOAs and Private Open Space

Other Entities

Pending or by Annual Contract
- Bressi Ranch
- Carlsbad Raceway
- Fox Miller Brodiaea Site

Unmanaged Properties
- Undeveloped Standards Area
- Other Unmanaged Properties

*Managed by Center for Natural Lands Management (CNLM)

Basemap Legend

City of Carlsbad

Jurisdictional Boundary

Freeway

Major Road

River

N

Feet

0 4,750

Technology Associates International Corporation

City of Carlsbad
Current Preserve Ownership/Management

Figure 5

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Date: 12/16/2011

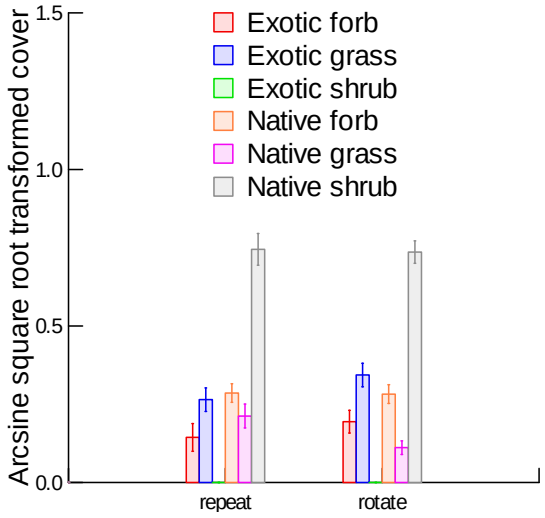
2.2 Monitoring

Long-term monitoring of habitats and species is being conducted on all actively managed preserves, as described below. Table 10 summarizes the years during which monitoring of priority species has occurred on each preserve, and Figures 6 – 13 show the known locations of these species based on data from Preserve Managers and the California Natural Diversity Database (CNDDB).

2.2.1 Vegetation Communities

Coastal Sage Scrub Habitat

CNLM began a long-term monitoring program in coastal sage scrub (CSS) habitat during the spring of 2009 by setting up modified Whittaker plots (see CNLM 2010a for methods and rationale). CNLM collaborated with Dr. Douglas Deutschman of San Diego State University (SDSU) in 2010 and developed a rotating panel approach to monitoring for a trial period prior to determining the ideal sample replicate size. After 3 years of repeated sampling among 47 plots set up in four preserve areas (including many parcels owned by the City), data were collected on enough sites to adequately determine the most informative and efficient system of sampling. The annual sample size is still being determined pending one more consultation with Dr. Deutschman; however, it is believed that visiting different sites (distributed evenly across the landscape and with respect to slope and aspect) every year on a 3-year return interval will be more suitable than re-visiting the same sites year after year. The graph below shows the similarity of the results between rotating and repeat visit plots for all three years (2009 -2011) combined. Native forbs and shrubs are equivalent between the two panels, and exotic forbs and grasses, perhaps the most sensitive year to year measure, are very similar between the two panels. Native grasses show the most variability between the two panels, but this is not necessarily an important difference since CNLM is most interested in tracking the exotic forbs and grasses with respect to native forbs and shrubs.

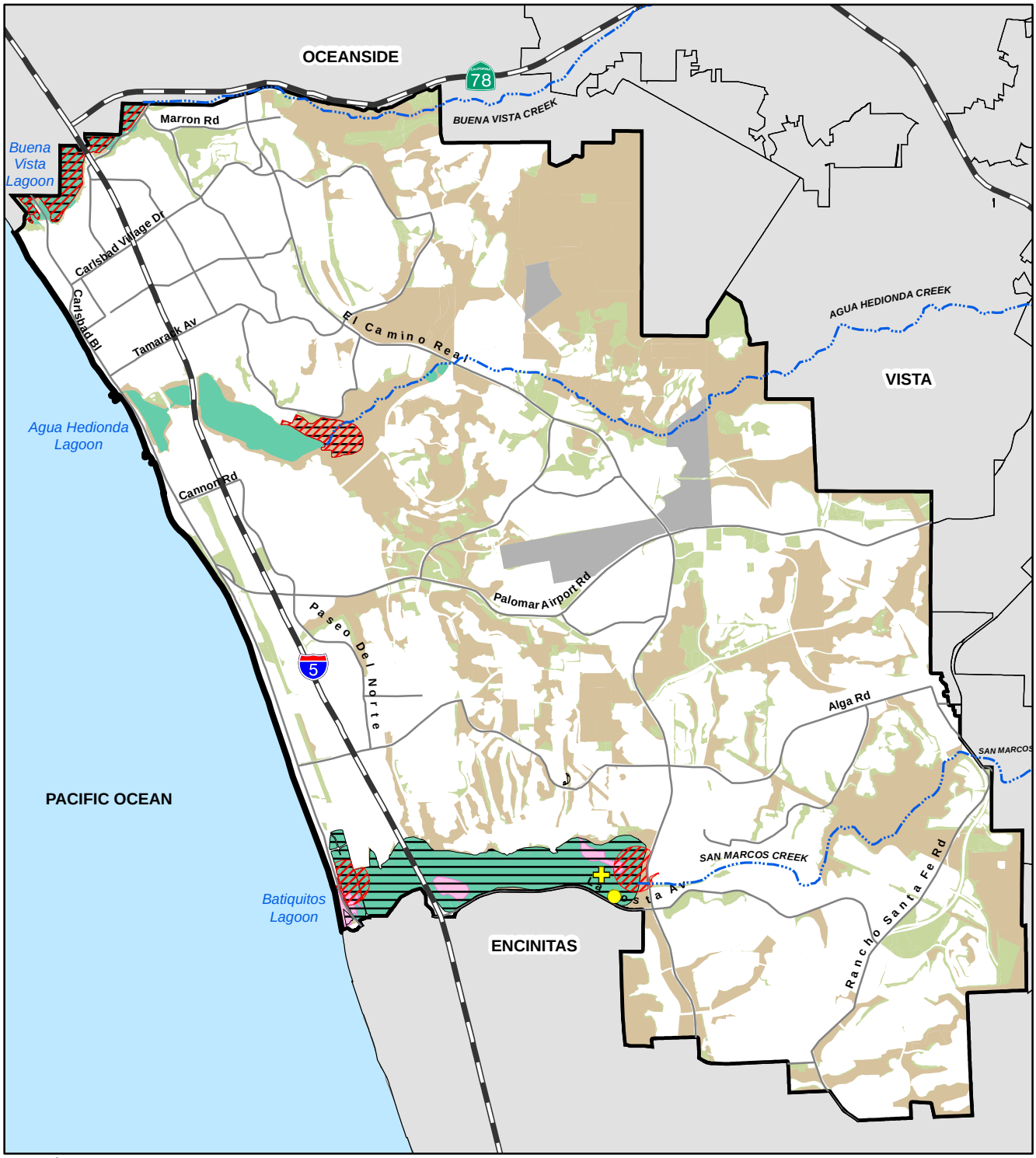


Arcsine square root transformed average (+/- 1s.e.) decimal percent cover categorized by origin and growth form for repeat plots (N = 7 plots in 2009, 8 in 2010 and 2011), and rotate plots (N = 11 in 2009, 15 in 2010, and 11 in 2011) for a total of 45 plots.

Table 10. Summary of Priority Species Surveys Conducted on Actively Managed Preserves

Species	Agua Hedionda Lagoon ER	Batiquitos Lagoon ER	BV Creek ER	BV Lagoon	Calavera/ Rob Ranch E	Carlsbad Highlands	Carlsbad Oaks N	City Preserves	Emerald Pointe	Encinas Ck	Kelly Ranch	Rancho La Costa
Lagoon/Coastal Species												
Belding's savannah sparrow	1973-2010[1]	1973-2010[1] 2001-2008[2]	No lagoon species or habitat in this preserve	1973-2010[1]			Lagoon habitat and species do not occur in these preserves					
California least tern	NP	2001-2011[2]		NP								
Light-footed clapper rail	2000-2011[2]	2000-2011[2]		2000-2011[2]								
Western snowy plover	NP	2001-2011[2]		NP								
Riparian Species												
Least Bell's vireo	2008	NP	2008	NP	2009	NP	NP	2010-2011	NP	2009	NP	NP
SW willow flycatcher	SWWF does not occur in these preserves											
Vernal Pool Species												
California Orcutt grass	There are no vernal pool species or habitat on any of these preserves											
Little mousetail												
San Diego button-celery												
Spreading navarretia												
Riverside fairy shrimp												
San Diego fairy shrimp												
Vernal Pool/Upland Species												
Thread-leaved brodiaea	NP	NP	Present; No surveys	NP	2006-2008	2008	2007-2008	2010-2011	NP	NP	NP	2005-2008
San Diego thornmint	NP	NP	NP	NP	2008	NP	2007-2008	2010-2011	2010	NP	NP	2005-2011
Upland Species												
Del Mar manzanita	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	2009	2005, 2008
Del Mar mesa sand aster	NP	unknown	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
Encinitas baccharis	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
California gnatcatcher	2008	2008	2008	NP	2007	2008	2007	2011	2009	2009	2003-2007	2005, 2007, 2010

NP = Not present
[1] Every 5 years
[2] Annually



Legend

- California Least Tern Location*
- Western Snowy Plover Location*
- Western Snowy Plover USFWS Proposed Critical Habitat
- Belding's Savannah Sparrow Area*
- California Least Tern Area*
- Light-Footed Clapper Rail/Western Snowy Plover Area*

* Recent location (2000 to 2010)

Note: Symbology overlap occurs where there are multiple species mapped at a particular location.

Sources: USFWS 2011, CNDDB 2010, Bird Atlas 2001

Basemap Legend

- City of Carlsbad
- Hardline/Softline Preserve
- Not A Part
- Jurisdictional Boundary
- Freeway
- Major Road
- River
- Natural Vegetation Outside Preserve

N

Feet

0 6,400

Technology Associates International Corporation

City of Carlsbad
Current Status of Lagoon/Coastal Species - Birds

Figure 6

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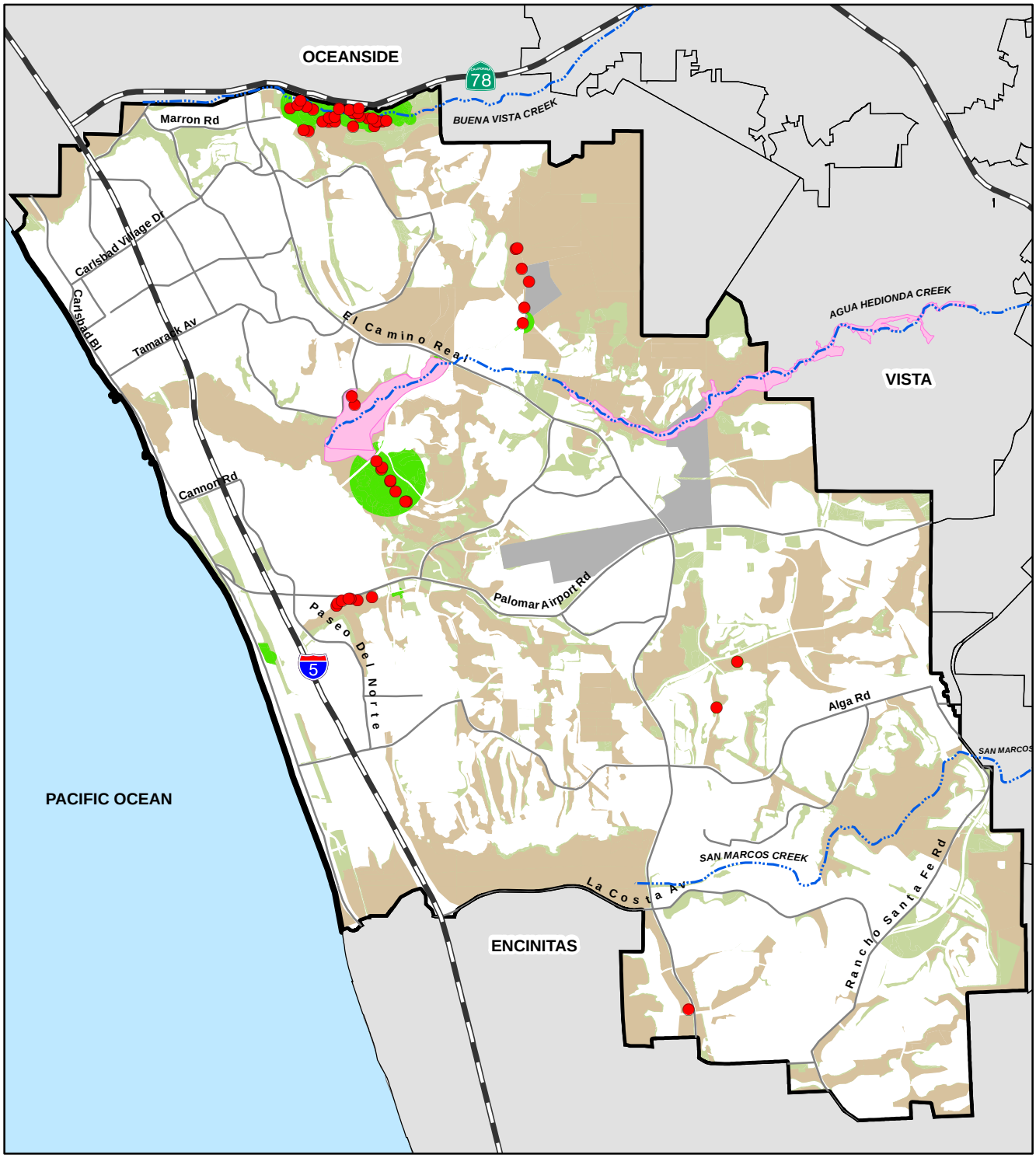
Date: 12/16/2011



Legend

- Least Bell's Vireo Location*
- Least Bell's Vireo Area*
- Southwestern Willow Flycatcher USFWS Proposed Critical Habitat

* Recent location (2000 to 2011)

Sources: CNLM 2011, CNDDB 2010, USFWS 2008

Basemap Legend

- City of Carlsbad
- Hardline/Softline Preserve
- Not A Part
- Jurisdictional Boundary
- Freeway
- Major Road
- River
- Natural Vegetation Outside Preserve

N

Feet

0 6,400

Technology Associates International Corporation

City of Carlsbad
Current Status of Riparian Species - Birds

Figure 7

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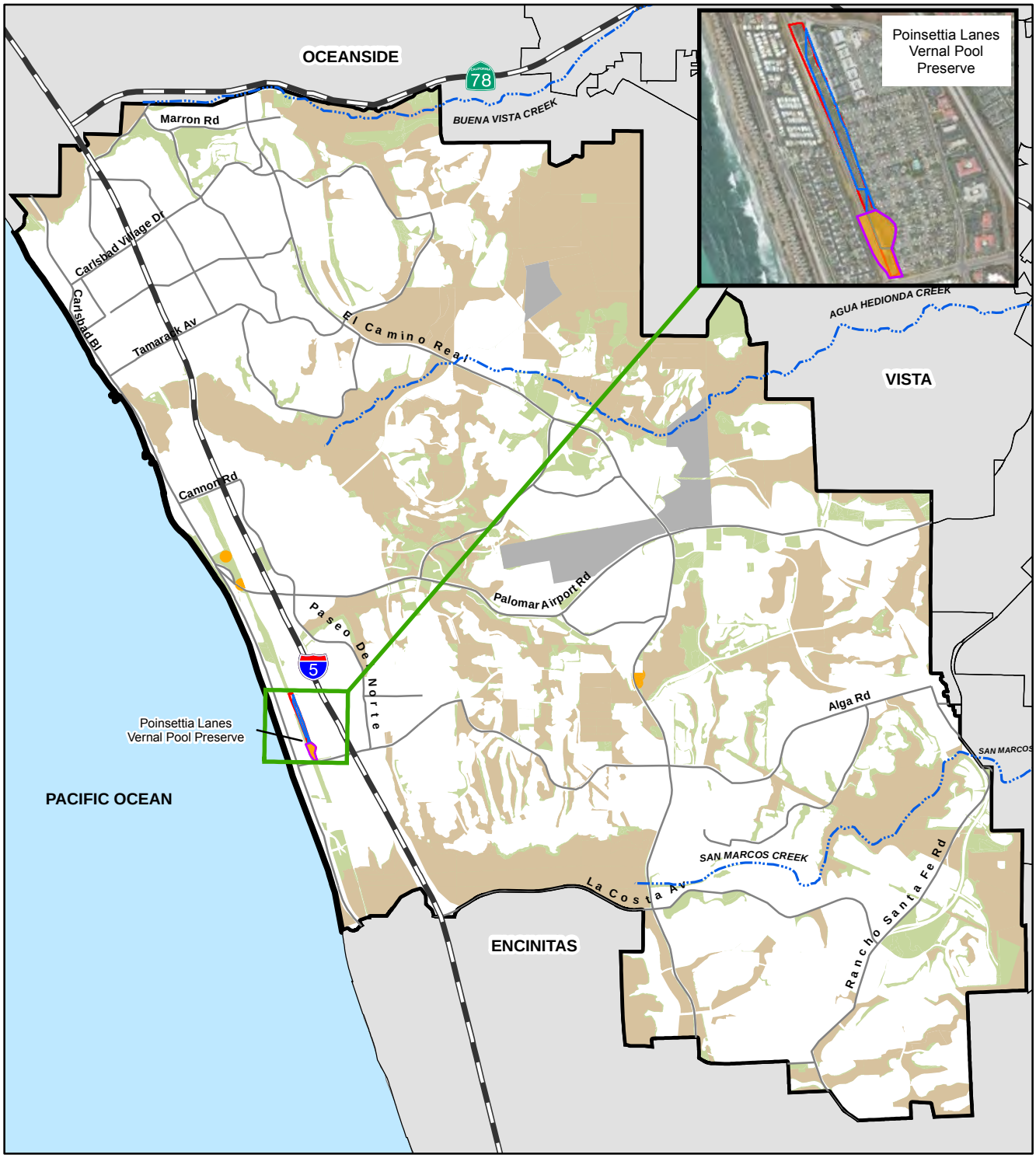
Date: 12/16/2011



Legend

- San Diego Fairy Shrimp Area*
- Riverside Fairy Shrimp Area*
- San Diego Fairy Shrimp USFWS Final Critical Habitat
- Spreading Navarretia Final/Riverside Fairy Shrimp Proposed USFWS Critical Habitats

* Recent location (2000 to 2011)

Sources: USFWS 2011, CNDDB 2010

Basemap Legend

- City of Carlsbad
- Hardline/Softline Preserve
- Not A Part
- Jurisdictional Boundary
- Freeway
- Major Road
- River
- Natural Vegetation Outside Preserve

N

Feet

0 6,400

Technology Associates International Corporation

City of Carlsbad
Current Status of Vernal Pool Species - Plants/Invertebrates

Figure 8

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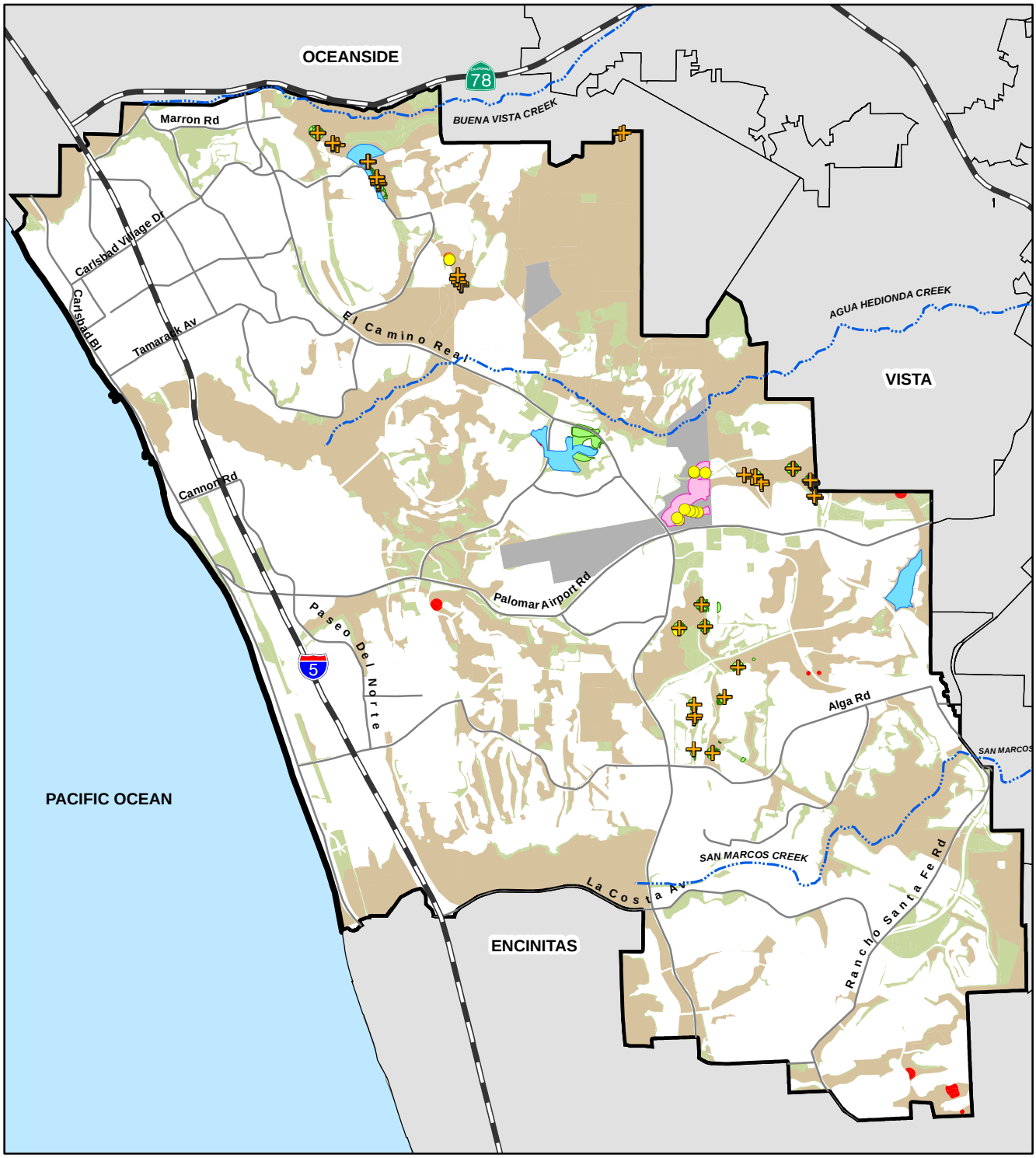
Date: 12/16/2011



Legend

- San Diego Thorn-Mint Location*
- Thread-Leaved Brodiaea Location*
- San Diego Thorn-Mint Area*
- Thread-Leaved Brodiaea Area*
- San Diego Thorn-Mint USFWS Final Critical Habitat
- Thread-Leaved Brodiaea USFWS Final Critical Habitat

* Recent location (2000 to 2011)

Sources: CNLM 2011, CNDDB 2010, USFWS 2008

Basemap Legend

- City of Carlsbad
- Hardline/Softline Preserve
- Not A Part
- Jurisdictional Boundary
- Freeway
- Major Road
- River
- Natural Vegetation Outside Preserve

N

Feet

0 6,400

Technology Associates International Corporation

City of Carlsbad
Current Status of Upland/Vernal Pool Species - Plants

Figure 9

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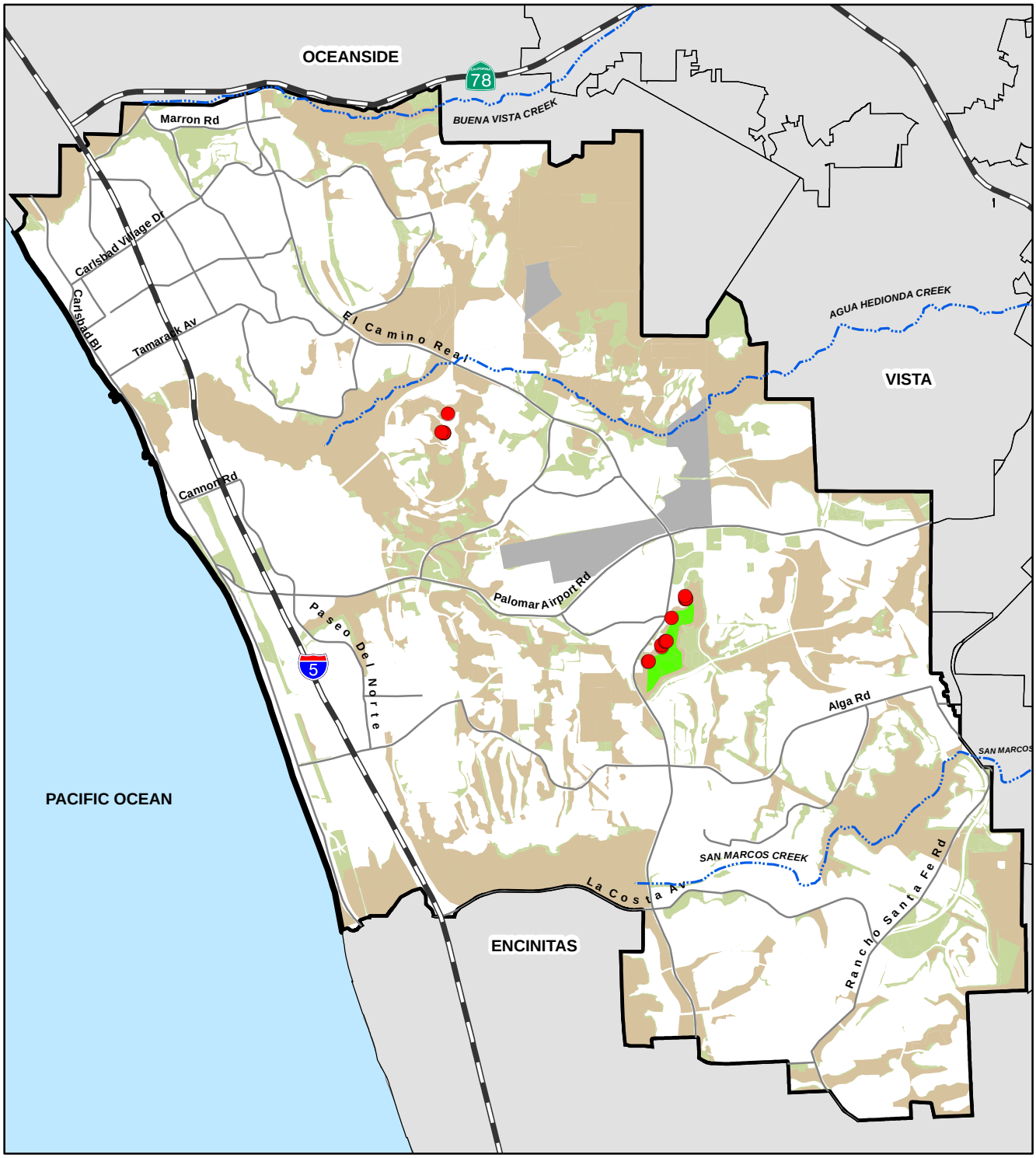
Date: 12/16/2011



Legend

- Del Mar Manzanita Location*
- Del Mar Manzanita Area*

* Recent location (2000 to 2011)

Sources: CNLM 2011

Basemap Legend

- City of Carlsbad
- Hardline/Softline Preserve
- Not A Part
- Jurisdictional Boundary
- Freeway
- Major Road
- River
- Natural Vegetation Outside Preserve

N

Feet

0 6,400

Technology Associates International Corporation

City of Carlsbad
Current Status of Upland Species - Plant

Figure 10

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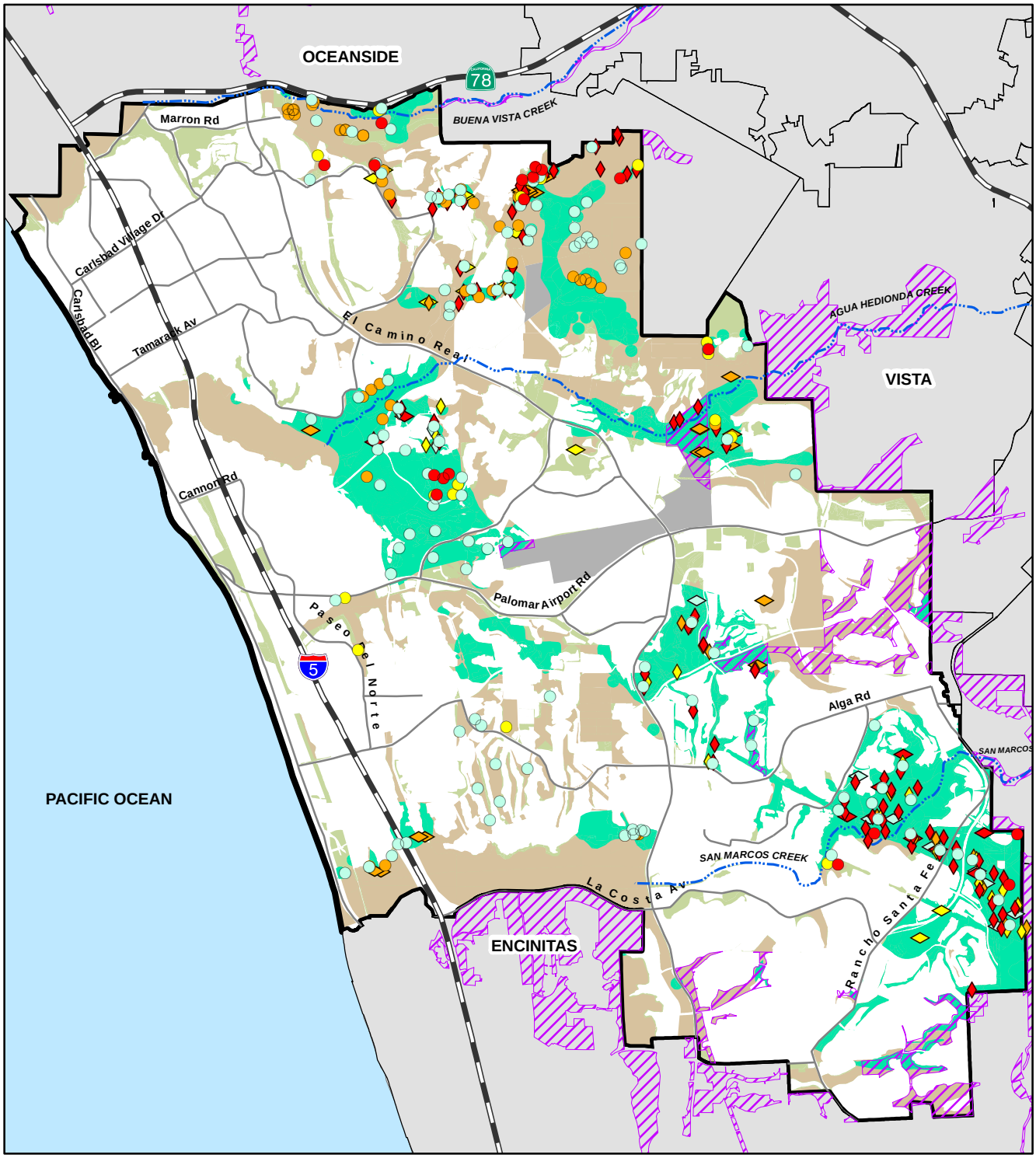
Date: 12/16/2011



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City of Carlsbad
Current Status of Coastal California Gnatcatcher

Figure 11

File: T:\projects\carlsbad_ps\plots\figures\2011AnnualReport\Birds-Upland Species CAGN.mxd

Date: 12/16/2011

Grassland

CNLM has conducted 3 years of grassland habitat monitoring at the Village H parcel within the Calavera Hills-Robertson Ranch preserve (CNLM 2011a). Percent cover of functional groups and species richness were recorded every other year between 2007 and 2011. These results show that during normal or high rainfall years (2009 and 2011), exotic grasses, such as purple false-brome (*Brachypodium distachyon*), dominated the spaces between clumps of needlegrass (*Nassella* spp.); however, during low rainfall conditions (2007), the needlegrass had a higher vegetative cover. Interestingly, brome grasses (*Bromus* spp.) had a higher relative cover during a drier year (2007) than during the two wetter years, whereas the cover of false purple brome increased with increased rainfall. Italian rye (*Lolium multiflorum*) responded roughly equally during all 3 years. Needlegrass, the dominant native feature of the grassland, generally maintained the same amount of cover across the monitoring period and appeared to respond better than other species to lower rainfall. Additional data may show that exotic grasses represent a threat to this community. So far, however, the needlegrass grassland appears to be stable.

One of the goals of this monitoring program is to better understand when, where, and if weed treatments are an appropriate management action for this habitat area. Additionally, the data could prove useful during post-fire restoration if the habitat were to burn by providing baseline information about the community assemblage and ecology of this site.

2.2.2 Lagoon/Coastal Species

Belding's Savannah Sparrow
Passerculus sandwichensis beldingi

Critical Locations and Major Populations

The 1999 MHCP identified critical locations and major populations in Agua Hedionda Lagoon and Batiquitos Lagoon.

Long-term Monitoring

Surveys are conducted approximately every 5 years as part of an ongoing census effort. In 2010, 30 coastal salt marshes in California were surveyed (Zembal and Hoffman 2010). Results of surveys conducted within Carlsbad are summarized below. See Figure 6 for a location map.

	1973	1977	1986	1991	1996	2001	2006	2010
Buena Vista Lagoon	0	5	1	0	0	6	5	0
Agua Hedionda Lagoon	37	16	45	13	29	22	24	18
Batiquitos Lagoon	0	20	47	50	36	66	37	44

Overall Condition and Major Threats

Approximately 3,372 breeding territories were detected in California during the 2010 census. This is the highest total since counts began in 1973 and 7.6% higher than the next highest count, reported in 2006 (Zembal and Hoffman 2010). However, the number of territories was markedly lower in 2010 than in 2006 at both Agua Hedionda and Buena Vista Lagoons. Encroachment of freshwater marsh habitat, proliferation of invasive species, and human disturbances continue to exert pressure upon Belding's and the habitat necessary to support the species (Zembal and Hoffman 2010).

Buena Vista Lagoon: The 2010 surveys revealed that the formerly occupied territories no longer contained Belding's savannah sparrow. Encroachment of freshwater marsh habitat and song sparrows has contributed to the decline of this species within Buena Vista Lagoon, in addition to human disturbance. Potential for restoration of the territories exists, and is highest on the islands and the north-east portion of the inner lagoon. Additional improvements to the habitat could be made by cleanup of trash and homeless encampments, as well as invasive species control. However, the transition to freshwater marsh habitat limits the potential of the Buena Vista to support Belding's savannah sparrow (Zembal and Hoffman 2010).

Agua Hedionda Lagoon: The 2010 surveys revealed a 25% decline in territories from 2006. The territories were concentrated along a picklweed (*Salacornia* spp.) belt on the inland edges of the inner lagoon, which is threatened by encroaching freshwater marsh. Regular dredging maintains a connection to the ocean, resulting in good potential for habitat restoration in this lagoon; however, flow is constricted due to the narrowness of the opening. Human disturbances continue to be an issue in the lagoon, although CalTrans has installed fencing along the northern edge of the lagoon to exclude potential trespassers. Although CDFG is actively working to control detrimental species, including invasive algae (*Caulerpa taxifolia)* and Algerian Sea-lavender (*Limonium ramosissimum*), much of the previously existing Belding's habitat has been affected and no longer supports adequate nest cover (Zembal and Hoffman 2010).

Batiquitos Lagoon: The 2010 surveys revealed that there was a 19% increase from the 2006 surveys, which showed a 44% decrease from the 2001 numbers (Zembal and Hoffman 2010). Past restoration of Batiquitos Lagoon resulted in the expansion of pickleweed, which is a critical component of Belding's habitat, and likely led to the doubling of numbers found between the 1996 and 2001 surveys. The 44% reduction in Belding's found in 2006 was presumably influenced by the reverting of much of the habitat back to freshwater marsh due to inflow of urban freshwater runoff at the eastern edge of the lagoon (Zembal and Hoffman 2010). Much of the remaining pickleweed dominated marsh habitat is too narrow to support Belding's (Zembal and Hoffman 2010).

Management Actions Conducted to Protect the Species

Management actions include habitat management through invasive species control. The top priorities for CDFG to protect this species are habitat enhancement, protection and restoration in the form of improved tidal flushing, sediment control, limiting human disturbances, limit upstream runoff, and the continued funding of a statewide census.

California Least Tern

Sterna antillarum browni

Critical Locations and Major Populations

The 1999 MHCP identified critical locations in all three lagoons. The population at Batiquitos Lagoon is considered a major population.

Long-term Monitoring

Annual least tern monitoring, funded by CDFG, was conducted at Batiquitos Lagoon from 1973 through 2011 (Figure 6). Biological data were collected in the following categories: estimation of breeding pairs (based on number of nests, less the number of re-nests), and productivity (total number of nests, number of eggs, number of chicks hatched, number of chicks reaching fledgling age, and number of fledglings surviving to disperse). Mortality and predation data were also collected. In 2011, by order of the governor of California, all new state contracts for personel services were frozen, including the contract to conduct least tern monitoring and predator control; however, the work is funded through a mitigation account established by the Port of Los Angeles, which operations independently of the State budget. Nevertheless, as a result, the 2011 monitoring in Batiquitos Lagoon was conducted by trained and permitted volunteers, rather than by private contractor. More importantly, only limited predator control activities were conducted by CDFG staff – less than 100 hours in 2011, as compared to 1,150 hours in 2010 (Sisson 2011).

	2001	2002	2003	2005	2006	2007	2008	2009	2010	2011
No. Nests	222	226	615	596	627	594	610	649	480	532
No. Pairs	192	203-205	574	571	601	575-578	596	576-620	457-480	457-519
Estimated No. of Fledglings	73-99	53-66	155-228	109-128	223-270	146-226	143-187	212-233	208-261	20-37

Overall Condition and Major Threats

An estimated 6437-6699 California least tern breeding pairs established 6968 nests and produced 1971-2245 fledglings at 51 documented locations throughout the state in 2010. Statewide survey data for 2011 are not available. The recorded minimum breeding pairs in 2010 was about 10% lower than in 2009 (Marschalek 2010, Squires 2010). This represents

the lowest count recorded for California since 2004. Six sites (Camp Pendleton, Naval Base Coronado, Pt. Mugu, Batiquitos Lagoon, Bolsa Chica Ecological Reserve, and Huntington State Beach) had over 300 minimum breeding pairs, which represented 73% of the state total. Between 2008 and 2010, the statewide average chick mortality rate increased from 14% to 18%. Based on the data reported from Batiquitos Lagoon (Foster 2011) the average chick mortality for 2011 is likely to be at a record high due to the lack of predator control.

At Batiquitos Lagoon Ecological Reserve, there was a steady increase in clutch size from 2008 to 2010, while the number of nests and breeding pairs has been less stable (Marschalek 2010). The number of nests increased between 2008 and 2009, and then decreased by more than 26% in 2010 (Marschalek 2011). After increasing in the 2008 and 2009 seasons, the 2010 nesting and breeding pair counts were the lowest since 2002 (Marschalek 2011). The 2011 data showed an increase in the number of nests and breeding pairs from 2010; however, in 2011 the number of surviving fledglings decreased by more than 80% from 2010, presumably due to a lack of funding for monitoring and predator control (Foster 2011, Sisson 2011). Continued threat of predation from many species, including black-crowned night herons (*Nycticorax nycticorax*), gull-billed terns (*Gelochelidon nilotica*), American kestrel (*Falco sparverius*), Red-tailed hawk (*Buteo jamaicensis*), American crow (*Corvus brachyrhynchus*), gulls (*Larus* spp.) and common raven (*Corvus corax*), is a major concern for the species (Foster 2011, Marschalek 2010).

Management Actions Conducted to Protect the Species

As described above, the level of management, including habitat management and predator control, was greatly reduced in 2011. Because the least tern nests on the ground, it is highly vulnerable to predators. Unless active predator control resumes, the population is likely to decrease very rapidly.

Light-footed Clapper Rail

Rallus longirostris levipes

Critical Locations and Major Populations

The 1999 MHCP identified critical locations and major populations at all three lagoons in Carlsbad.

Long-term Monitoring

In 2011, the 32nd consecutive annual census of light-footed clapper rails in California coastal wetlands was conducted in 21 marshes by mapping territorial pairs based on their calls. This long-term monitoring program is funded by CDFG. Clapper rails are typically monitored by two methods – spring call counts, and winter high tide counts. Results through the 2011

season are summarized below for areas within Carlsbad (Zembal et al. 2009, Zembal et al. 2010a, Zembal et al. 2010b, Zembal et al. 2011). See Figure 6 for additional information.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Buena Vista Lagoon	5[1]	3[1]	6[1]	5[1]	5[1]	6[1]	8[1]	8[1]	9[1]	9[1]	6	3[1]
Agua Hedionda Lagoon	2	2	1	4	5	4[1]	7[1]	4	7	6	2[1]	7
Batiquitos Lagoon	2[1]	3[1]	3[1]	5	11	16[1]	19[1]	22	22	26[1]	36[1]	43[1]

[1]includes unpaired individuals (all others are pairs)

Overall Condition and Major Threats

The 2007 counts represented the highest numbers (443 breeding pairs) since the surveys began in 1980; up until then, populations had been steadily increasing. The population crashed to 234 pairs in 2008, presumably due to weather-related causes, but has been increasing steadily ever since (Zembal et al. 2011). The population recovered 37% in 2009 to 320 breeding pairs, and increased to 376 pairs in 2010 and 441 pairs in 2011, just 2 pairs less than the record high in 2007.

The largest subpopulation (137 breeding pairs in 2011) occurs in Upper Newport Bay; the second largest subpopulation (113 breeding pairs) occurs in the Tijuana Marsh National Wildlife Refuge. These two subpopulations account for 56.7 percent of the total breeding population in California. Three subpopulations occur within Carlsbad, which account for 12 percent of the total population (Figure 3). Batiquitos Lagoon supports the third largest subpopulation (43 pairs/individuals) in the state.

Batiquitos Lagoon has seen record highs in each of the last four seasons, while Buena Vista Lagoon and Agua Hedionda Lagoon saw drop-offs in the 2010 survey after remaining relatively stable during the 2008 and 2009 seasons (Zembal et al. 2010a, Zembal et al. 2010b, Zembal et al. 2011). In 2011, Agua Hedionda Lagoon increased from two unpaired individuals in 2010 numbers to seven pairs, while Buena Vista Lagoon decreased from six pairs in 2010 to three unpaired individuals (Zembal, et al. 2011). In order to combat the decline of the Buena Vista Lagoon population, 15 captive-bred light-footed clapper rails were released on July 19, 2011 (Zembal, et al. 2011).

Despite the crash in 2008, which reduced the number of pairs by almost 50 percent, the population has recovered well, and has almost returned to the maximum recorded population size. Habitat degradation (e.g., invasion by non-native trees and shrubs) and predators are the greatest threats to the light-footed clapper rail.

Management Actions Conducted to Protect the Species

Management actions include habitat restoration via tidal enhancement, predator study and control program, nesting site provision, captive breeding protocol development, and continued long-term monitoring (Zembal et al. 2011). Additional priorities for CDFG are continued habitat enhancement and restoration, and funding of a statewide census.

Western Snowy Plover

Charadrius alexandrinus nivosus

Critical Locations and Major Populations

The 1999 MHCP identified critical locations and major populations at all three lagoons.

Long-term Monitoring

Western snowy plover monitoring has been conducted annually at Batiquitos Lagoon through 2010. Limited surveys were conducted in 2011 by trained and permitted volunteers. Results through 2011 are summarized below. See Figure 6 for a location map.

Monitoring Results for Batiquitos Lagoon

	2001	2002	2003	2005	2006	2007	2008	2009	2010	2011
Nests	19	25	29	24-25	16	5	6	5	3	5
Pairs or Breeding Adults	8-9[1]	10[1]	26[2]	24[2]	18[2]	4[2]	8[2]	6[2]	3[1]	?
No. Fledglings	10-16	17	9-10	9-12	10+	2-3	3-4	3	6	0

[1]Pairs
[2]Breeding Adults

Overall Condition and Major Threats

The numbers of nests, breeding adults, and fledglings throughout California plummeted in 2006 and 2007. The numbers remained relatively steady between 2007 and 2009 (Squires and Wolf 2009, Squires 2010), but showed a decrease in 2010. The monitoring results at Batiquitos Lagoon were consistent with this pattern. Despite the drop in number of nests and breeding pairs in 2010, a total of six chicks fledged, which is the highest number recorded since 2006. The decline in snowy plover numbers within Batiquitos Lagoon and throughout the state in recent years may be due to predator activity, as well as the decline in suitable foraging habitat (Squires 2010).

Management Actions Conducted to Protect the Species

The following has been conducted on Batiquitos Lagoon Ecological Reserve to encourage snowy plover nesting: (1) Habitat management – the three paths linking the breeding habitat with the north mud flats that had been created in 2008 were maintained. All three

paths were maintained via the use of herbicide and two of the paths were also hand-weeded; (2) Predator control - exclosures (wire cages) were placed over active nests to protect the eggs from predators, monitoring of western snowy plovers to assess number of breeding adults and annual productivity, monitors also noted predation events and coordinated with predator control personnel (Squires 2010).

2.2.3 Riparian Species

Least Bell's Vireo

Vireo bellii pusillus

Critical Locations and Major Populations

There are no critical locations or major populations of least Bell's vireo in the City of Carlsbad according to the 1999 MHCP.

Long-term Monitoring

Focused species surveys were conducted on several preserves by CNLM between 2008 and 2011, as summarized below. Incidental sightings during other activities were also recorded. Figure 7 shows the recorded observations from focused surveys and incidental observations.

	Estimated Number of Pairs			
Preserve	**2008**	**2009**	**2010**	**2011**
Buena Vista Creek Ecological Reserve	3 to 4 pair	3 pair 3 males	7 pair 2 males	3 pair 2 males
Calavera Hills/Robertson Ranch East	1 pair[1] 1 male[1]	1 indv.[1]	NS	NS
Encinas Creek	1 pair	1 pair 3 males	1 male	1 male
City Preserves				
The Crossings Golf Course	NS	1 pair, 3 males	1 pair, 3 males	0
Lake Calavera	NS	NS	0	0
Poinsettia Park	NS	NS	0	0
Lagoon Lane	NS	NS	0	0

NS = not surveyed
[1] incidental observation

Overall Condition and Major Threats

Over the course of 4 years (2008 – 2011), the number of least Bell's vireo pairs and/or individual males on Buena Vista Creek Ecological Reserve, Calavera Hills/Robertson Ranch, Encinas Creek, and The Crossings preserves has been somewhat variable. More survey data is needed to differentiate between natural variability and a long-term increase or decrease

in territories over time throughout the HMP preserve system. Least Bell's vireo habitat is well-protected and appears to be in good condition on actively managed properties. Although no nest monitoring has occurred, this species appears to be breeding successfully in the Preserve.

Management Actions Conducted to Protect the Species

Habitat management, homeless encampment removal, and cowbird trapping.

SW Willow Flycatcher
Empidonax traillii extimus

Critical Locations and Major Populations

There are no critical locations or major populations in the City of Carlsbad according to the 1999 MHCP. USFWS proposed critical habitat is located along Agua Hedionda Creek, east of El Camino Real, and along the eastern portion of Agua Hedionda Lagoon, west of El Camino Real (Figure 7).

Long-term Monitoring

All available survey data indicate that the southwestern willow flycatcher does not presently occur as a breeding species in Carlsbad. However, focused species surveys are conducted in some areas of suitable habitat by CNLM, and surveyors regularly search for this species during focused surveys conducted for the least Bell's vireo, which has similar habitat requirements.

Overall Condition and Major Threats

Not applicable (see above).

Management Actions Conducted to Protect the Species

Management of potentially suitable habitat.

2.2.4 Vernal Pool Species

California Orcutt Grass
Orcuttia californica

Little Mousetail
Myosurus minimus ssp. *apus*

San Diego Button-Celery
Eryngium aristulatum var. *parishii*

Riverside Fairy Shrimp
Streptocephalus woottoni

San Diego Fairy Shrimp
Branchinecta sandiegonensis

Spreading Navarretia
Navarretia fossalis

Critical Locations and Major Populations

There are three vernal pool complexes in the HMP preserve system: (1) Poinsettia Lane Train Station, (2) Hieatt property, north of the airport, and (3) Manzanita Apartments property, east of El Camino Real and south of the airport. The Poinsettia Lanes vernal pool has been identified as a critical location for all vernal pool species by the 1999 MHCP. Populations of these species have also been identified as major populations by the 1999 MHCP. The other vernal pools are not identified as critical locations or major populations according to the 1999 MHCP.

Long-term Monitoring

No long-term monitoring is being conducted for vernal pool species. These species, many of which are State and/or Federally listed, are not covered by the HMP. However, all of the vernal pool species listed above, as well as Orcutt's brodiaea (*Brodiaea orcuttii*, not covered by MHCP), are known to occur on the Poinsettia Lanes vernal pools, based on 2008 surveys conducted by Dudek. In addition, San Diego fairy shrimp and San Diego button-celery occur on the Manzanita Partners site. See Figure 8 for a map showing proposed critical habitat and recorded observations of sensitive vernal pool species.

Overall Condition and Major Threats

The Poinsettia Lanes vernal pool preserve has a high percentage of non-native species cover. This preserve does not currently have active management; however, the right-of-way (ROW) where the pools are located are mowed as part of regular ROW maintenance by the North County Transit District (NCTD), which helps keep the non-natives in check. Although not within the HMP boundary, a watershed buffer adjacent to the pools was set aside as mitigation for the Water's End Project. The Water's End vernal pool buffer area was restored to native coastal sage scrub habitat to help buffer against edge effects and changes in vernal pool hydrology. Dudek completed a 5-year restoration monitoring/management program for this area. The Wildlife Agencies conducted a site visit and final sign off in July of 2008.

The vernal pools on the Hieatt Property were restored by Helix Environmental Planning Inc. (Helix). The restoration plan was initiated on March 2, 2006, and was to last 2 years. Restoration monitoring reports have not been submitted to the City or Wildlife Agencies, and no request has been made for sign off on the success of the restoration. Prior to restoration, the pools did not contain any sensitive species, but contained the following vernal pool indicator species: dwarf wooly-heads (*Psilocarphus brevissimus* var. *brevissimus*), water pygmyweed (*Crassula aquatica*), chaffweed (*Centunculus minimus*), and grass poly (*Lythrum hyssopifolia*). On October 23, 2009, ESA biologist Christina Schaefer visited the site and found no signs of vernal pool indicator plant species or other signs of a functioning vernal pool. The entire area was overrun by weeds.

The vernal pool area on the Manzanita Apartments Property was enhanced/restored in 2000, and 5 years of maintenance and monitoring was conducted by Dudek. The 5-year success criteria outlined in the restoration plan were met, although no official sign-off by the Wildlife Agencies has occurred. Seven existing degraded pools were enhanced, seven suspected historic vernal pools were restored, and adjacent native upland habitat was enhanced (Dudek 2005). In 2008, the condition of this restored vernal pool was determined to be good (A. Hayworth pers. comm.); at project completion, all vernal pools held water during the rainy season, all pools had at least one of four vernal pool target plant species present, San Diego fairy shrimp were detected at five of the pools, coastal sage scrub habitat surrounding the pools is mature and healthy, and non-native species were under control and did not pose a threat to the vernal pools (Dudek 2005). A follow up visit was made by the City HMP Coordinator and HMP Preserve Steward in April 2011 to assess the condition of the pools. The pools appeared to be in good condition overall; however the pools are surrounded by non-native grasses, which will need to be controlled. As reported in Section 1.3.2 the area will soon be under long-term management and monitoring by HRS.

Other Locations

Additional vernal pools have been identified to the north of the Poinsettia Lanes site along the same NCTD right-of-way (LSA 2010). Several of these pools are reported to support San Diego fairy shrimp. These pools, which are generally in poor condition (few vernal pool species and dense cover of non-native grasses), are not currently protected by a Conservation Easement or other open space protection.

Management Actions Conducted to Protect the Species

Currently, the Water's End watershed buffer for the Poinsettia Lanes Vernal Pools is being managed by the HOA, and the vernal pools are being managed by the NCTD (Level 1 management). The buffer area has been fenced and signed to protect from unauthorized access and to provide public education. The Hieatt property vernal pools do not have active management or monitoring. Although not currently managed, Manzanita Apartments vernal pools will be under active management and monitoring beginning in the next reporting period (2011-2012).

2.2.5 Vernal Pool/Upland Species

San Diego Thornmint

Acanthomintha ilicifolia

Critical Locations and Major Populations

The 1999 MHCP identified critical locations and major populations in scattered locations throughout Carlsbad, mostly in private HOA preserve lands. Other populations of San Diego thornmint are located within the Carlsbad Oaks North and La Costa Villages preserves.

Long-term Monitoring

Long-term monitoring for San Diego thornmint occurs on Calavera Hills/Robertson Ranch, Carlsbad Oaks North, Emerald Pointe, and La Costa Villages. Note that plant counts can vary depending on rainfall and season. In addition, survey methods may differ depending on the size and density of the population.

Overall Condition and Major Threats

CNLM manages three San Diego thornmint populations in Carlsbad (Figure 9). A total of 342 individuals were observed at the Carlsbad Oaks North population in the spring of 2011. Between 2008 and 2010, 505 to 648 individuals were documented at this site. At Calavera Hills/Robertson Ranch, no individuals were documented in the spring of 2011, compared to four and two observed in 2009 and 2010. The cause for this decrease is unknown, but likely attributed to weather. In the past, rainfall was determined to be the primary driver of thornmint germination. However, the 2011 results suggest that other weather factors, such as average daily temperature, play an important role. At Rancho La Costa, 936 plants were observed in the spring of 2011, compared to 251 in 2009 and 380 in 2010. The cause of the large increase in thornmint at La Costa is not currently known.

Number of Individuals

Preserve	2008	2009	2010	2011
Calavera Hills/Robertson Ranch East	4	4	2	0
Carlsbad Oaks North	505	556	648	342
Emerald Pointe	NS	110	93	NS
Rancho La Costa (the Greens)	194	251	380	936

NS = not surveyed

This species appears to be well protected on actively-managed properties, and no current threats, aside from non-native forbs and grasses, have been identified. The status of thornmint on other properties in Carlsbad has not been assessed.

Management Actions Conducted to Protect the Species

This species is under active management within Calavera Hills/Robertson Ranch, Carlsbad Oaks North, Emerald Pointe, and La Costa Villages preserves. HOA managed properties generally only include Level 1 management (e.g., trash pick-up and fence maintenance).

Thread-leaved Brodiaea

Brodiaea filifolia

Critical Locations and Major Populations

The 1999 MHCP identified critical locations/major populations in the following preserves: Calavera Hills Phase II, Carlsbad Highlands Ecological Reserve, Rancho Carrillo, Fox-Miller, Brodiaea Preserve, and La Costa Villages.

Long-term Monitoring

Plant counts of this species can vary tremendously depending on timing and amount of rainfall, and the season during which the surveys were conducted (e.g., when plants are flowering or in their vegetative state). CNLM has determined that the plant count during the flowering season may represent only 2%-26% of the actual population size, since only a fraction of a population flowers at a given time. Due to the large variability in the plant counts, as described above, detailed survey results will not be provided in this report; however these details are available in the individual preserve-specific annual reports, which are available from the Preserve Manager.

Long-term monitoring surveys for thread-leaved brodiaea are being conducted on Buena Vista Creek Ecological Reserve, Calavera/Robertson Ranch, Carlsbad Oaks North, Carlsbad Highlands Ecological Reserve, Lake Calavera, Fox-Miller preserve, and La Costa Villages preserves. Figure 9 shows known locations and USFWS critical habitat for this species. Two new thread-leaved brodiaea localities were discovered in 2010, and a third locality (over 1,000 individuals) was discovered in 2011 at the Buena Vista Creek Ecological Reserve. Additionally, two new localities were discovered (one in 2010, and one in 2011) at Lake Calavera Preserve, and one new population was observed at Carlsbad Oaks North Preserve in 2011. CNLM set up long-term monitoring and experimental plots at Rancho La Costa a few years ago. In 2011, there were close to 16,000 individuals counted within the study plots. Full analysis of these data is expected in 2012.

Overall Condition and Major Threats

This species appears well protected on actively managed properties. The greatest threat to thread-leaved brodiaea is invasive species, especially non-native grasses and other annuals. In addition, off-road vehicles may pose a threat to the population on Carlsbad Highlands Ecological Reserve.

Management Actions Conducted to Protect the Species

Known populations on CNLM preserves are actively managed through invasive species removal, and monitored annually. In addition, CNLM has conducted a pilot study to determine the best method of invasive species removal. In 2011, the brodiaea restoration area on the Fox Miller property (mitigation for project impacts to this species) reached Year 5 of the restoration program. If the success criteria are met, the developer is expected to request final sign-off on this mitigation from the City and Wildlife Agencies. Once sign-off occurs, the property will be under long-term management. Management responsibilities of the Brodiaea Preserve (a previously unmanaged 1-acre property) were taken on by CDFG in 2010. The Rancho Carrillo population is managed by the Rancho Carrillo HOA.

2.2.6 Upland Species

Del Mar Manzanita

Arctostaphylos glandulosa ssp. c*rassifolia*

Critical Locations and Major Populations

The 1999 MHCP identified critical locations/major populations on preserve lands owned by the City, the County, private HOAs, and La Costa Villages.

Long-term Monitoring

Long-term monitoring for Del Mar manzanita occurs on La Costa Villages Preserve and Kelly Ranch (Figure 7). The identification to the subspecies level of individuals on both preserves has been conducted by CNLM and confirmed by taxonomic experts. Del Mar manzanita (nine individuals) was re-mapped on La Costa Villages Preserve pursuant to taxonomic confirmation. All individuals observed on Kelly Ranch were confirmed to be the Del Mar manzanita subspecies.

Overall Condition and Major Threats

The species is well protected within the Kelly Ranch and La Costa Villages Preserves, and no threats to the species require attention at this time. It should be noted, however, that no Del Mar manzanita seedlings were located, which may need to be studied in the future. If this trend continues, it will be necessary to investigate how to get seedlings to establish within the preserve (e.g., fire, manual scarification and/or stratification). The status of Del Mar manzanita on other properties has not been assessed.

Management Actions Conducted to Protect the Species

Habitat management, including invasive species removal, access control, and public outreach.

Del Mar Mesa Sand Aster

Corethrogyne filaginifolia var. *linifolia*

Critical Locations and Major Populations

There are no critical locations in Carlsbad according to the 1999 MHCP. The closest major population is at the southern boundary of Carlsbad according to the 1999 MHCP. The majority of the population within the MHCP Subregion is in the City of Encinitas, but may extend into Carlsbad on private HOA lands.

Long-term Monitoring

No monitoring is currently taking place.

Overall Condition and Major Threats

Unknown.

Management Actions Conducted to Protect the Species

Potentially suitable habitat on actively managed preserves is being managed through invasive species removal and access control.

Encinitas Baccharis

Baccharis vanessae

Critical Locations and Major Populations

The closest major population is at the southern boundary of Carlsbad according to the 1999 MHCP. The majority of the population is within Encinitas, but may extend into Carlsbad on private HOA lands. Within this major population, there are critical locations identified that may occur within Carlsbad; however, this has not recently been confirmed in the field.

Long-term Monitoring

No monitoring is currently taking place.

Overall Condition and Major Threats

Unknown.

Management Actions Conducted to Protect the Species

Potentially suitable habitat on actively managed preserves is being managed through invasive species removal and access control.

Orcutt's Hazardia

Hazardia orcuttii

Critical Locations and Major Populations

There are no naturally occurring critical locations or major populations in Carlsbad according to the 1999 MHCP. However, if the transplanted populations in Carlsbad prove to be self-sustaining, they would be considered critical populations.

Long-term Monitoring

The only known naturally occurring extant population of Orcutt's hazardia in the United States occurs on the Manchester Preserve in the City of Encinitas, which is managed by CNLM. In order to protect the species from possible extirpation, CNLM, with approval from the Wildlife Agencies, has transplanted individuals to locations on the Kelly Ranch and La Costa preserves that have very similar habitat conditions to that on the Manchester Preserve. These transplanted populations are monitored very closely as described below.

Overall Condition and Major Threats

Orcutt's hazardia were transplanted by CNLM to the CNLM's Kelly Ranch and Rancho La Costa preserves in 2003. CNLM has been tracking these transplants and documenting recruitment annually. A total of 125 individuals were transplanted at Kelly Ranch in 2003. A total of 104 of these survived and over 100 seedlings were observed (see data table below). In addition, 200 individual Orcutt's hazardia were planted at Rancho La Costa in 2003. In 2011, 156 adults were observed, and for the first time, seedlings (4 first year seedlings and 10 individuals older than 1 year) were observed as well.

Table 11. Counts of Orcutt's Hazardia Transplanted to Kelly Ranch Preserve

Life stage	Number of individuals counted, by year						
	2005	2006	2007	2008	2009	2010	2011
Adults	97	104	104	104	104	104	104
Seedlings			4	17	114	68	77
Seedlings > 1 year old[1]					14	29	22
Juvenile seedlings[2]			1	1	4	15	42
Total count			108	121	122	187	223

[1] This number is inclusive of the row count of seedlings above, and thus does not count toward the total count. Composed of seedlings that were known to occur the previous year, but show no growth. Most of these are underneath transplant shrubs.

[2] Juvenile is a loose grouping applied to non-flowering recruits that are branching and generally taller than four centimeters in height. It is assumed that most are greater than one year since germination, based on modal size of seedlings counted every year since 2007, and repeat observations. Adults are thus far solely transplants.

Management Actions Conducted to Protect the Species

Transplanting Orcutt's hazardia to new locations and studying the conditions under which seedlings thrive will reduce the possibility of local extinction (the species still occurs in northern Mexico) due to unforeseen events. All known populations, including the single naturally occurring and transplanted populations, are under active management by CNLM and are considered high priority for management and monitoring.

Coastal California Gnatcatcher

Polioptila californica californica

Critical Locations and Major Populations

No major or critical populations have been identified in the MHCP. However, the regional stepping-stone corridor that provides dispersal opportunities between south San Diego County and Camp Pendelton (and into Orange and Riverside Counties) runs through Carlsbad. In addition, several areas of USFWS Critical Habitat have been identified within the City (Figure 11).

Long-term Monitoring

Two aspects of long-term monitoring for the California gnatcatcher are highlighted below. The first is a description of a large, coordinated survey effort conducted over approximately two thirds of the suitable habitat within the HMP in 2010, and the second is the success of coastal sage scrub habitat creation/restoration that was conducted at The Crossings Golf Course open space preserve to provide additional high quality habitat for gnatcatchers in the City.

2010 Coordinated Survey Effort

Long-term monitoring for the California gnatcatcher occurs on all actively managed properties that contain suitable habitat; however, this represents only a small fraction of the total amount of suitable habitat on open space lands in the City. In order to better understand and manage this species, the City and its land management partners (CDFG, CNLM, SDHC) developed a summary of the conservation and monitoring goals of the HMP and MHCP, reviewed historical and recently collected data, identified survey area gaps, and revised the monitoring goals and questions for the CAGN in the HMP. After identifying priority survey areas, the City and its management partners developed a 2010 breeding season survey protocol and coordinated surveys across much of the suitable CAGN habitat within the City, including many HOA-managed properties. The primary objective for this effort was to determine the abundance, status (i.e. pair or single male) and distribution of CAGN across the City. The results of the 2010 survey effort are summarized below and detailed in a summary survey report that was prepared by CNLM (2010b). It is the intention of the managing partners to continue this coordinated monitoring effort across the City (on

as many properties as funding allows) every 3 years to assess overall population trends within the HMP preserve system.

All partners agreed that two to three visits per survey area (usually less than 100 acres per day) was sufficient to determine the presence or absence of the species. However, due to budget constraints, some areas could only be visited once. Approximately 25% of the areas surveyed received three survey visits, 60% two survey visits, and 15% one visit. Those areas that received one visit were generally areas in which CAGN were observed during the first visit and patch/area size was small (making it unlikely that additional individuals were missed); and thus, it was felt that time and money was better spent surveying additional areas or areas that needed a second or third visit. Surveys were coordinated among the survey team in areas adjacent to one another to avoid double counting.

The Crossings Golf Course

Pursuant to the HMP, impacts to 12.4 acres of coastal sage scrub habitat resulting from development of The Crossings Golf Course required the mitigation of 24.8 acres of coastal sage scrub habitat through creation, restoration and/or development. To provide flexibility for potential future mitigation needs, a total of 40 acres of mitigation was provided, consisting of approximately 30 acres of habitat creation/restoration and 10 acres of enhancement (e.g., invasive species removal and preservation of existing habitat on site). Baseline surveys were conducted in 2007 after initial habitat installation, and annual surveys were conducted through 2011 (Dudek 2011).

Overall Condition and Major Threats

2010 Coordinated Survey Effort

Approximately 1,500 acres of suitable habitat was surveyed in 2010. A total of 85 pair and 42 single male California gnatcatchers were observed, for a total of 127 territories (Figure 12). “Male” observations do not imply that they are single males. Many of these males are likely paired, as sex ratios of this magnitude in CAGN and many passerine bird species are uncommon (sex ratios are usually closer to 50:50, or a few % higher for males).

Gnatcatchers were observed throughout the City in almost all areas that were surveyed (Figure 12). In addition, gnatcatchers were observed in most unit areas and vegetation patch sizes. There seems to be no correlation between occupancy and unit area or vegetation patch size. Although there seems to be a correlation between the number of occupied patches to patch size (i.e. decrease in the number of occupied patches to patch size), this merely results from the occurrence of more small patches than large ones in Carlsbad. Units that were unoccupied tended to be extremely small (less than 1.0 acres) and/or lacked suitable habitat.

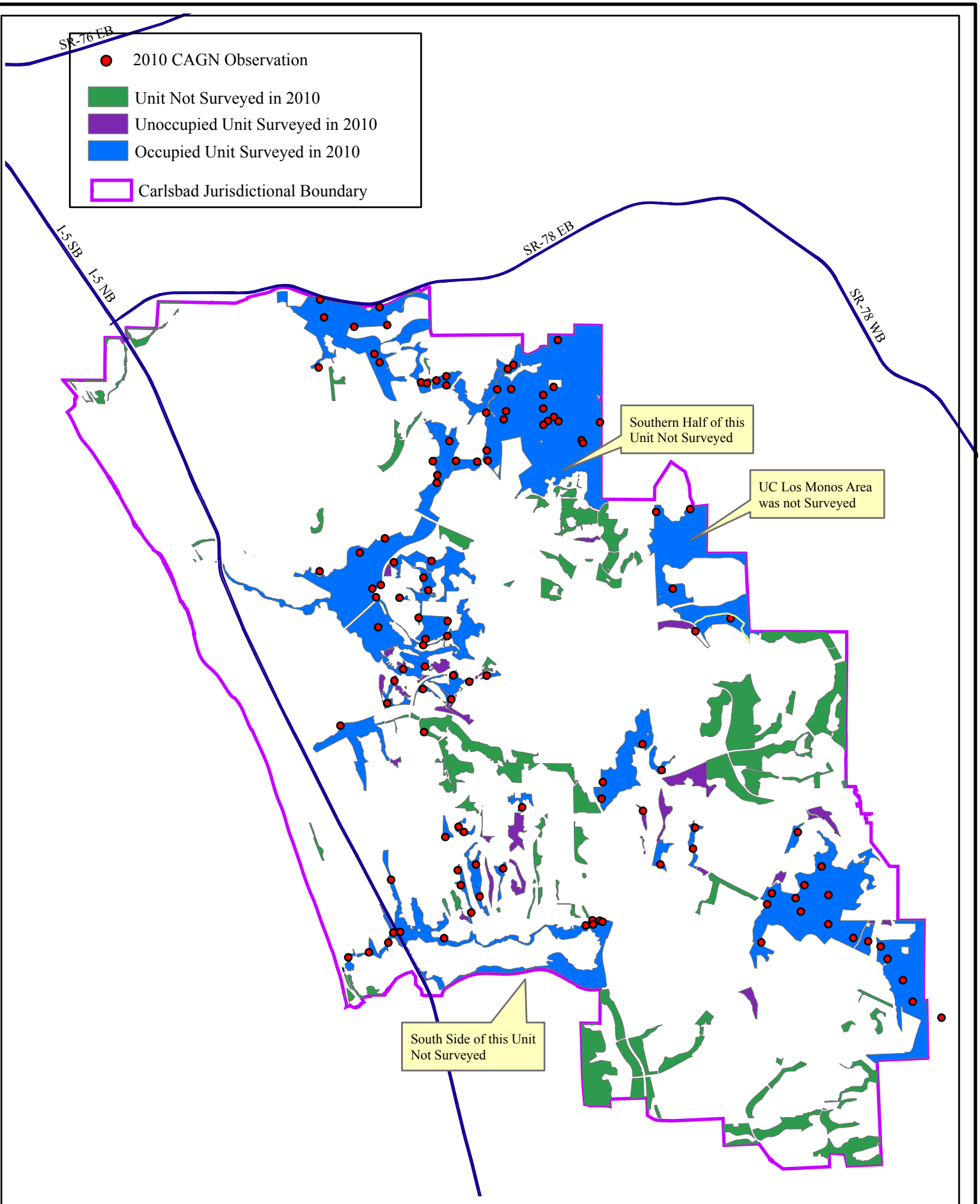


Figure 12
2010 CAGN Observations
Carlsbad, California

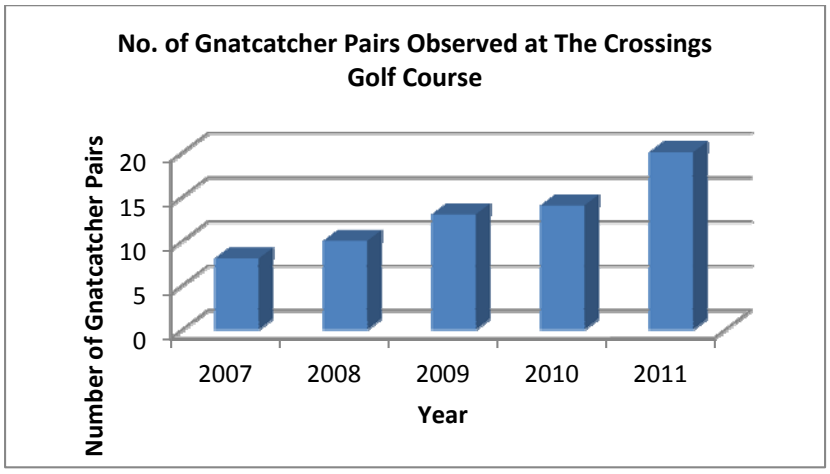
2,100 1,050 0 2,100 Feet

Center for Natural Lands Management

The 2010 survey season results provide a useful snapshot of CAGN abundance, status, and distribution in Carlsbad. CAGN are observed across the jurisdiction 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 play an important role in Carlsbad, especially during a catastrophic event, such as fire that burns some of the larger patches of coastal sage scrub (e.g., in La Costa Villagesand Calavera), by serving as refugia. These small patches could be a source of CAGN recolonization after such an event occurs. In addition, the smaller patches are likely to be important "stepping stones" for CAGN movement throughout the City.

The Crossings Golf Course

California gnatcatchers were observed foraging and nesting within mature coastal sage scrub creation/restoration areas in 2010, and continued using this habitat in 2011 (Dudek 2011). A total of 40 adult gnatcatchers (20 pairs) were observed evenly distributed across the project area during the 2011 breeding season. This is an increase of six pairs from the 2010 season, an increase of seven pairs from the 2009 season, an increase of ten pairs from the 2008 breeding season, and an increase of twelve pairs from the 2007 breeding season (see graph below).



In 2011, basic reproductive monitoring was conducted for all 20 gnatcatcher pairs. Fifteen of the 20 total gnatcatcher pairs displayed breeding behavior during monitoring visits in 2011. Of the 15 breeding pairs, 14 of these pairs made successful nesting attempts, and at least 37 fledglings (an average of 2.46 fledglings/breeding pair) were produced on site during the 2011 breeding season. In 2010, at least 29 fledglings were produced by twelve breeding pairs (2.42 fledglings/breeding pair). In 2009, at least 17 fledglings were produced by eight breeding pairs (2.125 fledglings/breeding pair). In 2008, at least 16 fledglings were produced by eight breeding pairs (2.0 fledglings/breeding pair). In 2007, at least 3 fledglings were produced by five breeding pairs (0.6 fledglings/breeding pair) (Dudek 2011).

Threats

There are currently no major threats to the coastal California gnatcatcher in the HMP preserve system. Most of the suitable habitat in the City is under active management, or under a conservation easement or other type of open space protection. The open space on HOA lands that were surveyed in 2010 appear to be well protected from unauthorized access, and the suitable gnatcatcher habitat was generally in moderate to excellent condition.

Management Actions Conducted to Protect the Species

Habitat management, continual patrolling and protection, fence and sign maintenance, nonnative species removal, erosion control activities, habitat evaluations and monitoring.

2.2.7 Wildlife Movement

CNLM Wildlife Movement Studies

CNLM manages several areas in Carlsbad that are connected by wildlife undercrossings, bridges, or along wildlife movement corridors. Over the last 6 years, CNLM has conducted pilot studies to evaluate different movement areas to determine which areas can be continually studied, and to develop a standard methodology. The primary objective is to evaluate movement of larger mammals, such as mule deer, coyote, bobcat and raccoon. Wildlife movement studies will continue in 2011-2012.

Three monitoring locations were selected based on potential for wildlife movement and inaccessibility to humans (to avoid vandalism). The locations are: (1) the Faraday wildlife undercrossing at Carlsbad Oaks North, (2) the Encinas Creek Vista Sewer Line, located in the Encinas Creek Preserve, and (3) the Ranch Santa Fe undercrossing, which connects the eastern and western side of the Rancho La Costa Preserve.

After years of trials, CNLM developed the following protocol, which started in 2010-11. The use of wildlife cameras was the selected methodology, as it is relatively inexpensive compared to active and continual on-the-ground tracking. Each camera (Cuddeback Digital Scout) was set to operate for approximately 60 days per quarter (October-December/January-March/April-June/July-September). It should be noted that the work at the Encinas Creek site was truncated to 2 quarters per year in 2010-11, but as of late 2011, it will be operated for all four sessions. The Carlsbad Oaks camera was installed in early 2011 (three other areas at Carlsbad Oaks were evaluated for 3 years, but were not useful). CNLM has run the camera at Rancho Santa Fe on and off since 2006.

At Faraday, coyotes, raccoon, deer and bobcat have been observed. Less than 15 animals are photographed in a typical session. The primary animals observed are coyote and raccoon, but several bobcat and one mule deer were also observed during the year. These observations are deemed very positive for the effectiveness of this undercrossing. Vegetation on each end is dense, and the corridor is not necessarily in the best location to facilitate movement. This is an important corridor to allow animals to avoid crossing over the very busy Faraday Avenue.

At Encinas Creek, coyotes and raccoon are primarily detected. Movement observations decrease as the vegetation in the easement grows up, but increase soon after clearing. It is not uncommon to have 20-30 observations of coyotes and 15-40 observation of raccoon during any session. This area is far from large core areas and is in a highly urbanized setting, so it is not surprising to not see bobcat or deer.

At Rancho Santa Fe, deer, bobcat and coyote have been observed. It is quite common to have over 30 observations during a session, but it seems that activity decreases in the summer. It is common to have 5-10 photos of deer, and over 15 photos of coyote in a session (slower in summer). Fewer than 3 photos of bobcat are observed during any session. These observation show that animals are likely trying to move towards (and back from) the eastern side of the Rancho La Costa Preserve area, but does not prove they are using the wildlife crossing. The San Diego Tracking Team does quarterly tracking at each side and within the tunnel. They have observed only coyote track in the tunnel. They have also observed deer tracks going up the slope to Rancho Santa Fe Road, and it is likely that they travel across the road.

San Diego Tracking Team

Quarterly tracking is conducted by the San Diego Tracking Team (SDTT). Figure 13 shows approximate monitoring locations. SDTT surveys were conducted by identifying tracks and scat in specific locations along permanent transects. In general, transects established by SDTT are approximately 1 mile long and 30 feet wide and are located along existing roads and trails. The purpose of these surveys is to detect (a) presence/absence of target mammal species, (b) substantial changes in wildlife movement patterns, and (c) the use of different habitats by target species.

College Boulevard/Cannon Road

A wildlife movement study was conducted by Dudek during the winter of 2010 in the vicinity of a new high school that is being built at the corner of College Boulevard and Cannon Road (Dudek 2010). Data were collected during a 3-week period in January and February of 2010 to identify the wildlife species that were moving through the area and to determine potential impacts to wildlife movement from existing and proposed land use. Methods included track surveys, motion-sensitive camera stations, and road-kill surveys. The study provided limited data due to

Figure 13. Wildlife Movement Monitoring Survey Locations

the season (e.g., wildlife is generally less active in the winter) and short duration (e.g., three weeks, as opposed to a full year); however, the report included a list of recommendations, such as fence installation or replacement, that could improve wildlife movement in the area. Species observed within the study area include those that are well-adapted to urban environments, such as coyote (*Cans latrans*), raccoon (*Procyon lotor*), and rabbits (*Sylvilagus audubonii*).

Agua Hedionda Creek

In June 2011, City staff, consultants, and representatives from CDFG met in the field to explore wildlife movement in the Agua Hedionda Creek area and access to the CDFG Agua Hedionda Lagoon Ecological Reserve. Currently a chain link boundary fence blocks surface wildlife access to the lagoon, leaving the only access points as drainage culverts under El Camino Real and Cannon Road. City staff and CDFG agreed that, in conjunction with the future dredging of Agua Hedionda Creek, some vegetation that currently blocks the culverts would be cleared on the reserve adjacent to Cannon Road to facilitate wildlife movement and reduce future sedimentation.

In October 2011, City staff met with representatives from Preserve Calavera to discuss wildlife movement through the Agua Hedionda Creek area and access to the CDFG Reserve. The City agreed to assess the potential use of a cantilevered walkway within one of the culverts under El Camino Real as part of the future developer's improvement plans provided design and funding were provided by others.

2.4 Adaptive Management Pilot Studies

CNLM is conducting a number of pilot studies to inform management decisions about certain sensitive plant species as described below. Details about Orcutt's hazardia may be obtained from the annual report for Kelly Ranch (available from CNLM). Results of the other studies will be presented in white papers prepared by CNLM. In addition, CNLM hosted a meeting with the USFWS, CDFG, and City of Carlsbad in June 2009 to discuss rare plant monitoring and management strategies. The status, current management practices, and perceived needs for four listed plants that occur on CNLM managed lands were discussed in the meeting. The four plants discussed were the ACIL, BRFI, Del Mar Manzanita, and Orcutt's hazardia. The primary conclusion of the meeting was that there is a need to organize working groups for each plant that was discussed (CNLM 2011b).

- **Orcutt's Hazardia Transplant study** – to identify environmental variables that might enhance or discourage survival of transplanted populations.

- **San Diego Thornmint Population Study** – to identify relationships between environmental variables, such as amount or timing of rainfall, and cover of thornmint and non-native species or functional groups.
- **Thread-leaved Brodiaea Population Study** – to determine the best way to determine the population size of this species by assessing vegetative, flowering, and corm states.
- **Thread-leaved Brodiaea Invasive Species Management Study** – to determine the effects of dethatching, herbicide, and detathching/herbicide in invasive species and thread-leaved brodiaea.
- **San Diego Thornmint Working Group** – to coordinate knowledge and monitoring efforts across the County. CNLM staff prepared a San Diego thornmint abstract that provides a useful summary of information that is most pertinent to management (Appendix B).

2.4 Enforcement

2.4.1 City-Owned Preserves

The City continues to coordinate and cooperate with local preserve managers and the Carlsbad and Oceanside Police Departments in enforcing the rules and regulations within HMP preserves. These efforts also include public outreach and fencing and signage. The City also expanded its contract with Able Security to augment patrolling at the Lake Calavera Preserve. Due in large part to the efforts of City and preserve management staff and contractors, compliant and non-invasive public use of the preserve areas has increased and, as a result, the number of new trails and incidents has decreased.

2.4.2 CNLM-Managed Preserves

In general, most of the preserves managed by CNLM had typical problems, such as off-trail use, and vandalism, but preserve damage was minimal. However, two preserves, Lake Calavera and Rancho La Costa, have had a history of particularly heavy unauthorized use. Historically, Lake Calavera was heavily used by many people whose activities had a negative impact on the preserve area. Active management and stepped up patrols over the last 3 years have dramatically reduced the unauthorized activity. For example, activities such as the use of radio-controlled planes and cars, unauthorized public events (such as mountain bike sales, contests, etc) and bike jump development, were rarely reported, if at all, during the reporting period, but were reported frequently a few years ago. The predominant unauthorized activities in 2011 were walking dogs without a leash, not picking up dog feces, and vandalizing signs, kiosks, and interior (trail blocking) fences. In the late summer and early fall of 2011, over 50 pounds of dog feces were picked up each week despite the fact that the City provides dog feces pick up bags and trash cans.

At Rancho La Costa, the primary problem is illegal cliff jumping and swimming at Box Canyon. CNLM's budget improved from the previous fiscal year, which allowed for an increase in patrol time during the summer months. Patrols included stationing a ranger at the canyon Tuesday through Friday from about noon to 6:00 p.m., and on weekends from about 2:00 to 6:00 or 7:00 p.m. CNLM documented trespass or attempted trespass, including date, time, point of access, number of individuals, whether individuals were deterred or trespassed, and other variables. During the summer of 2011, 173 individuals (individually or in groups in a total of 51 events) were documented attempting to trespass into the canyon. Of these 173 individuals, 145 (83%) were deterred. In the summer of 2010, a total of 381 individuals (in about 114 trespass events) attempted to trespass, of which 191 (50%) were deterred. In the summer of 2009, 177 individuals (in about 52 events) were documented attempting to trespass, of which 55 (30%) were deterred. This fiscal year, police were called on less than five occasions, a sharp reduction from the frequent calls during the summer of 2010 and in previous years. Despite a successful summer, it is acknowledged that this area will continue to be a problem in the future. CNLM is continuing to work with the City to encumber more funds to support this patrol effort.

Although one group of mountain bikers attempted to develop an unauthorized trail at the Rancho La Costa Preserve, other bikers tried to stop them, and reported them to CNLM staff. The unauthorized trail was immediately closed off. In general, the mountain bikers have been self enforcing, which has been a great help to CNLM.

2.4.3 CDFG-Owned Preserves

CDFG Ecological Reserves are patrolled by CDFG wardens, whose primary responsibility is to enforce fishing and hunting laws throughout the region. In addition to these responsibilities, wardens also conduct occasional sweeps of CDFG properties for unauthorized use, including horseback riders, ATVers, bikers, vandalism, dumping, and habitat destruction. Carlsbad Police Department has also responded to citizen reports of illegal activity on CDFG properties in the past. The City has secured an access letter from CDFG that allows the Carlsbad Police Department personnel to enter CDFG reserves.

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3.0 Financial Summary

3.1 City Funding in Support of HMP

The City uses two sources of funding to support implementation of the HMP: (1) permanent funding allocated specifically for management of City lands and HMP coordination, and (2) existing resources, including administrative staff and staff from the Property and Environmental Management Department, the Planning Division of the Community Development and Economic Department, and the Parks and Recreation 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 IA. Two of the City's main responsibilities are (1) oversight of the HMP Preserve, and (2) direct, active management of 600.6 acres of preserve land owned by the City. To fulfill the first responsibility, the City dedicated a senior-level staff planner and provides other administrative support for HMP coordination. The City also contracted with TAIC, with ESA as a subcontractor, to serve as the City's Preserve Steward, coordinating management throughout the HMP Preserve, and monitoring HMP compliance and management effectiveness. The annual cost of program administration was estimated to be approximately $79,750 in 2004 dollars (IA, page 24), which equals approximately $95,591 in 2011 dollars (U.S. Department of Labor Consumer Price Index). The City provides $125,000 in the annual budget to fund the contract with TAIC 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. Installation and maintenance of boundary fencing will be provided by the City; therefore, the cost for fence installation is not the responsibility of CNLM. However, CNLM installs and maintains sections of interior fencing to block off unauthorized trails as feasible.

3.1.2 *In-lieu* Habitat Mitigation Fees

As described in Section 1.3.5, *in-lieu* habitat mitigation fees are collected from developers for project-related impacts to certain types of native habitat outside of the preserve. These habitats include all habitat types in Groups E and F (non-native grassland, disturbed lands, eucalyptus, and agricultural lands) and some habitat types in Group D (unoccupied coastal sage scrub, coastal sage/chaparral mix, and chaparral, except southern maritime chaparral). The purpose of these fees is to fund the City's obligation to acquire, protect, and manage the Gnatcatcher Core Area.

As shown in Table 12, two mitigation fees (totaling $101,027.58) were paid during the current reporting period and $539.71 in interest accrued. Two expenditures were made during the reporting period. In January 2011, $1,353,510.00 from the fund was used to reimburse the cost of 50.13 acres of Core Area land that was previously purchased (see Section 1.3.7 for details). In addition, $217,070.50 was used to purchase 7.53 acres of coastal sage scrub habitat in the Core Area, which will be actively managed in perpetuity in accordance with the HMP. The shortfall of $357,533.71 was advanced by the City using the General Fund. *In-lieu* fees will continue to be collected for habitat impacts, as appropriate, and will be used to reimburse the General Fund and to purchase the remaining required Core Area acreage.

Table 12. *In-lieu* Mitigation Fee Account Activity, November 2010 – October 2011

Date	Description	Habitat Impacted	Total
11/01/10	**Beginning Fund Total**		**$1,111,479.50**
Fees Collected 11/01/10 – 10/31/11			
06/20/11	Hanson Reclamation	32.27 acres of disturbed lands	$88,064.83
09/23/11	Poinsettia Place	4.75 acres of disturbed lands	$12,962.75
		Total Fees Collected 11/01/11 – 10/31/11	*$101,027.58*
		Interest Earned 11/01/11 – 10/31/11	*$539.71*
		Total Revenue 11/01/11 – 10/31/11	***$101,567.29***
Funds Expended for Core Area Conservation 11/01/10 – 10/31/11			
01/25/11	Alemir Property	50.13 acres conservation credit	$1,353,510.00
10/21/11	Perkins Property	7.53 acres conservation credit	$217,070.50
		Total Funds Expended 11/01/11 – 10/31/11	***$1,570,580.50***
10/31/11	**Account Balance**		**($357,533.71)**

3.2 Status of Preserve Management Endowments

The endowment activity and status for preserves funded through endowments are given in Table 13. This includes all preserves managed by CNLM and SDHC, Buena Vista Creek Ecological Reserve, and Batiquitos Lagoon Ecological Reserve (other ecological reserves owned and managed by CDFG are funded through annual appropriations of regular CDFG funds). Totals are only given for CNLM-managed properties because complete information has not been received for the other preserves. During this past couple of years, the U.S. economy has experienced a severe recession and slow recovery, and endowment funds were greatly impacted. However, with careful planning, cost cutting, and a slight economic recovery during the latter part of the year, the endowment accounts remained largely intact overall.

Table 13. Endowment Status for HMP Preserves

Site Name	Preserve Manager[1]	Inception Date	Original Endmt	Inflation Adj. Original Endmt as of 9/30/11[2]	FY09-10 Budget	FY09-10 Expend.	Endowmt 9/30/11	Initial & Capital 9/30/11	Total Funds as of 09/30/11
Buena Vista Creek Ecological Reserve	CNLM	4/2007	$776,644	$848,108	$41,041	$42,185	$755,147	$19,996	$775,143
Calavera Hills II/Robertson Ranch E[3]	CNLM	6/2006	$1,650,293	$1,853,477	$78064	$73,905	$1,718,423	$38,448	$1,814,853
Carlsbad Oaks North	CNLM	3/2006	$1,020,311	$1,145,932	$44,781	$43,229	$955,934	$0	$955,934
Emerald Pointe	SDHC	12/2006	$194,068	$217,962	$9,445	$8,575	$181,401	$0	$181,401
Kelly Ranch	CNLM	3/2002	$296,125	$372,701	$14,761	$15,010	$341,160	$0	$341,160
La Costa Villages	CNLM	2/2002	$1,364,400	$1,717,225	$67,483	$69,301	$1,505,355	$0	$1,505,355
Nelson Parcel	CNLM	6/2001	$72,180	$92,282	$3,283	$2,865	$73,795	$0	$73,795
N. County Calvary Chapel	Helix	6/2006	$159,756	$179,425	unknown	$8,842	$160,136[4]	$0	$160,136[4]
N. County Habitat Bank/Encinas Ck	CNLM	5/2008	$425,862	$447,853	$22,185	$21,121	$399,350	$27,741	$427,091
TOTAL			**$5,959,639**	**$6,874,965**		**$285,033**	**$7,531,929**	**$86,185**	**$7,676,096**

[1] CNLM = Center for Natural Lands Management, SDHC = San Diego Habitat Conservancy.

[2] Adjusted for inflation to the current dollar value as of 9/30/11 based on Bureau of Labor Statistics Consumer Price Index.

[3] CNLM merged funds for these two projects to provide a cost savings for Robertson Ranch East Village

[4] As of June 2011

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Appendix A

Summary of Management and Monitoring Activities within HMP Management Units

November 1, 2010 - October 31, 2011

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Agua Hedionda	**Preserve Manager: CDFG**	**Agua Hedionda Lagoon Ecological Reserve** ▪ Information unavailable
	AH Lagoon Foundation	**Agua Hedionda Lagoon** ▪ Public education including: bat pollination talk, migratory bird festival (perils of migrating birds talk), World Water Day (water conservation, pollution, and wetlands education), and Earth Day (*Caulerpa taxifolia* talk), ▪ Trail Clean Up: North Shore Hubbs Trail (invasive species removal), and Trail Clean Up Day (all trails), weekly cleaning of North Shore trail, Kelly School Trail, and Discovery Center Trail ▪ Hosted Carlsbad Watershed Network meetings ▪ Birding walks (monthly). ▪ Lagoon Day run for public awareness of Carlsbad lagoons.
Arroyo La Costa	**HOAs**	Property-level management
Batiquitos Lagoon	**Preserve Manager: CDFG**	**Batiquitos Lagoon Ecological Reserve** ▪ Conducted focused species surveys for clapper rails ▪ Conducted focused species surveys for California least terns (volunteers; reduced effort from previous years)
	Batiquitos Lagoon Foundation	**Batiquitos Lagoon** ▪ Information unavailable
Bressi/Carrillo		Information unavailable
Buena Vista Creek	**Preserve Manager: CNLM** **Landowner: CDFG**	**Buena Vista Creek Ecological Reserve** ▪ Replaced and/or repaired vandalized fencing where necessary ▪ Trash removed from former encampments and other localities by Center personnel and volunteers ▪ Coordinated with the Carlsbad Watershed Network on maintenance of four habitat enhancement areas ▪ Conducted extensive invasive species treatment and removal within the riparian and upland areas using various funding sources ▪ Made enhancements to the Supplemental Environmental Project (SEP) restoration area including the installation of a new irrigation pump and pump system, and the planting of nearly two thousand riparian and riparian transition plants

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011 *continued*

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Buena Vista Creek ***continued***	**Preserve Manager: CNLM** **Landowner: CDFG** ***continued***	▪ Conducted general plant survey; searched for sensitive plant species ▪ Discovered a new locality of thread-leaved brodiaea containing an estimated 2,100 plants ▪ Surveyed the thread-leaved brodiaea localities discovered during the previous year ▪ Installed 2 brown-headed cowbird (*Molothrus ater*) traps resulting in the capture of 40 birds ▪ Staff worked with Preserve Calavera and students from Pacific Ridge High School in the SEP restoration effort ▪ Conducted regular patrols,, noting new weed infestations as they were encountered, and dissuading illegal users from trespass ▪ Fuel zones were cleared or thinned as required ▪ Developed an annual work plan for the upcoming management year
	Preserve Calavera	**Buena Vista Creek** ▪ Continued volunteer projects to support two Phase 2 restoration sites, secured donation of 20 yards of mulch, coordinated group planting, weeding and mulching, and logged over 300 volunteer hours ▪ Held first Endangered Species day event- with hike, poster contest, and art projects using trash collected in the BVCER. ▪ Provided funding for first cowbird trapping in the BVCER ▪ Worked with City of Oceanside, DFG and CNLM toward mitigation plan and site clean-up after sewer spill from broken Haymar sewer line in the creek ▪ Continued efforts toward permanent preservation of the rest of the Buena Vista Valley ▪ Continued work with Coastkeeper for water quality and stream condition evaluations of Buena Vista Creek
Buena Vista Lagoon	**Preserve Manager: CDFG**	**Buena Vista Lagoon Ecological Reserve** ▪ Conducted surveys for light-footed clapper rail
	Preserve Calavera	**Buena Vista Lagoon/Watershed** ▪ Partnered with BVAS in completing first two tasks of a comprehensive Watershed Management Plan for the BV Watershed ▪ Supported community education on native plants, wildlife and preserve management issues at various fairs and outreach events ▪ Identified problem with invasive snails and led volunteer "snail picking parties" at Carlsbad Oaks North and BVCER
Calavera	**Preserve Manager: CNLM**	**Calavera Hills Phase II/Robertson Ranch East** **Activity Highlights** ▪ Noted sensitive animals observed on-site while conducting patrols, maintenance, or other monitoring tasks ▪ Monitored grasslands at Village H for cover and species richness ▪ Assessed habitat for the San Diego thornmint (*Acanthomintha ilicifolia*) using standard methods ▪ Performed third year of CSS monitoring at several locations in the HCA ▪Treated invasive perennial pepperweed (*Lepidium latifolium*) along Calavera Creek ▪ Partner's for Fish and Wildlife proposal was completed and approved for funding

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011 *continued*

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Calavera ***continued***	**Preserve Manager: CNLM** ***continued***	▪ Treated invasive, non-native plant species at Village H including fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and artichoke thistle (*Cynara cardunculus*) ▪ Mowed crown daisy (*Chrysanthemum coronarium*) in Village H ▪ Restoration of Village R was maintained ▪ Removed more than 61 pounds of golf balls from Village H ▪ Removed and treated weeds (mechanical and chemical) in Village X parcel, adjacent to and surrounding thread-leaved brodiaea populations ▪ Corresponded with HOAs and landscapers to limit irrigation runoff into the HCA and control weeds inside their property ▪ Anchored vegetation was installed to block off unwanted trespass in Village U ▪ Performed regular patrol, site enforcement and trash pickup to protect the HCA ▪ Prepared CE compliance documentation and report
	Preserve Manager: CDFG	**<u>Carlsbad Highlands Ecological Reserve</u>** ▪ information unavailable
	Preserve Calavera	**<u>Calavera area</u>** ▪ Continued quarterly wildlife tracking surveys ▪ Partnered with CNPS for special native plant hike and listed species documentation ▪ Initiated meetings with SDG&E and City of Carlsbad to address construction/grading issues ▪ Worked on interpretive sign related to wildlife ▪ Conducted sample trail user counts, drafted forms and procedures and worked with City staff toward first formal counts and trail user survey ▪ Partnered with the city on several trail building and clean-up projects ▪ Support trail captain in stocking kiosks, picking up dog poop and monitoring trail conditions
Faraday	**Preserve Manager: CNLM**	**<u>Kelly Ranch</u>** **Activity Highlights** ▪ Worked with an Eagle Scout candidate on installing fencing around the upper trail and kiosk ▪ Mapped vegetation associations using the most recent classification system ▪ Counted Orcutt's hazardia (*Hazardia orcuttii*) seedlings and adults ▪ Conducted point-intercept cover estimation of Orcutt's hazardia habitat ▪ Conducted habitat assessment of stand of wart-stem lilac (*Ceanothus verrucosus*) ▪ Removed or treated nonnative plant species, including dozens of Natal grass (*Melinis repens*), a couple Veldt grass (*Ehrharta calycina*), and thousands of Saharan mustard (*Brassica tournefortii*) ▪ Performed regular patrol, site enforcement, and trash removal ▪ Conducted a CE compliance visit and report

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011 *continued*

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Los Monos	**Preserve Manager: CNLM**	**<u>Carlsbad Oaks North</u>** **Activity Highlights** ▪ Repaired and enhanced vandalized fencing ▪ Installed signage ▪ Documented wildlife movement using wildlife cameras ▪ Located and mapped a previously unknown locality of Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*) ▪ Assessed vegetative cover within the San Diego thornmint (*Acanthomintha ilicifolia*) population ▪ Assessed the vegetative cover within the largest thread-leaved brodiaea (*Brodiaea filifolia*) population ▪ Mapped and counted additional localities of thread-leaved brodiaea ▪ Monitored previously established CSS study plots ▪ Conducted a Nutall's scrub oak (*Quercus dumosa*) density study in three locations ▪ Monitored and maintained thread-leaved brodiaea impact area ▪ Patrolled the HCA regularly, picking up trash, removing weeds, and looking for other potential problems; one itinerant was removed ▪ Conducted a CE compliance visit and report to ensure the values of the HCA are preserved in perpetuity
	UCSD	**Dawson-Los Monos Preserve** ▪ Property-level management
Poinsettia/Aviara	**Helix Environmental**	<u>North Coast Calvary Chapel Open Space</u> **Activity Highlights** ▪Exotic plant species removal, trash removal, and erosion repair ▪Conducted surveys for the coastal California gnatcatcher ▪Conducted qualitative survey of wart-stemmed ceanothus
	Aviara Master HOA	Property-level management
	Other HOAs	Property-level management
	Preserve Manager: San Diego Habitat Conservancy	**<u>Emerald Pointe</u>** **Activity Highlights** ▪ Information unavailable

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011 *continued*

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Poinsettia/Aviara ***continued***	**Preserve Manager: CNLM**	**<u>North County Habitat Bank/Encinas Creek</u>** **Activity Highlights** ▪ Treated non-natives with herbicide including black mustard (*Brassica nigra*), ice plant (*Carpobrotus edulis*), fennel (*Foeniculum vulgare*) and Italian thistle (*Carduus pycnocephalus*) ▪ Performed surveys for California gnatcatcher (*Polioptila californica)* and least Bell's vireo (*Vireo bellii pusillus*) ▪ Performed camera surveys to determine presence and use of the Preserve by large mammals ▪ Mapped and treated several wetland weeds ▪ Trapped brown-headed cowbirds (*Molothrus ater*) ▪ Conducted regular patrols, site enforcement, and trash pickup ▪ Produced and provided annual reports, work plants, budgets and endowment status to the City of Carlsbad and the Wildlife Agencies
Villages of La Costa	**Preserve Manager: CNLM**	**<u>Rancho La Costa</u>** ▪ Established long-term monitoring plots for coastal sage scrub and collected year one data ▪ Continued long-term maintenance and monitoring at the Huff and Hubbard Slope restoration sites. ▪ Wildlife corridor tracking (tracking of wildlife) ▪ Focused surveys for sensitive plants: San Diego thornmint (*Acanthomintha ilicifolia*) and Orcutt's hazardia (*Hazardia orcuttii*) ▪ Continued long-term monitoring of the sensitive thread-leaf brodiaea (*Brodiaea filifolia*) ▪ Removal and treatment of non-native and invasive species, including: tree tobacco (*Nicotiana glauca*), onion weed (*Asphodelus fistulosus*), perennial pepper weed (*Lepidium latifolium*), pampas grass (*Cortaderia* spp.), tamarisk (*Tamarix* ssp.), palm trees (*Phoenix canariensis*, *Washingtonia filifera*), fennel (*Foeniculum vulgare*), artichoke thistle (*Cynara cardunculus*), eucalyptus trees (*Eucalyptus* spp), Ward's weed (*Carrichtera annua*), perennial veldt grass (*Ehrharta calycina*), Sahara mustard (*Brassica tournefortii*), acacia trees (*Acacia* spp.), fountain grass (*Pennisetum setaceum*), and nonnative, annual grasses ▪ Mitigation projects implemented at the Greens ▪ Trail improvements including trash removal, installation of signs and fencing ▪ Overall preserve improvements include trash removal, itinerant encampment removal, and trespass enforcement ▪ Volunteers from La Costa Canyon High School removed trash from Denk Mountain. ▪ Fuel breaks were mowed and maintained per City of Carlsbad Fire Department regulations ▪ Public education on conservation values and site sensitivities was performed throughout the year. ▪ Completed and submitted an Annual Report ▪ One full-time ranger and two part-time rangers conducted patrols and enforced compliance

Summary of HMP Management and Monitoring Activities, Nov 2010 – Oct 2011 *continued*

Management Unit (MU)	Management Entity[1]	Management and Monitoring Activities
Multiple MUs	**Preserve Manager: CNLM**	**City of Carlsbad Preserves** ▪ Conducted sensitive bird and avian community surveys on most properties ▪ Mapped the vegetation communities at the Crossings Golf Course ▪ Counted and mapped Thread-leaf brodiaea occurrences ▪ treated or removed zero and moderate-tolerance nonnative plant species ▪ Conducted evaluations and assessments for plant species ▪ Conducted routine patrols to protect the preserve and provide information to visitors ▪ Installed Signs and kiosks ▪ Participated in volunteer events organized by the City and provided public outreach events or education ▪ Met regularly with City staff and the City's Preserve Steward to discuss Preserve Management, as well as other issues pertaining to management and monitoring issues in Carlsbad
	City Parks and Recreation Department	▪ Trail clean up and maintenance monthly through volunteers (Total trails volunteers = 359, Total volunteer hours = 1,977); a total of 30 miles of trail improved and maintained by volunteers. ▪ Quarterly trail volunteer meetings ▪ Conducted a comprehensive survey of trail use including frequency of use and reasons for use.

Appendix B

San Diego Thornmint Abstract
Center for Natural Lands Management
June 13, 2011

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Center for Natural Lands Management

Plant Abstract Reference: Bot001
Draft v1c: June 13, 2011

San Diego thornmint

Acanthomintha ilicifolia

Prepared by: Deborah L. Rogers
Reviewed and revised by: Markus Spiegelberg, Patrick McConnell, Jessie Vinje

Taxonomic description: San Diego thornmint is an annual aromatic herb in the Lamiaceae (mint family). The Lamiaceae is a large, cosmopolitan family with over 240 genera. There are four species in the genus *Acanthomintha*, all of them in the California Floristic Province (Jokerst 1993).

Conservation status: Global Status: G1 - Critically Imperiled
(US) Federally threatened (1998) – 63 FR 54937
(California) State endangered (1982)
California Native Plant Society: List 1B.1 (rare throughout range and seriously threatened)
Covered in the following Habitat Conservation Plans (HCPs)*:
Fieldstone/La Costa & City of Carlsbad MSVP
City of Carlsbad HCP MSCP
City of Chula Vista Subarea Plan MSCP
City of La Mesa Subarea Plan MSCP
City of Poway Subarea Plan
City of Encinitas Subarea Plan MHCP
City of Oceanside Subarea Plan MHCP
City of San Marcos Subarea Plan MHCP
City of Escondido Subarea Plan MHCP
City of San Diego Subarea Plan MSCP
San Diego County MSCP
(*Not all plans have been executed yet via Implementing Agreements)

Distribution

Rangewide

Acanthomintha ilicifolia is known from 80 historical and 55 extant occurrences in coastal San Diego County, California, and 13 (within unknown status) occurrences in Baja California Norte, Mexico (Sierra Juarez and coastal) (USFWS 2009). The known extant occurrences in San Diego County range from the City of Oceanside in the north, to Ramona in the east, to Jamul in the southeast (see Figure 1). These occurrences range in elevation from sea level to 3,000 ft. (USFWS GIS analysis 2009). Approximately 70 percent of extant occurrences are currently protected from development (USFWS 2009).

The extant number of occurrences remains somewhat uncertain—both because of possible recent extirpations as well as the cryptic nature of some (especially small) occurrences. Although a comprehensive range-wide survey has not been conducted, limited surveys in the early 1990s (Bauder et al. 1994) and in 2010 (by the San Diego Thornmint Working Group initiated by CNLM, USFWS, and CDFG) revisited and confirmed 21 and 33 (out of 37) occurrences, respectively (i.e., not all 55 occurrences were revisited during either survey). It is not known whether the four occurrences not confirmed in 2010 are extirpated or were simply not apparent that year.

CNLM

This species occurs on three CNLM preserves: Manchester Habitat Conservation Area (S006), La Costa Habitat Conservation Area (S020), and Carlsbad Oaks North (S034) Preserves.

Reproductive biology: Plants in this genus are winter annuals: germinating in the winter rainy period, flowering in late spring, setting seed and dying in early summer. Reproductive output is affected by environmental conditions which somewhat determine number of branches, nodes per branch, and flowers per node. Seeds per flower, however, are fixed at a maximum of four. The breeding and mating systems of San Diego thornmint are unknown but study of other congeneric species indicate some level of self-compatibility and autogamous seed production (Steeck 1995). Insect visitation has been investigated for other congeneric species, with medium- and large-sized bees, particularly bumble bees, being noted as the most common visitors (Steeck 1995). For A. ilicifolia, insect visitation has been observed that may indicate a role in insect pollination although this has not been confirmed and no species-specific pollinators have been identified (Bauder and Sakrison 1997). However, a study of potential pollinators provided observations of insects < 6 mm landing on and entering San Diego thornmint flowers, with larger insects seemingly unable to enter the flowers (Klein 2009). That study further suggested that excessive ground thatch may interfere with insect visitation and also nesting of potential pollinators such as ground-nesting bees.

Much of the seed may be stored above-ground (and little in soil seed banks) in the dried calyces and may not be long-lived (Bauder and Sakrison 1999). A soil seed bank study, drawing samples from a Goodan Ranch/Sycamore Canyon population, revealed high variability in the concentration of seed in the soil between sites and among sampling dates. Germination rate of soil bank seed was generally low, except for the fall (October) collection date (Bauder and Sakrison 1999). A study of germination conditions indicated that optimal conditions for germination include a long daily cool period (~ 10 °C.) and that germination may be inhibited by warm temperatures (Bauder and Sakrison 1997). The relationship between seed germination and storage time has not been investigated. However, there is some evidence that, at least initially, there is a positive relationship between seed age and germinability (Bauder and Sakrison 1997). Preliminary observations from CNLM monitoring suggests a relationship between (total) annual precipitation and number of plants.

Life form: Annual herb.

Fire ecology: Largely unknown. In principle, fire may negatively impact natural regeneration through destruction of above-ground (and possibly also soil-) seed bank. However, depending on weed competition and timing of fire, fire may also enhance conditions for *A. ilicifolia* by reducing non-native vegetative competition. The specific effect of fire may be quite site-specific: depending on the nature of the competing vegetation (its response to fire relative to that of San Diego thornmint) and the specific fire characteristics (intensity, coverage, duration). For example, it has been observed that fire may have also opened up occupied thornmint habitat to the invasion of non-native, annual grass species (specifically purple false-brome, *Brachypodium distachyon*), which has possibly greatly reduced at least one thornmint occurrence (CBI 2010). It has been documented that A. *ilicifolia* can re-establish after fire (Sclafani 2005, CBI 2010). Occurrences on Viejas Mountain experienced high-severity fire in 2003. Thornmint response is unknown. At least one species management plan (USDA Forest Service) recommends allowing wildland and prescribed fires to burn freely in areas where San Diego thornmint occurs ((Winter 1991).

Genetic description:

Genetic structure: Not available (NA)
Genetic diversity: NA
Transmission genetics: NA
Cellular: NA. Note that many species in this family—with examples from *Thymus*, *Glechoma*, *Pycnanthemum*, *Salvia*, and *Mentha*—are polyploid, providing reasonable possibility that this species, also, may be a polyploid.

Ecology: Evidence of insect visitation but their relationship with pollination and fertilization is unknown. The species is found in association with California chaparral, coastal sage scrub, and annual grassland habitats. It is further restricted to heavy clay soils (derived from gabbro and soft calcareous sandstone substrates with a loose, crumbly structure and fissures approximately one to two feet deep), gentle slopes (ranging from 0 to 25 degrees),

and with open structure (low density of forbs and geophytes and low density or absence of shrubs) (Oberbauer 1993, USFWS 2008).

Possible threats to California populations include:

- Lack of information concerning relationship with potential pollinators
- Lack of information concerning natural seed source (soil vs above-ground) and longevity of seed above-ground, soil seedbank, and in controlled storage
- Lack of information concerning amount and distribution of genetic variation; mating system; and relative viability of selfed vs outcrossed seeds
- Lack of information concerning local adaptation (including adaptive genetic diversity and ploidy determination)
- Lack of information concerning effective translocation practices (For example, of seven known translocation attempts (of five occurrences), five have failed (USFWS 2009)). Similar difficulties have been experienced in attempts to establish new populations of congeneric and similarly threatened species (Pavlik and Espeland 1998)
- Loss of suitable (although 'protected') habitat because of lack of financial resources or management-related species information
- Competition with non-native exotic plant species (e.g., Bauder and Sakrison 1999, USFWS 2009) such as purple false-brome

CNLM Management implications:

- Management of vegetative competition is important: attention to avoiding negative impact on potential pollinators
- Stochastic events (e.g., several unfavorable reproductive years or certain fire events) could threaten viability of existing occurrences, especially those small in size
- Translocation attempts may be high risk
- High failure rate in translocation attempts, and the lack of genetic information, suggests caution in any seed movement among occurrences.
- Small occurrences could be further at risk due to loss of pollinators or inbreeding depression—neither of which has been investigated.

Management considerations:

1. Is it important to rapidly expand existing populations (especially small populations)? Reasons could include:
    a. Evidence that there is inadequate natural recruitment
    b. Recent fragmentation of once-continuous or larger populations
    c. Loss or potential loss of habitat as a result of competition from exotic invasives
2. Is sexual reproduction limiting?
    a. Evidence of inbreeding depression?
    b. Loss of specialist (or generalist) pollinators?
    c. Inadequate (or too vulnerable) soil or above-ground seed bank?
3. How is fire disturbance most likely to affect thornmint survival and reproduction? What, if any, management actions should be taken towards allowing or moderating wildland fires?

Management actions:

1. Monitor existing *A. ilicifolia* occurrences at a temporal and spatial scale that will allow detection of any trend towards extirpation.
2. Develop fire plans (or revise existing fuel management plans or five-year management plans) for CNLM preserves on which there is an occurrence of *A. ilicifolia*. Communicate to and discuss these plans with the local fire agencies.

3. Develop information on patterns of genetic variation among populations (genetic structure), including information on genetic variation in some adaptive traits so as to inform decisions regarding artificial propagation/restoration and any translocation events. Develop plan and grant proposal and/or work with collaborators.
4. Investigate or encourage the investigation among collaborators insect pollination and fertilization of this species.
5. Investigate or encourage the investigation of inbreeding depression.
6. Investigate or encourage the investigation of shelf-life (i.e., effects on germination) of seed stored in *ex situ* conditions.
7. Depending on results of Management Action #6, conduct seed collections during good seed years, using collection guidelines that are to be developed following information gained from Management Action #3.

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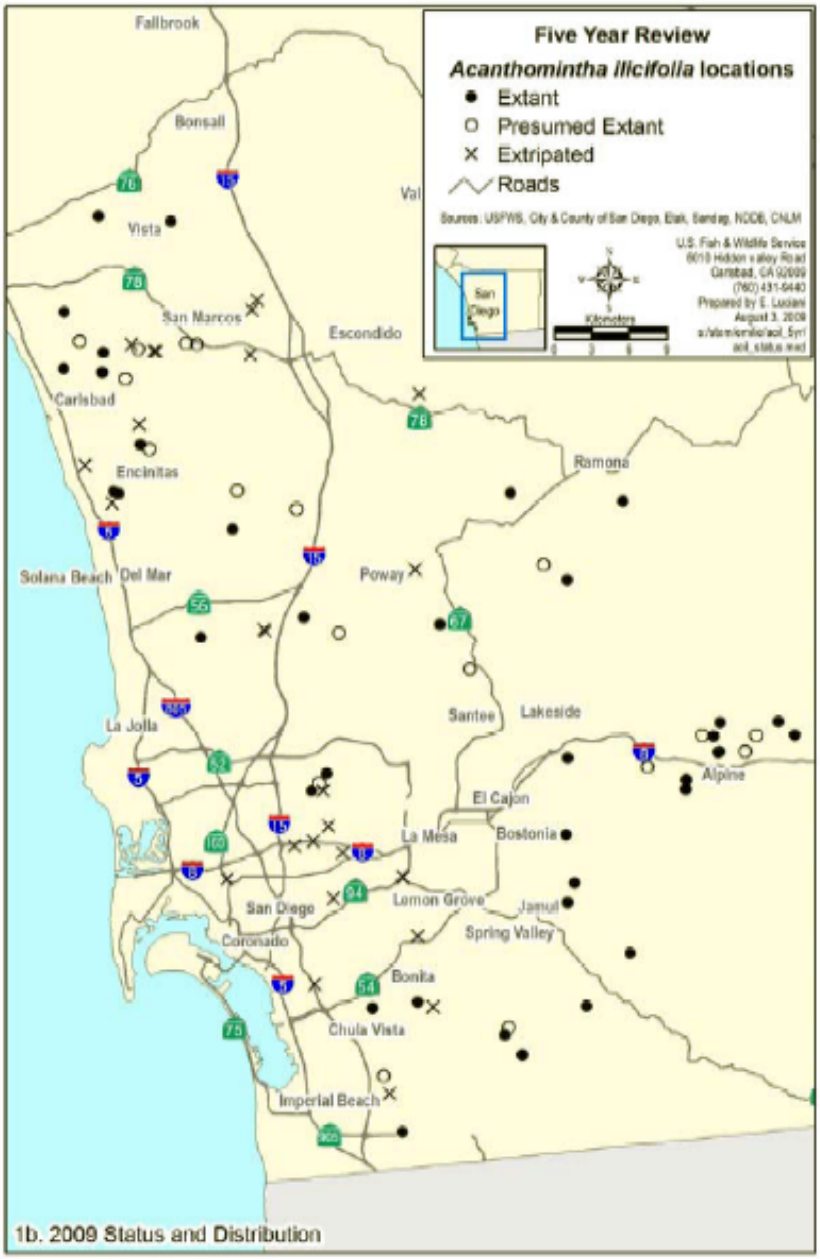

Figure 1. Status and distribution of *Acanthomintha ilicifolia* 2009 (USFWS 2009).

Abstracts from key literature:

Title: Demography of natural and reintroduced populations of Acanthomintha duttonii, an endangered serpentinite annual in northern California
Authors: Pavlik, B.M. and E.K. Espeland.
Source: Madroño 45 (1) 31-39, 1998
Abstract: The purpose of this study was to 1) demographically monitor the only remaining natural population of the rare serpentinite annual plant *Acanthomintha duttonii* (Lamiaceae); 2) attempt to reintroduce a new, experimental population within historic range; and 3) evaluate the new population by comparing its demographic characteristics with those of the natural population. The natural population of A. duttonii at Edgewood Park significantly and progressively increased in abundance and density between 1990 and 1994, then began a decline that lasted through 1997. In general, high density and high yield (reproductive plants produced from previous year's nutlet production) were associated with average or below-average years of precipitation while low densities and yields were associated with above-average rainfall years. During the entire study period, survivorship to reproduction remained fairly high and consistent, indicating that population trends were due to variations in nutlet production and the influence of cryptic factors that operate in the seed bank. The experimental population at Pulgas Ridge differed in several critical respects from the natural population, including low germination, low and variable survivorship, low nutlet production and perhaps high nutlet mortality. These features reduced the potential for self-sustained growth in the experimental population, which is likely to be extirpated within the next few years. This failure to produce a self-sustaining population of A. duttonii emphasizes the urgent need for in situ preservation of self-sustaining natural populations of serpentinite species.