Chula Vista Central City Preserve Area Specific Management Directives (ASMDs) for Preserve Management Area 4 (PMA 4), City of Chula Vista

Prepared for

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RECON Number 3693B
April 26, 2004

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1.0 INTRODUCTION

1.1 Purpose of the Plan

Using the baseline biological information obtained through the California Natural Community Conservation Plan (NCCP) grant funded special study, this Area Specific Management Directives (ASMD) plan has been prepared to provide guidelines for the protection, maintenance, and management of preserved natural open space on Preserve Management Area 4 (PMA 4) of the City of Chula Vista's Central City Preserve (Preserve). The Central City Preserve was created in response to the City of Chula Vista Multiple Species Conservation Program (MSCP) Subarea Plan as a means to protect sensitive biological resources within the jurisdiction. The natural open space of PMA 4 supports sensitive and depleted plant communities and species unique to the region. MSCP covered flora and fauna species and sensitive habitats are the primary resources identified for protection in this PMA. The PMA also acts to enhance the quality of life for residents of Chula Vista.

1.2 Multiple Species Conservation Program

The MSCP is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple species and the preservation of natural vegetation communities of San Diego County. The City of San Diego along with the County of San Diego and other adjacent jurisdictions developed a subregional plan under the California Natural Community Conservation Planning Act of 1991 that encompasses 582,243 acres across a total of 12 jurisdictions (City of San Diego 1998). The MSCP provides a framework for preserving and protecting natural resources and federal and state endangered, threatened, or sensitive species. It addresses the potential impacts of urban growth, loss of natural habitat and species endangerment, and creates a plan to mitigate for the potential loss of covered species and their habitats due to direct, indirect, and cumulative impacts of future development of both public and private lands within the MSCP area. This MSCP Subregional Plan is implemented through local Subarea Plans prepared by the participating jurisdictions. These Subarea Plans are prepared in coordination with federal and state resource agencies and result in the issuance of permits that allow for a certain level of impact to state and federally listed species.

The City of Chula Vista has prepared and adopted an MSCP Subarea Plan to guide implementation of the MSCP within its corporate boundaries (City of Chula Vista 2003). The MSCP Subarea Plan is a plan and a process for the local issuance of permits under the federal and state Endangered Species Acts for impacts to threatened and endangered species. Also included in the MSCP Subarea Plan are implementation strategies, preserve design, and management guidelines.

The MSCP Subarea Plan designates a natural habitat preserve system and provides a regulatory framework for determining impacts and designating mitigation associated with

proposed projects. The MSCP Subarea Plan identifies a series of focused planning areas within which some lands will be dedicated for preservation of native habitats.

There are 86 sensitive plant and wildlife species in the MSCP Subarea Plan that are considered MSCP covered species. These species are considered to be adequately protected within the MSCP Subarea Plan Preserve lands.

Implementation of this Subarea Plan will ensure conservation and management of approximately 9,243 acres (City of Chula Vista 2003). An estimated 4,993 acres will be located within the Subarea Plan boundary and will result in a Preserve that is managed by the City and/or other designated managing entities (City of Chula Vista 2003). An additional approximately 4,250 acres will be conserved outside of the Subarea as a result of mitigation for development within the City and implementation of this Subarea Plan (City of Chula Vista 2003). Each area of the Chula Vista Preserve is unique in terms of existing conditions, Preserve configuration, ownership of land, the existence and location of sensitive species, and management needs.

There are eight plants that are identified in the MSCP Subarea Plan as “narrow endemic species” based on their limited distributions in the region and their potential to occur in Chula Vista. Four species identified as narrow endemics are known to occur within PMA 4, including Otay tarplant (*Deinandra conjugens*), San Diego thornmint (*Acanthomintha ilicifolia*), variegated dudleya (*Dudleya variegata*), and snake cholla (*Cylindropuntia californica* var. *californica* [=*Opuntia parryi* var. *serpentina*]). These narrow endemics are sensitive biological resources and some are state or federally listed as threatened or endangered species.

1.3 Goals of the Area Specific Management Directives Plan

The goals of this ASMD plan are to develop measures for managing and maintaining the biological resources within PMA 4 to ensure that the MSCP covered species are adequately protected. As described in the MSCP Subarea Plan (City of Chula Vista 2003), these measures are categorized into two levels of management activities for the Preserve: Priority 1 and Priority 2.

Priority 1 measures include management tasks that are necessary to ensure that the covered species are adequately protected. These management directives will be funded through financing mechanisms created by the City or through project financing pursuant to Section 8.0 of the MSCP Subarea Plan (City of Chula Vista 2003) and carried out by the City or appropriate managing entity.

Priority 2 measures are not required for covered species status; rather, they are recommendations for enhancing the quality and function of the Preserve, including public education and provision of barriers to direct public access (i.e., vegetation, rocks/boulders, and/or fencing). While Priority 2 directives will be incorporated to the

extent feasible, it is recognized that many of these directives cannot be implemented immediately, but may occur over time as funding sources become available.

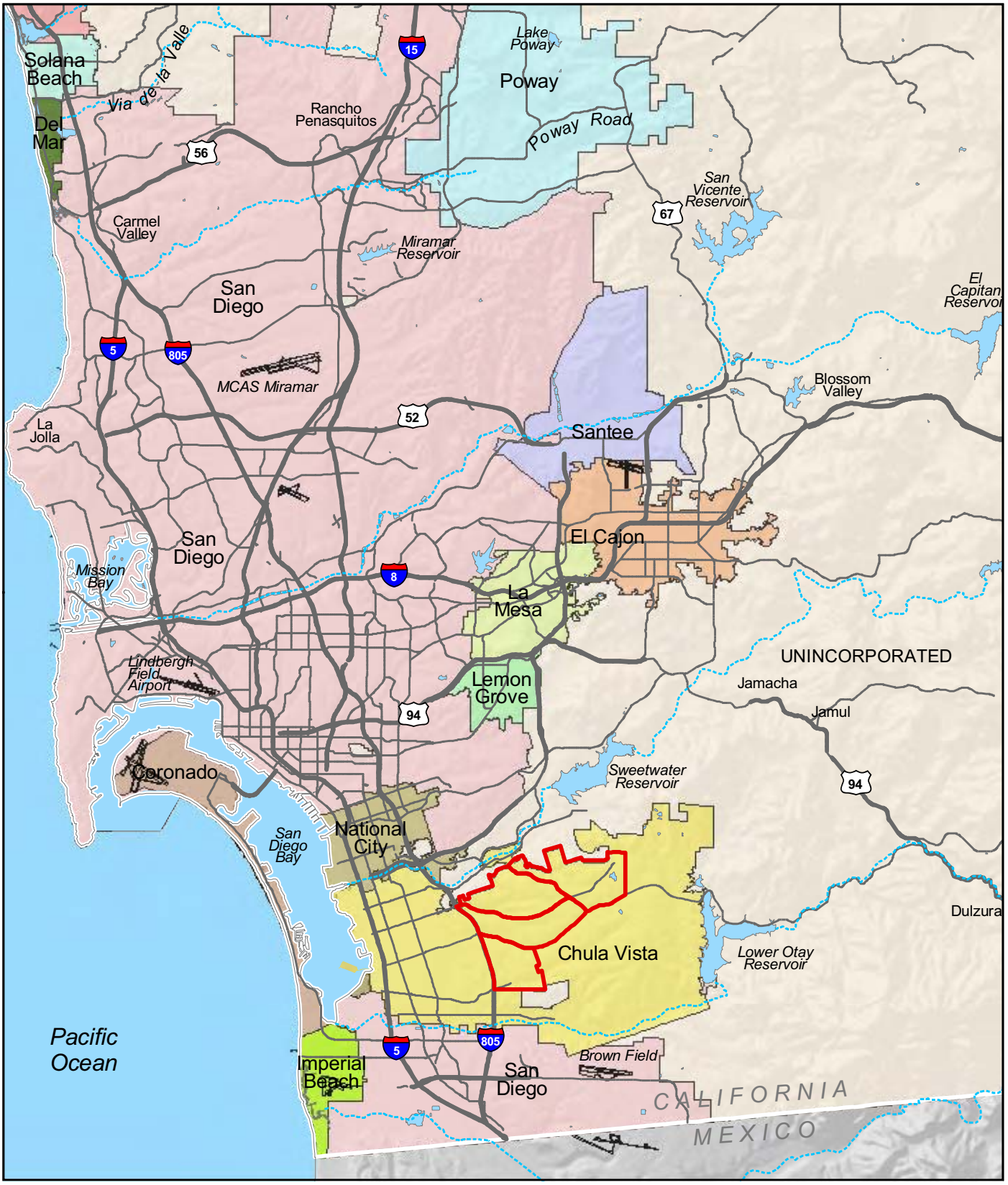
Funding for these management activities is described in Section 12.1 of this document.

1.4 Description of the Central City Preserve Management Areas

The City of Chula Vista Preserve is divided into three main PMAs: Central City, North City, and Otay Ranch. The Framework Management Plan for the Central City and North City PMAs is the City Planning Component Framework Management Plan. The Preserve in the City Planning Component includes the existing open space encompassed by the communities of Bonita Long Canyon, Rancho del Rey, Terra Nova, Sunbow, and EastLake I, and open space that will be dedicated as development occurs in the future communities of Rolling Hills Ranch and Bella Lago (City of Chula Vista 2003). Lands conserved on the southern parcel of San Miguel Ranch within the City are also included in the Preserve. However, these conservation areas have been dedicated to the U.S. Fish and Wildlife Service (USFWS) San Diego National Wildlife Refuge (SDNWR) and will be maintained and managed by USFWS. The Preserve areas in the City Planning Component consist primarily of coastal sage and maritime succulent scrub and include known populations of narrow endemics including Otay tarplant, San Diego thornmint, variegated dudleya, snake cholla, and other covered species such as San Diego barrel cactus (*Ferocactus viridescens*) and coastal California gnatcatcher (*Polioptila californica californica*), as well as many other sensitive plants and animals.

The Central City PMA is in the central portion of the City of Chula Vista (Figure 1) east of Interstate 805 (I-805), south of State Route 54 (SR-54) and Bonita Road, and north of Otay Lakes Road (Figure 2). The Central City PMA covers approximately 1,350 acres and is subdivided further into four Preserve Management Areas for data management purposes and for the development of the ASMDs. PMA 1, PMA 2, PMA 3, and PMA 4 are shown in Figure 3. Each PMA consists of a number of isolated open space areas, referred to as subunits, surrounded by residential development. Each of these subunits was assigned a number to organize and distinguish each distinct survey area (Figure 4). The City of Chula Vista is responsible for the management of the open space, which is included as preserve land in the MSCP Subarea Plan.

In an effort to compile all available historical data on the flora and fauna in this open space, environmental documents prepared for the construction of residential developments around the canyons within the preserve area and the Natural Diversity Data Base (NDDB; State of California 2003e) were reviewed. Data were compiled from various resources, including surveys that were conducted by RECON in 2002 and 2003, baseline biological resources reports, environmental impact reports, and revegetation plans. Literature reviewed for this document is presented in Attachment A.



Preserve Boundary

FIGURE 1
Regional Location of the
Central City Preserve

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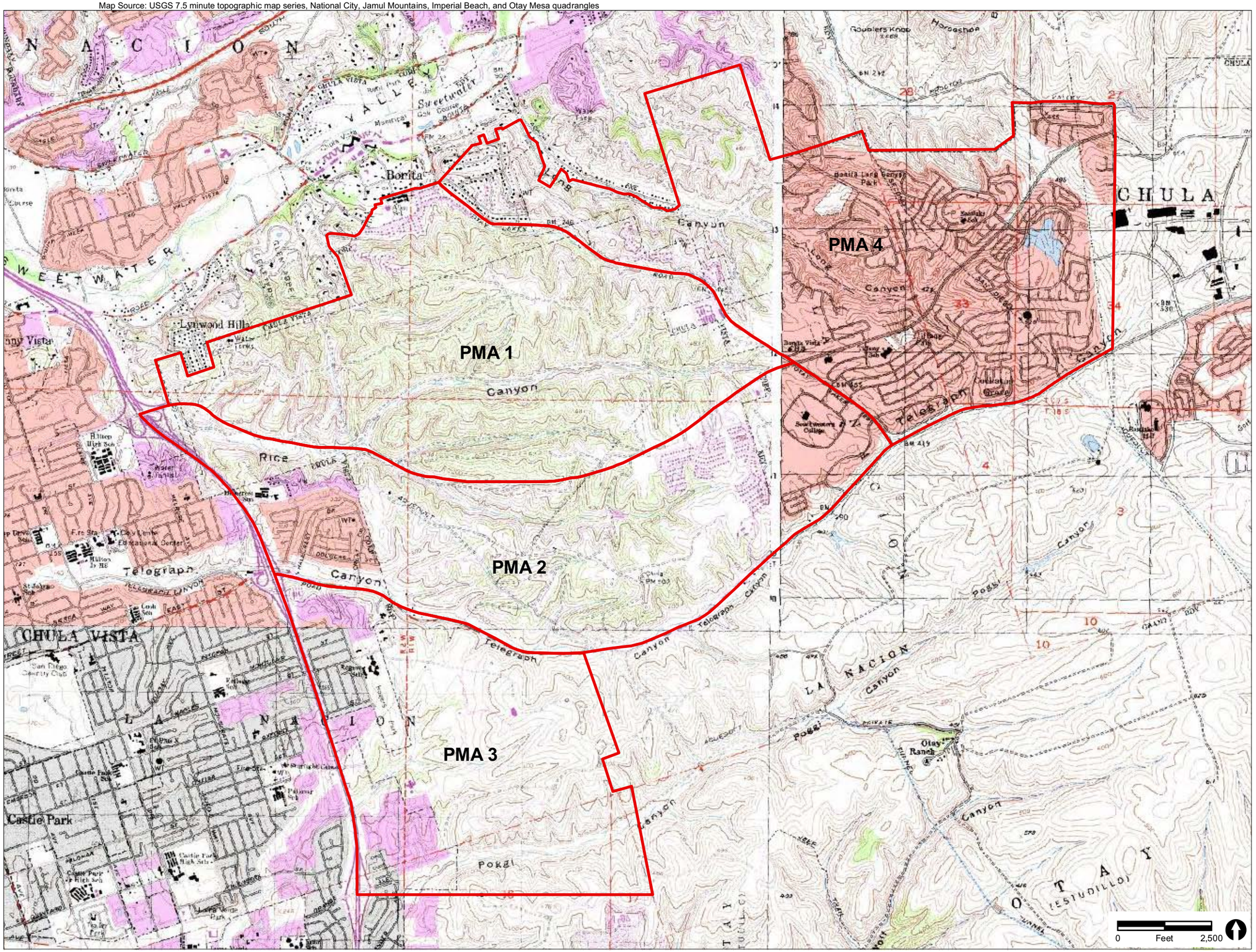
Map Source: USGS 7.5 minute topographic map series, National City, Jamul Mountains, Imperial Beach, and Otay Mesa quadrangles



Preserve Management Area (PMA) Boundary

FIGURE 2

Central City Preserve on USGS Map

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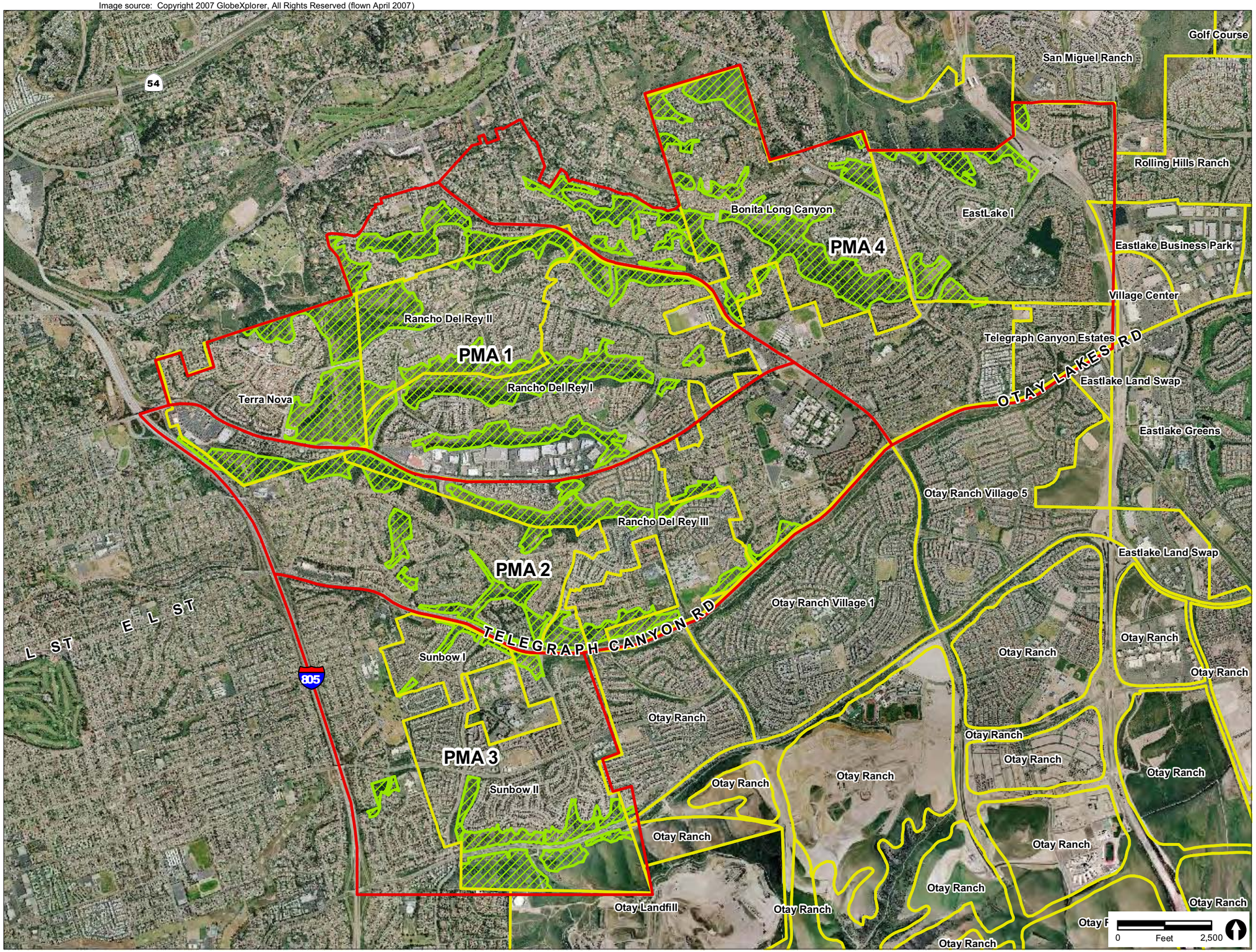

Preserve Management Areas

Major Projects

PMA Subunits

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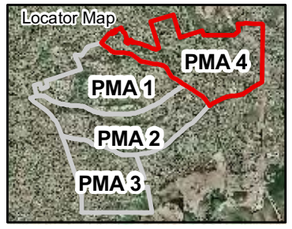
FIGURE 3

Aerial Photograph of the Central City Preserve

Image source: Copyright 2007 GlobeXplorer, All Rights Reserved (flown April 2007)

Preserve Management Areas

- PMA 4
- Other PMAs
- PMA Subunits
- 10ft Topographic Lines



0 Feet 1,200

FIGURE 4

Preserve Management Area 4 (PMA 4)

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1.5 PMA Ownership and Requirements

The open space of PMA 4 is owned and managed by the City of Chula Vista. Management responsibilities are outlined in Section 7.0 of the MSCP Subarea Plan (City of Chula Vista 2003). Preparation of the ASMDs required for specific management actions is described below.

The City will designate a Habitat Manager to accomplish the long-term Preserve management activities identified in the ASMDs. The Habitat Manager will be tasked to accomplish the day-to-day operations associated with managing the Preserve and will be authorized to make decisions related to allocation of Preserve management program funding. Although the management structure for each of the PMAs may differ, the Habitat Manager will be responsible for coordinating Preserve management activities within each PMA. The Habitat Manager will determine Preserve management program priorities, and will be responsible for the allocation of the Biological Enhancement Program funds discussed in Section 8.0 of the MSCP Subarea Plan (City of Chula Vista 2003). The Habitat Manager will coordinate Planned Responses to Changed Circumstances in the Preserve as defined in Section 5.8 of the MSCP Subarea Plan should they occur.

2.0 DESCRIPTION OF PMA 4

2.1 Vicinity Map and Location Description of the PMA

PMA 4 includes eighteen subunits, 4-1a, 4-1b, 4-1cE, 4-1cW, 4-1dN, 4-1dS, 4-1e through 4-1h, 4-2a through 4-2d, and 4-3a through 4-3d, totaling 310.0 acres. These areas are located east of I-805, north of Otay Lakes Road and East H Street, and south of San Miguel Mountain. PMA 4 is shown in Figure 4.

2.2 History of Land Use within PMA 4

Historically, the natural lands within PMA 4 were likely used for cattle ranching; over time, lands within the PMA were converted to residential and commercial development. Development includes the Bonita Long Canyon and Eastlake I subdivisions, and part of the Salt Creek subdivision.

2.3 Physical Setting of the PMA

2.3.1 Site Description

2.3.1.1 Topography

The eastern half of PMA 4 is bisected by Long Canyon, which drops from 430 feet AMSL in the center of the area to 100 feet in the northeastern corner. Steep canyons surrounding it and other arroyos dominate the landscape in the western and northern

parts of the area. The southern part of the site has a gentle, south-facing slope above Telegraph Canyon. The western half of the area is composed of rolling hills, with hilltops above 600 feet AMSL (USGS 1967).

2.3.1.2 Soils

PMA 4 contains the following soil types: Diablo clay, Diablo-urban land complex, Linne clay loam, and Olivenhain cobbly loam. Diablo clay and Linne clay loam soils predominate throughout PMA 4. Diablo clays are most common, with Diablo-urban land complex soils mapped in the flat, southern area that has long been developed, and Linne clay loam soils on the gentle slopes in the north-central part of the area. Olivenhain cobbly loam is found on some of the steep slopes in the eastern part of the site.

These soils support a great variety of plant life, including narrow endemic species in scattered populations including San Diego thornmint, variegated dudleya, and large populations of Otay tarplant on Linne and Diablo clays, while Olivenhein cobbly loam soils supports snake cholla and San Diego barrel cactus populations.

2.4 Current Land Use

Surrounding land uses include residential development interspersed with open space canyons, commercial development, and schools. In PMA 4, the mesa tops are generally developed for urban uses, while the canyon areas make up the majority of the Preserve.

3.0 BASELINE BIOLOGICAL INFORMATION

The City of Chula Vista was awarded a grant from the State of California Natural Community Conservation Planning (NCCP) grant program to fund the Central City Preserve baseline biological study, as well as preparation of this ASMD. As described in Section 7.3.1 of the Subarea Plan, baseline biological studies were conducted to better define the locations and biological values of resources found in the Central City PMAs. The primary goal of these studies was to identify specific biological resources appropriate for management focus and to define functional biological management units for the PMA. As described in Section 7.3.1 of the Subarea Plan (City of Chula Vista 2003), this baseline survey was anticipated to pay particular attention to potential locations of narrow endemic species and specifically Otay tarplant.

3.1 Sensitive Species

For purposes of the baseline study, a species was considered sensitive if it is: (1) listed by state or federal agencies as threatened or endangered or are candidates or proposed for such listing; (2) considered rare, endangered, or threatened by the State of California and listed in the NDDB (State of California 2003a, 2003b, 2003c, 2003d, 2003e); (3) a

narrow endemic or covered species in the City of Chula Vista MSCP Subarea Plan (City of Chula Vista 2003); (4) on Lists 1B or 2 of the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (2001); or (5) considered rare, sensitive, or noteworthy by local conservation organizations or specialists. Noteworthy plant species are considered to be those that are on Lists 3 and 4 of the CNPS *Inventory*. Sensitive habitat types are those identified by the NDDB (State of California 2003a) and Holland (1986). Assessments for the potential occurrence of sensitive or noteworthy species are based upon known ranges and habitat preferences for the species and species occurrence records from the NDDB.

Sensitive plant and wildlife species information is presented in detail in the Baseline Biological Resources Report (RECON 2004), including the following attachments and figures. Attachment 4 of the Baseline Biological Resources Report lists the sensitive plant species known to occur or with potential to occur in the PMAs. Attachment 5 of the Baseline Biological Resources Report lists sensitivity status codes. Attachment 6 of the Baseline Biological Resources Report provides complete general descriptions of all sensitive plant species known to occur in the Central City Preserve. Attachment 8 of the Baseline Biological Resources Report lists the sensitive animal species known to occur or with potential to occur in the PMAs. Attachment 9 of the Baseline Biological Resources Report provides complete general descriptions of all sensitive wildlife species known to occur in the Central City Preserve. Descriptions include sensitivity status, life history, and range. Figures 11a-11m of the Baseline Biological Resources Report map the locations of sensitive wildlife and plants detected during the current surveys.

3.1.1 Sensitive Plant Species

Thirteen listed, sensitive, and rare plant species are present in PMA 4. These species are discussed below. Photographs of the MSCP covered species known to occur in PMA 4 are provided in Attachment B. Several sensitive plant species are historically known from the PMA or are known to occur in the vicinity of the site, but were not observed during surveys. These species and their potential to occur are discussed in the Baseline Biological Resources Report (RECON 2004). ASMD management priorities and directives for these sensitive species are discussed in Section 5.0.

3.1.1.1 MSCP Covered Species

Otay tarplant (*Deinandra conjugens* [=*Hemizonia conjugens*]). Otay tarplant is a federally listed threatened, state listed endangered, CNPS List 1B, and narrow endemic species covered under the MSCP. This species is present in subunits 4-1a (30,000 individuals), 4-1cW (50 individuals), 4-2a, and 4-2b

Critical habitat for Otay tarplant has been designated by the USFWS (2002). Three Critical Habitat Units (CHU) have been designated by USFWS including Unit 1, the Sweetwater/Proctor Valley CHU; Unit 2, the Chula Vista CHU; and Unit 3, the Otay

Valley/Big Murphy's CHU. The Chula Vista CHU contains approximately 520 acres including populations known from Long Canyon. The Chula Vista CHU contains populations in the western extent of the species distribution, which although isolated from each other, may contain significant amounts of genetic diversity and, are therefore, considered essential to the conservation of the species (USFWS 2002).

The Chula Vista CHU includes one management subunits of PMA 4: 4-2a. This management subunit corresponds to Chula Vista CHU Area A as identified in the Federal Register Final Rule on Otay Tarplant Critical Habitat (USFWS 2002).

Although not designated as Critical Habitat for Otay tarplant, subunit 4-1a has a large population of Otay tarplant with approximately 30,000 individuals detected in 2003 (RECON 2004). Management actions for these populations are described in Section 5.0 of this document.

San Diego thornmint (*Acanthomintha ilicifolia*). This annual is federally threatened, state listed as endangered, an MSCP covered species and narrow endemic, and a CNPS List 1B species. Populations of this species are present in subunits 4-1cW (approximately 500 individuals) and 4-2b (approximately 75 individuals).

Snake cholla (*Cylindropuntia californica* [=*Opuntia parryi* var. *serpentina*]). This perennial cactus is a narrow endemic species covered under the MSCP and a CNPS List 1B species. A few individuals of snake cholla occur in the Diegan coastal sage scrub in subunit 4-1cW.

Variegated dudleya (*Dudleya variegata*). This succulent perennial is an MSCP covered species, is considered to be a narrow endemic, and a CNPS List 1B species. Approximately 50 variegated dudleya individuals are present in subunit 4-2a.

San Diego barrel cactus (*Ferocactus viridescens*). This succulent perennial is an MSCP covered species and a CNPS List 2 species. Small populations of San Diego barrel cactus are scattered throughout subunits 4-1a, 4-1cE, 4-1dS, 4-1e, 4-1f, 4-1g, and 4-1h.

Orcutt's bird's-beak (*Cordylanthus orcuttianus*). Orcutt's bird's-beak is a CNPS List 2 and MSCP covered species. A few individuals of this species are present in subunit 4-1g.

3.1.1.2 Other Sensitive Species

San Diego sand aster (*Lessingia filaginifolia* var. *filaginifolia* [=*Corethrogyne filaginifolia* var. *incana*]). This perennial herb is a CNPS List 1B species. Small, scattered populations of San Diego sand aster occur in the Diegan coastal sage scrub of most PMA 4 subunits.

Palmer's grappling hook (*Harpagonella palmeri* var. *palmeri*). This annual herb is a CNPS List 2 species. This species is present in PMA subunits 4-1a, 4-1b, 4-1cW, 4-2a, and 4-2b.

California adolphia (*Adolphia californica*). California adolphia is a CNPS List 2 species. A few shrubs were observed in subunits 4-1dN, 4-1dS, 4-1e, and 4-1f in the Diegan coastal sage scrub.

Munz's sage (*Salvia munzii*). Munz's sage is a CNPS List 2 species. Munz's sage shrubs are present in subunit 4-1f and 4-1h (approximately 35 individuals) in the Diegan coastal sage scrub vegetation.

Small-flowered morning glory (*Convolvulus similans*). This annual is a CNPS List 4 species. This species is present along the drainages of subunits 4-1a (thousands of individuals), 4-1b, 4-1cW, 4-2a (thousands of individuals), and 4-2b.

San Diego County viguiera (*Viguiera laciniata*). This perennial shrub is a CNPS List 4 species. San Diego County viguiera shrubs are widely scattered in the coastal sage scrub vegetation of most PMA 4 subunits.

Graceful tarplant (*Holocarpha virgata* ssp. *elongata*). Graceful tarplant is a CNPS List 4 species. One individual was detected within subunit 4-1h.

Decumbent goldenbush (*Isocoma menziesii var. decumbens*). Decumbent goldenbush is a CNPS List 1B species. It is present in subunits 4-1f (approximately 25 individuals) and 4-2c (approximately 75 individuals).

3.1.2 Sensitive Wildlife

No sensitive invertebrate species were identified in PMA 4.

3.1.2.1 Reptiles and Amphibians

No sensitive amphibian species were observed in PMA 4. A number of sensitive species have a potential to occur; these species are discussed in the Baseline Biological Resources Report (RECON 2004).

Three sensitive reptile species were observed in PMA 4. These species are discussed below. A number of other sensitive species have a potential to occur; these species are discussed in the Baseline Biological Resources Report (RECON 2004).

MSCP Covered Species

Belding's orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*). The Belding's orange-throated whiptail is a CDFG species of special concern and MSCP

covered species. Belding's orange-throated whiptails were observed in subunits 4-1a and 4-2b, and are expected to occur in other scrub areas.

San Diego horned lizard (*Phrynosoma coronatum blainvillii*). The San Diego horned lizard is a CDFG species of special concern and MSCP covered species. A San Diego horned lizard was observed in subunit 4-2b. This species has a low potential to occur in the coastal sage scrub habitat throughout PMA 4. Prior to urban development, this species would have been common on the mesa tops of PMA 4.

Other Sensitive Species

Red diamond rattlesnake (*Crotalus exsul*). The red diamond rattlesnake is a CDFG species of special concern. Red diamond rattlesnakes were observed in subunits 4-1a and 4-2b, and are expected to occur throughout PMA 4, particularly in south-facing Diegan coastal sage and maritime succulent scrub areas.

3.1.2.2 Sensitive Birds

Twelve sensitive bird species were detected on PMA 4. These species are discussed below and are shown on Figures 11a-11m in the Baseline Biological Resources Report (RECON 2004). Several other sensitive bird species have the potential to occur; these species are discussed in the Baseline Biological Resources Report.

MSCP Covered Species

Least Bell's vireo (*Vireo bellii pusillus*). The least Bell's vireo is federally and state listed endangered and an MSCP covered species. This species was observed in subunit 4-2b during the focused surveys conducted in 2003. The least Bell's vireo is expected to breed in the southern willow scrub of this subunit.

Coastal California gnatcatcher (*Polioptila californica californica*). The coastal California gnatcatcher is a federally listed threatened species, a CDFG species of special concern, and an MSCP covered species. Twenty-six coastal California gnatcatcher locations were mapped in PMA 4. For the purposes of this report, a 'gnatcatcher location' may represent either an individual or pair of gnatcatchers. Coastal California gnatcatchers were observed in subunits 4-1a (3 locations), 4-1cE (2 locations), 4-1dS (1 location), 4-1e (1 location), 4-1f (2 locations), 4-1h (2 locations), 4-2a (2 locations), 4-2b (10 locations), 4-2c (1 location), and 4-3b (2 locations). Of these mapped locations, subunits 4-1e and 4-3b showed evidence of nesting behavior (i.e., carrying nesting material). Subunit 4-2b had the largest number of gnatcatcher locations, occurring approximately every 700 feet throughout the subunit.

American peregrine falcon (*Falco peregrinus*). The American peregrine falcon is a state listed endangered, California fully protected, and MSCP covered species. This

species was observed flying over subunit 4-1a. The American peregrine falcon is not expected to nest on-site.

Swainson's hawk (*Buteo swainsoni*). The Swainson's hawk is a state listed threatened species and an MSCP covered species. A Swainson's hawk was observed foraging in subunit 4-1e. This species is not expected to breed in PMA 4, as the local breeding population has been extirpated (Unitt 1984).

Cooper's hawk (*Accipiter cooperii*). The Cooper's hawk is a CDFG species of special concern and an MSCP covered species. Cooper's hawks were observed in subunits 4-1a, 4-2a, and 4-2b. Suitable nesting habitat occurs in the mature riparian vegetation along the main drainage in PMA 4.

Northern harrier (*Circus cyaneus hudsonius*). This species is a CDFG species of special concern and an MSCP covered species. Northern harriers were observed in subunit 4-1g. Suitable nesting habitat occurs along the major drainage in PMA 4.

Coastal cactus wren (*Campylorhynchus brunneicapillus couesi*). The coastal cactus wren is a CDFG species of special concern and an MSCP covered species. Coastal cactus wrens were observed in subunits 4-1a, 4-2a and 4-2b. This species is expected to occur in other subunits of PMA 4.

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*). The southern California rufous-crowned sparrow is a CDFG species of special concern and an MSCP covered species. Southern California rufous-crowned sparrows were observed in PMA subunits 4-1h, 4-2b, and 4-2c, and are expected to occur in the coastal sage scrub throughout PMA 4.

Other Sensitive Species

Yellow warbler (*Dendroica petechia*). The yellow warbler is a CDFG species of special concern. The yellow warbler was observed in PMA 4, subunit 4-2b. This species is expected to breed in the southern willow scrub habitat.

Yellow-breasted chat (*Icteria virens*). The yellow-breasted chat is a CDFG species of special concern. This species was observed in subunit 4-2b during the focused riparian bird surveys conducted in 2003. Suitable breeding habitat is present for the yellow-breasted chat in PMA 4.

Double-crested cormorant (*Phalacrocorax auritus albociliatus*). The double-crested cormorant is a CDFG species of special concern. This species was observed flying over subunit 4-1b. This species is not expected to use any of the resources within any of the PMAs, as there is no appropriate habitat available.

White-tailed kite (*Elanus leucurus*). The white-tailed kite is a state of California fully protected species. This species was observed in subunits 4-1g and 4-1h. Suitable nesting habitat occurs on-site.

3.1.2.3 Sensitive Mammals

One sensitive mammal species, southern mule deer (*Odocoileus hemionus fuliginata*), was detected in PMA 4. There is a potential for several other sensitive species to occur, including San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), southern grasshopper mouse (*Onychomys torridus ramona*), and San Diego desert woodrat (*Neotoma lepida intermedia*) as discussed in the Baseline Biological Resources Report (RECON 2004).

MSCP Covered Species

Southern mule deer (*Odocoileus hemionus fuliginata*). The southern mule deer is an MSCP covered species. Southern mule deer scat was observed in subunit 4-1g and tracks were observed in subunit 4-2b. This species is likely to occur in most subunits of PMA 4, especially within the subunits where the open space area is large enough or provides movement from one open area to another.

3.2 Botanical Resources

There are 10 vegetation communities and land cover types present in PMA 4: Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, maritime succulent scrub, disturbed maritime succulent scrub, mule fat scrub, southern willow scrub, non-native grassland, freshwater marsh, tamarisk scrub, and disturbed. The acreages of these vegetation communities and land cover types on PMA 4 are shown in Table 1.

General plant species information is provided in the Baseline Biological Resources Report: plant species historically observed in PMA 4 are listed in Attachment 3 and Attachment 16 provides a list of plants identified during the baseline biological surveys in each subunit of PMA 4. A total of 203 plant species were identified in PMA 4. Of this total, 140 (69.0 percent) are species native to San Diego County and 63 (31.0 percent) are non-native species.

TABLE 1
VEGETATION COMMUNITIES AND
LAND COVER TYPES ON PMA 4

Vegetation Type	Acres
Maritime succulent scrub	92.8
Disturbed maritime succulent scrub	1.3
Diegan coastal sage scrub	120.8
Disturbed Diegan coastal sage scrub	13.7
Southern willow scrub	14.2
Mule fat scrub	1.1
Fresh water marsh	1.0
Native grassland	6.7
Disturbed native grassland	2.8
Non-native grassland	37.6
Tamarisk scrub	1.7
Eucalyptus woodland	0.2
Disturbed	16.1
Total for PMA 4	310.0

3.2.1 Maritime Succulent Scrub (92.8 acres) and Disturbed Maritime Succulent Scrub (1.3 acres) (Holland Code 32400)

Maritime succulent scrub is present in subunits 4-1a, 4-1dS, 4-1e, 4-1f, 4-2a, 4-2b, 4-3a, and 4-3b. Disturbed maritime succulent scrub is present in subunits 4-1cE and 4-1cW. In PMA 4, this community is dominated by San Diego barrel cactus, Mohave yucca (*Yucca schidigera*), snake cholla, and jojoba (*Simmondsia chinensis*). This vegetation community occurs mainly on south-facing slopes and supports sensitive wildlife species such as coastal cactus wren.

3.2.2 Diegan Coastal Sage Scrub (120.8 acres) and Disturbed Diegan Coastal Sage Scrub (13.7 acres) (Holland Code 32500)

Diegan coastal sage scrub is present in subunits 4-1a, 4-1b, 4-1cE, 4-1cW, 4-1dN, 4-1e, 4-1f, 4-1g, 4-1h, 4-2a, 4-2b, 4-3c, and 4-3d. Diegan coastal sage scrub is considered to be high-quality habitat for a number of species that reside in the area. This community is dominated by species such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), broom baccharis (*Baccharis sarothroides*), common encelia (*Encelia californica*), coast goldenbush (*Isocoma menziesii*), lemonadeberry (*Rhus integrifolia*), San Diego sand aster, jojoba, and San Diego County viguiera.

Disturbed Diegan coastal sage scrub is present in subunits 4-1a, 4-1cE, 4-1dN, and 4-2c. Disturbed Diegan coastal sage scrub is present in areas that include a greater percentage of weedy, non-native species. These include tocolote (*Centaurea melitensis*), Russian thistle (*Salsola tragus*), tree tobacco (*Nicotiana glauca*), horehound

(*Marrubium vulgare*), black mustard (*Brassica nigra*), wild oats (*Avena* sp.), and bromes (*Bromus* spp.).

3.2.3 Southern Willow Scrub (14.2 acres) (Holland Code 63320)

Southern willow scrub is present in subunits 4-2a, 4-2b, and 4-2c. In PMA 4, southern willow scrub is primarily dominated by western sycamore (*Platanus racemosa*), western cottonwood (*Populus fremontii*), Gooding's black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), and red willow (*Salix laevigata*).

3.2.4 Mule Fat Scrub (1.1 acres) (Holland Code 63310)

Mule fat (*Baccharis salicifolia*) dominates small patches of this community in subunits 4-1e and 4-2d. Due to the proximity to tamarisk scrub, this community in subunit 4-2d is in danger of being invaded by the highly invasive tamarisk (*Tamarix* sp.).

3.2.5 Freshwater Marsh (1.0 acre) (Holland Code 52400)

Freshwater marsh is dominated by salt marsh fleabane (*Pluchea odorata*), broad-leaved cattail (*Typha latifolia*), and salt heliotrope (*Heliotropium curassavicum*). A very narrow band of this community is present in the drainage that bisects the coastal sage scrub and maritime succulent scrub vegetation on the eastern half of subunit 4-2c.

3.2.6 Native Grassland (6.7 acres) and Disturbed Native Grassland (2.8 acres) (Holland Code 42100)

Native grassland patches occur within the Diegan coastal sage scrub vegetation in subunits 4-1a and 4-2a and are dominated by species including needlegrass (*Nassella* sp.), common goldenstar (*Bloomeria crocea*), and blue-eyed grass (*Sisyrinchium bellum*). Non-native grass species such as wild oats and bromes have invaded the native grassland areas to some extent.

The area mapped as disturbed native grassland is in subunit 4-2c, adjacent to a patch of disturbed land. The disturbed native grassland is dominated by the same native grass species as above, but with a greater percentage of bare ground and non-native grassland species.

3.2.7 Non-native Grassland (37.6 acres) (Holland Code 42200)

Non-native grassland is present in subunits 4-1a, 4-1dS, 4-1g, 4-2a, and 4-2c. This vegetation community is dominated by non-native species including bromes and wild oats.

3.2.8 Tamarisk Scrub (1.7 acres) (Holland Code 63810)

Tamarisk scrub is present in subunits 4-1dS and 4-2d. This community is dominated by the non-native and highly invasive tamarisk. This weedy vegetation community is usually a monoculture of tamarisk that has supplanted native wetland plant species. Tamarisk typically invades following disturbance in sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation creates high salinity in the stream (Holland 1986).

3.2.9 Eucalyptus Woodland (0.2 acre) (Holland Code 11100)

Eucalyptus woodland occurs in subunit 4-2a between residential housing, coastal sage scrub, and non-native grassland. Eucalyptus trees (*Eucalyptus* spp.) provide bird species, including raptors, with foraging and nesting opportunities.

3.2.10 Disturbed (16.1 acres) (Holland Code 12000)

Disturbed habitat is present in subunits 4-1cE, 4-1dN, 4-1dS, 4-2a, 4-2b, 4-2d, 4-3d. Disturbed habitat in PMA 4 includes trails and open areas that have been cleared of vegetation. These disturbed areas have a mixture of native and non-native vegetation including California buckwheat, broom baccharis, wild oat, tocolote, and filaree (*Erodium* sp.).

3.2.11 Invasive Exotic Plant Species

The major invasive exotic threats to native plant species in the Central City Preserve Area are non-native grasses, including pampas grass (*Cortaderia jubata*), bromes, wild oats, ryegrass (*Lolium* spp.), and herbaceous species, such as sweet fennel (*Foeniculum vulgare*) and black mustard. These species quickly establish populations in disturbed areas and the interface of disturbed areas and native habitat. Non-native grasses, sweet fennel, and black mustard invade native habitats and replace the native herbaceous understory species. At the end of the growing season of these non-natives, they dry out and provide fuel for wildfires.

Pampas grass is a threat to native plants throughout PMA 4. Wind disperses this species' seed and it will rapidly outcompete native plants for resources. The majority of the subunits have been invaded by pampas grass to some degree. Pampas grass has been used in the plant palette of adjacent non-Preserve open space districts that may be managed by the City and homeowner associations. These areas provide source populations that are invading the Preserve in PMA 4.

Tocolote, a ubiquitous weed that occurs throughout PMA 4, is a serious threat to native species, particularly narrow endemic species that inhabit open grassland such as Otay tarplant, variegated dudleya, and San Diego thornmint.

Other invasive plant species pose a threat to native plant species, habitat structure, and wildlife species populations. These species include sweet fennel (*Foeniculum vulgare*), ice plant (various species), tamarisk, hollow-stem asphodel (*Asphodelus fistulosus*), and filaree.

Figures 11a-11c, 11e-11f, and 11h-11l in the Baseline Biological Resources Report (RECON 2004) illustrate the locations of invasive exotic species identified in PMA 4. Attachment 16 of the Baseline Biological Resources Report lists all the plant species observed, both native and non-native within each subunit of PMA 4. This plant list is more comprehensive than the map depiction of invasive plant locations. Since the focus of this biological study was to identify locations of narrow endemic plant species, efforts were directed towards that goal, and not every population of invasive species were mapped; however, non-native species detected were recorded in Attachment 16 of the Baseline Biological Resources Report (RECON 2004).

3.3 Zoological Resources

General zoological resource information is presented in the Baseline Biological Resources Report (RECON 2004). Attachment 17 of the Baseline Biological Resources Report provides a list of species present within each subunit of PMA 4. Wildlife observed includes 16 species of butterflies, 7 species of reptiles, 66 species of birds, and 8 species of mammals.

3.3.1 Reptiles

The diversity and abundance of reptile species vary with habitat type. Many reptiles are restricted to certain vegetation communities and soil types, although some species may forage in adjacent communities. Other species are ubiquitous and use a variety of vegetation types for foraging and shelter.

Four common reptile species were detected in PMA 4: western fence lizard (*Sceloporus occidentalis*), common side-blotched lizard (*Uta stansburiana*), California striped racer (*Masticophis lateralis lateralis*), and the San Diego gophersnake (*Pituophis catenifer annectens*). Three additional sensitive species were observed. These are discussed in the Section 3.1 of this document.

3.3.2 Birds

The ability of native habitats to support a diversity of bird species is dependent on quality, habitat size and diversity, and the degree of fragmentation. Diegan coastal sage scrub provides good foraging, nesting, and cover for a variety of birds, including songbirds. Grassland habitats support a number of grassland birds and provides foraging habitat for raptors as well. Riparian habitats typically have a high number of bird

species because they provide protection and food even throughout the dry summer months.

Bird species commonly observed in the Diegan coastal sage scrub and maritime succulent scrub include Anna's hummingbird (*Calypte anna*), bushtit (*Psaltriparus minimus minimus*), wrentit (*Chamaea fasciata henshawi*), western scrub-jay (*Aphelocoma californica*), white-crowned sparrow (*Zonotrichia leucophrys*), coastal California gnatcatcher, blue-gray gnatcatcher (*Polioptila caerulea*), California towhee (*Pipilo crissalis*), spotted towhee (*P. maculatus*), Bewick's wren (*Thyromanes bewickii*), and house finch (*Carpodacus mexicanus frontalis*).

Riparian vegetation communities provide habitat for many resident and migratory bird species. Species observed within the southern willow scrub include common yellowthroat (*Geothlypis trichas*), lesser goldfinch (*Carduelis psaltria*), and song sparrow (*Melospiza melodia*).

Birds and raptors observed in non-native grassland and disturbed environments include mourning dove (*Zenaida macroura marginella*), northern mockingbird (*Mimus polyglottos*), house finch, American crow (*Corvus brachyrhynchos hesperis*), common raven (*Corvus corax clarionensis*), western meadowlark (*Sturnella neglecta*), red-tailed hawk (*Buteo jamaicensis*), and European starling (*Sturnus vulgaris*).

3.3.3 Mammals

Naturally vegetated areas provide cover and foraging opportunities for a variety of mammal species. Many mammal species are nocturnal and are detected during daytime surveys by sign such as scat, tracks, and burrows.

Mammal species observed and detected within PMA 4 include Virginia opossum (*Didelphis virginiana*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), southern pocket gopher (*Thomomys umbrinus*), woodrat (*Neotoma* spp.), coyote (*Canis latrans*), common raccoon (*Procyon lotor*), and southern mule deer.

4.0 CENTRAL CITY PMA MANAGEMENT

The Central City PMA Preserve lands are already dedicated to the City and are surrounded by existing urban development. The City Planning Component Framework Management Plan (Section 7.5 of the MSCP Subarea Plan) serves at the Framework Management Plan for the Central City PMA. This ASMD for PMA 4 incorporates the requirements of the City Planning Component Framework Plan, as well as the requirements incorporated into Table 3-5 of the MSCP Subregional Plan (Appendix A; City of Chula Vista 2003).

4.1 Current Management in the Central City PMA

The City Public Works Operations Department is currently managing lands within the Central City PMA (City of Chula Vista 2003). Management tasks currently funded and undertaken include Priority 1 general maintenance tasks, including:

- Removal of trash, debris, and other solid waste
- Maintenance of trails and fences
- Implementation of security programs to enforce “no trespassing” rules, curtail illegal activities and activities that may degrade resources, such as grazing, shooting, illegal planting, dumping, and off-road-vehicle traffic
- Limited weeding along the Preserve/urban boundary interfaces

Subsequent to the adoption of the Subarea Plan and issuance of Take Authorization to the City from the Wildlife Agencies, the Habitat Manager will be assigned to coordinate with the City Public Works Operations Department and to expand Preserve management activities within the Central City PMA. As discussed in Section 8.3.1.1 of the Subarea Plan (City of Chula Vista 2003) a new Central City Preserve Biological Enhancement Program (BEP) will be established, providing funds for enhanced management within the Central City PMA. Working with a qualified biologist selected by the City, the Habitat Manager will determine the priorities for enhanced management and long-term monitoring in the Central City PMA based upon this ASMD and will assume responsibility for allocation of the Biological Enhancement Program funds. These funding mechanisms are described in Section 12.1 of this document.

4.2 City Planning Component Framework Management Plan

Framework Management Plans, as described in the MSCP Subarea Plan (City of Chula Vista 2003), establish two levels of management activities for the Preserve (Priority 1 and Priority 2). The following summarizes the principles used to develop the recommendations for Preserve management priority levels. Only the portions of the Priorities discussion pertinent to the Central City Preserve and PMA 4 are included here. For a full discussion of Priority actions, refer to Section 7.3 of the Subarea Plan.

Priority 1: These measures are for managing and maintaining biological resources within the Preserve, including management tasks that are necessary to ensure that the Covered Species are adequately protected. These management directives will be funded through financing mechanisms created by the City or through project financing pursuant to Section 8.0 (of the Subarea Plan) and carried out by the City or appropriate managing entity. These management directives will be included in each ASMD.

Priority 2: These measures are not required for Covered Species status, rather they are recommendations for enhancing the quality and function of the Preserve, including

public education and provision of barriers (vegetation, rocks/boulders, and/or fencing) to direct public access. Where provisions of barriers are required to meet specific species management goals, as detailed in Table 3-5 of the MSCP Subregional Plan, installation of such barriers will become a condition of the ASMDs and will be Priority 1. In instances where new populations of covered species/narrow endemics have been identified within a PMA, barriers may be needed to protect these previously unknown populations. In those cases, the installation of barriers may be determined to be a Priority 1 action. Although Priority 2 directives will be incorporated into these ASMDs to the extent feasible, it is recognized that many of these directives cannot be implemented immediately, but will instead occur over the life of the Subarea Plan as funding sources become available.

The following sections discuss the management issues identified in the Subarea Plan for the Central City PMA. Management issues specific to PMA 4 are also discussed as appropriate including management priorities for narrow endemic plants, covered plant and animal species, focusing on the coastal California gnatcatcher and other sensitive species identified within PMA 4.

5.0 PMA 4 MANAGEMENT DIRECTIVES

5.1 Priority 1 Management Directives

Priority 1 long-term Management Directives apply to all PMA 4 subunits and include the following maintenance and management activities that are explained in additional detail in Sections 7.4.4 and 7.5 of the MSCP Subarea Plan and Attachment C:

- Quarterly Preserve Tour: Tour all subunits to identify areas requiring major refuse removal, security program implementation, maintenance of trails and fences, and invasive exotic (weed) species removal.

- Quarterly Litter Removal and Access Control Maintenance: Remove minor litter and/or dumping. Arrange for the removal of large litter and/or dumping (if necessary). Repair and maintain trails, fencing, and signage as needed. Implement any necessary security programs to enforce “no trespassing” rules, curtail illegal activities and activities that may degrade resources, such as illegal planting within the Preserve, dumping, vagrant encampments, and off-road-vehicle traffic.

- Limited weeding along Preserve/urban interfaces: Arrange for weed removal in areas identified as invasive weed concerns to the extent the budget will allow. Notify homeowner’s association of any invasive species planting violations or other issues.

- Annual Report: Prepare an annual report that includes activities and accounting of budget expenditures, qualitative reporting of Preserve status and summary of available quantitative biological information, incidental sightings of sensitive plant

and animal species, and the adaptive management work program for the coming year.

5.2 Priority 2 Management Directives

The following long-term Priority 2 tasks, listed in order of importance, include the following survey and restoration activities. These tasks will be conducted to the extent that funding is available and as otherwise directed in the annual adaptive management work program created by the Habitat Manager. A summary of the Priority 2 tasks recommended in each subunit is provided in Table 2. However, due to changing conditions over time, the necessity of performing these tasks should be evaluated and adjusted at the discretion of the Habitat Manager.

- Brush management: Every three years evaluate the need for brush management measures as detailed in Section 8.0 of this document and schedule as needed.

- Narrow endemic quantitative surveys: As funding allows, approximately once every five years conduct global positioning system (GPS) census surveys of reference locations of narrow endemics. The timing of surveys should take into account the blooming period of the species.

- MSCP covered wildlife species quantitative surveys: Approximately once every five years conduct surveys for MSCP covered wildlife species, particularly the coastal California gnatcatcher. Bird surveys should be conducted between January through mid-March to coincide with pre-nesting behavior. Bird territoriality and mating behavior at the start of the mating season should provide for more thorough survey results.

- Photopoint surveys/spring qualitative surveys: As funding allows, establish photopoints in the following areas of each subunit: populations of narrow endemic plants, areas with problem weed invasions, and native vegetation areas adjacent to weed-infested areas. Conduct baseline photos for all points.

  Once every five years, photodocument known locations of narrow endemic species within the Preserve. The timing of this management task should correspond with the blooming period of the target species.

  Once every five years, photodocument areas with problem weed invasions and the adjacent native habitat areas to track the changes in the level of weed invasion, and to ensure that weed populations are not expanding into native habitat.

- Targeted weed eradication/restoration: Manage for weed eradication as budget and adaptive management priorities set by the Habitat Manager allow.

TABLE 2
PRIORITY 2 MANAGEMENT DIRECTIVES

Priority 2 Management Directives to be Implemented as Funding Becomes Available (listed in order of importance)	Subunit																	
	4-1a	4-1b	4-1cE	4-1cW	4-1dN	4-1dS	4-1e	4-1f	4-1g	4-1h	4-2a	4-2b	4-2c	4-2d	4-3a	4-3b	4-3c	4-3d
1 - Brush Management	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2 - Narrow endemic quantitative surveys	●		●	●							●	●						●
3 - MSCP covered wildlife species quantitative surveys	●		●			●	●	●	●	●	●	●	●			●		
4 - Photopoint surveys/Spring qualitative surveys	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
5 - Targeted weed eradication/restoration	●	●	●	●					●		●	●	●					
6 - Drainage, culvert, and desiltation basin maintenance											●	●	●					
7 - Flood control measures											●	●	●					
8 - Evaluate status and maintenance needs of existing trails	●		●	●			●	●	●	●		●	●					
9 - Habitat connectivity enhancement			●		●						●	●		●				●
10 - Public outreach/education	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

NOTE: The intent of this table is to graphically depict Priority 2 tasks to be completed as funding is available and in order of importance.

The following additional Priority 2 management directives should be pursued as funding becomes available. These management directives are further described in Attachment C of this document and Sections 7.4.5 and 7.5 of the MSCP.

- Drainage, culvert, and desiltation basin maintenance: performing standard maintenance of culverts, and cleaning desiltation basins.
- Flood control measures: Perform standard maintenance, such as clearing and dredging existing flood channels.
- Status and maintenance needs of existing trails: Assess the conditions of existing trails and determine which require maintenance.
- Habitat connectivity enhancement: improve habitat quality on the edges of adjacent subunits.
- Public outreach/education: educating the public about the biological resources and benefits of the open space Preserve.

6.0 SUBUNIT-SPECIFIC DIRECTIVES

6.1 Subunit Priority

In order to provide a framework for making decisions about the priorities for conducting management tasks, in consultation with the Wildlife Agencies, the subunits of PMA 4 were ranked according to the types and population numbers of sensitive species and habitats. The high priority subunits are recommended to be given primary consideration for weeding, trail management, and other sensitive species management issues. The high priority subunits are considered the most biologically valuable and the most worthy of funding expenditure—money spent on these subunits would provide the greatest benefit to covered species.

In order to rank the subunits that require priority attention for management tasks, the following features were considered: sensitive vegetation community acreages, the presence of narrow endemic and sensitive plant species, and the presence of MSCP covered animal species. These features were listed by subunit, with amounts of vegetation acreage or number of individuals recorded where applicable, and these features were given a high, medium, or low rank. High ranking biological features included large acreages of maritime succulent scrub habitat or regionally significant populations of narrow endemic plants and animals, such as Otay tarplant, San Diego thornmint, coastal cactus wren, and coastal California gnatcatcher. Moderate ranking was given to smaller acreages of maritime succulent scrub or large patches of coastal sage scrub, and to smaller populations of narrow endemics and covered animal species. The lowest ranking was given to small areas of maritime succulent and coastal sage

scrub and small populations of narrow endemic plants and covered animals with less regional sensitivity.

High ranking features scored eight points, medium ranking features scored three points, and low ranking features scored one point. The points were totaled, and the subunits ranked based on total number of points. In cases where two or more subunits had identical totals, those subunits were ordered according to total acreage, with the larger acreage given a higher priority ranking. The spreadsheet used to determine the total points scored is provided in Attachment D. The priority ranking results are presented in Table 3 with a brief description of the important features of the subunit.

6.2 Subunit-Specific Management Directives

This section focuses on the individual subunits and provides a summary of the MSCP covered species and vegetation communities present. Management issues and tasks unique to each subunit are discussed as well.

6.2.1 Subunit 4-1a

Figure 11a in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.1.1 Summary Description

Table 4 summarizes the area of each habitat type in subunit 4-1a. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)
- San Diego barrel cactus (MSCP covered species)

Animals
- Belding's orange-throated whiptail (MSCP covered species)
- Coastal California gnatcatcher (MSCP covered species; three locations)
- Cooper's hawk (MSCP covered species)
- Coastal cactus wren (MSCP covered species; nesting)
- American peregrine falcon (MSCP covered species)

TABLE 3
SUBUNITS RANKED BY PRIORITY

Priority	Subunit	Ranking Features
1	4-2b	High: Maritime succulent scrub, Otay tarplant, coastal cactus wren, least Bell's vireo
2	4-2a	High: Southern willow scrub, Otay tarplant, coastal cactus wren Moderate: Native grassland, variegated Dudleya, California gnatcatcher
3	4-1a	High: Otay tarplant, coastal cactus wren Moderate: Palmer's grapplinghook, California gnatcatcher
4	4-1cW	High: San Diego thorn-mint, Otay tarplant Moderate: Snake cholla
5	4-2c	High: Southern willow scrub Moderate: disturbed native grassland, mule fat scrub, California gnatcatcher
6	4-1e	Moderate: Mule fat scrub, California gnatcatcher
7	4-1h	Moderate: San Diego barrel cactus, California gnatcatcher
8	4-1dS	Moderate: California gnatcatcher
9	4-1f	Moderate: California gnatcatcher
10	4-1g	Low: Orcutt's bird-beak, San Diego barrel cactus, northern harrier, southern mule deer
11	4-1cE	Moderate: California gnatcatcher
12	4-2d	Moderate: Mule fat scrub
13	4-3b	Moderate: California gnatcatcher
14	4-1b	Low: Palmer's grapplinhook
15	4-3c	No points
16	4-3a	No points
17	4-3d	No points
18	4-1dN	No points

TABLE 4
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1a

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	8.4
Disturbed coastal sage scrub	4.6
Native grassland	1.9
Non-native grassland	27.8
TOTAL	42.7

Subunit 4-1a is the third largest PMA 4 subunit. Within PMA 4, this subunit ranks third in priority for implementing management actions. The eastern portion of subunit 4-1a is dominated by non-native grassland with small areas of disturbed coastal sage scrub. This habitat supports southern California rufous-crowned sparrow, coastal cactus wren, and coastal California gnatcatcher. Significant populations of invasive species, tamarisk, sweet fennel and marsh-rosemary, are present in this area.

Maritime succulent scrub dominates the western portion of this subunit. A small patch of native grassland occurs within the maritime succulent scrub area. This area supports Otay tarplant, San Diego barrel cactus, coastal cactus wren, and coastal California gnatcatcher.

6.2.1.2 Management Issues

Management issues for biological resources in subunit 4-1a include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species. In addition, shrub thinning may be needed over the long term to sustain habitat for San Diego barrel cactus, coastal California gnatcatcher, coastal cactus wren, and Belding's orange-throated whiptail.

Periodic thatch removal, as funding permits, in the Otay tarplant habitat area is also recommended to ensure the long-term persistence of this population of approximately 30,000 plants. To the extent possible, and as funding allows, thatch removal should extend from the center of Otay tarplant populations to the border of grasslands and open areas and the surrounding shrubs. The shrubs can act as a buffer zone to slow additional or repeated invasion of non-native species.

Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Coastal cactus wren habitat is at risk of conversion over the long term due to increasing dominance of shrubs, primarily lemonadeberry, within the coast cholla (*Cylindropuntia*

prolifera) patches. Lemonadeberry is capable of outcompeting cholla and over time will likely dominate areas formerly dominated by coast cholla. In addition to competition affects between lemonadeberry shrubs and cholla, if a wildfire does occur in the Preserve, the presence of large shrubs in the cholla patches would likely make the fire burn hotter than would otherwise be the case. If the fire is of sufficient heat intensity, chollas may be killed or severely damaged. In that case, recovery of the cholla patches may not be possible or will take many years to recover without management intervention. After a wildlfire, the populations of coastal cactus wrens may decline due to lack of suitable nesting and foraging habitat. Propagation of coast cholla to enhance cholla patches may be needed to ensure long-term persistence of cactus wren populations when cholla patches die from drought or disease.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Management for Belding's orange-throated whiptail in the PMA will consist of maintaining existing open habitat and encouraging habitat inhabited by prey species. Belding's orange-throated whiptail's preferred prey species is termites, and areas where this prey would be present, such as in woodpiles and sticks and leaf litter should be left undisturbed or disturbance should be minimized during other management actions such as weed-control efforts.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Periodically dethatch dry annual weeds from Otay tarplant occupied habitat, approximately once every five years or as determined by the Habitat Manager as funding allows.

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to San Diego barrel cactus populations to ensure that the cactus are not outcompeted by native shrubs over the long term.

- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

- Every five years, the Habitat Manager should assess the need for thinning of lemonadeberry shrubs in and immediately adjacent to (within approximately 25 feet) of coast cholla patches that are occupied by or could support coastal cactus wrens.

This management action will give better assurance that successional changes or wildfires do not eliminate habitat for this covered bird species.

- Control weeds, as funding allows, primarily mustard and annual grasses, in Diegan coastal sage and maritime succulent scrub habitats to maintain habitat quality for coastal cactus wrens. Weeding should be focused in and immediately adjacent to patches of coast cholla.

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage and maritime succulent scrub habitats to maintain habitat quality for coastal California gnatcatcher and other covered species. These management efforts will also benefit Belding's orange-throated whiptail by maintaining open habitat for this species.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this covered bird species.

- Woodpiles, sticks, and leaf litter should be left undisturbed or disturbance should be minimized during other management actions, such as weed-control efforts, to maintain habitat quality for Belding's orange-throated whiptail.

6.2.2 Subunit 4-1b

Figure 11b in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.2.1 Summary Description

Table 5 summarizes the area of each habitat type in subunit 4-1b. No covered species are known to occur in this subunit.

TABLE 5
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1b

Vegetation Community or Land Cover Type	Acreage
Coastal sage scrub	5.0
TOTAL	5.0

Subunit 4-1b is the twelfth largest PMA 4 subunit. Within PMA 4, this subunit ranks fourteenth in priority for implementing management actions. This subunit is comprised entirely of coastal sage scrub vegetation that does not currently support any covered

species. A significant population of marsh-rosemary, an invasive exotic species, is present in subunit 4-1b.

6.2.2.2 Management Issues

Management issues for biological resources in subunit 4-1b include weeding to reduce edge effects.

Priority Management task recommendations to be performed as funding becomes available:

- Control weeds as funding allows, primarily marsh-rosemary, mustard, and annual grasses, to maintain habitat quality over the long term.

6.2.3 Subunit 4-1cE

Figure 11c in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.3.1 Summary Description

Table 6 summarizes the area of each habitat type in subunit 4-1cE. The following covered species are known to occur in this subunit:

Plants
- Snake cholla (MSCP covered species; narrow endemic)
- Barrel cactus (MSCP covered species)

Animals
- Coastal California gnatcatcher (MSCP covered species; two locations)

TABLE 6
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1cE

Vegetation Community or Land Cover Type	Acreage
Disturbed maritime succulent scrub	0.3
Coastal sage scrub	7.3
Disturbed coastal sage scrub	0.6
Disturbed	0.3
TOTAL	8.5

Subunit 4-1cE is the ninth largest PMA 4 subunit. Within PMA 4, this subunit ranks eleventh in priority for implementing management actions. Subunit 4-1cE is dominated by native scrub communities that support the coastal California gnatcatcher. A small patch of marsh-rosemary, an invasive exotic species, is present in this subunit along the western boundary.

6.2.3.2 Management Issues

Management issues for biological resources in subunit 4-1cE include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Over the long-term, snake cholla can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of snake cholla populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to snake cholla populations to ensure that the cactus are not outcompeted by native shrubs over the long-term.

- Annually monitor trail use adjacent to snake cholla populations to determine if recreational activities are impacting this species. Trails adjacent to the snake cholla and San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain habitat quality for coastal California gnatcatcher.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this covered bird species.

6.2.4 Subunit 4-1cW

Figure 11b in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.4.1 Summary Description

Table 7 summarizes the area of each habitat type in subunit 4-1cW. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)
- San Diego thornmint (MSCP covered species; narrow endemic)
- Snake cholla (MSCP covered species; narrow endemic)

TABLE 7
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1cW

Vegetation Community or Land Cover Type	Acreage
Disturbed maritime succulent scrub	1.0
Coastal sage scrub	3.2
TOTAL	4.2

Subunit 4-1cW s the 16th largest PMA 4 subunit. Within PMA 4, this subunit ranks fourth in priority for implementing management actions. Subunit 4-1cW is vegetated with native scrub communities and supports three narrow endemic species: Otay tarplant, San Diego thornmint, and snake cholla. This subunit does not currently support any covered animal species.

6.2.4.2 Management Issues

Management issues for biological resources in subunit 4-1cW include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Periodic thatch removal in the Otay tarplant and San Diego thornmint habitat area is recommended to ensure the long-term persistence of these populations. To the extent possible, and as funding allows, thatch removal should extend from the center of Otay tarplant populations to the border of grasslands and open areas and the surrounding shrubs. The shrubs can act as a buffer zone to slow additional or repeated invasion of non-native species.

Over the long-term, snake cholla can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of snake cholla populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Periodically dethatch dry annual weeds from Otay tarplant and San Diego thornmint occupied habitat, approximately once every five years or as determined by the Habitat Manager and as funding allows.

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to snake cholla populations to ensure that the cactus are not outcompeted by native shrubs over the long term.

- Annually monitor trail use adjacent to snake cholla populations to determine if recreational activities are impacting this species. Trails adjacent to the San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

6.2.5 Subunit 4-1dN

Figure 11d in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.5.1 Summary Description

Table 8 summarizes the area of each habitat type in subunit 4-1dN. No covered species are known to occur in this subunit.

TABLE 8
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1dN

Vegetation Community or Land Cover Type	Acreage
Coastal sage scrub	0.5
Disturbed coastal sage scrub	0.4
Disturbed	0.5
TOTAL	1.4

Subunit 4-1dN is the 18th largest PMA 4 subunit. Within PMA 4, this subunit ranks 18th in priority for implementing management actions. Subunit 4-1dN is vegetated with a patch of coastal sage scrub that is contiguous to a larger area of scrub. No covered species are currently known from this subunit.

6.2.5.2 Management Issues

Management issues for biological resources in subunit 4-1dN include weeding to reduce edge effects.

Priority Management task recommendations to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, to maintain habitat quality over the long term.

6.2.6 Subunit 4-1dS

Figure 11d in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.6.1 Summary Description

Table 9 summarizes the area of each habitat type in subunit 4-1dS. The following covered species is known to occur in this subunit.

Plants
- Barrel cactus (MSCP covered species)

Animals
- Coastal California gnatcatcher (MSCP covered species; one location)

TABLE 9
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1dS

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	12.1
Non-native grassland	0.3
Tamarisk scrub	0.9
Disturbed	2.0
TOTAL	15.3

Subunit 4-1dS is the fifth largest PMA 4 subunit. This subunit ranks eighth in priority for implementing management actions. Maritime succulent scrub is the dominant vegetation community in subunit 4-1dS. This habitat supports a coastal California gnatcatcher location. Tamarisk scrub, a community dominated by an invasive exotic species, is present in this subunit.

6.2.6.2 Management Issues

Management issues for biological resources in subunit 4-1dS include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to

ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitat to maintain habitat quality for coastal California gnatcatcher.
- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this covered bird species.
- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the snake cholla are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

6.2.7 Subunit 4-1e

Figures 11d and 11e in the Baseline Biological Resources Report show the locations of biological resources in this subunit (RECON 2004).

6.2.7.1 Summary Description

Table 10 summarizes the area of each habitat type in subunit 4-1e. The following covered species are known to occur in this subunit:

Plants
- San Diego barrel cactus (MSCP covered species)

Animals
- Coastal California gnatcatcher (MSCP covered species; nesting)
- Swainson's hawk (MSCP covered species)

TABLE 10
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1e

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	1.9
Coastal sage scrub	2.4
Mule fat scrub	0.2
TOTAL	4.5

Subunit 4-1e is the fourteenth largest PMA 4 subunit. This subunit ranks sixth in priority for implementing management actions. Subunit 4-1e is dominated by native scrub habitats that support San Diego barrel cactus, coastal California gnatcatcher, and foraging habitat for Swainson's hawks. No covered species are known to occur in the small strip of mule fat scrub in this subunit.

6.2.7.2 Management Issues

Management issues for biological resources in subunit 4-1e include weeding to reduce edge effects for covered species and monitoring of trail use to determine if recreational activities are impacting covered species.

Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat. These management actions will also benefit the quality of foraging habitat for the Swainson's hawk.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to San Diego barrel cactus populations to ensure that the cactus are not outcompeted by native shrubs over the long term.

- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the snake cholla and San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain habitat quality for coastal California gnatcatcher and other covered bird species.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this and other covered bird species.

6.2.8 Subunit 4-1f

Figure 11e in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.8.1 Summary Description

Table 11 summarizes the area of each habitat type in subunit 4-1f. The following covered species are known to occur in this subunit:

Plants
- San Diego barrel cactus (MSCP covered species)

Animals
- Coastal California gnatcatcher (MSCP covered species; two locations)

TABLE 11
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1f

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	3.6
Coastal sage scrub	9.0
TOTAL	12.6

Subunit 4-1f is the sixth largest PMA 4 subunit. This subunit ranks ninth in priority for implementing management actions. The native scrub vegetation in subunit 4-1f supports San Diego barrel cactus and two coastal California gnatcatcher locations.

6.2.8.2 Management Issues

Management issues for biological resources in subunit 4-1f include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to San Diego barrel cactus populations to ensure that the cactus are not outcompeted by native shrubs over the long term.

- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain habitat quality for coastal California gnatcatcher.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this covered bird species.

6.2.9 Subunit 4-1g

Figures 11e and 11f in the Baseline Biological Resources Report show the locations of biological resources in this subunit (RECON 2004).

6.2.9.1 Summary Description

Table 12 summarizes the area of each habitat type in subunit 4-1g. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)
- Orcutt's bird's-beak (MSCP covered species)
- San Diego barrel cactus (MSCP covered species)

Animals
- Northern harrier (MSCP covered species)

TABLE 12
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1g

Vegetation Community or Land Cover Type	Acreage
Coastal sage scrub	3.1
Non-native grassland	6.8
TOTAL	9.9

Subunit 4-1g is the seventh largest PMA 4 subunit. This subunit ranks tenth in priority for implementing management actions. Non-native grassland dominates subunit 4-1g and supports Orcutt's bird's-beak. The coastal sage scrub supports San Diego barrel cactus. Both communities present in this subunit provide foraging and nesting habitat for the northern harrier. A large population of pampas grass is present in this subunit as well.

6.2.9.2 Management Issues

Management issues for biological resources in subunit 4-1g include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Periodic thatch removal in the Otay tarplant habitat area is also recommended to ensure the long-term persistence of this population of approximately 30,000 plants. To the extent possible, and as funding allows, thatch removal should extend from the center of Otay tarplant populations to the border of grasslands and open areas and the surrounding shrubs. The shrubs can act as a buffer zone to slow additional or repeated invasion of non-native species.

Management measures for Orcutt's bird's-beak may include periodic weeding in Orcutt's bird's-beak occupied habitat to reduce competition from exotics species. This weeding program can be conducted on a five-year rotation or at the discretion of the Habitat Manager.

Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Recommended management for other covered species will be sufficient to maintain habitat for northern harrier.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Control weeds as funding allows, primarily pampas grass, mustard, and annual grasses, to maintain habitat quality over the long term.
- Periodically dethatch dry annual weeds from Otay tarplant occupied habitat, approximately once every five years or as determined by the Habitat Manager as funding allows.
- Periodically weed in Orcutt's bird's-beak occupied habitat to reduce competition from exotics species, approximately once every five years or as determined by the Habitat Manager and as funding allows.

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to San Diego barrel cactus and Orcutt's bird's-beak populations to ensure that the cactus are not outcompeted by native shrubs over the long term.

- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

6.2.10 Subunit 4-1h

Figure 11f in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.10.1 Summary Description

Table 13 summarizes the area of each habitat type in subunit 4-1h. The following covered species are known to occur in this subunit:

Plants
- San Diego barrel cactus (MSCP covered species)

Animals
- Coastal California gnatcatcher (MSCP covered species; two locations)
- Southern California rufous-crowned sparrow (MSCP covered species)

TABLE 13
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-1h

Vegetation Community or Land Cover Type	Acreage
Coastal sage scrub	5.0
TOTAL	5.0

Subunit 4-1h is the eleventh largest PMA 4 subunit. This subunit ranks seventh in priority for implementing management actions. Subunit 4-1h is vegetated entirely with coastal sage scrub. This community supports San Diego barrel cactus, coastal California gnatcatcher, and southern California rufous-crowned sparrow.

6.2.10.2 Management Issues

Management issues for biological resources in subunit 4-1h include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-

term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate this habitat.

Long-term management of southern California rufous-crowned sparrow habitat includes weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate habitat for this covered species.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Every three to five years the Habitat Manager should assess the need for shrub thinning adjacent to San Diego barrel cactus populations to ensure that the cactus are not outcompeted by native shrubs over the long term.
- Annually monitor trail use adjacent to San Diego barrel cactus populations to determine if recreational activities are impacting this species. Trails adjacent to the San Diego barrel cactus are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.
- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain habitat quality for coastal California gnatcatcher and southern California rufous-crowned sparrow.
- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher and southern California rufous-crowned sparrow habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for these covered bird species.

6.2.11 Subunit 4-2a

Figures 11g, 11h, and 11i in the Baseline Biological Resources Report show the locations of biological resources in this subunit (RECON 2004).

6.2.11.1 Summary Description

Table 14 summarizes the area of each habitat type in subunit 4-2a. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)
- Variegated dudleya (MSCP covered species; narrow endemic)

Animals
- Coastal California gnatcatcher (MSCP covered species)
- Cooper's hawk (MSCP covered species)
- Coastal cactus wren (MSCP covered species)

TABLE 14
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-2a

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	1.3
Diegan coastal sage scrub	49.0
Southern willow scrub	1.2
Native grassland	4.8
Non-native grassland	1.2
Eucalyptus woodland	0.2
Disturbed	0.2
TOTAL	57.9

Subunit 4-2a is the second largest PMA 4 subunit. This subunit ranks second in priority for implementing management actions. Subunit 4-2a is dominated by Diegan coastal sage. This scrub communities support the federally threatened coastal California gnatcatcher, coastal cactus wren and cooper's hawk. In addition, native grassland and a small area of maritime succulent scrub and southern willow scrub are present. The maritime succulent scrub supports coast barrel cactus. The native grassland supports the federal threatened and state endangered Otay tarplant and variegated dudleya. No sensitive species were observed in the southern willow scrub habitat.

6.2.11.2 Management Issues

Management issues for biological resources in subunit 4-2a include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Periodic thatch removal in the Otay tarplant and variegated dudleya habitat area is also recommended to ensure the long-term persistence of these populations. To the extent possible, and as funding allows, thatch removal should extend from the center of these populations to the border of grasslands and open areas and the surrounding shrubs. The shrubs can act as a buffer zone to slow additional or repeated invasion of non-native species.

Long-term management of coastal California gnatcatcher and coastal cactus wren habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be

thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate this habitat.

Recommended management for other covered species will be sufficient to maintain habitat for Cooper's hawk.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Periodically dethatch dry annual weeds from Otay tarplant and variegated dudleya occupied habitats, approximately once every five years or as determined by the Habitat Manager and as funding allows.

- Control weeds as funding allows, primarily mustard and annual grasses, in scrub habitats to maintain habitat quality for coastal California gnatcatcher and coastal cactus wren.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in scrub habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for covered bird species.

6.2.12 Subunit 4-2b

Figures 11j, 11k, and 11l in the Baseline Biological Resources Report show the locations of biological resources in this subunit (RECON 2004).

6.2.12.1 Summary Description

Table 15 summarizes the area of each habitat type in subunit 4-2b. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)
- San Diego thornmint (MSCP covered species; narrow endemic)

Animals
- Belding's orange-throated whiptail (MSCP covered species)
- San Diego horned lizard (MSCP covered species)
- Least Bell's vireo (MSCP covered species)
- Coastal California gnatcatcher (MSCP covered species; ten locations including nesting evidence)
- Cooper's hawk (MSCP covered species)
- Coastal cactus wren (MSCP covered species; nesting)
- Southern California rufous-crowned sparrow (MSCP covered species)

TABLE 15
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-2b

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	57.6
Diegan coastal sage scrub	27.4
Southern willow scrub	10.9
Disturbed	4.5
TOTAL	100.4

Subunit 4-2b is the largest PMA 4 subunit. This subunit ranks first in priority for implementing management actions. Subunit 4-2b is dominated by Maritime succulent scrub and Diegan coastal sage scrub. These scrub communities support Belding's orange-throated whiptail, San Diego horned lizard, the federally threatened coastal California gnatcatcher, coastal cactus wren, Cooper's hawk, southern California rufous-crowned sparrow and southern mule deer. In addition, small inclusions of native grassland are present within the scrub communities and southern willow scrub. The small areas of native grassland supports the federal threatened and state endangered Otay tarplant and San Diego thornmint. The federal and state listed endangered least Bell's vireo was observed in the southern willow scrub habitat.

6.2.12.2 Management Issues

Management issues for biological resources in subunit 4-2b include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Periodic thatch removal in the Otay tarplant and San Diego thornmint habitat area is also recommended to ensure the long-term persistence of these populations. To the extent possible, and as funding allows, thatch removal should extend from the center of these populations to the border of grasslands and open areas and the surrounding shrubs. The shrubs can act as a buffer zone to slow additional or repeated invasion of non-native species.

Long-term management for the least Bell's vireo includes weeding in and adjacent to vireo habitat and monitoring and controlling the brown-headed cowbird population. Weeding in habitat adjacent to vireo habitat will minimize or eliminate edge effects to the species. Weed species that are recommended for targeted removal in least Bell's vireo habitat include tamarisk, giant reed (*Arundo donax*), and pampas grass.

Coastal cactus wren habitat is at risk of conversion over the long term due to increasing dominance of shrubs, primarily lemonadeberry, within the coast cholla patches. Lemonadeberry is capable of outcompeting cholla and over time will likely dominate areas formerly dominated by coast cholla. In addition to competition affects between lemonadeberry shrubs and cholla, if a wildfire does occur in the Preserve, the presence

of large shrubs in the cholla patches would likely make the fire burn hotter than would otherwise be the case. If the fire is of sufficient heat intensity, chollas may be killed or severely damaged. In that case, recovery of the cholla patches may not be possible or will take many years to recover without management intervention. After a wildlfire, the populations of coastal cactus wrens may decline due to lack of suitable nesting and foraging habitat. Propagation of coast cholla to enhance cholla patches may be needed to ensure long-term persistence of cactus wren populations when cholla patches die from drought or disease.

Long-term management of coastal California gnatcatcher and southern California rufous-crowned sparrow habitats may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate the habitat for these covered species.

Management for Belding's orange-throated whiptail will consist of maintaining existing open habitat and encouraging habitat inhabited by prey species. Belding's orange-throated whiptail's preferred prey species is termites, and areas where this prey would be present, such as in woodpiles and sticks and leaf litter should be left undisturbed or disturbance should be minimized during other management actions such as weed-control efforts.

Management for San Diego horned lizard includes minimizing irrigation adjacent to the Preserve and removal of trash to discourage Argentine ants from becoming established. In addition, educational signage should be placed at appropriate locations in the preserve indicating the sensitivity of the animal, discouraging its removal as a pet, and discouraging pet owners from allowing their pets to roam free in the open space.

Recommended management for other covered species will be sufficient to maintain habitat for Cooper's hawk.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Periodically dethatch dry annual weeds from San Diego thornmint occupied habitat, approximately once every five years or as determined by the Habitat Manager and as funding allows.

- Periodically dethatch dry annual weeds from Otay tarplant occupied habitat, approximately once every five years or as determined by the Habitat Manager and as funding allows.

- Annually monitor trail use adjacent to narrow endemic plant populations to determine if recreational activities are impacting these species. Trails adjacent to narrow endemic populations are recommended to be evaluated for closure. Evaluation of trails for closure will be conducted by the Habitat Manager.

- Control weeds as funding allows, primarily tamarisk, giant reed, and pampas grass, in and adjacent to riparian habitats to maintain and improve habitat quality for least Bell's vireo.

- Control cowbird populations in riparian areas.

- Every five years, the Habitat Manager should assess the need for thinning of lemonadeberry shrubs in and immediately adjacent to (within approximately 25 feet) of coast cholla patches that are occupied by or could support coastal cactus wrens. This management action will give better assurance that successional changes or wildfires do not eliminate habitat for this covered bird species.

- Control weeds, as funding allows, primarily mustard and annual grasses, in Diegan coastal sage and maritime succulent scrub habitats to maintain habitat quality for coastal cactus wrens. Weeding should be focused in and immediately adjacent to patches of coast cholla.

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage and maritime succulent scrub habitats to maintain habitat quality for coastal California gnatcatcher and other covered bird species. These management efforts will also benefit Belding's orange-throated whiptail by maintaining open habitat for this species.

- Every five years, the Habitat Manager should assess the need for thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes in the absence of fire do not slowly eliminate habitat for this covered bird species.

- Woodpiles, sticks, and leaf litter should be left undisturbed or disturbance should be minimized during other management actions, such as weed-control efforts, to maintain habitat quality for Belding's orange-throated whiptail.

- To maintain adequate food sources for San Diego horned lizard, minimize irrigation adjacent to the Preserve and remove trash to discourage Argentine ants from becoming established.

- Place educational signage at appropriate locations in the preserve indicating the sensitivity of the San Diego horned lizard, discouraging its removal as a pet, and discouraging pet owners from allowing their pets to roam free in the open space.

6.2.13 Subunit 4-2c

Figure 11l in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.13.1 Summary Description

Table 16 summarizes the area of each habitat type in subunit 4-2c. The following covered species are known to occur in this subunit:

Animals
- Coastal California gnatcatcher (MSCP covered species)
- Southern California rufous-crowned sparrow (MSCP covered species)

TABLE 16
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-2c

Vegetation Community or Land Cover Type	Acreage
Disturbed coastal sage scrub	8.1
Southern willow scrub	2.2
Freshwater marsh	1.0
Disturbed native grassland	2.8
Non-native grassland	1.6
TOTAL	15.7

Subunit 4-2c is the fourth largest PMA 4 subunit. This subunit ranks fifth in priority for implementing management actions. Subunit 4-2c is dominated by disturbed Diegan coastal sage scrub. These scrub communities support the federally threatened coastal California gnatcatcher, and Southern California rufous-crowned sparrow. In addition, areas of disturbed native grassland, southern willow scrub and freshwater marsh are present.

6.2.13.2 Management Issues

Management issues for biological resources in subunit 4-2c include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species.

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain long-term habitat quality for coastal California gnatcatcher and southern California rufous-crowned sparrow.

- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher and southern California rufous-crowned sparrow habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for these covered bird species.

6.2.14 Subunit 4-2d

Figure 11l in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.14.1 Summary Description

Table 17 summarizes the area of each habitat type in subunit 4-2d. No covered species are known to occur in this subunit.

TABLE 17
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-2d

Vegetation Community or Land Cover Type	Acreage
Mule fat scrub	0.9
Tamarisk scrub	0.8
Disturbed	7.7
TOTAL	9.4

Subunit 4-2d is the eighth largest PMA 4 subunit. This subunit ranks twelfth in priority for implementing management actions. Subunit 4-2d is dominated by disturbed areas along with small areas of mule fat scrub. No covered species were found in this subunit.

6.2.14.2 Management Issues

Management issues for biological resources in subunit 4-2d include weeding to reduce edge effects.

Management task to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, to maintain and improve habitat quality over the long term.

6.2.15 Subunit 4-3a

Figure 11h in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.15.1 Summary Description

Table 18 summarizes the area of each habitat type in subunit 4-3a. No covered species are known to occur in this subunit.

TABLE 18
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-3a

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	5.0
TOTAL	5.0

Subunit 4-3a is the eleventh largest PMA 4 subunit. This subunit ranks 16th in priority for implementation of management actions. Subunit 4-3a is dominated by maritime succulent scrub. No covered species were found in this subunit.

6.2.15.2 Management Issues

Management issues for biological resources in subunit 4-3a include weeding to reduce edge effects.

Management task to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, to maintain habitat quality over the long term.

6.2.16 Subunit 4-3b

Figures 11h and 11i in the Baseline Biological Resources Report show the locations of biological resources in this subunit (RECON 2004).

6.2.16.1 Summary Description

Table 19 summarizes the area of each habitat type in subunit 4-3b. The following covered species are known to occur in this subunit:

Animals

- Coastal California gnatcatcher (MSCP covered species; two locations including nesting evidence)

TABLE 19
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-3b

Vegetation Community or Land Cover Type	Acreage
Maritime succulent scrub	3.0
TOTAL	3.0

Subunit 4-3b is the fifteenth largest PMA 4 subunit. This subunit ranks thirteenth in priority for management actions. Subunit 4-3b is dominated by maritime succulent scrub. This scrub community supports the federally threatened coastal California gnatcatcher.

6.2.16.2 Management Issues

Long-term management of coastal California gnatcatcher habitat may include weeding to reduce the risk of catastrophic fire. Management actions may also require that surrounding native brush, i.e., lemonadeberry, may need to be thinned periodically to ensure that successional changes in the absence of fire do not slowly eliminate gnatcatcher habitat.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, in Diegan coastal sage habitats to maintain habitat quality for coastal California gnatcatcher.
- Every five years, the Habitat Manager should assess the need for selected thinning of lemonadeberry shrubs in coastal California gnatcatcher habitat to ensure that successional changes, in the absence of fire, do not slowly eliminate habitat for this covered bird species.

6.2.17 Subunit 4-3c

Figure 11m in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.17.1 Summary Description

Table 20 summarizes the area of each habitat type in subunit 4-3c. No covered species are known to occur in this subunit.

TABLE 20
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-3c

Vegetation Community or Land Cover Type	Acreage
Diegan coastal sage scrub	5.5
TOTAL	5.5

Subunit 4-3c is the tenth largest PMA 4 subunit. This subunit ranks fifthteenth in priority for implementing management actions. Subunit 4-3c is dominated by Diegan coastal sage scrub. No covered species were found in this subunit.

6.2.17.2 Management Issues

Management issues for biological resources in subunit 4-3c include weeding to reduce edge effects.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Control weeds as funding allows, primarily mustard and annual grasses, to maintain habitat quality over the long term.

6.2.18 Subunit 4-3d

Figure 11m in the Baseline Biological Resources Report shows the locations of biological resources in this subunit (RECON 2004).

6.2.18.1 Summary Description

Table 21 summarizes the area of each habitat type in subunit 4-3d. The following covered species are known to occur in this subunit:

Plants
- Otay tarplant (MSCP covered species; narrow endemic)

TABLE 21
VEGETATION COMMUNITIES AND LAND COVER TYPES
SUBUNIT 4-3d

Vegetation Community or Land Cover Type	Acreage
Diegan coastal sage scrub	3.4
Disturbed	0.9
TOTAL	4.3

Subunit 4-3d is the thirteenth largest PMA 4 subunit. This subunit ranks seventeenth in priority for implementing management actions. Subunit 4-3d is dominated by coastal sage scrub with a small area of disturbed habitat.

6.2.18.2 Management Issues

Management issues for biological resources in subunit 4-3d include weeding to reduce edge effects and monitoring of trail use to determine if recreational activities are impacting covered species. Periodic thatch removal in the Otay tarplant habitat area is also recommended to ensure the long-term persistence of this population of approximately 25 plants.

Priority Management task recommendations in order of importance to be performed as funding becomes available:

- Periodically dethatch dry annual weeds from Otay tarplant occupied habitat, approximately once every five years or as determined by the Habitat Manager as funding allows.
- Control weeds as funding allows, primarily mustard and annual grasses, to maintain habitat quality over the long term.

7.0 SPECIES-SPECIFIC DIRECTIVES

7.1 Management Issues and Monitoring of MSCP-Covered Species (Priority 1 Species)

Each covered species has specific management directives within the MSCP Preserve system. Management directives for each covered species known to occur in PMA 4 are summarized in Table 22. This summary is based on Table 3-5 of the MSCP Subregional Plan contained in Appendix A of the City of Chula Vista Subarea Plan (City of Chula Vista 2003). As described in Section 7.3.1 of the Subarea Plan, the baseline biological surveys in the Central City PMA were intended to pay particular attention to potential locations of Narrow Endemic Species, and specifically, Otay Tarplant. The ASMDs for the Central City Preserve focus on management goals and activities to ensure survival of these important species.

7.2 Management and Monitoring of Other Sensitive Biological Resources (Priority 2 Species)

There are several plant and animal species on the Preserve that are considered sensitive, but are not covered by the MSCP. Specific management directives are provided for below. Future surveying and monitoring of all plant and wildlife species discussed below is recommended only as funds become available. Monitoring for these species should include recording incidental sightings by qualified biologists or the Habitat Manager. These sighting locations should be hand-mapped and reported in the annual report as a list of observed sensitive species.

7.2.1 Plants

For most of the sensitive plants present on the Preserve, invasive weeds are the primary threat to the existing populations. These weeds may increase the risk of fire and have detrimental effects to the plants. Recreational activity is also a major cause of disturbance to the sensitive resources on the Preserve. Trampling, and destroying the vegetation allows for the exotic weeds to become opportunistic. Redirecting activity to less sensitive areas when possible is recommended, and implementing an aggressive

TABLE 22
SPECIES-SPECIFIC DIRECTIVES

Otay tarplant (*Deinandra conjugens*)
Otay tarplant is a federally listed threatened and state listed endangered species. This MSCP covered species is on the list of narrow endemics, which requires jurisdictions to specify and implement measures in their Subarea Plans to avoid or minimize impacts to all populations. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures for monitoring of populations and adaptive management of preserves, taking into consideration the extreme population fluctuations from year to year, and specific measures to protect against detrimental edge effects to this species. ***Baseline Biological Survey Summary*** Rare plant surveys by RECON (2003) recorded this species in subunits 4-1a (30,000 individuals), 4-1cW (50 individuals), 4-2a, and 4-2b. ***Management*** Otay tarplant is threatened by invasion of non-native annual grasses and herbs. Otay tarplant is somewhat tolerant of weed competition, but over time the populations are likely to decline without implementation of weed control measures. Control of non-native weeds is recommended for Otay tarplant populations. It is recommended that a weeding program be implemented on a three- to five-year rotation, at the discretion of the Habitat Manager and as funding is available. Currently, the competitive effects of these weedy species are impacting Otay tarplant. These effects likely include direct competition for light and water, particularly in the seedling and early rosette stage, when the plants have a short stature and can easily be covered by weedy species (Dodero pers. obs.). Competition for water can be intensified in dry rainfall years when moisture supplies are limited. In weedy sites, Otay tarplant population numbers may be depressed even further in dry years, than would be the case than in a less weedy environment. In addition to direct competitive effects, in many instances, the weedy thatch material can completely cover the ground in tarplant habitat that naturally would be more open. The weedy thatch reduces or eliminates open ground that is essential for pollinators to nest in. An effective method of weed management in the Otay tarplant habitat area can include periodic thatch removal to decrease competition from weed species. Another method that can be used, at the discretion of the Habitat Manager, is to increase the number of individuals in a declining population through the implementation of a seed-bulking program. Seed bulking entails growing plants in cultivation to increase the amount of seed available for restoration or enhancement purposes. In the case of Otay tarplant, the implementation of weed control efforts, such as thatch removal, will likely be sufficient to allow declining populations to rebound from existing seedbanks. ***Monitoring*** The distribution and abundance of Otay tarplant should be measured both qualitatively and quantitatively within the Preserve. A qualified biologist with experience identifying Otay tarplant and native grassland habitat restoration should conduct the long-term biological monitoring.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Otay tarplant (*Deinandra conjugens*)
Qualitative: Permanent reference points should be established within the Preserve at three to five of the representative sites with high-density Otay tarplant populations identified in the baseline biological resources report and at the discretion of the Habitat Manager. The reference sites should be field-surveyed using GPS equipment and a permanent marker, such as stake or a sign, should identify each reference site. Photographs of the reference Otay tarplant populations should be taken annually, at approximately the same time of year and from the same aspect. Qualitative monitoring of the Otay tarplant will include a photodocumentation survey conducted every five years in late spring/early summer and will be timed to coincide with the peak flowering period of the Otay tarplant (May to June). The focus of these surveys is to identify weed invasion and competition and ascertain, at the discretion of the Habitat Manager, if dethatching and weed management actions are appropriate. The results of this qualitative survey should be contained in that year's annual report. **Quantitative:** The distribution and abundance of Otay tarplant should be measured quantitatively at least once every five years. A quantitative survey should be conducted in the first rainfall year that is at least 70 percent of the historic average. If none of five years meet the rainfall criterion, then the survey should be conducted in year five. An initial quantitative survey should be conducted in the first year that meets the rainfall criterion. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken. The quantitative survey should use field GPS equipment to map the aerial coverage of Otay tarplant in each subunit. The survey will also include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compare the relative cover of the survey year to the official baseline coverage.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

San Diego thornmint (*Acanthomintha ilicifolia*)
San Diego thornmint is a federally listed threatened and state listed endangered species. This species is on the list of narrow endemics, which requires jurisdictions to specify and implement measures in their Subarea plans to avoid or minimize impacts to all populations. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures to protect against detrimental edge effects from the surrounding development. ***Baseline Biological Survey Summary*** During rare plant surveys in 2003, RECON recorded populations of this species in subunits 4-1cW (approximately 500 individuals) and 4-2b (approximately 75 individuals). ***Management*** San Diego thornmint is found in open grassland habitat and is threatened by invasion of non-native annual grasses and herbs. San Diego thornmint populations are being impacted by the competitive effects of weedy species. Control of non-native weeds on a three- to five-year rotation is recommended for this thornmint population at the discretion of the Habitat Manager and as funding allows. An effective method of weed management in the thornmint habitat area can include periodic thatch removal to decrease competition from weed species. Another method to increase the number of individuals in declining populations is the implementation of a seed bulking program. Seed bulking entails growing plants in cultivation to increase the amount of seed available for restoration or enhancement purposes. ***Monitoring*** The distribution and abundance of San Diego thornmint should be measured both qualitatively and quantitatively within the Preserve. A qualified biologist with experience identifying San Diego thornmint and native grassland habitat restoration should conduct the long-term biological monitoring. **Qualitative:** Qualitative monitoring of the San Diego thornmint will include one photodocumentation survey conducted every five years in late spring and will be timed to coincide with the peak flowering period of the San Diego thornmint (approximately mid-April to mid-May). The focus of these surveys is to identify weed invasion and competition and ascertain, at the discretion of the Habitat Manager, if dethatching and weed management actions are needed. The results of this qualitative survey should be included in that year's annual report. **Quantitative:** The distribution and abundance of San Diego thornmint should be measured quantitatively at least once every five years. A quantitative survey should be conducted in the first rainfall year that is at least 70 percent of the historic average. If none of five years meet the rainfall criterion, then the survey should be conducted in year five. An initial quantitative survey should be conducted in the first year that meets the rainfall criterion. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

San Diego thornmint (*Acanthomintha ilicifolia*)
The quantitative survey should use field GPS equipment to map the aerial coverage of San Diego thornmint around the permanent reference points in the Preserve. The survey will include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compare the relative cover of the survey year to the official baseline coverage.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Snake cholla (*Cylindropuntia californica* var. *californica*)
Snake cholla is on the list of narrow endemics, which requires jurisdictions to specify and implement measures in their Subarea plans to avoid or minimize impacts to all populations. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures to protect against detrimental edge effects to this species, and promote translocation opportunity where appropriate. ***Baseline Biological Survey Summary*** Rare plant surveys by RECON (2003) recorded a few individuals of snake cholla in the Diegan coastal sage scrub in subunits 4-1cE and 4-1cW. ***Management*** Some populations of snake cholla in PMA 4 occur adjacent to unauthorized bike and walking trails in open maritime succulent scrub and Diegan coastal sage scrub. When located next to unauthorized trails, the use of brush piles may be effective at redirecting bicycles and foot traffic. Planting of additional native plant species to redirect recreational activities should only be done where the plantings of shrubs will not cause competition with the snake cholla. Over the long term, snake cholla can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of snake cholla populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires that may eliminate snake cholla populations. Previous snake cholla translocation and propagation efforts in PMA 2 in Rancho Del Rey SPA III (RECON 2002) have been effective in minimizing development impacts and similar propagation efforts can be used to increase population densities in areas where the species is in decline as determined by the Habitat Manager. ***Monitoring*** The distribution and abundance of snake cholla should be measured both qualitatively and quantitatively within the Preserve. A qualified biologist with experience identifying snake cholla should conduct the long-term biological monitoring. **Qualitative:** Permanent reference points should be established within the Preserve at representative sites identified in the baseline biological resources report. Choosing sites where snake cholla occurs adjacent to trails would be particularly useful in tracking the status of the population, as well as trail widening. Qualitative monitoring of the snake cholla will include one photodocumentation survey conducted any time of the year, once every five years. The focus of these surveys is to identify whether the shrub cover is covering the snake cholla (i.e., restricting the snake cholla's access to sunlight) and if trails are widening adjacent to snake cholla populations. This will aid in determining if shrub thinning and/or trail maintenance management actions are needed. The results of this qualitative survey should be contained in that year's annual report.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Snake cholla (*Cylindropuntia californica* var. *californica*)
Quantitative: The distribution and abundance of snake cholla should be measured quantitatively at least once every five years. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken. The quantitative survey should use field GPS equipment to map the aerial coverage of snake cholla. The survey will also include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compared to population numbers with the baseline data.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Variegated dudleya (*Dudleya variegata*)
Variegated dudleya is on the list of narrow endemics, which requires jurisdictions to specify and implement measures in their Subarea plans to avoid or minimize impacts to all populations. ***MSCP Conditions of Coverage*** Area-specific management directives must include species-specific monitoring and specific measures to protect against detrimental edge effects to this species, including effects caused by recreational activities. ***Baseline Biological Survey Summary*** Rare plant surveys by RECON (2003) recorded approximately 50 variegated dudleya individuals in subunit 4-2a. ***Management*** Although this variegated dudleya population is small, it can be managed in conjunction with weeding activities that focus on the San Diego thornmint and Otay tarplant at those locations. Periodic thatch removal at these sites will benefit all of the sensitive plant species found at these locations. It is recommended that a weeding program be implemented on a three- to five-year rotation, at the discretion of the Habitat Manager and as funding is available. ***Monitoring*** The distribution and abundance of variegated dudleya should be measured both qualitatively and quantitatively within the Preserve. A qualified biologist with experience with variegated dudleya identification should conduct the long-term biological monitoring. **Qualitative:** Permanent reference points should be established at representative sites with populations of variegated dudleya identified in the baseline biological resources report. Qualitative monitoring of variegated dudleya will include one photodocumentation survey conducted every five years in late spring and will be timed to coincide with the peak growing period of this species (approximately May and June). The focus of these surveys is to identify weed invasion and competition and determine if dethatching and weed management actions are needed. The results of this qualitative survey should be included in that year's annual report. **Quantitative:** The distribution and abundance of variegated dudleya should be measured quantitatively at least once every five years. A quantitative survey should be conducted in the first rainfall year that is at least 70 percent of the historic average. If none of five years meet the rainfall criterion, then the survey should be conducted in year five. An initial quantitative survey should be conducted in the first year that meets the rainfall criterion. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Variegated dudleya (*Dudleya variegata*)
The quantitative survey should use field GPS equipment to map the aerial coverage of variegated dudleya around the permanent reference points in the Preserve. The survey will also include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compare the population abundance of the survey year to the official baseline coverage.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

San Diego barrel cactus (*Ferocactus viridescens* var. *viridescens*)
San Diego barrel cactus is an MSCP covered species. In PMA 1, this species is typically found on dry hills within open coastal sage scrub or maritime succulent scrub communities. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures to protect against detrimental edge effects, unauthorized collection, and include appropriate fire management/control practices to protect against a too-frequent fire cycle. ***Baseline Biological Survey Summary*** Rare plant surveys by RECON (2003) recorded small populations of San Diego barrel cactus scattered throughout subunits 4-1a, 4-1dS, 4-1e, 4-1f, 4-1g, and 4-1h. ***Management*** Area-specific management directives must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management and control. Primary management for this species is periodic monitoring to determine whether weed control measures are required to enhance habitat quality. Over the long term, San Diego barrel cactus can be covered by associated native species and this may cause the slow decline of populations due to competition. Long-term management of San Diego barrel cactus populations may require that surrounding native brush be thinned to reduce competition and the threat of catastrophic fires. ***Monitoring*** The distribution and abundance of San Diego barrel cactus should be measured both qualitatively and quantitatively within the Preserve. **Qualitative:** Permanent reference points should be established within the Preserve at three to five of the representative sites identified in the baseline biological resources report at the discretion of the Habitat Manager. Choosing sites where coast barrel cactus occurs adjacent to trails would be particularly useful in tracking the status of the population as well as trail widening. Qualitative monitoring of the San Diego barrel cactus will include one survey conducted any time of the year, once every five years. The focus of these surveys is to identify whether the shrub cover is covering the San Diego barrel cactus (i.e., restricting the cactus' access to sunlight) and if trails are widening adjacent to San Diego barrel cactus populations. This will aid in determining if shrub thinning and/or trail maintenance management actions are needed. The results of this qualitative survey should be contained in that year's annual report. **Quantitative:** The distribution and abundance of coast barrel cactus should be measured quantitatively at least once every five years. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

San Diego barrel cactus (*Ferocactus viridescens* var. *viridescens*)
The quantitative survey should use field GPS equipment to map the aerial coverage of coast barrel cactus. The survey will also include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compared to population numbers with the baseline data.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Orcutt's bird's-beak (*Cordylanthus orcuttianus*)
Orcutt's bird's-beak is a CNPS List 2 and MSCP covered species that occurs in coastal sage scrub habitat, particularly near streams and riparian habitat. ***MSCP Conditions of Coverage*** At the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included. ***Baseline Biological Survey Summary*** During spring surveys conducted by RECON in 2003, a few individuals of this species were recorded in subunit 4-1g. ***Management*** Recommended management for this species includes weeding to reduce competition with exotics species. Long-term management of Orcutt's bird's-beak populations may require that surrounding native brush be thinned periodically as determined by the Habitat Manager to maintain open habitat and reduce competition with native shrubs in the absence of fire. ***Monitoring*** The distribution and abundance of Orcutt's bird's-beak should be measured both qualitatively and quantitatively within the Preserve. **Qualitative:** Permanent reference points should be established at the population's location in subunit 4-1g, as identified in the Baseline Biological Resources Report. The reference sites should be field-surveyed using GPS equipment and a permanent marker, such as stake or a sign, should identify the reference site. Photographs of the reference Orcutt's bird's-beak population should be taken from the same aspect. Qualitative monitoring of the Orcutt's bird-beak will include one survey conducted during the spring flowering period once very five years. The results of this qualitative survey should be contained in that year's annual report. **Quantitative:** The distribution and abundance of Orcutt's bird's-beak should be measured quantitatively at least once every five years. A quantitative survey should be conducted in the first rainfall year that is at least 70 percent of the historic average. If none of five years meet the rainfall criterion, then the survey should be conducted in year five. An initial quantitative survey should be conducted in the first year that meets the rainfall criterion. The official baseline population abundance and coverage data, collected for the baseline biological survey, will be used to compare future years and determine when and what adaptive management measures should be taken.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Orcutt's bird's-beak (*Cordylanthus orcuttianus*)
The quantitative survey should use field GPS equipment to map the aerial coverage of Orcutt's bird's-beak. The survey will also include an estimate of the relative cover of other native and weed plant species present. The results of this quantitative survey should be reported in that year's annual report and compared to population numbers with the baseline data.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Belding's orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*)
Belding's orange-throated whiptail is a CDFG species of concern and is covered under the MSCP. ***MSCP Conditions of Coverage*** Area-specific management directives must address edge effects. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, Belding's orange-throated whiptails were observed in subunits 4-1a and 4-2b. ***Management*** Management for Belding's orange-throated whiptail on the PMA will consist of monitoring efforts, maintaining existing potential habitat, encouraging habitat inhabited by prey species, and maintaining linkages to off-site habitat. Belding's orange-throated whiptail's preferred prey species is termites, and areas where this prey would be present, such as in woodpiles and sticks and leaf litter should be left undisturbed or disturbance should be minimized by other management actions such as weed control efforts. When budgets allow, populations near development should be monitored for trends that might change due to edge effects such as domestic pets, exotic plants, and invasive ants (USGS and San Diego State University [SDSU] 2001). ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of Belding's orange-throated whiptail and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

San Diego horned lizard (*Phyrnosoma coronatum blainvillii*)
The San Diego horned lizard is a CDFG species of concern and is covered under the MSCP. The San Diego horned lizard occurs primarily in coastal sage scrub habitat. Suitable habitat to support this species exists throughout PMA 1. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures to maintain native ant species, discourage the Argentine ant, and protect against detrimental edge effects to this species. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, one San Diego horned lizard was observed in subunit 4-2b. ***Management*** Management for this species will include maintaining the existing suitable habitat. Based on the small number of observations it is likely that this species is in decline in the Central City Preserve, including PMA 4. The widespread introduction of non-native Argentine ants that displace the native ants has caused the decline of this species throughout the urbanized portions of coastal San Diego County. In addition, predation by domestic pets (i.e., cats), collection for pets, and losses caused by recreational activities such as mountain biking have also contributed to population declines. Within the Preserve, irrigation should be minimized and trash removed in order to discourage Argentine ants. The Center for the Reproduction of Endangered Species (CRES) has been monitoring the San Diego horned lizard for the past six years and has identified biological differences in horned lizards that inhabit disturbed habitat types. Horned lizards that inhabit disturbed habitats have a smaller body size and larger home range with lower plant diversity than those lizards found in pristine coastal sage scrub habitats (Zoological Society of San Diego 2001). This species tends to occur along roadsides, near thick vegetation. It is recommended that new trails should not be created where the species is known to occur (USGS and SDSU 2001). In addition, educational signage should be placed at appropriate locations in the preserve indicating the sensitivity of the animal, discouraging its removal as a pet, and discouraging pet owners from allowing their pets to roam free in the open space. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of San Diego horned lizard and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Least Bell's vireo (*Vireo bellii pusillus*)
The least Bell's vireo is federally and state listed as endangered and is an MSCP covered species. This species is a summer resident that inhabits riparian vegetation comprised of southern willow scrub with an understory of mule fat. ***MSCP Conditions of Coverage*** Area-specific management directives must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species. Any clearing of occupied habitat must occur between September 15 and March 15. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, this species was observed in subunit 4-2b. The least Bell's vireo is a summer resident that breeds in southern willow scrub vegetation, particularly in areas with an understory of mule fat. ***Management*** MSCP management directives include measures to provide appropriate successional habitat, upland buffers for known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species. Any clearing of occupied habitat must occur between September 15 and March 15. Long-term management for the least Bell's vireo includes weeding in and adjacent to vireo habitat. Weeding in habitat adjacent to vireo habitat will minimize or eliminate edge effects to the species. Weed species that are recommended for targeted removal in least Bell's vireo habitat include tamarisk, giant reed (*Arundo donax*), and pampas grass. The brown-headed cowbird population in subunit 4-2b should be monitored and controlled as funding allows. ***Monitoring*** The distribution and abundance of least Bell's vireo shall be measured quantitatively within the Preserve. A qualified biologist shall conduct the long-term biological monitoring. The results of the 2003 focused surveys conducted by RECON and reported in the baseline biological resources report will constitute the baseline abundance of least Bell's vireo in the Preserve. **Quantitative:** Quantitative sampling for least Bell's vireo will focus on suitable southern willow scrub habitat in the Preserve. Every five years, a single survey will be conducted during the month of May to maximize the potential for detection. The survey shall be conducted only during optimal weather conditions. The results of this quantitative survey shall be reported in the annual report and compare the results with the official baseline data.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Coastal California gnatcatcher (*Polioptila californica californica*)
The coastal California gnatcatcher is federally listed as threatened, a CDFG species of special concern, and an MSCP covered species. The coastal California gnatcatcher typically occurs in or near sage scrub and prefers habitat dominated by California sagebrush. The bird also uses chaparral, grassland, and riparian woodland habitats where they occur adjacent to sage scrub. ***MSCP Conditions of Coverage*** Area-specific management directives must include specific measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to maintain or improve habitat quality including vegetation structure. ***Baseline Biological Survey Summary*** A total of 29 gnatcatcher locations were observed in PMA 1. Five gnatcatcher locations were observed in subunit 1-1a; one of which includes a pair exhibiting nesting behavior (i.e., carrying nesting material). One gnatcatcher nest was positively identified. Two gnatcatcher locations were identified in subunit 1-1d. Six coastal California gnatcatcher locations were observed in subunit 1-2a, one of which includes a pair with three fledglings. Nine gnatcatcher locations were identified in subunit 1-2b. Six gnatcatcher locations were identified in subunit 1-2c. One gnatcatcher location was identified in subunit 1-2e. ***Management*** MSCP management directives for this species include; measures to reduce and minimize disturbance to habitat during the nesting period between February 15 to August 15, and fire protection measures to reduce the potential of habitat degradation and conversion due to unplanned fires. Areas containing high value gnatcatcher habitat, i.e., maritime succulent scrub and California sagebrush-dominated Diegan coastal sage scrub, are priority conservation areas. Management measures to maintain or improve habitat quality of high value conserved habitat are also required by the management directives for this species. It is recommended that suitable habitat in PMA 1 be monitored for coastal California gnatcatcher to determine the long-term status of the species, and the appropriate areas of habitat to be maintained or enhanced through weed control, if necessary. Occupied gnatcatcher areas should be monitored for the presence of brown-headed cowbirds (*Molothrus ater*), to prevent brood-parasitism. Threats to coastal California gnatcatcher habitat are primarily from weed invasion, particularly by black mustard. Mustard is invading to varying extent Diegan coastal sage and maritime succulent habitat in PMA1. This weed invasion makes these communities more susceptible to repeated fires that can change their structure and diversity. High priority should be given to controlling mustard invasions in gnatcatcher habitat. Another management issue is the successional changes that occur in these habitats in the absence of fire. Over time, large shrubs, primarily lemonadeberry (*Rhus integrfolia*), tend to cover slopes completely to the exclusion of other shrub species. This is especially evident on north

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Coastal California gnatcatcher (*Polioptila californica californica*)
facing slopes. This domination by a single plant species reduces the suitability of habitat for the gnatcatcher by decreasing the plant and insect diversity that the birds need to survive. Every five years, the Habitat Manager should survey large shrub (i.e., lemonadeberry) cover in the PMA to determine if weeding is necessary to improve habitat quality and diversity for the gnatcatcher. Since prescribed fire is not likely to be used in canyon adjacent to houses, at the discretion of the Habitat Manager, a shrub-thinning program may be implemented. Trimming large shrubs by hand would minimize disturbance of adjacent habitat. This shrub material can be removed from the site or used in adjacent Preserve areas as wildlife habitat. ***Monitoring*** The distribution and abundance of coastal California gnatcatcher should be measured quantitatively within the Preserve. A qualified biologist holding a valid U.S. Fish and Wildlife Service 10(a)(1)(A) recovery permit should conduct the long-term biological monitoring. The results of the 2003 focused surveys conducted by RECON and reported in the baseline biological resources report will constitute the baseline abundance of coastal California gnatcatchers in the Preserve. **Quantitative:** Quantitative sampling for coastal California gnatcatcher will focus on suitable coastal sage scrub habitat in the Preserve. Every five years, a single survey will be conducted during the month of February to maximize the potential for detection. The survey should be conducted only during optimal weather conditions. The results of this quantitative survey should be reported in the annual report and compare the results with the official baseline data.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

American peregrine falcon (*Falco peregrinus*)
The American peregrine falcon is a state listed endangered, California fully protected, and MSCP covered species. This species has very low population numbers in the County, being primarily a rare fall and winter visitor. The three known nesting sights are outside of the City of Chula Vista. ***MSCP Conditions of Coverage*** This species has very low population numbers in the County, being primarily a rare fall and winter visitor. All three known nest sites are outside the City of Chula Vista. Participating jurisdictions' guidelines and ordinances, and state and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, this species was observed flying over subunit 4-1a. The American peregrine falcon is not expected to nest on site ***Management*** Managing for habitat quality of scrub and grassland vegetation will maintain adequate foraging area for this species. State and federal wetland regulations will provide additional habitat protection resulting in no net loss of wetlands. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they shall record sightings of American peregrine falcon and hand-map the location of that sighting. Those sightings shall be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Cooper's hawk (*Accipiter cooperii*)
The Cooper's hawk is a CDFG species of special concern and an MSCP covered species. This hawk mainly breeds in oak riparian woodlands and on rare occasions may also use eucalyptus trees (Unitt 1984). ***MSCP Conditions of Coverage*** Area-specific management directives must include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests. ***Baseline Biological Survey Summary*** Cooper's hawks were observed in subunits 4-1a, 4-2a, and 4-2b. Suitable nesting habitat occurs in the mature riparian vegetation along the main drainage in PMA 4. ***Management*** Management for Cooper's hawk includes general Preserve maintenance in riparian areas, such as weed removal, to maintain habitat quality for this species. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of Cooper's hawk and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Swainson's hawk (*Buteo swainsoni*)
The Swainson's hawk is a state-listed threatened species and an MSCP covered species. This species is a rare visitor during migration that forages in grasslands and agricultural fields. ***MSCP Conditions of Coverage*** No conditions for coverage are required for this species. Table 3-5 of the MSCP includes the following notes: Additional conservation of grassland habitats should be a priority and one of the primary factors in the design of the preserves in the major amendment areas. This species is a rare migrant through the area. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, a Swainson's hawk was observed foraging in subunit 4-1e. This species is not expected to breed in PMA 4, as the local breeding population has been extirpated (Unitt 1984). ***Management*** No management measures are anticipated to be implemented for this species. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of Swainson's hawk and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Coastal cactus wren (*Campylorhynchus brunneicapillus couesi*)
The coastal cactus wren is a state species of special concern and an MSCP covered species. This species uses habitat containing coast cholla patches. ***MSCP Conditions of Coverage*** Area-specific management directives must include restoration of maritime succulent scrub habitat, including propagation of cactus patches, active/adaptive management of cactus wren habitat, monitoring of populations within preserves, and specific measures to reduce or eliminate detrimental edge effects. No clearing of occupied habitat may occur from the period February 15 through August 15. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, coastal cactus wrens were observed or detected in subunits 4-2b. This species is expected to occur in other subunits of PMA. ***Management*** Management of cactus wren habitat may include weeding to reduce the risk of catastrophic fire, management of maritime succulent scrub habitat, including propagation of and enlargement of cholla patches, and monitoring of populations within the Preserve and specific measures to reduce or eliminate detrimental edge effects. It is recommended that a weeding program be implemented on a three- to five-year rotation, at the discretion of the Habitat Manager and as funding is available. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of coastal cactus wren and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
The southern California rufous-crowned sparrow is a CDFG species of special concern and an MSCP covered species. Southern California rufous-crowned sparrows are year-round residents that can be found in coastal sage scrub that is generally steep and rocky and in grassy areas of coastal sage scrub (Unitt 1984). Southern California rufous-crowned sparrows are also known to inhabit grassland areas that have been created by fire and human disturbance when the grasslands are adjacent to coastal sage scrub (Unitt 1984). ***MSCP Conditions of Coverage*** Area-specific management directives must include maintenance of dynamic processes, such as fire, to perpetuate some open phases of coastal sage scrub with herbaceous components. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, Southern California rufous-crowned sparrows were observed in PMA subunit 4-1h. ***Management*** Under the MSCP approximately 61 percent of potential southern California rufous-crowned sparrow habitat, in addition to 71 percent of mapped localities for the species is conserved. MSCP specific management directives for this species include maintenance of fire processes to perpetuate herbaceous components in open phases of coastal sage scrub. Management for the southern California rufous-crowned sparrow should be directed at maintaining the native herbaceous component within the sparrow's habitat, either by prescribed burns or manual methods such as dethatching of grasslands or shrub thinning along the grassland costal sage scrub interface. It is recommended that dethatching be conducted on a three- to five-year rotation, at the discretion of the Habitat Manager and as funding is available. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of San Diego rufous-crowned sparrow and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Northern harrier (*Circus cyaneus hudsonius*)
The northern harrier is a CDFG species of special concern and an MSCP covered species. This species forages over grassland and coastal sage scrub vegetation. ***MSCP Conditions of Coverage*** Area-specific management directives must manage agricultural and disturbed lands that become part of the preserve within four miles of nesting habitat to provide foraging habitat; include an impact avoidance area (900-foot or maximum possible within preserve) around active nests; and include measures for maintaining winter foraging habitat in preserve areas. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, northern harriers were observed in subunit 4-1g. Suitable nesting habitat occurs along the major drainage in PMA 4. ***Management*** General preserve maintenance, such as weeding and trash removal, will benefit this species. No specific management directives are recommended. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of San Diego rufous-crowned sparrow and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

TABLE 22
SPECIES-SPECIFIC DIRECTIVES
(continued)

Southern mule deer (*Odocoileus hemionus fuliginata*)
The southern mule deer is not a sensitive species, but is covered under the MSCP for its aesthetic and intrinsic value, as the largest native herbivore in the plan area. Mule deer use and modify several different plant communities: coastal sage scrub, chaparral and oak woodlands. ***MSCP Conditions of Coverage*** No conditions for coverage are required for this species. Table 3-5 of the MSCP includes the following notes: Although not considered sensitive, this broadly distributed species has aesthetic and intrinsic values, and is the only large native herbivore in the plan area thereby making it an important species to protect. The criteria used to define core and linkage areas consist of maintaining ecosystem function and processes, including large mammal movement. ***Baseline Biological Survey Summary*** During RECON surveys in 2003, southern mule deer scat was observed in subunit 4-1g and tracks were observed in subunit 4-2b. This species is likely to occur in most subunits of PMA 4. ***Management*** Approximately 105,000 acres of mule deer habitat is conserved with the MSCP Preserve system (City of San Diego 1997). Under the plan, core and linkage areas were designed to maintain ecosystem function including large animal movement throughout different areas of the preserve system. Wildlife agencies are required to monitor the MSCP Preserve area for changes in ecosystem function and develop adaptive management strategies should the need arise. General management directives for maintaining habitat quality and function, such as weeding and trash removal, will benefit this species. ***Monitoring*** Whenever qualified biologists are working within the Preserve, they should record incidental sightings of southern mule deer and hand-map the location of that sighting. Those sightings should be reported in the annual report as a list of observed sensitive species.

weeding management program to reduce the possibility of destructive fire. These guidelines should be considered when managing the following Priority 2 sensitive resources on the Preserves:

- Small-flowered morning glory – This annual species is associated with native grasslands and is frequently found growing with Otay tarplant. Weeding programs implemented for Otay tarplant will benefit small-flowered morning glory.
- Palmer's grappling hook – This annual species grows in clay soils and would benefit from weed removal efforts to reduce competition with non-native weeds.
- San Diego sand aster – This species grows primarily in openings in coastal sage scrub, as well as in disturbed areas. It is likely that this open habitat will be maintained by periodic fires or through vegetation management activities conducted to maintain openings occupied by this species.
- San Diego County viguiera – General Preserve weeding will benefit this species.
- California adolphia – General preserve weeding, particularly focused on mustard, will benefit this species. This species can be propagated by seed and is a good candidate for use in brush management areas due to its low flammability and low maintenance requirements.
- Graceful tarplant – This species is tolerant of some disturbance. The species can be found along the margins of trails. General Preserve weeding will benefit this species.
- Munz's sage – This species will benefit from general Preserve weeding. Mustard invasion into Diegan coastal sage scrub is likely the greatest threat to this species and is recommended to be targeted for removal.

7.2.2 Wildlife

7.2.2.1 Reptiles and Amphibians

- Red diamond rattlesnake – Primary management activity for this species would be educating homeowners and Preserve users about the importance of rattlesnakes to ecosystem function and emphasize that rattlesnakes should not be harmed if encountered in the Preserve.

7.2.2.2 Birds

The following sensitive bird species are found in the Preserve. General maintenance activities such as weeding programs for other species are anticipated to be adequate to maintain habitat quality for these species.

- Double crested cormorant
- White-tailed kite
- Yellow warbler
- Yellow-breasted chat

8.0 BRUSH MANAGEMENT

8.1 Introduction

Brush management is required to be undertaken in areas where urban development interfaces with open space, in order to reduce fire fuel loads and reduce potential fire hazard. In accordance with the City of Chula Vista's MSCP Subarea Plan, the City of Chula Vista will develop a brush abatement program that will focus particularly on edges between urban areas and open space Preserve lands.

As stated in Section 7.4.5.1 of the City of Chula Vista MSCP Subarea Plan, brush management for the communities of Bonita Long Canyon, Rancho del Rey, and Terra Nova is funded by Open Space Districts or Landscape Lighting and Maintenance Districts, and the work is contracted by the City. In these communities, Zone 1 brush management extends 30 feet beyond any structure, as required by the Fire Marshal. In addition, if a property line is located more than 30 feet from the structure, 5 to 10 feet of Zone 1 brush management is undertaken outside the property line to ensure fire department access to the open space.

The Preserve boundary adjacent to existing communities begins 10 feet beyond property lines. Therefore, in most cases Zone 1 brush management activity will be accomplished outside Preserve boundaries. Zone 2 activities are limited to the maximum extent practicable, as determined by the Fire Marshal, in order to reduce encroachment into the Preserve. Zone 3 does not apply to existing communities.

Zone 2 brush management activities are recommended within 30 feet from the Zone 1 limit. Vegetation removal and thinning should reduce the vegetation density to approximately 50 percent total cover. These recommendations should be evaluated on a case-by-case basis by the Fire Marshal.

8.2 PMA 4 Brush Management Analysis

Brush management issues will vary by slope aspect. On south-facing slopes vegetation within PMA 4 tends to be dominated by Diegan coastal sage scrub and maritime succulent scrub. On south-facing slopes these communities will tend to be more open than vegetation communities on north-facing slopes. The fuel loads will, in general, be lower on these south-facing slopes and present less of a fire hazard. Species that dominate on south-facing aspects will include California sagebrush, jojoba, San Diego County viguiera along with various cactus species and other succulents. South-facing

slopes are more likely to support sensitive or covered species than dense north-facing slopes. Covered species such as snake cholla and San Diego barrel cactus are commonly found on south-facing slopes within PMA 4.

On north-facing slopes within PMA 4, the vegetation tends to be far more dense than on south-facing slopes In general, north-facing slopes will have higher fuel loads and present a greater fire hazard. Species that dominate on north-facing slopes tend to be larger shrubs and small trees, particularly lemonadeberry and toyon. These species will likely need to be thinned to achieve the desired fuel loads, under the brush management guidelines for Zones 1 and 2. Because north-facing slopes naturally have better moisture conditions than south-facing slopes, vegetation growth is going to be faster on north slopes and therefore, more frequent brush management is likely to be needed there.

To reduce the long-term costs of brush management within the Preserve, the Habitat Manager should evaluate the Zone 1 and 2 areas to determine if replacement planting with non-flammable or low flammability native species is appropriate. These replacement plantings are intended to replace high fire risk shrubs that have been removed by brush management activities with low flammability species and to maintain functional wildlife habitat. If feasible, all replacement native plantings should be from seed stock or cuttings that are collected within approximately 15 miles of the area, to ensure that the local native species genetic pool is maintained.

On north-facing slopes in particular, after larger trees and shrubs are thinned or cleared, dormant native species may begin growing during the first and subsequent rainy seasons. Grasses and native bulb species may become active after competition from large shrubs is reduced. In addition, weedy species, such as mustard, may start to infill areas that have been thinned. The Habitat Manager should evaluate the need for follow-up weed control after thinning, as funding allows, and to the extent feasible, should encourage the growth of low statured native grasses, herbs, and succulents.

On north-facing slopes native bunchgrasses are excellent for replacement of higher flammability shrubs. Selected species that are appropriate for south-facing slopes may also be used on north-facing slopes, at the discretion of the Habitat Manager. The following species can be used for replacement plantings:

- Purple needlegrass (*Nasella pulchra*)
- Melic grass (*Melica imperfecta*)
- Foothill needlegrass (*Nasella lepida*)
- Blue-eyed grass (*Sisyrinchium bellum*)
- Bladderpod (*Isomeris arborea*)
- Coast cholla (*Cylindropuntia prolifera*)
- Chalk lettuce (*Dudleya pulverulenta*)
- Lady fingers (*Dudleya edulis*)
- Jojoba (*Simmondsia chinensis*)

On south-facing slopes, cacti and succulents are excellent for replacement of higher flammability shrubs. In addition, selected shrub species that are either low or slow growing can also be used at the discretion of the Habitat Manager. The following species can be used for replacement plantings:

- Coast cholla (*Cylindopuntia prolifera*)
- Shore cactus (*Cylindopuntia littoralis*)
- Snake cholla (*Cylindopuntia californica* var. *californica*)
- Mojave yucca (*Yucca schidigera*)
- San Diego barrel cactus (*Ferocactus viridescens*)
- Chalk lettuce (*Dudleya pulverulenta*)
- Lady fingers (*Dudleya edulis*)
- Fish-hook cactus (*Mamillaria dioica*)
- Golden-spined cereus (*Bergerocactus emoryi*)
- Cliff spurge (*Euphorbia misera*)
- San Diego bursage (*Ambrosia chenopodifolia*)
- San Diego County viguiera (*Viguiera laciniata*)
- Jojoba (*Simmondsia chinensis*)

8.3 Guidelines for Sensitive Species Avoidance

The Habitat Manager should follow the guidelines listed below for sensitive species when conducting brush management activities within the Preserve:

1. The Habitat Manager should assess the potential for covered and sensitive species to be impacted by brush management activities. The Baseline Biological Resources Report, and subsequent monitoring survey reports, should be reviewed to determine if sensitive species are known in the vicinity of the brush management area.

2. The Habitat Manager should field check the site prior to any clearing and thinning of vegetation to verify that covered and sensitive species have not moved into the area since the baseline surveys were completed.

3. If the Habitat Manager determines that covered or sensitive species are located in or adjacent to the proposed brush management area and may be impacted, the Habitat Manager will develop site-specific minimization measures, such as focusing clearing and/or thinning efforts on the non-covered species. When implementing brush management actions, the goal within the Preserve is to maintain functional habitat while reducing fuel loads to levels recommended by the Fire Marshal.

8.4 Guidelines for Maintenance in Brush Management Areas

The following are management criteria and habitat maintenance and monitoring standards for the brush management areas of PMA 4. These criteria have been incorporated into these ASMDs in order to assure that long-term habitat values are

maintained within the Preserve adjacent to development where concerns for wildfire safety require management of fuel loadings.

- All brush management activities within the Preserve should be conducted in accordance with the provisions of the City's MSCP Subarea Plan in order to avoid impacts to covered species while maintaining the City's fire safety brush management criteria (see Section 7.4.4 of the Subarea Plan).
- Minimize disturbance of native herbaceous and succulent vegetation within the brush management areas.
- No disturbance of surface soils, rocks, lichens, mosses, or other cryptogams should occur within the brush management areas.
- Brush management activities should be scheduled for the summer and fall, outside the rainy season and growing season when soils and herbaceous growth is more easily impacted and wildlife breeding activity is under way.
- The Habitat Manager should clearly flag shrubs for removal or thinning prior to the fuel reduction activity, and only marked shrubs should be removed or thinned.
- The Habitat Manager should mark shrubs for removal and thinning in such a way as to maintain the maximum allowable shrub cover under City of Chula Vista MSCP Subarea Plan guidelines in Section 7.4.4.
- The Habitat Manager should mark shrubs for removal and thinning in such a way as to maintain the maximum possible shrub species diversity.
- The Habitat Manager should mark shrubs for removal and thinning in such a way as to maintain known nesting sites for the coastal California gnatcatcher and other sensitive species.
- The Habitat Manager should minimize the frequency of future removal requirements by eliminating large, fast-growing individual plants near structures and encouraging a natural vegetation change from coastal sage scrub to maritime succulent scrub, wherever appropriate.

9.0 TRAILS AND ACCESS

The following Priority 1 management directives from Section 7.5.3 of the MSCP Subarea Plan provide guidance in monitoring and managing trails and subunit access.

- Develop all new recreation facilities in or adjacent to the Preserve consistent with the adjacency guidelines found in Section 7.5.2 of the MSCP Subarea Plan.

- Locate trails, view overlooks, and staging areas in the least sensitive areas of the Preserve, particularly away from known locations of narrow endemic species. Locate trails along the edges of urban land uses adjacent to the Preserve, or the seam between land uses (e.g., agriculture/habitat) and follow existing dirt roads as much as possible rather than entering habitat or wildlife movement areas. Avoid locating trails between two different habitat types due to the typically heightened resource sensitivity in those locations.

- In general, avoid paving trails unless management and monitoring evidence shows that paving is warranted, and will not impact any sensitive species or habitat covered under the City's MSCP. Clearly demarcate and monitor trails for degradation and off-trail access and use. Provide trail repair/maintenance as needed. Undertake measures to counter the effects of trail erosion including the use of stone or wood crossjoints, edge plantings of native grasses, and mulching of the trail.

- Minimize trail widths to reduce impacts to critical resources. To the maximum extent practicable, do not locate new trails wider than four feet in core Preserve areas or wildlife corridors. Where trails are planned in concert with sewer or water utility easements, the trail width should consider the easement requirements for the utility. Trails should not be encouraged within SDG&E easements. Provide trail fences or other barriers at strategic locations when protection of sensitive resources is required.

- Limit the extent and location of equestrian trails to the less sensitive areas of the Preserve. Locate staging areas for equestrian uses at a sufficient distance (e.g., 300 to 500 feet) from areas with riparian and scrub habitats to ensure that the biological values of the Preserve are not impaired.

- Limit the access to the Preserves through signage, fencing, or other appropriate barriers. The number of access points should also be limited as a means to increase Preserve management efficiency. The access points may be coordinated with cul-de-sacs or parking areas.

- Provide sufficient signage to clearly identify public access to the Preserve. Barriers such as vegetation, rocks/boulders, or fencing may be necessary to protect highly sensitive areas. Use an appropriate type of barrier based on location, setting, and use. For example, use chain link or cattle wire to direct wildlife movement, and natural rocks/boulders or split-rail fencing to direct public access away from sensitive areas. Lands acquired through mitigation may preclude public access in order to satisfy mitigation requirements.

- Off-road-vehicle activity is an incompatible use in the Preserve and should be prohibited.

- Restore areas disturbed by off-road vehicles to native habitat where possible or critical, or allow vegetation to regenerate.

9.1 Existing Trails

Existing trails throughout the PMA 4 open space are made up of narrow footpaths; wide trails used by bicycle and horseback riders; SDG&E easement access roads; and water, sewer, storm drain, and desiltation basin access roads (Figure 5). Public use of the trails on PMA 4 consist of primarily passive activities, such as jogging, hiking, bicycling, horseback riding, nature appreciation, and wildlife watching. City departments, San Diego Water Department, and SDG&E use some of the trails as access roads for utility maintenance.

9.2 Trail Monitoring

Trail monitoring is extremely important in evaluating environmental impacts resulting from a variety of uses on the trails. Some activities will impact the integrity of the trails more so than others, and will need to be actively monitored. Impacts from foot and bicycle traffic along trails should be monitored in areas adjacent to narrow endemic plant populations including Otay tarplant, San Diego thornmint, variegated dudleya, and snake cholla.

9.3 Trail Maintenance, Rerouting, and Decommissioning

There are a number of variables that contribute to trail construction and maintenance. The location of the trail, soil type, adjacent biological resources, and trail usage all contribute to its unique needs. There are general guidelines that, when adhered to, can greatly reduce or prevent trail degradation and impacts to resources, and minimize maintenance expenses.

The existing trails recommended for evaluation for rerouting or decommissioning are shown on Figure 5. The factors considered for this recommendation include trail redundancy or adjacency to a population of MSCP covered species. If decommissioning a particular trail adjacent to sensitive resources is impracticable, the Habitat Manager should pursue barrier options, such as installing fencing around the sensitive resource. Access roads for utility maintenance must remain open.

As an adaptive management strategy, the Habitat Manager should periodically (i.e., every three to five years, as funding is available) evaluate trails for possible rerouting or decommissioning. Any proposed trail closures must be reviewed and coordinated with trail planning efforts in the City.

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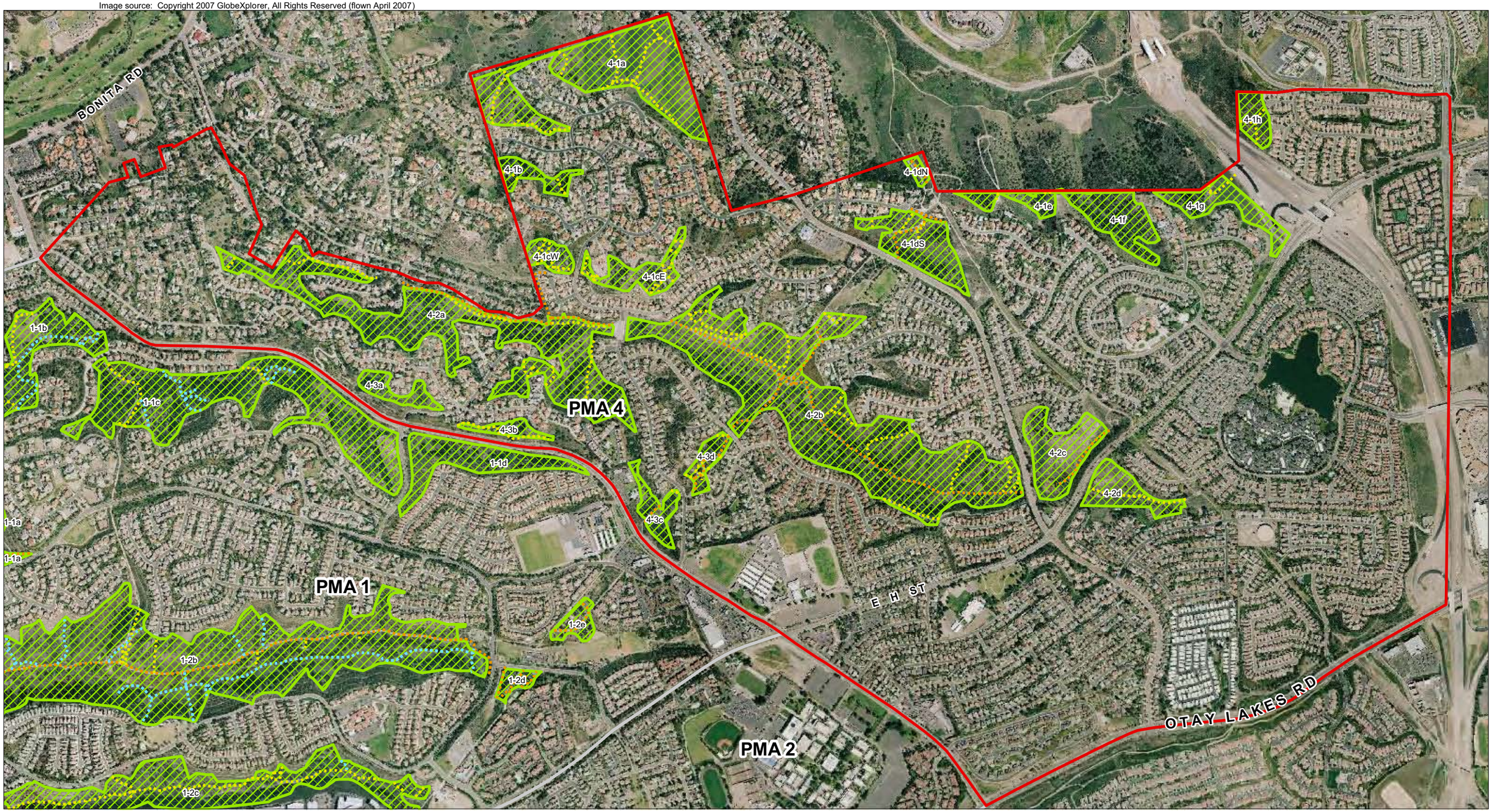


PMA 4

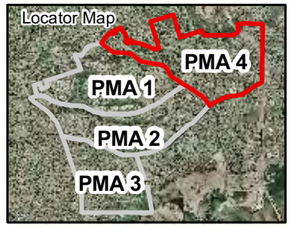
Other PMAs

PMA Subunits

Existing Trail

Existing Utility Maintenance Access Road (City of Chula Vista and SDG&E)

Existing Trail Recommended for Evaluation of Possible Closure



0 Feet 1,200

FIGURE 5

Preserve Management Area 4 Trails

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10.0 COMPATIBLE USES

The three following land uses and activities are considered compatible with the biological objectives of the Chula Vista MSCP Subarea Plan (City of Chula Vista 2003) and will be allowed within the PMA. These compatible uses are based on Section 6.2 of the Subarea Plan (City of Chula Vista 2003) and are modified to be site-specific to PMA 4.

10.1 Public Access and Recreation

Recreational activities consistent with the goals of the MSCP Subregional Plan and Section 6.2 of the Chula Vista MSCP Subarea Plan and permitted within the PMA are as follows.

1. Limited public access and passive recreation are permitted uses within the PMA. Trails are permitted pursuant to and consistent with the provisions of Section 6.3.2 of the Chula Vista MSCP Subarea Plan. Access points, new trails and facilities, and control of public access will be consistent with the City Planning Component Framework Management Plan (Section 7.5 of the Subarea Plan; City of Chula Vista 2003) and the area specific management directives. The Appropriate Managing Entity, as defined by the Subarea Plan (i.e., the City or the Habitat Manager) is authorized to close selected areas of the Preserve to public use, temporarily or permanently, if public access has resulted in or is expected to result in significant negative impact to sensitive species. Closures to public access may also occur during breeding seasons a if deemed necessary by the Appropriate Managing Entity.

2. Litter and trash removal, maintenance, repair, refurbishment, and replacement of structures in existing locations, trails, and roads are allowed as needed. These activities will be provided through PMA management programs identified in the Subarea Plan.

3. In order to allow passive recreational opportunities for the public, and ensure continued habitat values, riding and hiking trails will be allowed within the PMA only when consistent with Section 7.5.3 of the MSCP Subarea Plan. Passive recreation includes hiking, bird watching, and, under specified locations identified in approved projects and/or area specific management plans, mountain biking and horseback riding. Equestrian use, hiking, and bicycles may be allowed when in accordance with the Subarea Plan as determined by the Appropriate Managing Entity.

4. Some areas of the PMA may remain in private ownership. The owners of these areas may fence these areas of the PMA to deter trespassing with appropriate City permits, if applicable. Any new fencing on private or public PMA lands must not significantly adversely affect the full functioning of the PMA and must not significantly impede wildlife movement.

5. The public access to finger canyons will be limited through fencing or other appropriate barriers and signage.

10.2 Preserve Management, Scientific, and Biological Activities

All scientific research related to habitat conservation, monitoring, and habitat restoration and enhancement activities are permitted within the PMA, subject to approval by the City and/or Appropriate Managing Entity, as applicable, including obtaining any necessary permits. All such activities must be consistent with the MSCP Subarea Plan. This includes any conditions associated with 401 certifications, U.S. Army Corps of Engineers 404 permits, State of California 1600 permits, or other resource conservation permits. In addition, reasonable access will be provided to the wildlife agencies for the purposes of monitoring species and habitat and evaluating compliance with the permit.

Any take resulting from management and/or scientific activities undertaken pursuant to Section 7.0 of the MSCP Subarea Plan, including Section 7.5—City Planning Component Framework Management Plan—and the Otay Ranch RMP (Appendices D, E, and/or F), and/or pursuant to area specific management directives prepared pursuant to this Subarea Plan, will be authorized by the Take Authorizations. All of the above activities should be carried out under a regional program implemented by the wildlife agencies, City of Chula Vista, or Habitat Manager.

10.3 Emergency, Safety, and Police Services

The interface between current and future urban development and the PMA requires increased coordination between the Habitat Manager and agencies responsible for public safety and enforcement of immigration laws. The PMA must accommodate access for emergency response, fire control and management, and enforcement of immigration laws.

All law enforcement agencies will be allowed access to the PMA, as necessary, to enforce the law. All medical, rescue, and other emergency agencies are allowed access to the PMA to carry out operations necessary to the health, safety, and welfare of the public. In PMA areas managed by the City or the City's authorized representative, the City should allow emergency repairs to infrastructure to be made by the involved agency, consistent with normal practices and with federal and state take authorization in conformance with existing federal and state laws.

If permanent damage is caused to PMA habitat, due directly to the action(s) of City emergency crews, the City will revegetate disturbed and/or destroyed habitat or will mitigate pursuant to the Subarea Plan. Impacts will be quantified by the Habitat Manager. Law enforcement and fire control agencies, the National Guard, the Immigration and Naturalization Service (INS), the Border Patrol, and organizations and agencies operating within the PMA are subject to all applicable requirements of federal

and state law. The MSCP Subregional Plan and the Subarea Plan will create no additional permit requirements beyond those of existing federal and state law for the activities of these agencies.

11.0 ADMINISTRATION AND MANAGEMENT STRUCTURE

11.1 Adaptive Management

Adaptive management strategies need to be developed by the Habitat Manager and used to deal with inevitable successional changes in the absence of fire, climate change, and for unforeseen circumstances. Adaptive management can include management/control of selected native species, particularly lemonadeberry, so that this large shrub species does not become overly dominant.

Because the PMA is situated within urban Chula Vista, the biological resources will need to be actively managed to ensure the long-term persistence of covered species. Research has shown species diversity in fragmented habitat patches decreases with time (Soule et al. 1988 and 1992). Observation of canyon systems in the San Diego area, over a 30- to 40-year period shows that, in the absence of active management, that formerly common species that are not tolerant of human-related disturbance will disappear over time (Dodero pers. obs.).

The long-term habitat management challenge will be to adaptively manage the biological resource in a way that maximizes the chances that they will persist. Preserve monitoring efforts are designed to provide the Habitat Manager with the necessary data to detect changes in habitat quality and function over the long-term. Repeat photography, as funding allows, at selected locations within each PMA subunit will be the most cost effective tool for detecting the inevitable changes that will occur as vegetation communities.

Broad goals of adaptive management are:

- Monitor for changes in native vegetation community composition, in particular changes that negatively affect covered species including narrow endemic plants.
- If significant changes in habitat quality are detected and these changes are affecting covered species in a negative manner (i.e., population numbers are declining) review potential management actions that can reverse trends of population decline.
- Respond to changes through implementation of adaptive management strategies such as native shrub control, rare plant propagation and reintroduction; and focused weed control programs that increase the likelihood of long-term persistence of covered species.

11.2 Habitat Manager

The City will designate an individual to implement the Chula Vista MSCP Subarea Plan Preserve management programs. The Habitat Manager should have the following experience and capabilities:

- Demonstrated experience managing biological resources, including endangered species.
- Demonstrated ability to interact effectively with local and regional conservation agencies, recreational agencies, and the local community.
- Demonstrated ability to coordinate continued monitoring efforts of the Preserve's flora and fauna.
- Demonstrated ability to efficiently manage personnel and finances.
- The ability and willingness to cooperate with local and regional agencies and direct experience in working with governing boards and/or advisory committees representing such agencies.

The Habitat Manager would be expected to implement management directives, seek additional funding for Preserve management, monitor population trends of covered species and invasive exotic species, use adaptive management strategies as conditions on the Preserve evolve, and coordinate public outreach activities.

11.3 Maintenance, Usage, and Development Guidelines

The open space in PMA 4 will be open to the public. In addition, utility easements and facilities need regular maintenance and improvement. The following guidelines are provided for public safety and for protection of native habitat and wildlife while preserving the natural park experience for everyone. If any maintenance activity adversely impacts natural or cultural resources, mitigation will be required in accordance with the City of Chula guidelines and any other applicable regulations.

11.3.1 Utilities Operation and Maintenance

11.3.1.1 San Diego Gas & Electric

San Diego Gas & Electric (SDG&E) has developed a Subregional Natural Community Conservation Plan (SDG&E 1995) designed to provide long-term conservation of habitats and species while allowing SDG&E to develop, install, maintain, operate, repair, and replace facilities on public and private land within the subregional plan area, including land set aside for the protection of plants and animals.

Implementation of SDG&E's Subregional NCCP is independent of the MSCP Subregional Plan and other plans such as the Subarea Plan. Therefore, SDG&E may conduct necessary operations, maintenance, repair, and replacement activities for all facilities that are or may be located within the PMA, provided the activities are conducted in accordance with the Subregional NCCP. However, many projects will require California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) review, such as projects that are subject to permits from the California Public Utilities Commission, Coastal Commission, Energy Commission, State Lands Commission, and several other state and federal agencies.

11.3.1.2 City of Chula Vista

Existing City utilities and associated infrastructure in the Preserve should be managed and maintained according to the provisions and guidelines of Section 6.3.3 of the MSCP Subarea Plan.

12.0 ANNUAL COSTS FOR MANAGEMENT DIRECTIVES IMPLEMENTATION

12.1 Annual Cost Estimate for Management Directives

The budget and funding generated within the Central City Community Facilities Districts (CFDs) and Open Space Districts (OSDs) is set aside for the following tasks. Any additional Preserve maintenance and monitoring activities required within the Central City Preserve would be implemented as funding is available.

OSD/CFD Management Tasks:

- Landscape maintenance
- Trash collection and disposal
- Limited fire clearance and encroachment (shrub thinning)
- Regulation off-road-vehicle use within the Preserve
- Preserve signage and fencing maintenance

Table 23 presents the annual estimated Preserve management funding cost including the labor breakdown.

12.2 Funding Mechanism Recommendations

12.2.1 Current Funding

City funding for primary Preserve management is to be adjusted annually consistent with the Consumer Price Index (CPI). The City estimates that the average expenditure for

TABLE 23
PRESERVE MANAGEMENT FUNDING FOR CENTRAL CITY PMA 4

Priority 1—General Management Directives

Total funds available:	**310 acres @ $54/acre**	**$16,740**

Preserve Tour (Quarterly and as needed)

- Tour Preserve to ensure access controls are in place, identify areas requiring major refuse removal and trail and fence maintenance
- Tour edge areas and other priority areas identified as concerns for invasives

Habitat Manager	24 hours	$50.00/hour	4 x /year	$4,800	
					$4,800

Litter Removal and Trail and Fence Maintenance (Quarterly and as needed)

- Remove litter and/or dumping
- Repair and maintain trails, fencing, and signage as needed
- Implement any necessary security programs to enforce “no tresspassing” rules, curtail illegal activities and activities that may degrade resources

Labor	48 hours	$25.00/hour	4 x /year	$4,800	
Habitat Manager	4 hours	$50.00/hour	4 x /year	$800	
Miscellaneous Expenses				$490	
					$6,090

Limited Weeding along Preserve/Urban interfaces (Annual)

- Arrange and conduct weed removal in areas identified as invasive weed concerns
- Notify homeowners’ association(s) of any invasive species planting violations or other issues

Labor	100 hours	$25.00/hour	1 x /year	$2,500	
Habitat Manager	12 hours	$50.00/hour	1 x /year	$600	
Miscellaneous Expenses				$500	
					$3,600

TABLE 23
PRESERVE MANAGEMENT FUNDING FOR CENTRAL CITY PMA 4
(continued)

Annual Report

- Annual report of activities
- Annual accounting of budget expenditures
- Qualitative reporting of Preserve status and summary of photo surveys, if available
- Summary of available quantitative biological information, incidental sightings of covered plant and animal species
- Adaptive management program summary for upcoming year

Report production	16 hours	$25.00/hour	1 x /year	$400	
Habitat Manager	32 hours	$50.00/hour	1 x /year	$1,600	
Miscellaneous Expenses				$250	
					$2,250

Total Priority 1	**$16,740**

Priority 2—Biological Surveys and Restoration

Total funds available:	**310 acres @ $10/acre**	**$3,010**

Brush Management (Once every three years)

- Evaluate the need for and conduct brush management measures

Labor	96 hours	$25.00/hour	0.3 x /year	$720	
Habitat Manager	24 hours	$50.00/hour	0.3 x /year	$360	
Miscellaneous Expenses				$250	
					$1,330

Narrow Endemic Quantitative Surveys (Once every five years)

- Conduct GPS census surveys of reference locations of narrow endemics

Habitat Manager/ Biologist	24 hours	$50.00/hour	0.2 x /year	$240	
					$240

TABLE 23
PRESERVE MANAGEMENT FUNDING FOR CENTRAL CITY PMA 4
(continued)

MSCP Covered Wildlife Species Quantitative Surveys (Once every five years)

- Conduct focused surveys for MSCP covered wildlife species, particularly coastal California gnatcatcher

Habitat Manager/ Biologist	24 hours	$50.00/hour	0.2 x /year	$240	
					$240

Photo point Surveys/Spring Qualitative Surveys (Once every five/ten years)

- Establish permanent photo points in targeted areas (narrow endemic species locations, problem weed areas, and native vegetation areas adjacent to problem weed areas) and take baseline photos
- Every five years, photodocument narrow endemic species photo point locations
- Every ten years, photodocument problem weed areas and native vegetation areas adjacent to problem weed areas

Habitat Manager	24 hours	$50.00/hour	0.2 x /year	$240	
			0.1 x /year	$120	
Miscellaneous Expenses				$110	
					$470

Targeted Weed Eradication (Once every three years)

- Evaluate the need for and conduct targeted weed eradication measures

Labor	80 hours	$25.00/hour	0.3 x /year	$360	
Habitat Manager	8 hours	$50.00/hour	0.3 x /year	$120	
Miscellaneous Expenses				$250	
					$730

Total Priority 2	**$3,010**

NOTE: Additional Priority 2 management directives identified in Section 5.0, such as drainage, culvert, and desiltation basin maintenance; flood control measures; habitat connectivity; and public outreach/education, will be pursued as funding becomes available.

management in the Central City Preserve is approximately $54.00 per acre for fiscal year 2002.

General management and maintenance activities of the Central City Preserve is funded by various financing mechanisms including Open Space Districts (OSDs), Landscape Lighting and Maintenance Districts (LLMDs), Community Facilities Districts (CFDs), collectively referred to as the Central City districts, and the Biological Enhancement Program (BEP).

The Central City districts currently fund the following Priority 1 general maintenance tasks:

- Trash, debris, and other solid waste removal;
- Trail and fence maintenance;
- Security program implementation to enforce access issues and curtail illegal activities;
- Limited weeding along Preserve/urban interfaces; and
- Brush management along urban canyon edges.

Funding available from the Central City districts does not provide for restoration activities. In order to enhance the current levels of Preserve management throughout the Central City Preserve, the City will institute the Biological Enhancement Program. For as long as the City has Take Authority, the BEP will increase the average per-acre budget in the Central City Preserve by approximately $10.00 per acre, to a total average of $64.00 per acre, exclusive of administrative costs. These monies will fund additional management activities identified and prioritized to fulfill the conditions of coverage as set in the MSCP Subarea Plan.

12.2.2 Recommendations

12.2.2.1 Volunteer Services

In order to minimize the monetary costs of routine, simple maintenance tasks such as litter removal, the Habitat Manager is encouraged to participate in local, subregional, or regional programs that promote and feasibly use volunteer services. Continual volunteer programs may be established, such as “Friends of the Canyon”-type groups common throughout urban San Diego County. These groups would allow students, residents, and organizations the opportunity to volunteer and aid the Habitat Manager in the maintenance of the open space, and allow maintenance and management funds to be used for other Priority activities. Volunteers could assist with tasks such as weeding,

native species planting, and trash removal. Pesticide application is not an appropriate volunteer task, as an application license is required.

Volunteering can be encouraged through public outreach, as discussed in Section 9.0 of Attachment C. Literature may be distributed to residents, schools, and other organizations within or adjacent to the PMA. Additionally, potential volunteer opportunities may be offered to conservation organizations such as the Chula Vista Nature Center, San Diego Canyon Coalition, the San Diego Field Ornithologists, and the San Diego chapters of the National Audubon Society and Sierra Club.

12.2.2.2 Grants and Other Funding Sources

The Habitat Manager is encouraged to actively pursue funding sources in excess of the mandated BEP funds. Additional funding sources may include federal, state, regional, local, and private programs and grants.

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ATTACHMENTS

ATTACHMENT A

Literature Reviewed

Attachment A
Literature Review

A review of existing literature relevant to the Central City Preserve Management Areas was conducted. Literature reviewed included, but was not limited to the documents listed below.

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ATTACHMENT B

Covered Plant Species Photographs

Otay tarplant (*Deinandra conjugens*)

San Diego thornmint *(Acanthomintha ilicifolia)*

Snake cholla
(*Cylindropuntia californica* var. *californica*)

Variegated dudleya *(Dudleya variegata)*

San Diego barrel cactus
(Ferocactus viridescens)

Orcutt's bird's-beak *(Cordylanthus orcuttianus)*

ATTACHMENT C

Management Directive Descriptions

Attachment C
Management Directive Descriptions

1.0 ADJACENCY MANAGEMENT ISSUES AND EDGE EFFECTS

"Edge effects" is a general term for a variety of impacts to natural communities across a boundary with a modified landscape, such as agricultural fields or urban development. In scrub communities in an urbanizing matrix, edge effects result primarily from the impacts of human activities and influences, rather than changes in physical environmental processes. Edge effects reduce the effective size of preserves by reducing the area in which ecological processes continue without substantial modification. Further details are provided below.

1.1 Measures to Reduce Adjacency Issues and Edge Effects

1.1.1 Priority 1

- Enforce, prevent, and remove illegal and unauthorized intrusions into the Preserve on an annual basis, as well as on a complaint basis.
- Install barriers (fencing, rocks/boulders, appropriate vegetation) and/or signage where necessary to direct public access to appropriate locations.

1.1.2 Priority 2

Disseminate educational information to residents and landowners adjacent to the Preserve to heighten awareness of the Preserve's goals and purpose, and inform residents of access, appropriate plantings, construction, or disturbance within the Preserve boundaries, pet and livestock control, fire management, and other adjacency issues.

2.0 LITTER, MATERIALS STORAGE, AND ILLEGAL ACTIVITIES

Five Priority 1 management items have been identified in the MSCP Subarea Plan:

- Remove litter and trash on a regular basis, post signage to prevent and report littering in trail and road access areas, and provide and maintain trash cans and bins at trail access points.
- Impose penalties as applicable for littering, dumping, and violations of leash laws. Fines should be sufficient to prevent recurrence, cover reimbursement of costs to remove and dispose of debris, restore the area if needed, and pay for enforcement staff time.

- Prohibit permanent storage of materials (e.g., equipment and hazardous/toxic chemicals) within the Preserve and ensure appropriate storage per applicable regulations in any areas that may impact the Preserve due to potential leakage.

- Keep wildlife corridor crossings within the Preserve free of debris, trash, vagrant encampments, and all other obstructions to wildlife movement.

- Monitor Preserve areas to prevent illegal or unauthorized activities, such as vagrant encampments, off-road-vehicle use, illegal plant harvesting, and so on.

3.0 BIOLOGICAL MONITORING

The purpose of biological monitoring in the Preserve is to provide data that will allow the detection of significant changes in the status of the covered species. If, over the course of a number of years, the Preserve populations show a significant decline, adaptive management will be used to devise and implement remedial measures to reverse the decline.

A significant decline in any of the listed species that are the subject of the biological monitoring should be defined as greater than 50 percent reduction in the number of individuals or the relative percent cover over a period that includes at least two criterion years. To qualify as a criterion year, the rainfall that year must equal 70 percent of the historic average yearly rainfall.

Biological monitoring costs will vary each year as a result of the type and frequency of monitoring required. In years when extensive monitoring and reporting occurs, less money may be spent on routine maintenance and vice versa. Intensive monitoring has been temporally spaced to allow the bulk of the budget in most years to be spent on maintenance and management activities that directly benefit the species. Reserves accumulated from years in which less activity occurs carry forward to future years and provide opportunity for Priority 2 tasks such as intensive monitoring and census of species.

4.0 EXOTIC AND INVASIVE PLANTS SPECIES CONTROL AND REMOVAL

The purpose of this section is to describe an adaptive management strategy for removing and controlling existing populations of exotic plant species and measures to prevent the establishment of new exotics throughout the preserved open space. Controlling exotic weed populations contributes to meeting the Conditions of Coverage for MSCP Covered Species by maintaining or improving habitat quality and reducing edge effects.

4.1 Priority 1

- Do not introduce invasive non-native species into the Preserve. Encourage adjacent residents to voluntarily remove invasive exotics from their landscape.

- Direct priority funding to the monitoring and removal of invasive non-native plant species within the Preserve consistent with recommendations in this ASMD and pursuant to specific species requirements outlined in Table 3-5 of the MSCP Subregional Plan.

- Adopt and implement a SUSMP, pursuant to requirements as a co-permittee of the RWQCB NPDES permit, to minimize impacts to existing year-round runoff flow within the Preserve to the extent feasible in order to minimize potential invasion from non-native ant species.

4.2 Priority 2

- Provide information on invasive plants and animals harmful to the Preserve and prevention methods to Preserve visitors and adjacent residents.

- Use trained volunteers to monitor and remove exotic species as part of the Preserve, neighborhood, community, school, or other organizational programs. If done on a volunteer basis, prepare and provide information on methods and timing of removal to staff and to the public if requested.

- If eucalyptus trees or other non-native trees die or are removed from the Preserve area and are replaced, use appropriate native species. Ensure that eucalyptus trees do not spread into new areas nor increase substantially in numbers over the years. Eventual replacement by native species is preferred if locations are not being used as raptor nesting sites.

- Work with the California Department of Agriculture and/or University research specialists to develop an affirmative approach to limit the potential for invasion of non-native ant species into the Preserve.

5.0 DRAINAGES, CULVERTS, AND DESILTATION BASIN MAINTENANCE

Major drainages and channels are defined here as either natural or artificial channels that provide a course for the flow of water, whether that flow is continuous or intermittent. These drainages occur in the canyon bottoms and are often associated with riparian vegetation.

Culverts are structures that allow the flow of water along the ground level or a drainage structure that extends across or beneath roadways, canals, or embankments. Culverts are used for both roadway drainage and for channel crossings. Culverts are made of a

variety of materials, including corrugated metal pipe, concrete, and plastic. They also come in a variety of shapes, including round, box, and arch. End sections are often placed on culverts to control and enhance the entrance and exit hydraulic conditions. Often times, larger culverts contribute to wildlife movement. The locations of culverts and potential wildlife movement areas are shown on Figures 5a through 5m in the Baseline Biological Resources Report.

Desiltation basins, for the purposes of this document, are man-made structures that are able to reduce the velocity of moving water with a resulting deposition of silt particles onto the bottom of the basin or behind the structure. The locations of desiltation basins are shown on Figures 5a through 5m in the Baseline Biological Resources Report.

Sewer alignments traverse various subunits. Access roads and areas for maintenance are situated on or adjacent to the sewer alignments. These maintenance roads and areas are depicted on Figures 5a through 5m in the Baseline Biological Resources Report.

The Public Works Operations Department uses existing trails and SDG&E easements for maintenance access of drainages, culverts, sewer alignments, storm drain systems, and desiltation basins. The maintenance of these features should be under the direction of the Public Works Operations Department according to the provisions set in the existing permits. When renewing or applying for permits, the Public Works Operations Department should coordinate with the Habitat Manager to ensure that the needs of both parties are met.

6.0 FLOOD CONTROL

Flood control within the PMA is a conditionally compatible use according to the Subarea Plan (City of Chula Vista 2003). The following guidelines are from Section 6.3.2 of the Subarea Plan, with site-specific modifications.

Except as provided for in Section 6.3.3—Roads and Infrastructure—of the Subarea Plan, flood control within the PMA should be limited to existing agreements with the wildlife agencies unless demonstrated to be needed pursuant to a habitat restoration plan or any other City plan for controlling U.S. waters. Floodplains within the PMA should remain in a natural condition and configuration in order to allow for the ecological, geological, hydrological, and other natural processes to proliferate or be restored.

Except as provided for in the Subarea Plan, no berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the PMA unless approved by all appropriate agencies and adequately mitigated. Review must include impacts to upstream and downstream habitats, flood-flow volumes, velocities and configurations, water availability, and changes to the water table level.

In addition, except as provided for in the Subarea Plan, no riprap, concrete, or other man-made material should be used to stabilize river, creek, tributary, and channel banks within the PMA unless approved through a U.S. Army Corps of Engineers Section 404 permit and/or State of California 1600 agreement. All river, stream, and channel banks should be constructed with natural materials and bank stabilization should be constructed using natural, native plantings.

In the Subarea Plan, Priority 1 management guidelines for flood control are as follows:

- Perform standard maintenance, such as clearing and dredging of existing flood channels and cleaning desiltation basins outside the nesting or breeding seasons (approximately March 15 through June 31) of sensitive bird or wildlife species utilizing the riparian habitat. Standard maintenance should be performed to minimize any impacts to habitat and limited to tasks required to maintain the channel in a state that can adequately carry anticipated water quantities. Standard maintenance activities include repairing erosion damage, removing excess silt and debris, and repairing damaged fences or channel structures. New drainage channels should be designed to replicate, to the maximum extent possible, natural flows, and require as little ongoing maintenance as possible. All activities in drainages will be evaluated for conformance with federal and state wetland permitting regulations. If required by law, federal Clean Water Act, Section 404 and/or state Fish and Game Code Section 1600 et seq. permits will be obtained.

- Implement the Regional Water Quality Control Board (RWQCB) National Pollutant Discharge Elimination System (NPDES) Permit.

7.0 PUBLIC ACCESS, TRAILS, AND RECREATION

The following Priority 1 management directives from Section 7.5.3 of the MSCP Subarea Plan provide guidance in monitoring and managing public access, trails, and recreation.

- Incorporate into the City's Greenbelt Master Plan the following: location of all trails within the Preserve; guidelines for trail construction; and guidelines for design of hiking and equestrian staging areas.

- Develop all new recreation facilities in or adjacent to the Preserve consistent with the adjacency guidelines found in Section 7.5.2 of the MSCP Subarea Plan.

- Locate trails, view overlooks, and staging areas in the least sensitive areas of the Preserve, particularly away from known locations of Narrow Endemic species. Locate trails along the edges of urban land uses adjacent to the Preserve, or the seam between land uses (e.g., agriculture/habitat) and follow existing dirt roads as much as possible rather than entering habitat or wildlife movement areas. Avoid

locating trails between two different habitat types due to the typically heightened resource sensitivity in those locations.

- In general, avoid paving trails unless management and monitoring evidence shows otherwise. Clearly demarcate and monitor trails for degradation and off-trail access and use. Provide trail repair/maintenance as needed. Undertake measures to counter the effects of trail erosion including the use of stone or wood crossjoints, edge plantings of native grasses, and mulching of the trail.

- Minimize trail widths to reduce impacts to critical resources. To the maximum extent practicable, do not locate new trails wider than four feet in core Preserve areas or wildlife corridors. Where trails are planned in concert with sewer or water utility easements, the trail width should consider the easement requirements for the utility. Trails should not be encouraged within SDG&E easements. Provide trail fences or other barriers at strategic locations when protection of sensitive resources is required.

- Limit the extent and location of equestrian trials to the less sensitive areas of the Preserve. Locate staging areas for equestrian uses at a sufficient distance (e.g., 300 to 500 feet) from areas with riparian and scrub habitats to ensure that the biological values of the Preserve are not impaired.

- Limit the access to finger canyons through signage, fencing, or other appropriate barriers.

- Provide sufficient signage to clearly identify public access to the Preserve. Barriers such as vegetation, rocks/boulders, or fencing may be necessary to protect highly sensitive areas. Use an appropriate type of barrier based on location, setting, and use. For example, use chain link or cattle wire to direct wildlife movement, and natural rocks/boulders or split-rail fencing to direct public access away from sensitive areas. Lands acquired through mitigation may preclude public access in order to satisfy mitigation requirements.

- Off-road-vehicle activity is an incompatible use in the Preserve and should be prohibited.

- Restore areas disturbed by off-road vehicles to native habitat where possible or critical, or allow vegetation to regenerate.

7.1 Existing Trails

Existing trails throughout the PMA 4 open space are made up of narrow footpaths; wide trails used by bicycle and horseback riders; SDG&E easement access roads; and sewer, storm drain, and desiltation basin access roads (Figure C-1).

7.2 Trail Uses

A variety of uses will be allowed throughout the trail systems on the PMA. Recreational activities will include hiking, equestrian, and mountain biking on the multi-use trail system. When trails encounter sensitive resources, fencing will provide protection and prevention of degradation to these areas. Recreation on the PMA consists of primarily passive activities, such as jogging, hiking, bicycling, horseback riding, nature appreciation, and wildlife watching. When domestic animals are brought on the Preserves, they should be constrained (leashed) at all times and cleaned up after by the owner.

7.3 Trail Maintenance, Rerouting, and Decommissioning

This information is intended to serve trail maintenance crews. There are a number of variables that contribute to trail construction and maintenance, making this an inexact science. The location of the trail, soil type, climate, and applied usage to the trails all contribute to its unique needs. There are general guidelines, however, when adhered to that can greatly reduce or prevent trail degradation and minimize maintenance expenses.

7.3.1 Trail Rerouting and Decommissioning

Trails located adjacent to sensitive resources identified in the baseline biological report should be evaluated by the Habitat Manager for possible rerouting or decommissioning. Any proposed trail closures must be reviewed and coordinated with trail efforts in the City.

Trail rerouting is beyond the responsibilities of a trail maintenance crew. New trail alignments must be flagged by experienced park staff and then reviewed by resource specialists for compliance with the California Environmental Quality Act (CEQA). Trail maintenance crews can provide valuable assistance by alerting park staff to those trail routes that may need to be rerouted.

7.4 Trail Monitoring and Management

Trail monitoring is extremely important in evaluating environmental impacts resulting from a variety of uses on the trails. Some activities will impact the integrity of the trails more so than others, and will need to be actively monitored more closely. It is therefore

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PMA 4
Other PMAs
PMA subunits
Trails

FIGURE C-1
PMA 4 Trails

beneficial to track when activities occur more frequently than others (there may be seasonal differences). Impacts from foot and bicycle traffic along trails should be monitored in areas adjacent to narrow endemic plant populations including Otay tarplant, San Diego thornmint, variegated dudleya and snake cholla.

The best application of regulations will come from regular patrolling by the Habitat Manager combined with effective education and an active monitoring program. Trail monitoring provides organizations and individuals a sense of what is occurring in the open space and a method to document degradation and damage to public lands.

8.0 HABITAT CONNECTIVITY

Roads that separate subunits decrease the habitat connectivity in PMA 4, particularly Otay Lakes Road, Corral Canyon Road and East H Street. Another factor that decreases habitat connectivity is the presence of disturbed or non-native vegetation on the edges of adjacent subunits.

To enhance habitat connectivity, based on the availability of funding, areas of disturbed vegetation in immediate proximity to road edges could be weeded and revegetated with native species. Potential areas for habitat connectivity enhancement are between the following groups of subunits: 4-2a and 4-2b, 4-3c and 4-3d, 4-3d and 4-2b, 4-2b and 4-2c, and 4-2c and 4-2d.

9.0 PUBLIC OUTREACH AND EDUCATION

Interpretation and education has become a widespread management tool of natural resources as it has the capacity to reduce inappropriate behavior voluntarily through education (Black 2002). The level and type of education and interpretation will depend on the needs, interests, and expectations of the visitor and may include a wide range of interpretive media, including pamphlets or newsletters and signage within the Preserve. As funding becomes available, the following management measures are recommended:

- Distribute literature to residents adjacent to Preserve open space and local schools and organizations that serves to remind the community of the open space, its protected status, reasons for its establishment and ongoing existence, information on regional open space happenings, and any other information deemed pertinent by the Habitat Manager.

- Install signs at Preserve entrances and/or trail heads that are interpretive of the open space, and cover such topics as purpose, ecological descriptions, common species, and importance of the open space in and of itself and as a part of the Subregional system. Signs should also include information such as herbicide use dates, rattlesnake warnings, scheduled trail repair or maintenance, and other items of concern. Signs informing the public about restrictions to protect the Preserves should

be posted at trailheads. Restrictions include activities such as littering, allowing off-leash pets, harassing or killing endangered or other animals, fires, poaching, removing reptiles as pets, and removal of plant material. Other advisory signs could encourage visitors to pick up trash and to notify the Habitat Manager of violation.

10.0 FENCING RECOMMENDATIONS

If funding is available, permanent fencing preventing human foot and bicycle traffic may be placed at appropriate locations, such as populations of narrow endemic plant species (see Figures 5a through 5m in the baseline biological resources report), on the Preserves to limit the amount of human disturbance to the habitat, and control access as needed. The Preserve Habitat Manager should assess the need for fencing where trails are adjacent to or bisect narrow endemic plant habitat. The Habitat Manager should monitor for signs of trespass or fence damage during the quarterly Preserve tour.

At major hiking and equestrian trailheads, where necessary and as funding permits, barrier posts should be placed in the trail to prevent motorized vehicles from entering the trail while allowing hikers and horses to pass through.

ATTACHMENT D

PMA 4 Ranking Worksheet

PMA 4										Subunits									
	Ranking Criteria	4-1a	4-1b	4-1cE	4-1cW	4-1dN	4-1dS	4-1e	4-1f	4-1g	4-1h	4-2a	4-2b	4-2c	4-2d	4-3a	4-3b	4-3c	4-3d
Total Subunit Acreage		42.7	5	8.5	4.2	1.4	15.3	4.5	12.6	9.9	5	57.9	100.4	15.7	9.4	5	3	5.5	4.3
Maritime Succulent Scrub	> 50 acres high; 20-50 acres mod	8.4					12.1	1.9	3.6				**57.6**			5	3		
Disturbed Maritime Succulent Scru	none			0.3	1														
Coastal Sage Scrub	> 50 acres mod; 20-50 acres low		5	7.3	3.2	0.5		2.4	9	3.1	5	49	27.4					5.5	3.4
Disturbed Coastal Sage Scrub	none	4.6		0.6		0.4								8.1					
Native Grassland	relative: > 5acres; 2-5 acres; 0-2 acres	1.9										4.8							
Disturbed Native Grassland	relative: > 5 acres; 2-5 acres; 0-2 acres													2.8					
Non-native Grassland	> 10 acres low	27.8					0.3			6.8		1.2		1.6					
Southern Willow Scrub	< 1 acre mod; > 1 acre high											1.2	10.9	2.2					
Mule Fat Scrub	< 1acre mod; > 1 acre high							0.2						1	0.9				
Freshwater Marsh	< 1acre mod; > 1 acre high																		
Tamarisk Scrub	none						0.9								0.8				
Eucalyptus Woodland	none											0.2							
Disturbed	none			0.3		0.5	2					0.2	4.5		7.7				0.9
San Diego Thorn-mint	Very high priority species				**500**								75						
California Adolphia						P	P	P	P										
Small-flowered Morning Glory		1000	P		P							1000s	P						
Orcutt's Bird's-beak	MSCP covered species = low									P									
Snake Cholla	≥ 30 = high ; < 30 = mod				P														
Otay Tarplant	high priority species	**30,000**			**50**							**P**	**P**						
Variegated Dudleya	moderate priority species											50							
San Diego Barrel Cactus	> 50 individuals to register	P		P			P	P	P	P	142								
Palmer's Grapplinghook	> 100 individuals mod; 10-99 individuals low	150	100		30							1000	P						
Graceful tarplant	none										1								
Decumbent Goldenbush	none								25					75					
San Diego Sand Aster	none	P	P		P		P	P	P	P	P	P	P	P	P	P			P
Munz's Sage	none								P		35								
San Diego County Viguiera	none	P	P	P	P	P		P	P			P	P	P				P	P
Orange-throated Whiptail	MSCP covered species = low	P											P						
SD Horned Lizard	MSCP covered species = low												P						
Red Diamond Rattlesnake	none	P											P						
Double-crested Cormorant	none		P																
White-tailed Kite	none									P	P								
Northern Harrier	MSCP covered species = low									P									
Cooper's Hawk	MSCP covered species = low; moderate priority for nesting	P										P	P						
Swainson's Hawk	MSCP covered species = low							P											
American Peregrine Falcon	MSCP covered species = low	P																	
Coastal Cactus Wren	very high priority species	**P(N)**										**P**	**P (N)**						
California Gnatcatcher	≥ 5 individuals = high; < 5 = mod	3		2			1	1	2		2	2	**10 (N)**	1			2		
Least Bell's vireo	high priority species												**P**						
Yellow-breasted Chat	none												P						
Yellow Warbler	none												P					P	
Southern California rufous-crowned sparrow	MSCP covered species = low										P		P	P					
Mule Deer	MSCP covered species = low; recognition for only location									P			P						
Ranking using 8,3,1 System		25	0	4	19	0	4	8	4	7	7	35	55	18	3	0	3	0	0
Priority order		**3**	**15**	**11**	**4**	**18**	**9**	**6**	**10**	**7**	**8**	**2**	**1**	**5**	**12**	**16**	**13**	**14**	**17**
High Priority (8 points)																			
Moderate Priority (3 points)																			
Low Priority (1 point)																			
P = Present																			
N = Nesting																			
Boldface = MSCP Covered Species																			