CARLSBAD OPEN SPACE MANAGEMENT PLAN

1.0 INTRODUCTION: OSMP PROCESS AND STRUCTURE

The OSMP is the framework plan to implement the Carlsbad Habitat Management Plan (HMP) that was developed, along with the Multiple Habitat Conservation Plan (MHCP), with the input of the wildlife agencies, the Coastal Commission, and the public to establish a process, standards, guidelines, and conditions for long-term conservation and management of the sensitive species and habitats within the north coastal portions of San Diego County. These two documents (HMP and MHCP) provide a regulatory context with which the OSMP must maintain consistency. The purpose of the OSMP is:

1. To describe a process and structure for open space management and monitoring in the City of Carlsbad.

2. To identify and describe key open space management issues in the City.

3. To recommend strategies and solutions for effectively handling these open space management issues.

4. To quantify expected management and monitoring costs for implementation of the OSMP.

The information and analysis synthesized during the development of this plan was used to help quantify management and monitoring costs in the Open Space Management Funding Analysis, which is contained in Appendix A. This plan was developed with substantial input from the wildlife agencies, key City of Carlsbad staff (Planning Department, Parks Department, and Police Department), interest groups, and the general public. Appendix B includes a list of people and organizations invited to participate.

The MHCP is a comprehensive, multiple jurisdictional planning program designed to develop an ecosystem preserve in northwestern San Diego County. Implementation of the regional preserve system is intended to protect viable populations of key sensitive plant and animal species and their habitats, while accommodating continued economic development and quality of life for residents of this north county region. The MHCP is one of several large multiple jurisdictional habitat planning efforts in San Diego County each of which constitutes a subregional plan under the State of California's Natural Community Conservation Planning (NCCP) Act of 1991.

The current MHCP study area encompasses approximately 29,962 acres of natural habitat across seven incorporated cities in northwestern San Diego County (Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista). These jurisdictions will implement their respective portions of the MHCP plan through citywide "subarea" plans, which describe the specific implementing mechanisms each city will institute for the MHCP. The seven subarea plans will contribute collectively to the conservation of biological communities and species in the MHCP study area. In turn, the MHCP plan, in concert with other subregional plans, will contribute to continued ecosystem viability in southern coastal California. The Carlsbad HMP, which covers a total of 6,449 acres of open space (5,329 acres of natural habitat), is the MHCP subarea plan for the City of Carlsbad.

The specific biological and conservation objectives of the HMP are to:

- Conserve the full range of vegetation types remaining in the City, with a focus on rare and sensitive habitats.

- Conserve areas of habitat capable of supporting the HMP species in perpetuity.

- Maintain functional biological cores.
- Maintain functional wildlife corridors and habitat linkages within the City and to the region, including linkages that connect gnatcatcher populations and movement corridors for large mammals.
- Conserve rare vegetation communities.
- Conserve narrow endemic species and maintain populations of target species.
- Apply a "no net loss" policy to the conservation of wetlands, riparian and oak woodland habitats throughout the City, and to coastal sage scrub and chaparral within the coastal zone.

Implementation of OSMP will be a critical component necessary for achieving these goals and maintaining compliance with the Implementing Agreement and endangered species take permits for species covered by the HMP and the MHCP. Therefore, compliance with the MHCP and HMP requirements is the first and guiding priority of the OSMP. An MHCP-wide monitoring plan (MHCP Volume III) was developed to provide guidance and direction for management of covered species and their habitats in compliance with the conditions for coverage identified in the biological analysis of the MHCP (MHCP Volume II). The Carlsbad OSMP will need to be consistent with the monitoring and management requirements of the MHCP monitoring plan.

There are three major components to open space management in the City of Carlsbad, (1) monitoring and adaptive management of species, habitat condition, and ecological processes, (2) management of threats and impacts to species and habitats, and (3) creation and maintenance of recreational and educational opportunities. Each of these components raises a number of important open space management issues. Most of these issues are not unique to Carlsbad and have well-established open space management solutions; however, some of these issues will require further thought and consensus from the City, the wildlife agencies, the Coastal Commission, and the interested public before workable solutions can be implemented by this City-wide Open Space Management Plan (OSMP).

The issues addressed in this plan are organized and discussed as they apply across the City, but in practice they will be implemented in the biogeographic and preserve management context of Management Units and Subunits, as defined for the OSMP. Individual preserve managers will identify which management issues affect their particular subunit (preserve area) and will develop and implement area-specific management directives (ASMDs) as a part of their individual preserve management plans, but in coordination with related ASMDs and other management issues throughout the rest of the Management Unit. Note that many ASMDs already exist as they have been stipulated by the conditions for coverage in the MHCP conservation analysis and will be incorporated into individual preserve management plans.

There are three additional categories of land in the OSMP planning area that are not included in the areas identified as preserved within the HMP or MHCP, including other natural lands, developed parks, and drainage basins.

Other Natural Lands – The OSMP covers all of the natural lands in the City (7,345 acres). However, the HMP covers 5,329 acres of natural lands including all existing or proposed preserves (100% conserved) and standards areas (where a portion will be developed according to HMP/MHCP standards and the rest conserved). The remaining 2,015 acres of natural lands (mostly isolated smaller fragments of habitat) were not included in the HMP and MHCP primarily because they did not contribute significantly to the overall preserve design; however, they are included in the OSMP planning area and will continue to be managed as open space.

Developed Parks – Developed parks have been incorporated into the GIS Inventory so that City-wide management can be scheduled, tracked and analyzed in this database. This category includes existing parks as well as parks developed in the future.

Drainage Basins – The City's drainage basin facilities were also incorporated into the GIS Inventory for the OSMP so that management can be scheduled, tracked and analyzed in this database. The drainage basin parcels are included as an overlay because they are sometimes covered by other categories and may overlap with the HMP/MHCP areas.

1.1 Process and Structure for Implementation of the Carlsbad OSMP

This section of the OSMP outlines the basic process and structure for implementation of the OSMP for monitoring, management, oversight, and reporting responsibility. Additionally, there is a description of the calendar of events to facilitate the coordination and timing of periodic meetings and reports, and guidelines for how data will be coordinated, managed and analyzed.

1.1.1 Primary Entities Involved in Implementation

There are six primary entities or general groups involved in implementation of the OSMP, including the City of Carlsbad, their Preserve Steward and Preserve Managers who have direct responsibility for on the ground implementation on a daily basis, and the wildlife agencies, California Coastal Commission, and the broader scientific community, environmental NGOs and the general public who have the responsibility for reviewing and commenting on the associated planning documents, ongoing implementation process, and analysis and reports. A brief description of the roles of these entities follows below.

1. Wildlife Agencies

The wildlife agencies include the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). USFWS and CDFG are responsible for:

- Enforcing compliance by the City of Carlsbad with management and monitoring obligations of their Implementing Agreement and the Carlsbad HMP and MHCP.
- Reviewing Annual Reports and proposed annual work plans, three-year status summary reports, preserve management plans, and other associated management/research activities.

2. California Coastal Commission

The California Coastal Commission's primary mission is to plan for and regulate land and water uses in the coastal zone consistent with the policies of the Coastal Act. With respect to the MHCP and the Carlsbad HMP, the California Coastal Commission is responsible for:

- Overseeing development and HMP implementation in the Coastal Zone.
- Approval of the OSMP as a Local Coastal Plan Amendment.
- Reviewing of Annual Reports.

3. City of Carlsbad

The City of Carlsbad is responsible for:

- Overseeing implementation and maintaining compliance.
- Tracking habitat gains/losses using Habitrak.

- Compliance monitoring (development project review and approval).

- Species and habitat monitoring via the preserve steward and preserve managers.

- Management and maintenance via the preserve steward and preserve managers.

4. HMP Preserve Steward:

The Preserve Steward is a new role that has evolved from the necessity for the City of Carlsbad to have the services of a person with the necessary ecology, conservation biology, and statistics background to oversee the City-wide monitoring, management, and maintenance of the whole OSMP preserve system. The Preserve Steward will play the central role in preserve management, serving as the City's technical expert on preserve management. The preserve steward will be a contracted consultant or City staff person responsible for:

- Taking a leadership role in the overseeing and coordination of City-wide preserve management, monitoring and reporting.

- Frequent communication with the preserve managers, the City, and the wildlife agencies.

- Providing science-based technical guidance and direction to preserve managers for survey design, data collection and analysis.

- Supporting the City on compliance monitoring (review of predevelopment plans and post-construction conformance review) by training and updating City planning staff regarding development standards and guidelines required for development adjacent to preserve areas.

The Preserve Steward will have primary responsibility for coordinating all parties having a role in preserve management, including the preserve managers, City departments, the wildlife agencies, and public interest groups, as shown in Figure 1-1. The Preserve Steward will direct the collection of all monitoring data, review all data and reports, formulate hypotheses regarding the status of species and habitats, consult with other scientists as needed to interpret monitoring data, design and carry out research within the limits of the resources available for management, prescribe adaptive management programs when needed, and prioritize threats to the preserve system and direct management actions accordingly. One of the Preserve Steward's key responsibilities will be to continuously evaluate the effectiveness and efficiency of management activities in view of the resources available, and ensure that the most cost-effective measures are consistently used. When the MHCP structure is formed, the Preserve Steward role should evolve to become a subregional coordinator shared by all MHCP cities having approved plans.

5. Preserve Manager

The Preserve Manager is the person with on the ground responsibility for management and monitoring of each preserve area. Preserve managers may be employees of the City, recognized professional third party biological management entities (e.g., Center for Natural Lands Management), a state or federal agency (e.g., CDFG), or another public/semi-public land management entity (e.g., North County Transit or San Diego Gas and Electric). The preserve manager is responsible for:

- Development of a preserve management plan for each preserve area and updating the plan on a three-year basis.

- Managing individual preserve areas according their individual preserve management plans.

- Monitoring species, habitats, and management actions according to their preserve management plans.

- Coordinating with the preserve steward, other preserve managers, the City, and the wildlife agencies regarding open space management issues, management and monitoring.

- Collection of biological monitoring data according to MCHP-established protocols for preserve area, MHCP-level, and regional monitoring. Submittal of data to the preserve steward and wildlife agencies.

6. Scientific Community, Environmental NGOs and General Public

This last group includes the broader community of individuals and interest groups that play a role in the public process of open space planning and management within the NCCP context. The scientific community, environmental NGOs and general public have the opportunity and/or responsibility for:

- Reviewing Annual Reports.

- Observing actions and identifying issues in preserve areas.

- Providing input to the wildlife agencies, Coastal Commission, and the City as needs arise.

The structure for interaction of the several of these entities is shown in Figure 1-1.

Figure 1-1. Chain of command and decision authority among entities responsible for OSMP implementation.

1.1.2 Preserve Management Decision Authority

Preserve managers will have full budget discretion, within the limits of their funding, to implement preserve management and monitoring on non-City owned properties according to the directives of their preserve management plans and annual work plans. Actions and expenditures not specifically identified in preserve management plans or work plans are allowed if required as a part of a reasonable adaptive management response or to address another emergency situation. However, such unknown future expenditures must be carefully determined since they will likely exceed annual budgets and may reduce funding for future years when funding is supported by an endowment.

For the City-owned land, budgets will be spent according to the directives of their preserve management plans and annual work plans; however, budget discretion would remain with the City for annual approval of these plans and for actions and expenditures not specifically identified in these plans for adaptive management response or to address emergency situations not covered by the annual work plan for City-owned lands.

The preserve steward will assist preserve managers in making the decisions for actions and expenditures not identified in the preserve management plans or annual work plans and will be responsible for obtaining City approval for additional actions or expenditures when required.

If the preserve steward or the wildlife agencies determine that additional budget needs to be spent on a particular task, the preserve manager will comply with this decision. In general, the preserve manager will retain control of the budget and will be in charge of how it is spent.

Initially, the City Planning Department will work closely with the preserve managers and preserve steward to establish a chain of command and communication with the Police Department, Fire Department and other relevant City departments (see Figure 1-1). The Rangers and other employees of the preserve manager will go through an orientation process to understand the limits of their authority and to understand when they will need to call in the Police Department. Eventually, the chain of command and communication will become routine. Through the orientation process the rangers will also learn how to identify activities that are illegal or otherwise not permitted or acceptable uses in or near the OSMP preserve system.

If there is a conflict between the preserve management plans (MHCP, HMP, individual Preserve Management Plans, or annual work plans) and any other public need (such as a trail, sewer line, etc.) the City will evaluate and resolve the conflict as follows:

1. Is the public need a matter of health, safety and welfare, or is it a matter of convenience?
2. Was the project covered in the HMP as a project that would be permitted by the HMP, or is it a new project not previously addressed?
3. Is there a reasonable alternative that would avoid the impact?
4. Is the impact direct or indirect?
5. Is the impact temporary or permanent?
6. Would any covered species in the HMP be affected, directly or indirectly?
7. Can the impact be mitigated to less than significant?
8. Can the impact be mitigated by seasonal restrictions?
9. Would the impact cause an increase in costs or management effort by the preserve manager?

The City and preserve steward would consult with the wildlife agencies on these points and try to arrive at a consensus decision. The preserve steward would make recommendations to the City regarding the decision, but the City would be responsible for the final decision and will evaluate the impacts of this action on covered species or the resources they use in a timely and quantitative manner.

1.1.3 Planning Documents to Guide Implementation

There are several documents that City staff, the preserve steward, and preserve managers must be intimately familiar with. Because the permit duration for incidental take under the City's implementing

agreement is for 50 years and because the preserve system will be conserved and managed in perpetuity, there will be new staff at all levels that will eventually be a part of the implementation process. All current and future staff will be required to read and clearly understand the following documents, some of which will be updated and amended over the years:

1. The *Natural Community Conservation Planning Act* (NCCP) as a component of the *California Endangered Species Act*. This is the state-level legislation that dictates the guidelines for preparation and implementation of conservation plans that contribute to species recovery, such as the MHCP and Carlsbad HMP, and which provides a mechanism for legal incidental take of endangered, threatened, or otherwise sensitive species in California.

2. The *Federal Endangered Species Act* and *Habitat Conservation Planning Handbook*. Section 10(a) of this act and the associated handbook specify how habitat conservation plans, including the MHCP and Carlsbad HMP, should be prepared and implemented to provide for the conservation and management of federally endangered or threatened species, while allowing actions that may take listed species without precluding their recovery.

3. The *MHCP subregional plan* includes policies and guidelines for coordinated implementation across the entire MHCP preserve system. The *MHCP Conservation Analysis* (volume II) includes species-specific conditions for conservation and management. The *MHCP Monitoring Plan* (volume III) includes MHCP-wide guidelines for monitoring and management along with sample standardized survey protocols and data collection sheets. Recommended and required survey protocols will continue to be updated over time; therefore, current survey protocols will be obtained from and confirmed with the wildlife agencies annually.

4. The *Carlsbad Habitat Management Plan* (HMP) and *Implementing Agreement* are the two documents that contain the specific policies, guidelines, and permit conditions for management, monitoring, and reporting of species and habitat status and condition.

5. The *Carlsbad Open Space Management Plan* (this document) provides detailed direction regarding the coordination of entities and individuals responsible for management and monitoring, describes the primary open space management issues and recommended approaches to address those issues, and analyzes the funding requirements for open space management City-wide.

6. Preserve managers will be required to complete an individual *Preserve Management Plan* for each of the preserve areas they manage within one year of the time at which the preserve area is officially dedicated and recorded into the preserve system. The preserve management plans are required to be updated every three years thereafter. A draft update (or initial) preserve management plan is due in November of every third year and will be distributed to the preserve steward, City, wildlife agencies, and public for review and comment. The final preserve management plan due the following February. The specific contents of the preserve management plan are discussed in the next section.

7. Every year each preserve manager must submit an *Annual Work Plan* for each preserve area. A draft annual work plan is due each November to the preserve steward, City, and wildlife agencies for review and comment, and the final preserve management plan is due the following February. Each annual work plan will outline the planned monitoring and management actions for the year and include a prioritization of specific management needs and area-specific management directives (ASMDs) to be implemented in the adaptive management context.

1.1.4 Preserve Management Plan Preparation

At a basic level, open space management within the NCCP context is a process of taking the permit conditions specified in the Implementing Agreement and associated documents (the MHCP and Carlsbad HMP in this case) and integrating them into a preserve specific management actions. Figure 1-2 is a conceptual model of how the essential elements of habitat management interact in the NCCP context.

Following the organization in Figure 1-2, each preserve manager will develop a preserve management plan that describes the regional biogeographic significance and context of the preserve, the baseline biological conditions, and the known or expected stressors and threats to the biological value of the preserve. This information creates the context in which the permit conditions apply to each individual preserve area.

The obligations established in the permit conditions along with the biological and management issues will be evaluated to set resource management priorities and specific conservation objectives in each preserve management plan. These conservation objectives in turn will be used to develop management and monitoring Area-Specific Management Directives (ASMDs). The ASMDs are be paired with preserve management hypotheses (assumptions and expectations for the response or outcome of management actions), which are stated in the preserve management plans along with the ASMDs and can be tested through monitoring of the results of management actions and of species and habitat status. The preserve management plan will be developed and applied using the principles of adaptive management, where monitoring results would in turn be used to refine future management actions to better attain conservation objectives.

Appendix D is an outline of the required format for preserve management plans developed in the OSMP area. The outline has been adapted from the California Department of Fish and Game's guide to preparation of land management plans (CDFG 2003). It is important to use a standardized format for the preserve management plan so that the City of Carlsbad and the wildlife agencies may easily review and confirm that the preserve management plan includes the necessary goals, objectives, actions, priorities, and area-specific management directives (ASMDs) to manage and monitor species and habitats within the context of the Carlsbad HMP and overall MHCP. Appropriately designed and developed preserve management plans will greatly facilitate the ability of the City of Carlsbad to maintain compliance with the permit conditions of its Implementing Agreement for the HMP. The CDFG land management plan format is being used for the CDFG lands within the City and provides a consistent template for the non-CDFG preserve areas.

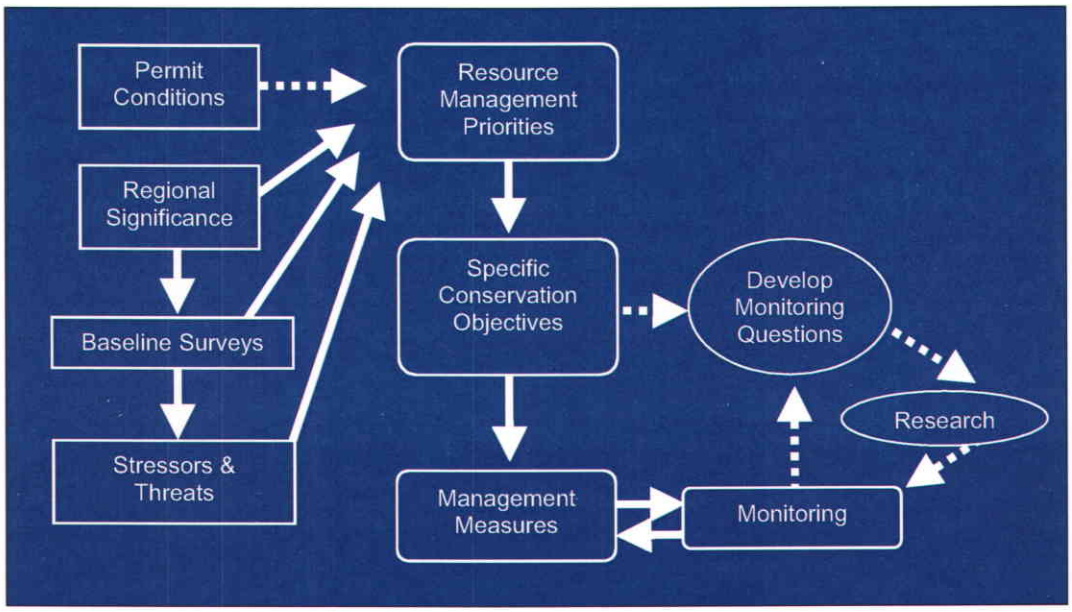

Figure 1-2. Generalized conceptual model of the Habitat Management Process within the NCCP context (*after* CBI 2001).

The preserve management plan will accomplish the following:

1. Provide an overall vision of preserve area and its role in the City-wide preserve system.

2. Identify the covered species that occur or have the potential to occur in the preserve area. The list of species covered by the Carlsbad HMP (the City's subarea plan to the MHCP) is included in Table 1-1. List 1 in Table 1-1 is species independently covered by the HMP. List 2 is species for

Table 1-1
Covered Species under the Carlsbad HMP

List 1: Species Proposed for Coverage under the Carlsbad HMP

Scientific Name	Common Name	Status*	MHCP Subregional Plan Vol. II Page Ref.
Plants			
Brodiaea filifolia	Thread-leaved brodiaea	FT/CE/NE	4-37
Chorizanthe orcuttiana	Orcutt's spineflower	FE/CE/NE	4-56
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	FSC	4-74
Euphorbia misera	Cliff spurge	None	4-101
Hazardia orcuttii	Orcutt's hazardia	FSC/NE	4-111
Quercus dumosa	Nuttall's scrub oak	FSC	4-159
Invertebrates			
Panoquina errans	Salt marsh skipper	FSC	4-202
Euphyes vestris harbisoni	Harbison's Dun Skipper	FSC/NE	4-196
Birds			
Pelecanus occidentalis californicus	California brown pelican	FE/SE	4-251
Plegadis chihi	White-faced ibis	FSC/SSC	4-256
Accipiter cooperii	Cooper's hawk	SSC	4-264
Pandion haliaetus	Osprey	SSC	4-269
Falco peregrinus anatum	American peregrine falcon	CE	4-280
Rallus longirostris levipes	Light-footed clapper rail	FE/CE/FP	4-285
Charadrius alexandrinus nivosus	Western snowy plover	FT/SSC	4-291
Sterna elegans	Elegant tern	FSC/SSC	4-299
Sterna antillarum browni	California least tern	FE/CE/FP	4-304
Empidonax traillii extimus	Southwestern willow flycatcher	FE/CE	4-314
Vireo bellii pusillus	Least Bell's vireo	FE/CE	4-321
Polioptila californica californica	Coastal California gnatcatcher	FT/SSC	4-333
Icteria virens	Yellow-breasted chat	SSC	4-360
Aimophila ruficeps canescens	California rufous-crowned sparrow	FSC/SSC	4-366
Passerculus sandwichensis beldingi	Belding's savannah sparrow	FSC/CE	4-371
Passerculus sanwichensis rostratus	Large-billed savannah sparrow	FSC/SSC	4-377
Reptiles			
Cnemidophorus hyperythrus beldingi	Orange-throated whiptail	SSC	4-245

* See the "Key to Legal and Management Status" that follows List 4.

Table 1-1 (Continued)
Covered Species under the Carlsbad HMP

List 2: Species Coverage Contingent on Other MHCP Subarea Plans being Permitted

Scientific Name	Common Name	Status*	MHCP Subregional Plan Vol. II Page Ref.
Plants			
Acanthomintha ilicifolia	San Diego thornmint **	FT/CE/NE	4-9
Ambrosia pumila	San Diego ambrosia	FE/NE	4-16
Ceanothus verrucosus	Wart-stemmed ceanothus **	FSC	4-50
Dudleya viscida	Sticky dudleya	FSC	4-89
Ferocactus viridescens	San Diego barrel cactus	FSC	4-106
Quercus engelmannii	Engelmann oak	None	4-165

* See the "Key to Legal and Management Status" that follows List 4.
** Coverage for this species is also contingent on funding for management of conserved areas.

List 3: Species Coverage Contingent on Funding for Management of Conserved Areas

Scientific Name	Common Name	Status*	MHCP Subregional Plan Vol. II Page Ref.
Plants			
Arctostaphylos glandulosa ssp. *crassifolia*	Del Mar manzanita	FE/NE	4-26
Baccharis vanessae	Encinitas baccharis	FT/CE/NE	4-32
Comarostaphylis diversifolia ssp diverifolia	Summer holly	FSC	4-63
Corethrogyne filaginifolia var. *linifolia*	Del Mar sand aster	None	4-68
Eryngium aristulatum var. *parishii*	San Diego button-celery **	FE/CE/NE	4-94
Iva Hayesiana	San Diego marsh elder ***	FSC	4-116
Myosurus minimus ssp. Apus	Little mousetail **	FSC/NE	4-133
Navarretia fossalis	Spreading navarretia **	FT/NE	4-140
Orcuttia californica	California Orcutt grass **	FE/CE/NE	4-147
Pinus torreyana ssp. *torreyana*	Torrey pine	FSC	4-154
Invertebrates			
Streptocephalus woottoni	Riverside fairy shrimp **	FE/NE	4-178
Branchinecta sandiegonensis	San Diego fairy shrimp **	FE/NE	4-184

* See the "Key to Legal and Management Status" that follows List 4.
** Coverage for this species is also contingent on the City of Carlsbad receiving legal control over the protection, management, and monitoring of the vernal pools adjacent to the Poinsettia Train Station in Carlsbad.
*** Coverage for this species is also contingent on other MHCP subarea plans being permitted.

Table 1-1 (Continued)
Covered Species under the Carlsbad HMP

List 4: MHCP Species Not Covered under the Carlsbad HMP

Scientific Name	Common Name	Status*	MHCP Subregional Plan Vol. II Page Ref.
Plants			
Dudleya blochmaniae ssp. *brevifolia*	Short-leaved dudleya	CE/NE	4-80
Lotus nuttallianus	Nuttall's lotus	FSC/NE	4-122
Tetracoccus dioicus	Parry's Tetracoccus	FSC	4-170
Invertebrates			
Euphydryas editha quino	Quino checkerspot butterfly	FE	4-211
Reptiles and Amphibians			
Scaphiopus [Spea] hammondii	Western spadefoot toad	SSC	4-215
Bufo californicus	Arroyo toad	FE/SSC	4-222
Clemmys marmorata pallida	Southwestern pond turtle	FSC/SSC	4-233
Phrynosoma coronatum blainvillei	San Diego horned lizard	FSC/SSC	4-238
Birds			
Aquila chrysaetos	Golden eagle	BEPA/SSC	4-274
Campylorhynchus brunneicapillus cousei	Coastal cactus wren	FSC/SSC/NE	4-328
Sialia mexicana	Western bluebird	None	4-355
Amphispiza belli belli	Bell's sage sparrow	FSC/SSC	4-380
Mammals			
Dipodomys stephensi	Stephens' kangaroo rat	FE/ST	4-401
Perognathus longimembris pacificus	Pacific pocket mouse	FE/SSC/NE	4-407
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	FSC/SSC	4-416
Lepus californicus bennetti	San Diego black-tailed jackrabbit	FSC/SSC	4-421
Felis concolor	Mountain lion	SPM	4-425
Odocoileus hemionus fuliginata	Southern mule deer	RGS	4-431

Key to Legal and Management Status of Species in Lists 1 - 4

FE - Federally Endangered
FT - Federally Threatened
BEPA - Bald Eagle Protection Act
FSC - Federal Species of Concern (former Category 2 Candidate)
CE - State Endangered
CT - State Threatened
SSC - State Species of Special Concern SPM - State Special Protected Mammal
RGS - State Regulated Game Species
None - No Federal, State, or City status
NE - Narrow Endemic Species in the MHCP

which coverage is contingent on other MHCP Cities subarea plans being permitted. List 3 is contingent on funding for management of conserved areas. List 4 is species that are not currently covered by the HMP.

3. Identify primary goals and objectives tied to the conditions of the HMP and Implementing Agreement as well as broader open space management goals.

4. Describe preserve-level and subregional monitoring activities.

5. Develop a comprehensive list of ASMDs for the preserve area.

Incorporate new information gained from adaptive management of the preserve and other nearby similar preserve areas, and new information contained in the MHCP Three-Year Status Summary Reports.

1.1.5 Communication to Coordinate Implementation

Effective and efficient implementation of the OSMP requires frequent communication among the primary entities involved in implementation (preserve managers, preserve steward, City, and wildlife agencies). The following section outlines the various reports, review periods, and meetings to coordinate this communication. The timing of these various modes of communication is critical for efficient implantation.

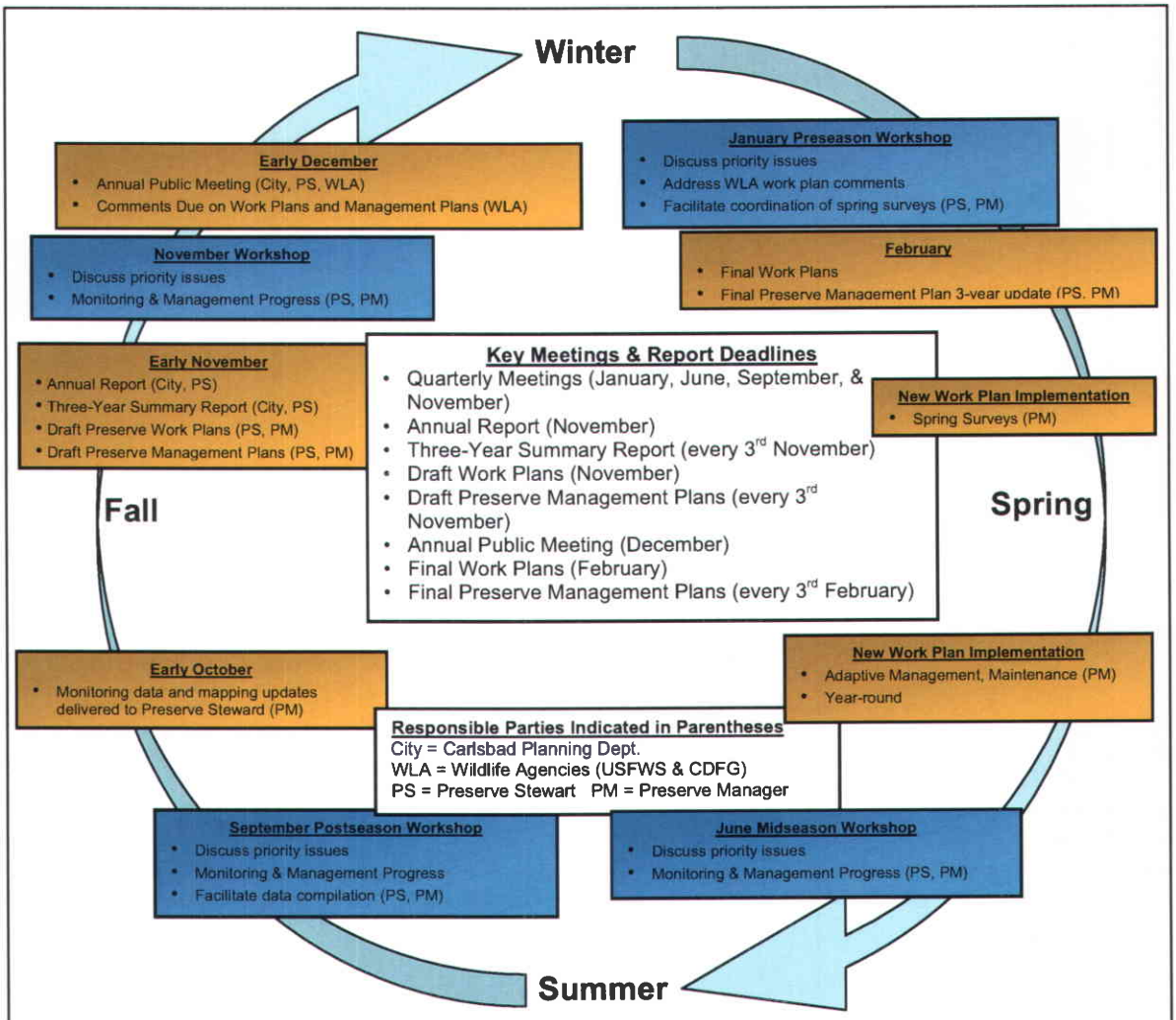

Figure 1-3. Annual Cycle of OSMP Meetings and Reports.

The reports and meetings are briefly described with target time periods for completion in parentheses:

Annual Report (due early November) includes but not limited to:

- Information, data, and analysis from all preserve areas integrated and analyzed by the preserve steward.
- Update of gains/losses calculated via Habitrak
- Descriptive text, maps and a GIS data layer with associated GIS calculations showing the areas conserved that year and during previous years.
- Descriptive text, maps and a GIS data layer with associated GIS calculations showing how the boundary of the preserve (e.g., boundary adjustments, permitted development) has changed.
- Descriptive text, maps and data for updated baseline surveys (vegetation mapping and species surveys).
- Summaries of management actions undertaken during the past year with an assessment of the success and adaptive management strategy for next year for each action.
- Summaries of all monitoring activities and associated data and analysis on status and trends of populations of covered species and condition of habitats.
- Current status of each covered species compared to the status at the time the take permit was signed. If data was not collected that year for a given species, previous year's data will be presented. If no baseline data exists, baseline surveys will be a priority for the next year.
- A list of priority open space management issues, key problem areas, and City-wide and area-specific actions to address these issues.
- Information on public use of the preserve system.
- Budget summaries showing actual compared to planned budget, status of endowments, etc.

Annual Public Meeting (early December):

- Presentation of information contained in annual report.
- Opportunity for scientific community and public input, questions, and answers.
- Attendance will include the wildlife agencies, the Coastal Commission, City, Preserve Steward, Preserve Managers, and other interested groups or individuals.

Preserve Management Plans and Annual Work Plans (draft due early November (every third year for Preserve Management Plans), final due following February):

- See Section 1.1.4 and Appendix D for required content and format.
- 30 day review by wildlife agencies and preserve steward; available for public review and comment.

Three-Year Summary Reports (early November):

- Comprehensive monitoring report summarizing previous three years relative to status and trends, MHCP goals, City-wide effectiveness of plan implementation.

Quarterly Carlsbad OSMP Workshop:

- To facilitate coordination between preserve areas/managers.
- To share ideas, address common problems, identify funding/grant opportunities (coordination of Section 6 and NCCP local assistance applications), etc.
- Required attendance - Preserve Managers, Preserve Steward
- Invited attendance – City, Coastal Commission, Wildlife Agencies, and public (key City and Wildlife Agency staff may be required for certain issues)

Status Memo from Preserve Steward (Quarterly):

- Memo to City and Wildlife Agencies providing a brief summary of the ongoing issues and progress on the work plan at each preserve area and City-wide
- Meetings with City staff as needed to resolve management monitoring issues

Status Memos from Preserve Managers (Monthly):

- Brief memo to Preserve Steward reporting status of new/ongoing issues and progress on work plan
- Discussion of management/monitoring activities of previous month

Frequent communication between Preserve Steward and Preserve Managers (ongoing as needed):

- Phone, email, field as needed
- Emergency/critical issue reporting to City, Wildlife Agencies and/or Coastal Commission as needed (Preserve Manager and/or Steward to report depending on severity of issue)

The above schedule and process for meetings and reporting will provide the structure for compliance monitoring (Is the HMP and OSMP being implemented according to the Implementing Agreement and the conditions, policies, and guidelines established therein?) and effectiveness monitoring (Is the conservation and management of the preserve system conserving the species and habitats as expected?). Figure 1-4 and 1-5 show schematically how the primary preserve management entities and reporting mechanisms interact to achieve effective compliance monitoring and effectiveness monitoring, respectively.

1.1.6 Mechanisms for Data Management and Updates

Coordination of data management is important at every preserve management and monitoring level. Field data collected to monitor the success of management actions and other ASMDs need to be consistently organized and analyzed so that adaptive management lessons can be shared and applied to other preserve areas. Species and monitoring data must be collected, analyzed, and summarized with standardized methods so that data from individual preserves can be combined for City-wide analysis and reporting, as well as for integration into subregional and regional monitoring programs.

Data Management Process:

- Preserve managers must use consistent survey methods and protocols (MHCP Monitoring Plan, Wildlife Agency protocols, other scientific methods with review of Preserve Steward)
  - Data Compilation and Reporting for monitoring data including habitat based monitoring and species-specific surveys.
    - Using standardized data entry formats preserve managers will submit data to preserve steward upon collection so that it can be analyzed by the steward, or the steward can be assured that it was collected and that it will be analyzed and interpreted in a timely manner for integration into annual report. Summary data will be prepared according to a consistent format.
  - Resource mapping updates
    - Resource mapping updates (primarily vegetation mapping) will be compiled and submitted to the preserve steward and the City in GIS format.
  - Individual research projects by preserve managers or others
    - Data types and formats will vary project to project; however, researchers should attempt to use consistent protocols and format whenever possible.
  - Primary data types to be collected and summarized City-wide
    - GIS data
    - Tabular data
    - Data summary reports

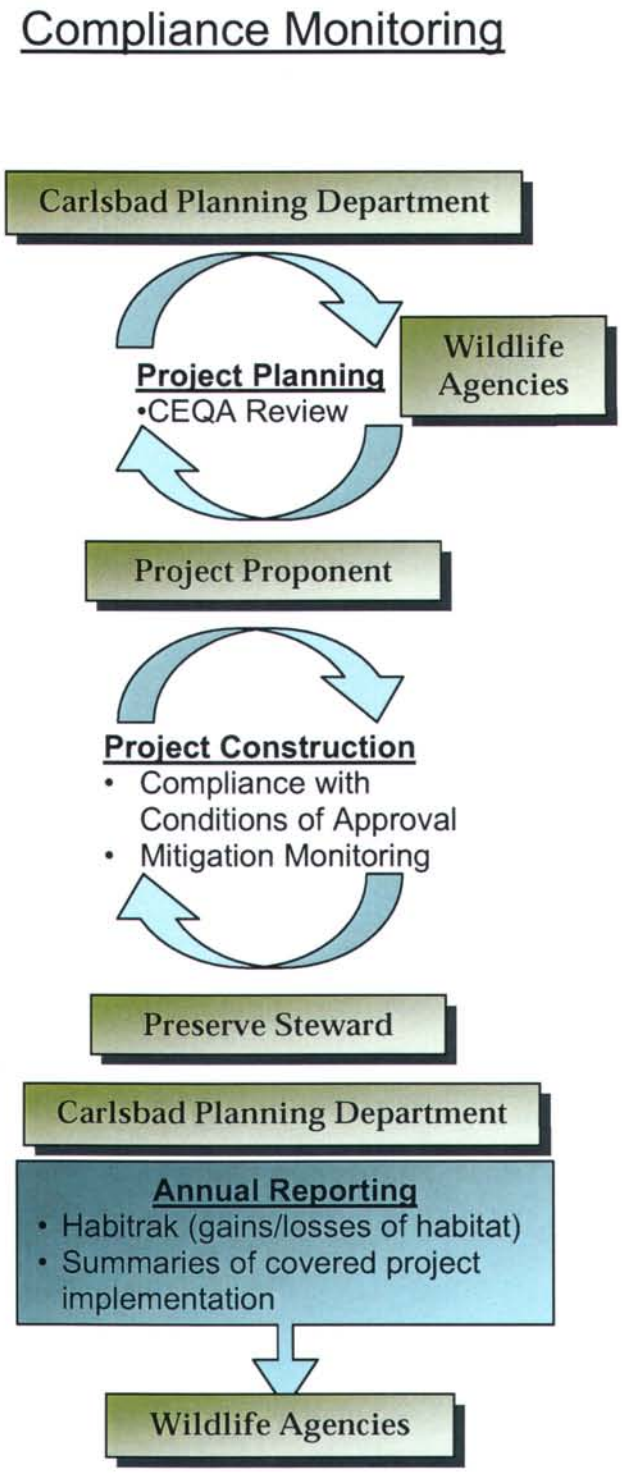

Figure 1-4. Compliance monitoring for implementation of development projects.

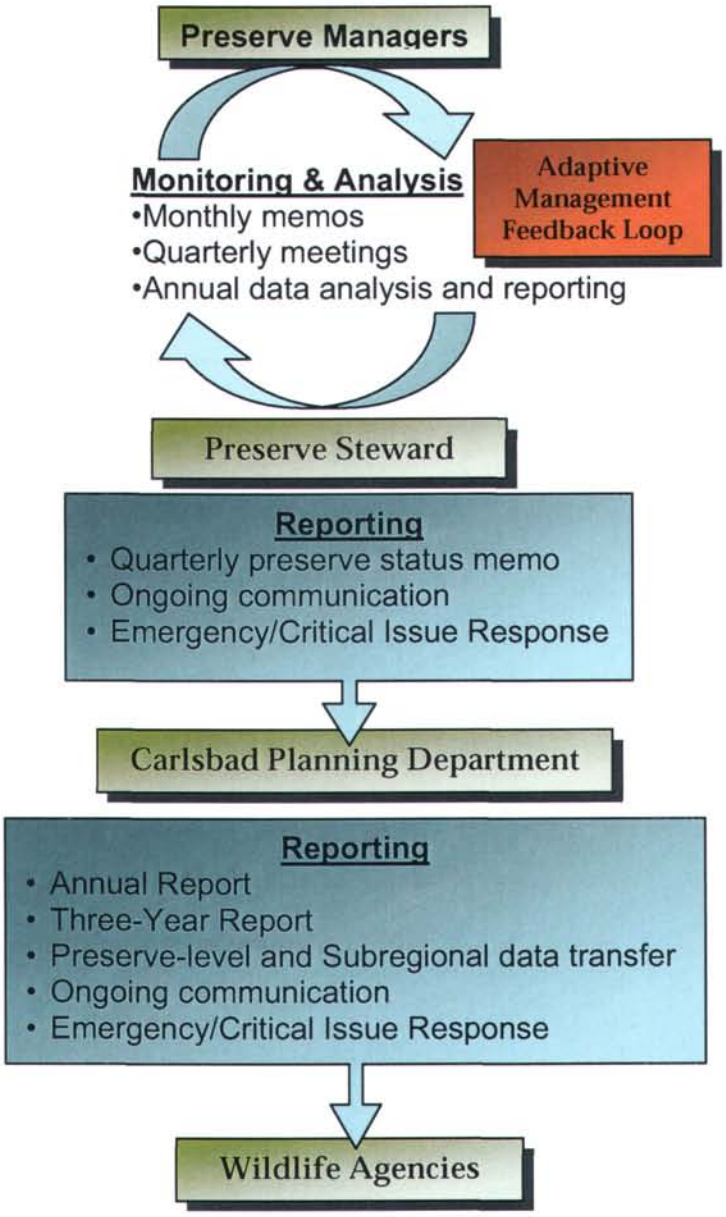

Figure 1-5. Effectiveness monitoring of biological management of the preserve system.

Ideally, data will be coordinated and managed with an Internet-based interface to make GIS mapping data accessible through the Internet. At a minimum, the City and preserve steward will provide preserve-level tabular data and pdf maps, along with preserve management plans, annual work plans, three-year summary reports and other general open space management information on City's web site.

1.1.7 Phasing of Implementation

There are two basic phases of implementation of the OSMP. The first phase is intended to establish the baseline for species status and habitat condition in the preserve areas. Phase I occurs within the first three years after signing of the implementing agreement or within the first year after a property is hardlined (dedicated and/or conservation easements recorded) into the preserve system. The second phase is the ongoing monitoring and management of the preserve system in perpetuity. Phase II starts once the baseline conditions have been established. The following outline identifies the key elements in each phase.

Phase I: Establish baseline database:

- Update vegetation maps where needed (as determined by the preserve steward and wildlife agencies).
- Conduct additional species baseline surveys where needed (as determined by the preserve steward and wildlife agencies).
- Preserve steward and the wildlife agencies determine and prioritize updates.
  - Priority 1 – Updates must be completed in first 1-2 years.
  - Priority 2 – Updates must be competed in first 3 years.
  - New preserves areas added to system – Updates, if needed, completed in first 1 year after adding to system.
- MHCP CSS Restoration Obligation –Subject to availability of regional funding or mitigation funding from other sources.

Phase II: Ongoing monitoring and management (in perpetuity):

- Regular surveys at preserve level and subregional level as prescribed by MHCP and HMP.
- Standard preserve management procedures.
- Baseline Surveys for new preserve areas (softline/standards areas) as they come online (see new preserve areas under Phase I).

1.2 Application of Adaptive Management Concepts to Open Space Management

The City and preserve managers in the OSMP area are responsible for managing individual preserve areas to ensure that conservation goals of the HMP/MHCP are met. The City expects that management and monitoring by preserve managers will occur though an adaptive management approach. The specific models for experiments, observational studies, and adaptive management will be developed by preserve managers in their preserve management plans to implement management actions and test a priori assumptions via purposeful science-based monitoring.

Monitoring at the preserve area scale needs to be focused on obtaining information for management purposes. In most instances, the array of threats or stressors of preserved habitats, their mechanisms of action, and the responses of the habitats and associated species are not completely understood at this time. Information gained through monitoring will inform management decisions through the adaptive

management process. Adaptive management acknowledges the lack of complete knowledge and understanding of a system at the outset of management actions. Adaptive management is a means to learn more about the system through the implementation of management actions and the monitoring of management results. Management actions can then be adapted to optimize management goals by incorporating new information gained through an iterative implementation and monitoring process.

There are six main steps in adaptive management:

1) Identification of the problem or management goal

2) Design of the management action or implementation plan

3) Implementation

4) Monitoring of management results

5) Evaluation of the results relative to the desired management goals, and

6) Adjustment of management actions.

The trigger for a change in the management approach/actions occurs when management results have not achieved the desired management goals. The assumptions underlying management goals must be stated explicitly and considered as hypotheses to be tested by carefully designed and implemented monitoring programs that are, in effect, management experiments. Ideally, management actions would be designed and implemented with experimental control sites and replication that would allow statistical interpretation of management results. At a minimum, careful measurement of key environmental and biological variables before and after the management action can provide some insight into the effects of management at that particular site.

1.3 Management of Threats and Impacts

This summary of threats and impacts to the species, habitats, and ecological processes in the OSMP area helps place the OSMP lands in the appropriate management context. The threats and impacts identified here are the main management issues that preserve managers in Carlsbad potentially will address on a day-to-day basis.

The terms threat and impact are value laden terms that change depending on context. Fire, for example is a natural ecological process that is necessary for many fire-adapted plant species to germinate, and for many animal species to maintain open habitat conditions to which they may be adapted. In a fully pristine and intact ecosystem fire is not a threat, per se, but only a natural ecological process that has an effect, but not necessarily a negative impact on the ecosystem. For habitats that exist in a matrix of suburban lands uses, however, fire is more often a threat. Fires that occur too frequently disrupt the natural regime of this ecological process and alter ecological communities. Activities associated with fire prevention and suppression, if not properly planned and implemented, can seriously impact protected habitats and populations.

Threats to habitats, species, and ecological processes may come from legal or illegal activities, and are numerous in suburbanized landscapes. Most threats come from the edges of preserves, the urban-wildlife interface, and are often categorized as edge effects. However, due to the highly fragmented configuration of open space in the City and the high edge-to-interior ratio, most portions of open space have the potential to be impacted by many of these threats. Therefore, these threats and their potential impacts will be a persistent management issue for preserve managers. Table 1-2 identifies the primary threats that have the potential to affect species, habitats, and ecological processes in the Carlsbad OSMP area.

TABLE 1-2.

MATRIX OF PRIMARY THREATS AND POTENTIAL EFFECTS ON SPECIES AND HABITATS MANAGED IN THE OSMP AREA

Threats / Potential Effects	Habitat Loss	Habitat Conversion - seral or type conversion	Trampling of habitat and soils	Altered soil moisture	Increased erosion	Decreased water quality	Reduction in disturbance-sensitive species	Source of exotic species introduction	Increase in exotic ant invasion	Exotic species dispersal	Reduction in native species diversity	Reduction in native pollinators	Reduced function of wildlife corridors	Reduction of area-dependent species	Altered predator-prey relationships	Roadkill	Littering
Public Use																	
Off-road vehicles	X		X		X	X	X				X	X	X	X		X	X
Noise from off-road vehicles											X		X	X			
Mountain biking	X		X		X	X					X		X	X			X
Equestrian uses	X		X		X	X		X		X	X		X				X
Hiking	X		X		X						X		X	X			X
Urban Edge																	
Fuel breaks	X			X	X	X	X	X	X	X	X	X		X	X		
Landscaping	X			X			X	X	X	X	X	X		X	X		
Irrigation runoff	X	X		X	X	X	X	X	X	X	X	X		X	X		
Herbicides and pesticides	X					X				X	X	X			X		
Urban noise							X				X			X	X		
Lighting							X				X			X	X		
Unsupervised pets/children	X		X		X	X	X	X		X	X		X	X			X
Habitat Fragmentation																	
Roads/utility corridors	X			X	X	X	X			X	X		X	X		X	X
Suburban residential/commercial construction	X												X	X			
Altered Ecological Processes																	
Fire regime (too frequent)		X		X	X		X			X	X	X	X	X	X		
Hydrology (no flood/scour, altered water table)		X		X		X				X	X		X		X		
Drought (lower water table, disease resistance)		X		X							X	X			X		
Predator-Prey Relationships (mesopredator release)							X		X	X	X		X	X	X	X	
Host-Pollinator Relationships (germination, gene flow)			X	X		X	X	X		X	X	X	X	X			

1.4 Goals for Preserve Management

Management of individual preserve areas must be guided by the overall goals of the preserve system. These goals are derived from HMP permit requirements, anticipated threats to the species and habitats, and general public expectations. They will be translated into Area Specific Management Directives by the Preserve Manager through analysis of the resources and threats for a given area. The goals are listed below, not in order of priority:

Management Plans and Funding

- Ensure that each preserve area has an up to date Area-Specific Management Plan that is adequately funded.
- Ensure that funds for management are invested prudently and expended only for legitimate preserve management purposes.
- Ensure that individual preserves are being properly managed, consistent with these goals, the applicable Area-Specific Management Plan, and the Open Space Management Plan.

Edge Effects

- Manage fire and fuel loads in the vicinity of development so that public safety is protected, while recognizing the beneficial role of fire in the ecosystem.
- Manage noise sources in the vicinity of preserves.
- Manage lighting in the vicinity of preserves to minimize impacts while allowing for reasonable lighting of public and private spaces.
- Address erosion problems promptly, while recognizing that flood events are part of the natural ecosystem process.
- Eliminate invasive, non-native plant and animal species from the preserve system. Seek to eliminate or reduce the occurrence of invasive species in adjacent areas of development.
- Eliminate feral domestic animals from the preserve system. Educate the public regarding the importance of keeping pets out of preserves.
- Maintain healthy populations of native predators (such as coyote and bobcat) within the preserve system

Public Access

- Eliminate unauthorized off-road vehicles from the preserve system.
- Eliminate illegal dumping of refuse in the preserve system.
- Eliminate migrant worker camps and other unauthorized uses within the preserve system.
- Manage trails and other recreational uses in the preserve system such that the biological integrity of the preserve system is maintained while allowing public education, enjoyment, and appreciation of the native landscape.
- Establish reasonable, enforceable regulations regarding public use of the preserve system. Maintain an effective enforcement presence in the preserves. Take appropriate and effective enforcement actions against serious violations of preserve regulations.

Monitoring and Reporting

- Ensure clear, effective, timely communication between all parties involved in management of the preserve system.
- Collect, analyze, interpret, and report data regarding the health of the preserve system to all interested parties in a uniform and timely manner. Follow recognized survey protocols for collecting data. Use the best available scientific methods to analyze data.

- Maintain effective forms of access controls to allow appropriate public visitation while minimizing impacts on the preserve system.
- Educate the public regarding all aspects of the preserve system

Other Biological Considerations

- Maintain vigilant oversight of the preserve system to guard against all types of impacts and threats, including but not limited to Changed Circumstances and Unforeseen Circumstances.
- Utilize Adaptive Management to address changes in the status of species at the earliest feasible opportunity. Pay particular attention to the rarest or most sensitive species, such as Narrow Endemics, vernal pool species, and species with very limited population or range.
- Maintain adequate connectivity for gnatcatchers and other species between important breeding areas. Use opportunities to widen constricted corridors where possible through acquisition or the entitlement process. Manage edge effects so that constricted corridors are not further impacted by adjacent human activities.

In addition to the above goals, the following table relates known and anticipated threats to areas of the preserve system where they may occur. This will allow prioritization of actions to address the threats. While many of the known threats are Citywide and affect all management units to some degree, other threats are of particular importance to specific management units. For example, while illegal offroad vehicle use has the potential to occur in any management unit, it is known to be problematic in certain management units. Preserve Managers must address these threats in their Preserve Management Plans, and annual reporting must describe how the threats are being addressed.

Potential Threats	Management Units Citywide (all Management Units)	Agua Hedionda	Arroyo La Costa	Batiquitos Lagoon	BressiRanch/Carrillo Ranch	Buena Vista Creek	Calavera Hills	Faraday	Los Monos Canyon	Poinsettia/Aviara	Villages of La Costa
Public Use											
Off-road vehicles						X	X				X
Noise				X	X	X	X				X
Mountain biking	X										
Equestrian uses		X			X						X
Hiking	X										
Urban Edge											
Fuel breaks	X										
Landscaping and Invasive Species	X										
Irrigation runoff	X										
Herbicides and pesticides	X										
Urban noise				X	X	X	X				X
Lighting		X	X	X	X		X	X		X	X
Unsupervised pets/children		X	X	X	X		X	X		X	X
Illegal dumping						X	X	X			X
Migrant Worker Camps		X				X	X	X			
Habitat Fragmentation											
Roads/utility corridors	X										
Suburban residential/commercial construction	X										
Altered Ecological Processes											
Fire regime (too frequent)	X										
Hydrology (no flood/scour, altered water table)		X	X	X	X				X		
Drought (lower water table, disease resistance)	X										
Predator-Prey Relationships (mesopredator release)	X										
Host-Pollinator Relationships (germination, gene flow)	X										

1.5 Recreational and Educational Opportunities

To be successful, the OSMP must have the full support of the public. Public support occurs when it becomes clear that there is something of value that is being protected and managed by the plan. Recreational and educational opportunities are the two most important ways in which to create and maintain a sense of value in the protection and management of open space in the City. The importance of recreational opportunities is obvious. Hiking, biking, boating, and equestrian uses are integral to many people's perceptions of open space, and integration of these public uses into the OSMP will be important. Less obvious, though are the ways in which educational opportunities create value and contribute to long-term public support of open space protection. By creating and integrating public educational opportunities into the OSMP and day-to-day preserve management, the City will have better informed "neighbors" of the open space who are more willing and educated to minimize the activities that may negatively impact the natural values (e.g., improved landscaping and watering practices, better control of pets, etc.). Furthermore, establishment of a strong educational outreach program will provide important nature learning opportunities for the City's school children, an opportunity that is often lost for many children in suburban America. Finally, education and outreach will have the effect of recruiting members of the public that live near or recreate in the OSMP area to become partners in stewardship and to be the eyes and ears for the City and other preserve managers, so that management problems or illegal uses can be quickly identified and corrected. An education/outreach component is a necessary part of most of the solutions identified in the focused analysis of management issues below (Section 3.0).