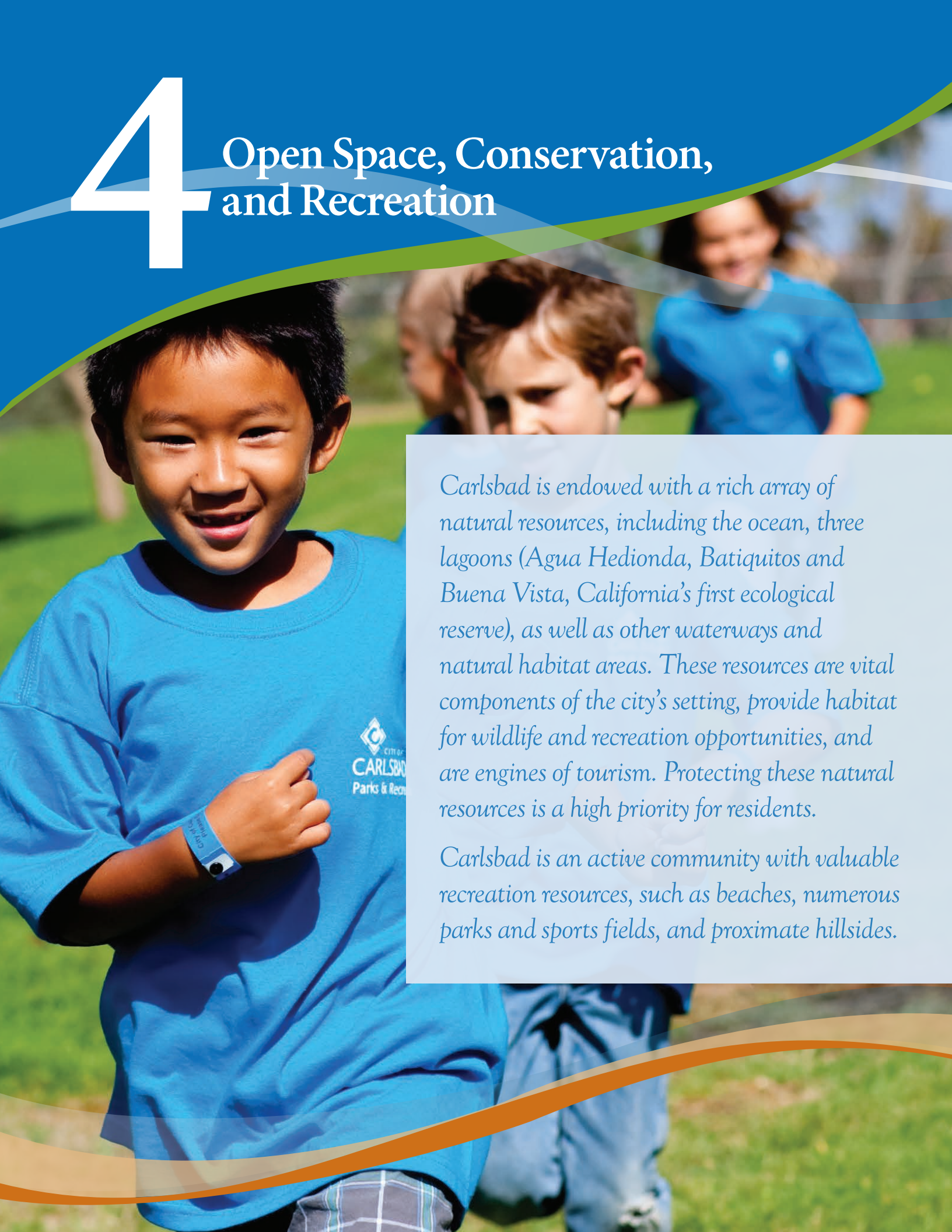
4 Open Space, Conservation, and Recreation



Carlsbad is endowed with a rich array of natural resources, including the ocean, three lagoons (Agua Hedionda, Batiquitos and Buena Vista, California's first ecological reserve), as well as other waterways and natural habitat areas. These resources are vital components of the city's setting, provide habitat for wildlife and recreation opportunities, and are engines of tourism. Protecting these natural resources is a high priority for residents.

Carlsbad is an active community with valuable recreation resources, such as beaches, numerous parks and sports fields, and proximate hillsides.

The city has a high proportion of dedicated open space land available for passive and active recreational uses, and as its population continues to grow, age, and diversify, Carlsbad must continue to meet its residents' changing outdoor and recreational needs. This element is intended to enhance resource conservation, ensure adequate open space for conservation and recreation, and promote accessibility to recreation areas for all residents and visitors.

Water supply, conservation, and recycling, including desalination, are addressed in Chapter 7: Sustainability Element.

4.1 Introduction

Background and Purpose

Open space is one of Carlsbad's principal defining features and serves several different purposes. Many open spaces are conserved as natural habitat. Other open spaces fulfill both habitat conservation and recreational needs, or are specifically designated for recreational use. The Open Space, Conservation, and Recreation (OSCR) Element addresses open space for resource conservation and recreation, as well as environmental quality topics such as air and water quality.

The OSCR Element accomplishes this, first, by establishing an overall classification system for open space, which provides the framework for more detailed discussion of open space needs for habitat and resource conservation, and parkland needs of a growing and changing population. Open space and park standards are consistent with those in the Carlsbad Growth Management Plan, and future demand for open space and parks is identified based on projected population growth considering the distribution of new residences.

The OSCR Element also addresses beaches, trails, and agricultural resources, followed lastly by discussion of air quality and water quality.

The OSCR Element consists of narrative and goals and policies, which provide direction to modify existing programs or establish new ones, and seek to preserve and enhance Carlsbad's natural and recreational resources such that they:

- Sustain and improve the social, economic, aesthetic, and environmental health of the city;
- Are accessible for all residents;
- Offer a balance of active and passive recreation opportunities;
- Enhance the community's environmental quality; and
- Provide learning opportunities about nature for Carlsbad residents and visitors.

Relationship to State Law

California state law (Government Code sections 65302(d)(1) and (e)) requires cities to adopt open space and conservation elements as part of their general plan. Open-space land is defined by California Government Code Section 65560(b) as any parcel or area of land or water that is essentially unimproved and devoted to open-space use, and that is designated on a local, regional or state open-space plan, including open space for the preservation of natural resources, and open space for outdoor recreation. Along with the housing element, the open space element has the most detailed statutory intent and, next to land use, is the broadest in scope.

Conservation elements are required to provide direction regarding the conservation, development, and utilization of natural resources. Because of the considerable overlap between requirements related to open space for conservation and the conservation element, these two are combined into one element in this General Plan.

Relationship to Community Vision

The OSCR Element is most closely tied to the following core values in the Carlsbad Community Vision:

Core Value 2: Prioritize protection and enhancement of open space and the natural environment. Support and protect Carlsbad's unique open space and agricultural heritage.

Core Value 3: Promote active lifestyles and community health by furthering access to trails, parks, beaches and other recreation opportunities.

Relationship to Other General Plan Elements

The OSCR Element bears a strong relationship to the Land Use and Community Design Element, since open space, conservation lands, and park facilities are essential components of a balanced land use pattern. Each open space, conservation area, or park facility has been located within a compatible land use area. The intent of the OSCR Element, however, is not to establish land use policies for these areas, but rather to outline conservation and recreational strategies in harmony with land use policies.

Open space for public safety is addressed in the Public Safety Element. The classification of open space and parks relates to the amount and location of the population, and in this respect the OSCR Element is closely related to the Land Use and Community Design and Housing elements. The OSCR Element is also related to the Mobility Element in that designated bicycle routes, trails and pedestrian routes provide crucial access to and through open space and parklands.

Finally, the Sustainability Element outlines the broad framework to minimize Carlsbad's reliance on fossil-fuel sources and decrease consumption of natural resources, and includes specific goals and policies pertaining to water conservation and recycling.

4.2 Open Space Framework

Carlsbad is situated along the Pacific Coast. Elevations range from sea level along the coast to about 1,000 feet above mean sea level at the southeastern border of the city. Land within the city's jurisdiction covers about 39 square miles (25,021 acres), about 38 percent of which is currently (2013) classified as open space. About 78 percent of this open space is comprised of natural open space such as native habitats, lagoons, and streams. The city's open space network boasts three lagoons, nearly 40 miles of hiking trails, and almost seven miles of coastline, as well as unique agricultural and horticultural resources such as the strawberry fields and the Flower Fields.

Open Space Classification

For purposes of the OSCR Element, open space is defined as: Any area of land or water that is devoted to an open space use and designated on the city's Land Use Map as open space, or dedicated in fee title or easement for open space purposes. The open space may be in its natural state or modified. This General Plan classifies open space into four categories (Figure 4-1):

- **Category 1:** Open Space for Preservation of Natural Resources (plant and animal habitat; nature preserves; beaches and bluffs; wetland and riparian areas; canyons and hillsides; and water features such as lagoons and streams)
- **Category 2:** Open Space for Managed Production of Resources (forestry; agriculture; aquaculture; water management; commercial fisheries; and major mineral resources)
- **Category 3:** Open Space for Outdoor Recreation (school recreation areas; public parks and recreation areas; greenways; trails; campgrounds; golf courses; and equestrian facilities)
- **Category 4:** Open Space for Aesthetic, Cultural and Educational Purposes (lands with scenic, historical and cultural value; land use buffers; open space that marks entries to the city from surrounding communities and to major developments and neighborhoods within the city; greenbelts providing separation from surrounding communities; and museums, arboreta, zoos, and botanical gardens)

Table 4-1 quantifies the existing amount of land that is designated on the Land Use Map as "open space" and/or dedicated in some other manner (e.g., easement, use agreement) as one of the open space categories described above. The amount of existing open space identified in Table 4-1 will increase as future additional open space is added to the city's open space system through implementation of the Growth Management Plan and Habitat Management Plan as lands subject to those plans develop over time, and through opportunistic acquisitions.

TABLE 4–1: EXISTING OPEN SPACE

DESCRIPTION	ACRES	% OF OPEN SPACE	% OF CITY
Open Space for Preservation of Natural Resources	7,344	78%	29%
Open Space for Managed Production of Resources	329	3%	1%
Open Space for Outdoor Recreation (programmed and unprogrammed)	1,191	13%	5%
Open Space for Aesthetic Cultural and Educational Purposes	582	6%	2%
TOTAL OPEN SPACE	**9,446**	**100%**	**38%**
CITY OF CARLSBAD	**25,021**		

Sums may not equal totals due to rounding.

Open Space, Active Lifestyles, and Quality of Life

Regular exercise has been proven to promote many health benefits. The Carlsbad community values access to parks and recreation resources, including the ocean and beaches, because active lifestyles lead to better physical and mental health outcomes, but also because outdoor recreation and an active lifestyle support community connectedness and a higher quality of life overall. In most communities, walking is the most common form of physical activity, is accessible across socioeconomic groups, and can be promoted in both urban and rural areas. In addition to health benefits, the City of Carlsbad Pedestrian Master Plan (2008) recognizes that walking also has the potential to address several other interrelated challenges in the city, including traffic congestion, air quality, and community-building. Smart planning for access to recreation and active, healthy lifestyles means taking a balanced approach to the provision of parks and recreation spaces, as well as creating safe and attractive pedestrian and bicycle connections that bring community members out to play and enjoy the city's various natural assets.

Growth Management

The creation and preservation of open space in the city is, in large part, due to the city's Growth Management Plan, which through the Citywide Facilities and Improvements Plan, establishes the following facility standards for open space and park facilities:

Open Space

Fifteen percent of the total land area in specified Local Facility Management Zones (LFMZ), exclusive of environmentally constrained non-developable land, must be set aside for permanent open space (public or private) and must be available concurrent with development.

The city is divided into 25 LFMZs. At the time the open space facility standard was established (1986), the city determined the standard should be applicable to LFMZs 11-15 and 17-25, but not to LFMZs 1-10 and 16 because those LFMZs were already developed or met/exceeded the open space standard.

Figure 4-1: Open Space

1 Open Space for Preservation of Natural Resources

2 Open Space for Managed Production of Resources

3 Open Space for Outdoor Recreation (Programmed and Unprogrammed)

4 Open Space for Aesthetic Cultural and Educational Purposes

Future Open Space and Visitor Services*

Lagoons/Water

Highways

Major Street

Planned Street

Railroad

City Limits

*See LUCD Element: Special Planning Considerations: Carlsbad Boulevard/Agua Hedionda Center'

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

Facility management plans have been approved for all LFMZs and, in zones where the open space standard is applicable, include requirements that ensure a minimum of 15 percent of the land in the zone is set aside as open space.

Parks

The Growth Management park facility standard is three acres of community parks or special use areas per 1,000 population within the park district. There are four park districts within Carlsbad, which correspond to the city's four quadrants. Parks and special use areas must be scheduled for construction within a five-year period beginning at the time the need is first identified, but beginning no sooner than August 22, 2017.[1] According to City Council Resolution No. 97-435, "scheduled for construction" means that the improvements have been designed, a park site has been selected, and a financing plan for construction of the facility has been approved.

The city's Growth Management Ordinance (Carlsbad Municipal Code Chapter 21.90) authorizes special facility fees to pay for improvements or facilities that are related to new industrial development. Since there is a substantial impact on existing recreation facilities from an increasing industrial employment base, the city recognized a need to impose and implement a park mitigation fee for industrial development. In November 1987, the City Council adopted its first park mitigation fee for the Zone 5 Local Facilities Management Plan. Additionally, a park mitigation fee was required as part of the Zone 13 and Zone 16 Local Facilities Management Plans. The purpose of this fee is to ensure adequate recreational facilities to accommodate the demand created by the daily influx of the industrial work force and population as industrial development grows.

Section 4.5 provides information regarding compliance with the park facility standard.

1 Amended by City Council Resolution No. 2017-170 (GPA 2017-0002/OAJ 17-0004)

4.3 Biological Resources and Open Space for Conservation

Habitats and Sensitive Biological Resources

The western edge of the city is characterized by sandy beaches and three low-lying river estuaries or lagoons – the Batiquitos, Agua Hedionda, and Buena Vista lagoons. The coastal portions of the city are largely developed; however, natural vegetation communities remain in and around the three coastal lagoons and on some of the higher, steeper-sloped, inland portions of the city. The lagoons dominate the city's coastal landscape and provide habitat for a variety of resident and migratory bird species, fish, and invertebrates as a part of the city's overall open space network.

Habitats and Natural Vegetation

Habitat types within the city include grassland, coastal sage scrub, chaparral, woodland, riparian, marsh and other wetlands, and open water. Of these habitat types, natural habitats and vegetation communities, including open water, cover approximately 7,574 acres, or 30 percent, of land within the city's jurisdiction. The majority of the natural vegetation communities in the city are comprised of coastal sage scrub (37 percent) and grassland (18 percent). The remainder of the city is made up of agricultural lands, disturbed lands, or developed lands. A summary description of the natural vegetation communities found within the city is provided below; a much more detailed description is provided in the Environmental Impact Report.

Upland Habitat

Coastal Sage Scrub

Three types of coastal sage scrub exist within the city, representing approximately 38 percent of the natural vegetation in the city: Diegan coastal sage scrub, maritime succulent scrub and coastal sage scrub- chaparral scrub. Coastal sage scrub is home to the federally-threatened coastal California gnatcatcher, as well as the orange-throated whiptail (a California Species of Special Concern) and the federally listed plant species, San Diego ambrosia. Coastal sage scrub is considered sensitive habitat under California regulations, but Diegan coastal sage scrub in particular is identified in the California Natural Diversity Database as a priority for monitoring and restoration. Within Carlsbad, the largest remaining areas of Diegan coastal sage scrub are in Calavera Hills, near the intersection of College Boulevard and Carlsbad Village Drive, and in the Villages of La Costa.

Chaparral

There are two categories of chaparral habitat located in Carlsbad: undifferentiated (including southern mixed and chamise chaparral) and southern maritime chaparral. Both these vegetation communities occur in a patchy distribution throughout the city and are located on wetter north- and west-facing slopes, alternating with coastal sage scrub, grasslands and oak woodlands. Southern maritime chaparral is the most limited type of chaparral in the city and is considered a sensitive habitat. Sensitive plant and animal species that may be found in chaparral habitat are the wart-stemmed ceanothus (designated as sensitive by the California Native Plant Society), the federally and state listed endangered Orcutt's spineflower, the California endangered short-leaved Dudleya, and the California Watch List species, Southern California rufous-crowned sparrow.

Grassland

There are approximately 1,807 acres of native and non-native grasslands within Carlsbad. Native grasslands are considered a sensitive habitat under California regulations and are identified in the California Natural Diversity Database as priority areas for monitoring and restoration. Within the city, native grassland vegetation is extremely limited. Non-native grassland is not considered a sensitive habitat; however, it may be a significant foraging habitat for raptors and the California fully protected white-tailed kite. Non-native grassland may also support sensitive animal and plant species such as the federally endangered Stephens' kangaroo rat and federal and state listed San Diego thorn-mint, and may serve as a habitat linkage for a number of wildlife species such as mule deer and scrub species such as California gnatcatcher.

Woodland

There are two types of woodlands that occur within Carlsbad: oak woodland (approximately 29 acres) and eucalyptus woodland (approximately 257 acres). Sensitive species that may occur in oak woodlands include the Cooper's hawk (a California Watch List species), regionally sensitive Harbison's Dunn skipper, and Nuthalls' scrub oak and Engelmann oak (designated as sensitive by the California Native Plant Society). Although eucalyptus woodland is a non-native community that does not support sensitive plant or wildlife species, it is often used for nesting by raptors and other birds or roosting by bats.

Riparian and Wetland Habitat

Riparian

Riparian habitats are found along drainages and streams, where soils tend to be moist during all or part of the year. Within Carlsbad, riparian communities may also be the result of agricultural runoff. There are approximately 572 acres of riparian habitat located in the city, consisting of riparian scrub, riparian woodland and riparian forest. Riparian habitats are all considered sensitive

under federal and state regulations and policies. Sensitive species that may occur in riparian habitats include the federally and state listed endangered Least Bell's vireo and willowy monardella. Sycamore-alder woodland supports nesting for a number of raptor species, including nesting of the white-tailed kite and Cooper's hawk.

Marsh, Estuarine, and Freshwater

Marsh and wetland habitats within Carlsbad consist of southern coastal salt marsh, freshwater marsh and cismontane alkali marsh, in addition to other wetland and aquatic habitat types, such as estuaries, freshwater/open water and vernal pools. There are approximately 1,466 acres of marsh habitats in the city, all of which are considered sensitive and are regulated under federal and state regulations and policies.

Sensitive species that may occur in salt marsh include the state listed California black rail and Belding's savannah sparrow, as well as the federally listed light-footed clapper rail. Plant species found in freshwater marsh include the state listed Spreading Navarretia.

Other wetland habitats include estuaries, freshwater/open water and vernal pools. Lake Calavera is the largest open water area in the city, apart from the three major coastal lagoons, and provides foraging habitat for the osprey (a California Watch List species). Vernal pools are highly restricted wetlands that contain high numbers of endangered, sensitive and endemic plant and animal species. Sensitive species found in vernal pool habitats include state and federally listed endangered California Orcutt grass and San Diego button-celery, as well as the federally listed San Diego fairy shrimp.

Special-Status Species

A total of 51 sensitive plant and animal species have been recorded as occurring or potentially occurring within the city. Of these, 20 are state and federally listed as threatened or endangered. Fifteen of the 51 sensitive species are considered to be narrow endemics, which are native species that have a highly restricted distribution, soil affinity, and/or habitat. The federal, state, and local laws and regulations that protect these species are discussed below.

Habitats and Resource Conservation Regulatory Context, and Plans and Programs

Regulatory Context

Federal Endangered Species Act

Under the Federal Endangered Species Act (ESA) of 1973, the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533[c]). The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under federal permit.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.) is a federal statute that makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird or attempt such actions, except as permitted by regulation.

California Fish and Wildlife Code

Under the California Fish and Wildlife Code, the California Department of Fish and Wildlife (CDFW) provides protection from "take" for a variety of species, including Fully Protected species. The Native Plant Protection Act of 1977 (Fish and Wildlife Code Sections 1900 et seq.) gives the CDFW authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations. The CDFW also protects streams, water bodies and riparian corridors through the streambed alteration agreement process under Section 1601 to 1606 of the California Fish and Wildlife Code.

California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of special-status plant species based on collected scientific information. Designation of these species by the CNPS has no legal status or protection under federal or state endangered species legislation.

California Coastal Act of 1976

As noted above, the CDFW identifies areas for the protection of environmentally sensitive habitats; under the California Coastal Act (CCA) protection is provided for these areas in the coastal zone. The CCA identifies environmentally sensitive habitats as areas in which plant or animal life and or their habitats are rare or vulnerable due to the special nature or role in an ecosystem that can be easily disturbed or degraded by human activities and developments.

California Natural Community Conservation Planning (NCCP) Act of 1991

The NCCP Act of 1991 provides a framework for state and local government, as well as private interest efforts plans for protection of regional biodiversity and the ecosystems upon which they depend. NCCP's allow for the appropriate, compatible economic activity to occur while ensuring the long-term conservation of multiple species. As a result of this act the Carlsbad Habitat Management Plan (HMP) was prepared under the Multiple Habitat Conservation Program (MHCP) (see below).

Local Plans and Programs

Multiple Habitat Conservation Program

Under the NCCP, Carlsbad and the cities of Encinitas, Escondido, Oceanside, San Marcos, Solana Beach and Vista participated in the preparation of the MHCP, which was adopted and certified by the San Diego Association of Governments (SANDAG) in 2003. The MHCP is a comprehensive sub-regional plan that addresses the needs of multiple plant and animal species in northwestern San Diego County, enabling cities to implement their portions of the MHCP through citywide subarea plans.

Habitat Management Plan for Natural Communities in the City of Carlsbad

The City of Carlsbad prepared a subarea plan as a part of the MHCP, called the Habitat Management Plan for Natural Communities in the City of Carlsbad or the HMP, which was adopted by the Carlsbad City Council in November 2004. The HMP outlines specific conservation, management, facility siting, land use, and other measures that the city will take to preserve the diversity of habitat and protect sensitive biological resources in the city while also allowing for additional development and growth as anticipated under the city's General Plan. Formal approval and adoption of the HMP occurred through issuance of a permit by wildlife agencies, namely United States Fish and Wildlife Service (USFWS) and CDFW, as well as execution of an implementation agreement between the city and the wildlife agencies. The HMP preserve contains natural habitats that are necessary to sustain threatened, listed or sensitive species, and to maintain biological value.

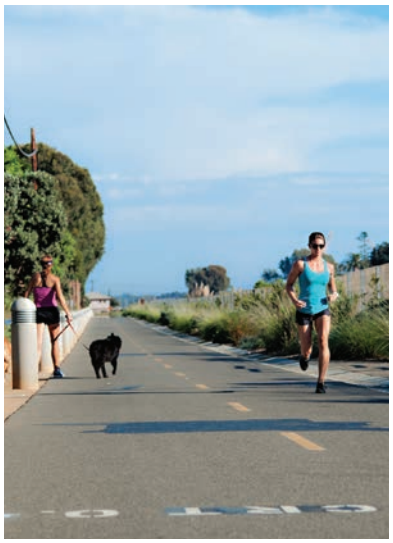
Figure 4-2: HMP Preserve Areas

Source: City of Carlsbad, 2012; SANDAG, 2013; Dyett & Bhatia, 2013.

One of the HMP management goals is to conserve a full range of vegetation community types, with an emphasis on sensitive habitat types. As part of the permit issued by the wildlife agencies, the city is required to preserve 6,478 acres of land within the city's jurisdictional boundaries and an additional 308 acres of habitat for the coastal California gnatcatcher outside of the city's jurisdiction (i.e., "gnatcatcher core"). As of December 2012, the city had preserved 5,877 acres within the city's boundaries, or 91 percent of the HMP target, leaving a remaining 601 acres within the city's boundaries to be preserved in hardline conservation or standards areas in order to meet the HMP permit requirements, as shown in Table 4-2. In addition, as of December 2012, the city had preserved 280 acres outside the city's boundaries, or 91 percent of the HMP target for the gnatcatcher core, leaving 28 acres outside the city's boundaries to be preserved as gnatcatcher habitat. The HMP preserves fall into one of three classifications, based upon the status of preservation: Existing Hardline Preserve, Proposed Hardline Preserves, and Standards Areas. The Existing Hardline Preserves include established private and city-owned preserves, CDFW Ecological Reserves, and pre-existing natural open space preserves. Preserve locations are shown in Figure 4-2. Table 4-3 shows actively managed preserves over 100 acres in size.

Open Space Management Plan

As a framework plan to assist in the implementation of the MHCP and HMP, the city's Open Space Management Plan establishes procedures, standards, guidelines and conditions for long-term conservation and management of sensitive species and habitat.



Community Forest Management Plan

The Community Forest Management Plan (2002) provides guidance to conserve forest areas through proper design, maintenance and education. The document includes guidelines and procedures for planting, maintaining, removing, replacing and preserving trees within public areas; some of the most visible landscape features include trees within the city's rights-of-way and other public areas.

Proposition C Open Space and Trails

In 2002, Proposition C was passed by Carlsbad voters, which authorized the City Council to exceed the $1 million capital spending limit for specified projects, one of which was the acquisition of open space and trail linkages. The Proposition C Open Space and Trails Ad Hoc Citizens' Committee was formed by the City Council in October 2005 to establish a prioritized list of potential property acquisitions associated with the open space and trails linkage component of Proposition C. The committee solicited nominations of potential open space acquisitions and received proposals for 13 properties. These properties were ranked using the committee's criteria and presented to the City Council in the

TABLE 4–2: HMP CONSERVATION TARGETS AND GAINS

VEGETATION TYPE	CONSERVATION TARGET (ACRES)	HABITAT GAINS (AS OF DECEMBER 2012; ACRES)
Grassland	707	637
Coastal Sage Scrub	2,139	1,777
Chaparral (Undifferentiated Types)	676	605
Southern Maritime Chaparral	342	346
Oak Woodland	24	13
Eucalyptus Woodland	99	95
Riparian Scrub, Woodland and Forest	494	452
Marsh, Estuarine, Freshwater and Other Wetlands	1,252	1,184
Disturbed Lands	745	768
TOTAL TARGET CONSERVATION WITHIN CARLSBAD	**6,478**	**5,877**
Gnatcatcher Core Area Contribution	308	280
TOTAL HMP TARGET CONSERVATION	**6,786**	**6,157**

Sources: Habitat Management Plan for Natural Communities in the City of Carlsbad, November 2004; Annual Report for the Carlsbad Habitat Management Plan, Year 8 (April 13, 2013).

TABLE 4–3: ACTIVELY MANAGED HMP PRESERVES OVER 100 ACRES IN SIZE, AS OF JULY 25, 2013

PRESERVE NAME	SIZE (AC)	PRESERVE MANAGER
Rancho La Costa	831	Center for Natural Lands Management
Batiquitos Lagoon Ecological Reserve	564	California Department of Fish and Wildlife
Carlsbad Highlands Ecological Reserve	472	California Department of Fish and Wildlife
Lake Calavera (city owned)	257	Center for Natural Lands Management
Calavera Hills II/Robertson Ranch	256	Center for Natural Lands Management
Carlsbad Oaks North	220	Center for Natural Lands Management
Agua Hedionda Ecological Reserve	197	California Department of Fish and Wildlife
Buena Vista Creek Ecological Reserve	142	California Department of Fish and Wildlife
Buena Vista Lagoon Ecological Reserve	140	California Department of Fish and Wildlife
Macario Canyon (city owned)	129	Center for Natural Lands Management
La Costa Glen	108	Center for Natural Lands Management

committee's final report in February 2007. Subsequent to the preparation of the final report, the City Council recommended three additional areas of the city be evaluated and included in the ranking.

Using the committee's report and other resources, the city works with non-profit organizations and state and federal wildlife agencies in exploring potential native habitat areas for open space conservation. Several conservation acquisitions have occurred to-date, including the Sherman property (now the CDFW's Buena Vista Creek Ecological Reserve), the Mitsuuchi property near Batiquitos Lagoon, and two Caltrans properties near Agua Hedionda Lagoon. Whether or not the city acquires open space lands itself, or another agency acquires and conserves the land, the Proposition C committee recommendations and evaluation guidelines provide detailed criteria for the evaluation of future potential conservation sites.

4.4 Beaches

An important component of the Carlsbad General Plan is the enhancement and maintenance of the city's beach community character and connectedness. The city has seven miles of beach and coastline divided into three main sections: North Carlsbad beaches, Carlsbad State Beach, and South Carlsbad State Beach. The beaches are mostly owned and managed by the California State Parks and Recreation Department, which provides lifeguard/public safety service, maintenance of public restrooms, picnic areas, operation of the South Carlsbad Campground, and various beach parking lots. Beaches in the city are described briefly below.

North Carlsbad Beaches

Beaches north of Pine Avenue to the Oceanside border are jointly owned by the state and the coastal property owners along that stretch. All North Carlsbad beaches are open to the public, and the City of Carlsbad provides public access to the beach at Rue des Chateaux, Beech Avenue, Christiansen Way, Grand Avenue, and Carlsbad Village Drive.

Carlsbad State Beach

Carlsbad State Beach, from Pine Avenue south to Cannon Road includes the Frazee State Beach, Tamarack Surf State Beach and Warm Water Jetty (in front of the power plant). This stretch of Carlsbad's shoreline is one of San Diego County's most popular beaches. The City of Carlsbad provides beach access at Pine Avenue, Sycamore Avenue, Maple Avenue, Cherry Avenue, Hemlock Avenue, and Tamarack Avenue. Two seawalls and a pedestrian walkway connect Pine Avenue to Cannon Road. The seawall south of Tamarack Avenue provides additional beach accessways and provides a pedestrian connection along this entire stretch of beach.

South Carlsbad State Beach

South Carlsbad State Beach stretches from La Costa Avenue to just north of Terramar Point and includes the popular 220-site South Carlsbad Campground and two day use areas. Beach areas within the South Carlsbad State Beach include the North Ponto and South Ponto beaches and Terramar Beach.

4.5 Parks and Recreation

Park Classification

The General Plan establishes three park classifications, as described below and depicted on Figure 4-3.

Community Parks

Community parks are typically 20-50 acres in size (though there are several smaller parks "grandfathered" into this classification), and designed to serve the recreational needs of several neighborhoods, with a focus on serving families from the vicinity with daily frequency. Community parks generally provide active and passive use amenities; however, they are not limited to the exclusive use of either. Minimum facilities should include:

- Family-oriented picnic areas
- Group picnic areas
- Turfed open space areas for free play
- Multi-purpose playfield(s) (lighted when appropriate)
- Tot lot areas
- Structures for lectures, meetings, skills, instructions, etc.
- Buffer areas
- Special use facilities such as community gardens, swimming pools, tennis courts, horseshoes, handball and racquetball courts, bicycle paths, skate parks, dog parks, etc. as per specific community demand may be located within these parks if appropriate to the interests and needs of the community in which the park is located.

Special Use Areas

Special use areas are typically between one and five acres in size, with only one or two basic uses, which can be either active or passive in orientation. Examples include, but are not limited to, swim facilities, skate parks, dog parks, tennis courts or picnic areas. School sites that operate under a joint-use facility agreement between the City of Carlsbad and a school district are also included in the inventory. Adequate access should be a primary siting criteria utilized in determining the location of special use areas.

Special Resource Areas

Special resource areas have citywide and potentially regional significance related to the quality of the site or service that it provides. This quality may be a natural feature (geological, ecological, hydrological), historical resource (architectural, archaeological), or some combination thereof. Special resource areas are typically larger than community parks.

Active and Passive Recreation. In addition to a park's primary classification, the city may describe a park as containing active and/or passive areas. Parks can be developed with either active or passive park amenities or a combination of both. Active park areas typically provide a form of organized and/or supervised recreation, such as gymnasiums, swim complexes, multi-use ball fields, tot lots, hard court play surfaces, volleyball, horseshoe areas, BMX bike courses, and skate parks or a combination thereof. Passive park areas often provide minimal or no amenities associated with active use. The very nature of passive use implies quiet, contemplative, low impact activity, such as nature trails, walkways, picnic tables, benches, and small turf and/or landscaped areas.

Regional Recreation. Three of the city's special resource areas (Lake Calavera, Agua Hedionda Lagoon and Batiquitos Lagoon) and one community park (Veterans Memorial), as well as the beaches, serve a regional recreation need; however, they will continue to function pursuant to their primary park classification as identified above.

Existing Park and Recreation Areas

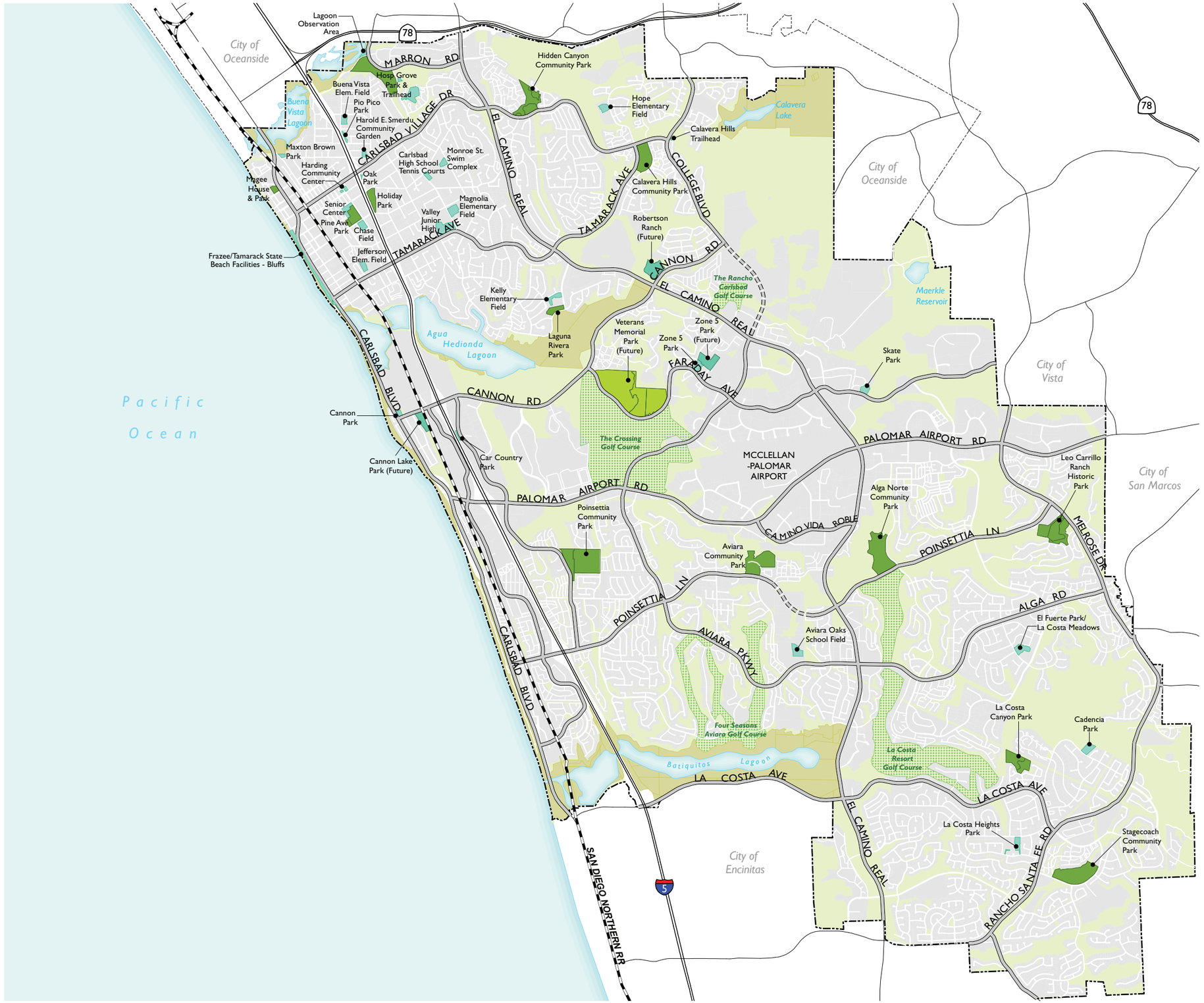
Carlsbad currently has 13 community parks (254.6 acres), 27 special use areas (81.1 acres), and five special resource areas (more than 1,300 acres). Table 4-4 provides a list of existing parks in the city, the quadrants in which they are located, and approximate acreages by park. Special resource areas do not count toward the Growth Management Plan. Although golf courses are a source of recreation, these park acreage numbers and ratios do not include land dedicated to golf courses (golf courses are not classified as parks). Golf courses are included in the calculation of the overall supply of open space in the city.

Future Park and Recreation Areas

The city's Parks and Recreation Needs Assessment and Comprehensive Action Plan, which was completed in Fall 2013, indicates the current trends and recreational needs identified by the Carlsbad community. The plan is based upon extensive community participation, and Table 4-5 identifies some of the anticipated future park development projects based upon input received.

In addition to the future parks identified in Table 4-5, an area referred to as Hub Park may provide an opportunity for a future park; however, the park is not planned at this time. In 1975, as a result of the approval of the Encina Power plant, SDG&E and the city entered into a lease that allows the city to use a portion of the SDG&E owned property on the south shore of Agua Hedionda Lagoon for park and recreational purposes. The term of the lease is for 60 years and can be extended to 99 years or 2074. The potential future park area is approximately 91 acres. Because this park is not a planned park, it is not included in the future park inventory.

Figure 4-3: Parks



- Existing Community Park
- Future Community Park
- Existing Special Use Areas
- Future Special Use Areas
- Existing Special Resource Areas
- Existing Golf Courses
- Other Open Space
- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; SANDAG, 2013; Dyett & Bhatia, 2(

TABLE 4–4: EXISTING COMMUNITY PARKS, SPECIAL USE AREAS, AND SPECIAL RESOURCE AREAS (2013)

FACILITY NAME	QUADRANT	ACRES
Existing Community Parks		
Alga Norte Community Park	SE	32.1
Aviara Community Park	SW	24.3
Calavera Hills Community Park	NE	16.8
Hidden Canyon Community Park (includes 12.7 acres of Carlsbad Village Drive open space)	NE	22
Holiday Park	NW	6.0
Hosp Grove Park	NW	27.1
La Costa Canyon Community Park (includes 8.9 acres of La Costa Canyon open space)	SE	14.7
Laguna Riviera Park	NW	4.2
Leo Carrillo Ranch Historic Park (includes 16.5 acres of Carrillo Ranch open space)	SE	27.4
Magee House and Park	NW	2.1
Pine Avenue Park (includes Madison Street parcels)	NW	8.2
Poinsettia Community Park (includes 11.1 acres of Poinsettia open space)	SW	41.2
Stagecoach Community Park	SE	28.5
Subtotal Community Parks		***254.6***
Existing Special Use Areas		
Aviara Oaks School Field	SW	4.7
Buena Vista Elementary School Field	NW	2.6
Business Park Recreational Facility (Zone 5 Park)	NW	3.0
Cadencia Park	SE	4.0
Calavera Hills Trailhead	NE	.3
Cannon Park	NW	1.7
Car Country	NW	1.0
Carlsbad High School Tennis Courts	NW	1.7
Chase Field	NW	2.7
Frazee/Tamarack State Beach Facilities Bluff	NW	8.8
Harding Community Center	NW	1.0
Harold E. Smerdu Community Garden	NW	1.3
Hope Elemntary School Field	NE	2.8
Hosp Grove Trailheads	NW	7.6
Kelly Elementary School Field	NW	2.9
Jefferson Elementary School Field	NW	2.2
La Costa Meadows Elementary/El Fuerte Park	SE	4.7
Lagoon Observation Area	NW	1.4
La Costa Heights Park	SE	3.5
Magnolia Elementary School Field	NW	4.0
Maxton Brown Park	NW	0.9

TABLE 4–4: EXISTING COMMUNITY PARKS, SPECIAL USE AREAS, AND SPECIAL RESOURCE AREAS (2013)

FACILITY NAME	QUADRANT	ACRES
Monroe Street Swim Complex	NW	2.0
Oak Park	NW	0.2
Pio Pico Park	NW	0.8
Senior Center Complex	NW	3.4
Skate Park	NE	3.4
Valley Junior High School Field	NW	8.5
Subtotal Special Use Areas		***81.1***
Existing Special Resource Areas		
Agua Hedionda Lagoon		254.0
Batiquitos Lagoon		484.0
Beaches		113.2
Buena Vista Lagoon		202.0
Lake Calavera		256.5
Subtotal Special Resource Areas		***1,309.7***
TOTAL EXISTING PARKLAND		**1,645.4**

Source: City of Carlsbad Parks and Recreation Department, 2013.

TABLE 4–5: ANTICIPATED FUTURE PARK DEVELOPMENT PROJECTS

QUAD	PARK DEVELOPMENT PROJECT	PARK CLASSIFICATION	ESTIMATED PARK ACREAGE
NW	Cannon Lake Park	Special Use Area	6.8
NW	Business Park Recreational Facility (Zone 5 Park) Expansion	Special Use Area	9.3
NE	Robertson Ranch Park	Special Use Area	11.2
SW	Poinsettia Community Park- Phase IIb	Community Park	NA[1]
SE	Leo Carrillo Ranch Park-Phase III	Community Park	NA[1]
CITYWIDE	Veteran's Memorial Park	Community Park	91.5

1 Improvements within existing park acreage; no additional park acreage to be added.

Parkland and Open Space Standards

Growth Management

The city's Growth Management Plan facility standard for parks is described in Section 4.2 and summarized below in Table 4.6. The city annually monitors the status of compliance with all Growth Management Plan facilities standards. As of 2013, the city's park facilities are consistent with the Growth Management Plan park facilities standard and citywide there is a ratio of three acres per 1,000 population. See below for information regarding future park demand.

Quimby Act

The 1975 Quimby Act (California Government Code Section 66477) authorizes cities to require developers to set aside land or pay fees for park improvements. The goal of the act is to require developers to help provide for parkland needs of new development. The act allows cities to require dedication or in lieu fees for community and neighborhood parkland contributions up to three acres per 1,000 population, or up to five acres per 1,000 population to match the existing ratio if it is higher than three acres per 1,000 population. Under the Quimby Act, fees must be paid and/or land conveyed directly to the local public agencies that provide park and recreation services communitywide; however, revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities. The city's parkland standards are consistent with the Quimby Act.

TABLE 4–6: PARK FACILITY STANDARDS

CLASSIFICATION	SIZE	LEVEL OF SERVICE	ACCESS	OWNERSHIP	STANDARD
Special Resource Area	100 acres + unique character and/or use not found in community parks	Citywide	Vehicular, bicycle, pedestrian	Public	N/A
Community Park	20-50 acres as a guideline, where acquisition of sufficient acreage is possible	Community	Vehicular, bicycle, pedestrian	Public	3 acres of community park or special use area per1,000 population
Special Use Area	1-5 acres	Neighborhood and community	Vehicular, bicycle, pedestrian	Public, private and quasi-public	
Recreational Facilities for Industrial Areas	Negotiable	In proximity to employees	Vehicular, bicycle, pedestrian	Public/private	_[1]

1 There is a fee based on square feet of industrial floor area.

Future Demand and Parkland Distribution

Carlsbad will have an estimated 51,821 dwelling units and 129,901 residents at buildout. Based on this projection and applying the current park standards from the Growth Management Plan, future demand for park land will be 389.7 acres citywide. Assuming completion of currently planned parks, including Veteran's Memorial Park and Robertson Ranch Park, the city will at buildout have a parkland surplus in each of the four quadrants, and a 64.9 acre surplus citywide. Table 4-7 summarizes the city's projected park needs and the estimated amount of future park acreage.

TABLE 4–7: PARK NEEDS PROJECTED FOR BUILDOUT

QUADRANT	BUILDOUT ESTIMATE
Northwest	
Population Estimate	37,904
Park Acres Needed	113.7
Future Park Acres[1]	144.3
Future Surplus or (Deficit)	30.6
Northeast	
Population Estimate	22,423
Park Acres Needed	67.3
Future Park Acres[1]	79.4
Future Surplus or (Deficit)	12.1
Southwest	
Population Estimate	27,795
Park Acres Needed	83.4
Future Park Acres[1]	93.1
Future Surplus or (Deficit)	9.7
Southeast	
Population Estimate	41,780
Park Acres Needed	125.3
Future Park Acres[1]	137.8
Future Surplus or (Deficit)	12.5
Citywide	
Population Estimate	129,901
Park Acres Needed	389.7
Future Park Acres[1]	454.6
Future Surplus or (Deficit)	64.9

1 Future park acres include the acreage of existing and future planned parks per Tables 4-4 and 4-5. In regard to Veteran's Memorial Park, because of the park's central location in the city, and pursuant to the city's Citywide Facilities and Improvement Plan, the 91.5 acre park will count toward satisfying the park needs of each quadrant (22.9 acres per quadrant).

Figure 4-4: Existing and Planned Future Recreational Trails

- 1, Existing Bike Lanes and Sidewalk Connection
- 1, Future Bike Lanes and Sidewalk Connection
- 2, Existing Paved Trail
- 3, Existing Unpaved Trail
- 3, Future Unpaved Trail
- 4, Existing Paved Open Space Trail
- 5, Existing Unpaved Open Space Trail
- 5, Future Unpaved Open Space Trail
- 6, Existing Regional Coastal Rail Trail & Sea Wall
- 6, Future Regional Coastal Rail Trail & Sea Wall
- 7, Future South Carlsbad Coastal

- Public Schools
- Existing Parks
- Future Parks
- Open Space

- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

The conceptual alignments shown on this exhibit are intended to be flexible and should not be interpreted to be rigid alignments. It is anticipated that the alignments and public easements for open space multi-use trials will be adjusted as warranted by environmental analysis and detailed planning when future developments occurs for the future exhibited alignments. However, the points where a trail passes from one zone to an adjacent zone or from one property ownership to another should remain consistent with the conceptual alignments as shown unless an agreement has been reached with the adjacent zone or property ownership to shift the alignment.
A General Plan amendment will not be required in the future to specifically site the conceptual alignments shown on this plan. A General Plan amendment wil be required if any trail segment shown on this conceptual plan is deleted.

4.6 Trails and Greenway System

Trails and greenways offer community benefits as places for exercise and solitude, and also play a key role in physically connecting the community and creating a network of open spaces. The City of Carlsbad has been working for many years to develop and implement a comprehensive trails system. Beginning in 1990, a Trails Feasibility Study laid the groundwork for planning trails in the city. The city's Open Space and Conservation Resource Management Plan (1992) expanded upon the study and provided conceptual trail alignments used to plan the city's trail network; this plan continues to be consulted for improvements to the city's trail network. In 2001 the City Council approved the Citywide Trails Report, which outlined the future vision and immediate steps to be taken to implement the Citywide Trails Plan.

Currently there are approximately 38 miles of unpaved recreational trails located in a variety of open space areas of the city; current plans call for another 23 miles to be built in the future. Existing trails are listed in Table 4-8, and existing and planned future recreational trails are indicated on Figure 4-4.

Carlsbad community members who participated in the Envision Carlsbad Phase 1 visioning process indicated that a major challenge to trails development and maintenance is the proper design and designation of trails by user group. Community members indicated that different user groups (walkers, bicyclists, equestrians) have different trail needs and that the network should provide different kinds of resources for each group. An important consideration for future trails development will be connectivity between off-road trails and major on-road pedestrian and bicycle routes, such that future improvements in the trail system also contribute to linkages between important sites (beaches, lagoons, schools, and others).

TABLE 4–8: EXISTING TRAILS

OPEN SPACE TRAILS	TRAIL SURFACE	LENGTH (MILES)
Aviara	Unpaved	6.0
Legoland	Paved	0.5
Hosp Grove	Unpaved	3.0
Cove Drive/Agua Hedionda	Unpaved	0.3
San Pacifico	Unpaved	1.0
Rancho Carrillo	Paved/unpaved	4.0
La Costa Valley	Paved/unpaved	1.3
La Costa Glen	Unpaved	1.2
Villagio	Unpaved	0.4
Arroyo Vista	Unpaved	0.7
Hidden Canyon Park	Unpaved	0.3
Villages of La Costa: The Oaks-South	Paved/old RSF Road	1.5
Villages of La Costa: The Ridge	Unpaved	1.5
Villages of La Costa: The Oaks-North	Unpaved	2.0
Villages of La Costa: Melrose 55 - Fioli Circle	Unpaved	0.3
The Crossings/Veteran's Park	Unpaved/paved	3.0
24 Hour Fitness to Hidden Valley Road	Unpaved	1.0
Village H-North of CBVD	Unpaved	0.4
Palomar Forum-Melrose/PAR	Unpaved	0.3
Robertson Ranch	Unpaved	1.5
Carlsbad Oaks North Business Park	Unpaved	1.3
Lake Calavera	Unpaved	6.2
The Ranch	Unpaved	0.7
Agua Hedionda Discovery Center	Unpaved	0.3
Subtotal Open Space Trails		*38.7*
Mobility Element Trails		
Calle Barcelona	Paved	1.3
College/Cannon Avenue - Calavera Hills II/RR	Unpaved	1.5
El Fuerte - Bressi Ranch	Unpaved	1.0
Alicante Road - VLC- The Greens	Unpaved/paved	1.0
Poinsettia Lane - El Fuerte to Brigantine	Unpaved	2.1
Subtotal Circulation Element Trails		*6.9*
Special Coastal Regional Trails		
Sea Wall	Paved	0.7
Coastal Rail Trail	Paved	0.7
Subtotal Special Coastal Regional Trails		*1.4*
TOTAL TRAIL MILES		**47.0**

Totals may not add due to rounding.

Source: City of Carlsbad Parks and Recreation Department, 2014.

4.7 Agricultural Resources

Existing Agricultural Lands

The City of Carlsbad's agricultural and horticultural resources are considered a valuable part of the city's open space heritage. Various levels of farming and cultivation of agricultural crops have occurred in the city. In the late 1880s agriculture development consisted of citrus fruits, avocados and olives and by the early 1900s dry farming was the town's principle industry. By 1914 farming was expanded to include flowers.

The Flower Fields and strawberry fields constitute a large portion of the existing agricultural uses in the city. The Flower Fields are a result of more than 85 years of floral cultivation, and today, comprise more than 50 acres of Giant Tecolote Ranunculus flowers, as well as approximately five acres of other specialty flowers, located at Carlsbad Ranch, east of Interstate 5 and north of Palomar Airport Road (see Figure 4-5). An additional 45 acres of agricultural land is located north of the Flower Fields along the south side of Cannon Road, and approximately 26 acres located to the east of that site (these sites are part of the Carlsbad Ranch Specific Plan and are lands affected by Proposition D; see discussion below). The land north of Cannon Road along the south shore of Agua Hedionda Lagoon is currently used for agriculture purposes, including: 1) an approximately 49 acre parcel located adjacent to the east side of Interstate 5 and north of Cannon Road that is currently used for the growing of strawberries (this area is not subject to Proposition D described below); and 2) approximately 172 acres that is also used for growing strawberries and other agricultural fields (this area is affected by Proposition D; see discussion below).

In recognition of this history, an agricultural conversion mitigation fee program was instituted as an incentive to retain agricultural land, and to support agricultural uses in the future. Under the program, $10,000 per acre is paid to the city when agricultural lands in identified areas within the Coastal Zone are developed; the funds are used to enhance the natural and agricultural environment, including the development of farmworker housing.

Cannon Road Open Space, Farming and Public Use Corridor

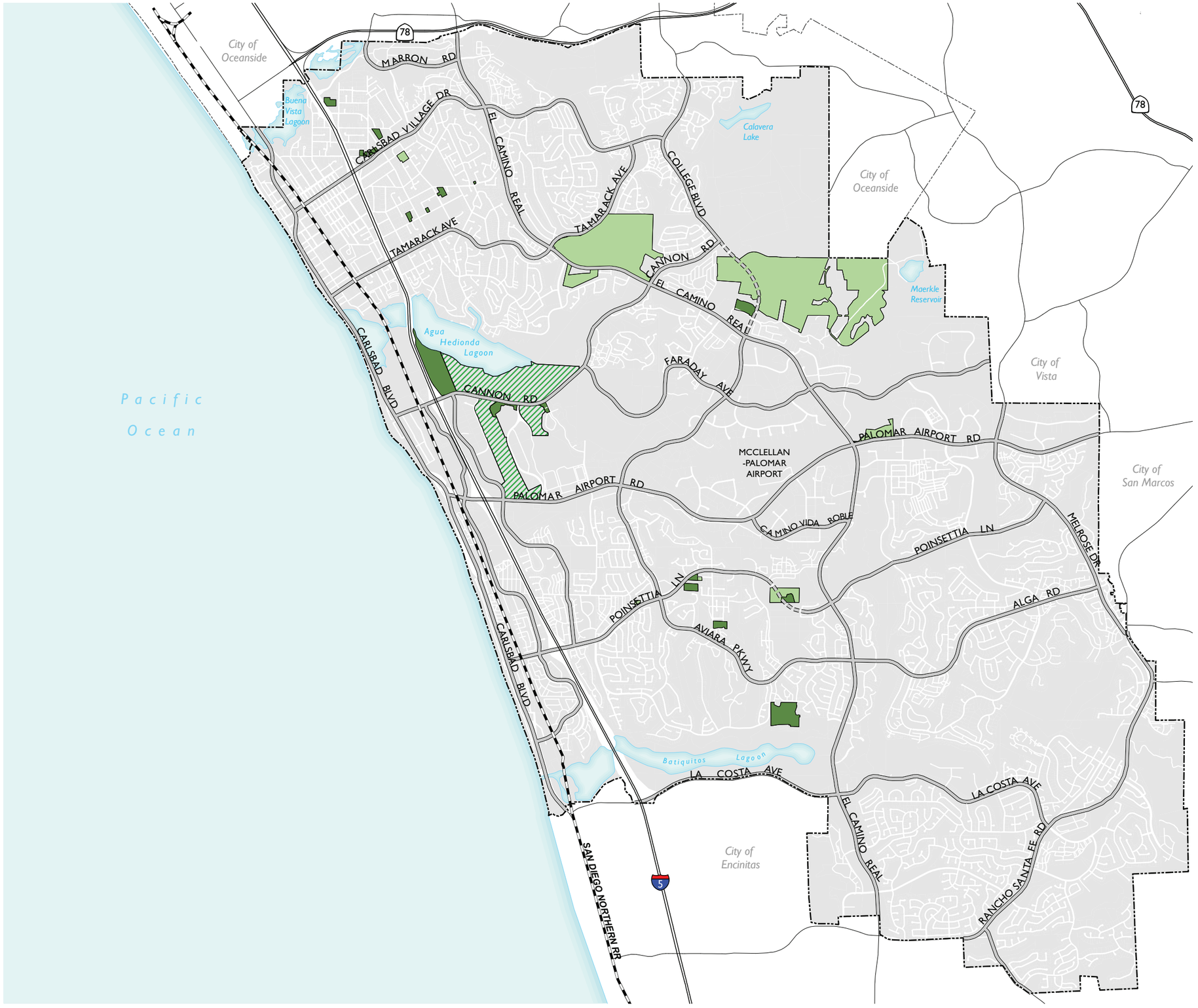
The Cannon Road Open Space, Farming and Public Use Corridor is shown on Figure 4-5. This area presents a unique opportunity for the city to create a sustainable, community-oriented open space area that balances social, economic and environmental values important to the community. In 2006, Carlsbad voters approved "Proposition D – Preserve the Flower and Strawberry Fields and Save Carlsbad Taxpayers' Money", which applies to land located within the Cannon Road Open Space, Farming and Public Use Corridor. Proposition D encourages the continuation of agriculture on lands within the corridor for

as long as such use is economically feasible for the landowner. Following voter approval of Proposition D, the City Council adopted the Cannon Road

Agricultural and Open Space Zone to implement the proposition. The new zone will become effective when the California Coastal Commission approves the associated LCP amendment. Once effective, the new zone will specify that if the landowners choose to discontinue agricultural use of the land, only open space uses are allowed, as well as limited commercial development that is developed in conjunction with and/or in support of a permitted agricultural or open space use.

The strawberry fields (top), and Flower Fields, (bottom), are existing agricultural businesses in Carlsbad, as well as iconic open spaces for many community members.

Figure 4-5: Existing Agricultural Lands



Agricultural Land

- Intensive Agriculture
- Extensive Agriculture
- Cannon Road Open Space, Farming, and Public Use Corridor
- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; SANDAG, 2012; Dyett & Bhatia, 2013.

4.8 Air Quality

Carlsbad's weather is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. Carlsbad is located within the San Diego Air Basin (SDAB) and is subject to the San Diego Air Pollution Control District guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The SDAB experiences frequent temperature inversions, trapping pollutions and creating smog. Subsidence inversions occur during the warmer months as descending air associated with the Pacific High pressure zone meets cool marine air. Radiation inversions develop on winter nights when air near the ground cools by heat radiation and air aloft remains warm.

Sensitive Receptors

Reduced visibility, eye irritation, and adverse health impacts are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, as identified by the California Air Resources Board (CARB), include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Air Quality Standards

Federal Clean Air Act

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the Clean Air Act, including the setting of National Ambient Air Quality Standards (NAAQS) for "criteria pollutants" under the Clean Air Act. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

State Regulations

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to the CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. The CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS.

The NAAQS and CAAQS are presented in Table 4-9, Ambient Air Quality Standards.

TABLE 4–9: AMBIENT AIR QUALITY STANDARDS

		CALIFORNIA STANDARDS[1]	NATIONAL STANDARDS[2]	
POLLUTANT	AVERAGE TIME	CONCENTRATION[3]	PRIMARY[3,4]	SECONDARY[3,5]
Ozone (O_3)	1 hour	0.09 ppm (180 µg/m3)	—	Same as Primary Standard
	8 hour	0.070 ppm (137 µg/m3)	0.075 ppm (147 µg/m3)	
Carbon Monoxide (CO)	1 hour	20 ppm (23 mg/m3)	35 ppm (40 mg/m3)	—
	8 hour	9.0 ppm (10 mg/m3)	9 ppm (10 mg/m3)	
Nitrogen Dioxide (NO_2)[6]	1 hour	0.18 ppm (339 µg/m3)	0.100 ppm (188 µg/m3)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	0.053 ppm (100 µg/m3)	
Sulfur Dioxide (SO_2)[7]	1 hour	0.25 ppm (655 µg/m3)	0.75 ppm (196 µg/m3)	—
	3 hour	—	—	0.5 ppm (1300 µg/m3)
	24 hour	0.04 ppm (105 µg/m3)	0.14 ppm (for certain areas)7	
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)7	—
PM_{10}[8]	24 hour	50 µg/m3	150 µg/m3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m3	—	
$PM_{2.5}$[8]	24 hour	—	35 µg/m3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m3	12.0 µg/m3	15.0 µg/m3
Lead[9,10]	30-day Average	1.5 µg/m3	—	—
	Calendar Quarter	—	1.5 µg/m3 (for certain areas)10	Same as Primary Standard
	Rolling 3-Month Average	—	0.15 µg/m3	
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m3)	—	—
Vinyl Chloride[9]	24 hour	0.01 ppm (26 µg/m3)	—	—
Sulfates	24 hour	25 µg/m3	—	—
Visibility reducing particles[11]	8 hour (10:00 a.m. to 6:00 p.m. PST)	See footnote 11	—	—

ppm= parts per million by volume µg/m3 = micrograms per cubic meter mg/m3= milligrams per cubic meter

TABLE 4–9: AMBIENT AIR QUALITY STANDARDS

1 *California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*

2 *National standards (other than O3, NO2, SO2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For NO2 and SO2, the standard is attained when the 3-year average of the 98th and 99th percentile, respectively, of the daily maximum 1-hour average at each monitor within an area does not exceed the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.*

3 *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*

4 *National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.*

5 *National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*

6 *To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards, the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.*

7 *On June 2, 2010, a new 1-hour SO2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.*

8 *On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m3 to 12 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.*

9 *CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*

10 *The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.*

11 *In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.*

Source: CARB 2013d.

San Diego Air Pollution Control District (SDAPCD)

While the CARB is responsible for the regulation of mobile emission sources within the state, local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. In San Diego County, O_3 and particulate matter are the pollutants of main concern, since the CAAQS for those pollutants are exceeded here in most years. For this reason, the SDAB has been designated as a nonattainment area for the state's PM_{10}, $PM_{2.5}$, and O_3 (1-hour and 8-hour) standards. The SDAB is also a federal O_3 marginal nonattainment area for the 2008 8-hour NAAQS for O_3 and a CO attainment (maintenance) area.

The SDAPCD and SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB, and the SDAPCD has developed rules and regulations that apply to construction in the region and several stationary sources.

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health.

Ozone. O_3 is a colorless gas that is formed in the atmosphere when volatile organic compounds (VOCs), sometimes referred to as reactive organic gases, and nitrogen oxides react in the presence of ultraviolet sunlight. The primary sources of VOCs and NO_x, the precursors of O_3, are automobile exhaust and industrial sources. Ideal conditions for O_3 formation occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes.

Nitrogen Dioxide. Most NO_2, like O_3, is not directly emitted into the atmosphere but is formed by an atmospheric chemical reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_x and are major contributors to O_3 formation. High concentrations of NO_2 can cause breathing difficulties and result in a brownish-red cast to the atmosphere with reduced visibility.

Carbon Monoxide. CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest levels of CO in Carlsbad typically occur during the colder months of the year—November to February—when inversion conditions are more frequent.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals, from sources such as automobiles, fireplaces, and industrial sources. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter (in microns) and pose a greater health risk than larger-size particles.

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline, the manufacturing of batteries, paint, ink, ceramics, and ammunition and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phase-out of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phase-out of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a toxic air contaminant (TAC). Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills.

Local Air Quality

SDAB Attainment Designation

An area is designated in attainment when it is in compliance with the NAAQS and/or CAAQS. These standards establish the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare.

TABLE 4–10: SDAB ATTAINMENT CLASSIFICATION

POLLUTANT	FEDERAL DESIGNATION	STATE DESIGNATION
Ozone (O3) (1 hour)	Attainment[1]	Nonattainment
Ozone (O3) (8 hour)	Nonattainment (Former Subpart I/ Basic)	Nonattainment
Carbon Monoxide (CO)	Attainment (Maintenance Area)	Attainment
PM10	Unclassifiable[2]	Nonattainment
PM2.5	Attainment	Nonattainment
Nitrogen Oxide (NO2)	Attainment	Attainment
Sulfur Dioxide (SO2)	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility-Reducing Particles	(no federal standard)	Unclassified

1 The federal 1-hour standard of 0.12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.

2 At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.

Sources: EPA 2012a; CARB 2012c.

The criteria pollutants of primary concern that are considered in this air quality assessment include O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. Although there are no ambient standards for VOCs or NO_x, they are important as precursors to O_3.

The SDAB is designated by EPA as an attainment (maintenance) area for the 1997 8-hour NAAQS for O_3 and as a marginal nonattainment area for the 2008 8-hour NAAQS for O_3. The SDAB was designated in attainment for all other criteria pollutants under the NAAQS with the exception of PM_{10}, which was determined to be unclassifiable. The SDAB is currently designated nonattainment for O_3 and particulate matter, PM_{10} and $PM_{2.5}$, under the CAAQS. It is designated attainment for the CAAQS for CO, NO_2, SO_2, lead, and sulfates.

Table 4-10, SDAB Attainment Classification, summarizes San Diego County's federal and state attainment designations for each of the criteria pollutants.

Air Quality Monitoring Data

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County, which measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. Ambient concentrations of pollutants from 2009 through 2011 collected at three stations closest to Carlsbad are presented in Table 4-11. The number of days exceeding the NAAQS and CAAQS is shown in Table 4-12. The state 8 hour O_3 standards were exceeded in 2009, 2010 and 2011; the state 1 hour standards were exceeded in 2009, while the federal 8-hour O_3 standard was exceeded in 2009. The state 24-hour PM_{10} standard was exceeded in 2009; the state annual PM_{10} standard was exceeded in 2009 and 2010; and the federal 24-hour $PM_{2.5}$ standard was exceeded in 2009, 2010 and 2011. Air quality in the Carlsbad region was in compliance with both CAAQS and NAAQS for NO_2, CO, and SO_2 during this monitoring period.

TABLE 4–11: AMBIENT AIR QUALITY DATA (PPM UNLESS OTHERWISE INDICATED)

POLLUTANT	AVERAGE TIME	2009	2010	2011	MOST STRINGENT AMBIENT AIR QUALITY STANDARD	MONITORING STATION
Ozone (O_3)	8-hour	0.084	0.072	0.075	0.070	Del Mar – Mira Costa College
	1-hour	0.97	0.85	0.091	0.090	
PM_{10}	Annual	24.6 µg/m³	21.0 µg/m³	18.8 µg/m³	20 µg/m³	Escondido – East Valley Parkway
	24-hour	74.0 µg/m³	43.0 µg/m³	40.0 µg/m³	50 µg/m³	
$PM_{2.5}$	Annual[1]	13.4 µg/m³	12.2 µg/m³	10.4 µg/m³	12 µg/m³	Escondido – East Valley Parkway
	24-hour	78.4 µg/m³	52.2 µg/m³	27.4 µg/m³	35 µg/m³	
NO_2	Annual	0.016	0.014	0.013	0.030	Escondido – East Valley Parkway
	1-hour	0.073	0.064	0.062	0.180	
Carbon Monoxide (CO)	8-hour	3.54	2.46	2.30	9.0	Escondido – East Valley Parkway
	1-hour[2]	4.40	3.90	3.50	20	
Sulfur Dioxide (SO_2)	Annual	0.001	0.000	—	0.030	San Diego – 1110 Beardsley Street
	24-hour	0.006	0.002	0.003	0.040	

Data represent maximum values

1 Federal data reflected for 2009 and 2010; not determined for California method.

2 Data were taken from EPA 2012c

Source: CARB 2012c; EPA 2012.

TABLE 4–12: FREQUENCY OF AIR QUALITY STANDARD VIOLATIONS

MONITORING SITE	YEAR	STATE 1-HOUR O3	STATE 8-HOUR O3	NATIONAL 8-HOUR O3	STATE 24-HOUR PM_{10}[1]	NATIONAL 24-HOUR $PM_{2.5}$[1]
Del Mar – Mira Costa College	2009	1	3	1	—	—
	2010	0	2	0	—	—
	2011	0	1	0	–	—
Escondido – East Valley Parkway	2009	–	–	–	5.6 (1)	2.0 (2)
	2010	–	–	–	0.0 (0)	2.0 (2)
	2011	–	–	–	0.0 (0)	3.0 (3)

1 Measurements of PM10 and PM2.5 are usually collected every 6 days and daily, respectively. "Number of days exceeding the standards" is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

Source: CARB 2012b.

4.9 Water Quality

Local Surface Waters

For administrative purposes, the San Diego Region is divided into 11 hydrologic units, which flow from elevated regions in the east toward coastal lagoons, estuaries, or bays in the west. The Carlsbad Hydrologic Unit (HU) is approximately 210 square miles in area extending from the headwaters above Lake Wolhford in the east to the Pacific Ocean in the west, and from Vista and Oceanside in the north to Solana Beach, Escondido, and the community of Rancho Santa Fe to the south. The cities of Carlsbad, San Marcos, and Encinitas are entirely within this HU. There are numerous important surface hydrologic features within the Carlsbad HU including three unique coastal lagoons, four major creeks, and two large water storage reservoirs.

Most of the surface flow in the streams and rivers of the San Diego Region comes from precipitation runoff and storm events. Precipitation occurs predominantly during the winter and spring months, and as a result, streamflows are highest during this period. Surface flows during summer and fall months are typically low, and consist of urban runoff, agricultural runoff, and surfacing groundwater.

Surface Water Quality

Major impacts to the Carlsbad HU include surface water quality degradation, sewage spills, beach closures, sedimentation, habitat degradation and loss, invasive species, and eutrophication. Pollutant conditions in the Carlsbad HU include bacterial indicators, eutrophic conditions, nutrients, sediments, sulfates, nitrates and phosphates. The sources of these pollutants are varied and include urban runoff, agricultural runoff, sewage spills, livestock/domestic animals, and other natural sources. Key water quality issues with the city's principal surface watersheds are discussed below.

Buena Vista Lagoon

Buena Vista Lagoon is a 350-acre fresh water lagoon managed by CDFW as a nature reserve. The principal water quality issues in the watershed relate to the lagoon, which is listed as impaired for nutrients, indicator bacteria, and sedimentation/siltation on the EPA's 2008 303(d) list; a listing means that waters are polluted or otherwise degraded and the total maximum daily loads (TMDLs) of pollutants that the waterbody can receive and still safely meet water quality standards need to be developed. The City of Vista has installed a series of check dams and a detention basin to assist in the removal of sediments traveling through the Buena Vista Creek, which is listed as impaired for selenium.

Agua Hedionda Lagoon

Agua Hedionda Lagoon is comprised of three inter-connected lagoons, divided by the Interstate 5 freeway and a railroad bridge. The Agua Hedionda Ecological Reserve was acquired in 2000 by the CDFW and consists of 186 acres of wetland at the eastern end of the lagoon. Although Agua Hedionda Lagoon is not listed as impaired, Agua Hedionda Creek, which feeds into Agua Hedionda Lagoon, is listed as impaired for indicator bacteria, phosphorus, Total Nitrogen as N, toxicity, manganese, and selenium on the EPA's 2008 303(d) list.

Batiquitos Lagoon

Batiquitos Lagoon was originally open to the ocean, but over time the construction of transportation corridors and other development resulted in sediment closing off the lagoon. In the mid-1990s, a significant lagoon restoration and enhancement project allowed for the lagoon to open to the ocean again, as it exists today. CDFW is responsible for ongoing maintenance and monitoring of the lagoon. Although Batiquitos Lagoon is not listed as impaired, two of the creeks that feed into Batiquitos Lagoon are listed—Encinitas Creek is listed as impaired for selenium and toxicity, and San Marcos Creek is listed as impaired for DDE, phosphorus, selenium, and sediment toxicity on the EPA's 2008 303(d) list.

TMDLs for the impaired waters associated with the three lagoons are being developed by the San Diego Water Board.

Water Pollution

As additional development occurs in Carlsbad and in other communities within the Carlsbad HU, impervious surfaces may increase from the placement of roads, parking lots, buildings and other infrastructure. Impervious surfaces reduce the amount of water infiltration into the ground and increase direct runoff into the city's creeks and lagoons; also, increased pollution can be generated from the daily activities of new residents and businesses. The increased direct runoff and daily activities could result in further water quality degradation and flooding concerns. In addition, if not controlled, development activities have the potential to cause soil erosion and sedimentation, which may result in increased rates of surface runoff, decreased water quality, and related environmental damage.

The City of Carlsbad currently employs a number of measures, including best management practices (BMPs), to prevent pollutants and hazardous materials from entering municipal stormwater conveyance systems. As storm drains are not connected to sanitary sewer infrastructure, water conveyed to these drains are not treated prior to discharging into creeks, lagoons and the ocean. Therefore, pollutants must be reduced and/or removed before entering urban conveyance systems. The city's Storm Water Protection Program covers all phases of development through planning, construction and existing development and

educates and monitors developers, businesses, municipal facilities, residents, school children, and the general public to help prevent pollutants and other hazardous materials from entering storm drains.

Regulatory Context

Clean Water Act

The 1972 federal Clean Water Act (CWA) is the primary federal law regulating water quality in the United States. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. At the federal level, the CWA is administered by the EPA. In California, the CWA is administered and enforced by the State Water Resources Control Board (SWRCB) and nine regional water quality control boards.

National Pollutant Discharge Elimination System Program

The federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources (Section 402). The NPDES permit program is the primary federal program that regulates point source and nonpoint-source discharges to waters of the United States. The SWRCB issues both general and individual NPDES permits for certain activities.

4.10 Goals and Policies

Goals

Open Space Framework

4-G.1 Develop a balanced and integrated open space system reflecting a variety of considerations—resource conservation, production of resources, recreation, and aesthetic and community identity—and ensuring synergies between various open space components and compatibility with land use planning.

4-G.2 Within the Cannon Road Open Space, Farming and Public Use Corridor (see Figure 4-5) create a unique, community-oriented open space area and ensure the area is permanently protected and preserved for open space uses.

Biological Resources and Open Space for Conservation

4-G.3 Protect environmentally sensitive lands, wildlife habitats, and rare, threatened or endangered plant and animal communities.

4-G.4 Promote conservation of hillsides and ridgelines.

Beaches; Parks and Recreation

4-G.5 Maintain a diversified, comprehensive system of open space for outdoor recreation, including, but not limited to: parks; beaches; areas for organized sports; connecting corridors containing trails; water recreation areas (beaches, lagoons, lakes); unique conservation areas for nature study; and, semi-developed areas for camping.

4-G.6 Offer a wide variety of recreational activities and park facilities designed to encourage educational benefits and active or passive participation by users of all ages and interests.

4-G.7 Operate a financially self-supportive system of recreational facilities and programs.

4-G.8 Coordinate the planning of park facilities and trails with other recreation-oriented land uses such as open space.

4-G.9 Improve and maintain high quality beaches for residents and visitors.

4-G.10 Increase public access to and use of the Cannon Road Open Space, Farming and Public Use Corridor (see Figure 4-5) primarily through the incorporation of public trails and active and passive recreation.

Trails and Greenways

4-G.11 Utilize greenways and trails to connect the city's open space network.

Agricultural Resources

4-G.12 Recognize the important value of agriculture and horticultural lands in the city, and support their productive use.

Air Quality

4-G.13 Protect air quality within the city and support efforts for enhanced regional air quality.

Water Quality

4-G.14 Promote the protection of Carlsbad's creeks, lagoons, ocean and other natural water bodies from pollution.

Policies

Open Space Framework

4-P.1 Maintain an integrated open space classification system that accommodates conservation, resource production, recreation, and aesthetic needs.

4-P.2 Designate for preservation as open space those areas that provide unique visual amenities within the urban form, such as agriculture, hillsides, ridges, valleys, canyons, beaches, lagoons, creeks, lakes and other unique resources that provide visual and physical relief to the cityscape by creating natural contrasts to the built-up, manmade scene.

4-P.3 Ensure that the Cannon Road Open Space, Farming, and Public Use Corridor is permanently protected and preserved for farming and open space uses.

4-P.4 Provide public access to open space areas where consistent with applicable access restrictions per the Habitat Management Plan, easements, deeds, etc. When natural open lands are privately-held, acquire or negotiate for public access if the land could be used for unprogrammed recreational uses. Public access shall not be provided where sensitive resources may be threatened or damaged, where public health and safety may be compromised or where access would interfere with the managed production of resources, such as agriculture.

4-P.5 Require compliance with the Growth Management Plan open space performance standard specified in the Citywide Facilities and Improvements Plan, and maintain appropriate criteria, standards, and classifications. The following open space areas shall not be utilized to meet the open space performance standard:

a. Schools, except public school playgrounds, athletic fields and courts for which the city has joint use agreements with the school districts.

b. Parks, public or private; however, credit may be granted for private parks if the granting of the open space credit will not adversely impact the city's ability to obtain all of the applicable open space priorities identified for the local facilities management zone (LFMZ) by the Open Space and Conservation Resource Management Plan (OSCRMP).

c. Open space that is not available to the public, unless it is an open space priority identified by the OSCRMP and the granting of the open space credit will not adversely impact the city's ability to obtain all of the open space priorities identified for the LFMZ by the OSCRMP.

d. Powerline easements, except where the land within the easement is identified by the OSCRMP as an open space priority, such as a trail or greenway, and the granting of the open space credit will not adversely impact the city's ability to achieve all of the open space priorities identified for the LFMZ by the OSCRMP. Major powerline easements that provide key links to the Carlsbad trail system shall receive credit toward the open space performance standard.

e. Golf courses, except those portions of golf courses identified by the OSCRMP as an open space priority, such as a trail or greenway. Credit may be granted for other areas of a golf course if the granting of the open space credit for this area will not adversely impact the city's ability to achieve all of the open space priorities identified for the LFMZ by the OSCRMP.

4-P.6 Require that adjustment of the boundaries of any open space area shown on the Land Use Map be allowed only if all of the following criteria are met:

a. The proposed open space area is equal to or greater than the area depicted on the Land Use Map; and

b. The proposed open space area is of environmental quality equal to or greater than that depicted on the Land Use Map; and

c. The proposed open space area is contiguous or within close proximity to open space shown on the Land Use Map.

The City Council may also adjust the boundary of any open space area shown on the Land Use Map if it finds that the adjustment is necessary to mitigate a sensitive environmental area that is impacted by development, provided the open space boundary modification preserves open space at a 2 to 1 ratio (proposed acreage to existing acreage) and is within close proximity to the original area of open space.

Additionally, the City Council may exempt public rights-of-way from the open space boundary adjustment requirements. However, environmental analysis shall be performed for all proposed public right-of-way improvements, and if determined that there are

significant adverse impacts to the value of the open space system, those impacts shall be mitigated.

The adjustment of open space boundaries shall not result in the exchange of environmentally constrained lands that are designated open space on the Land Use Map for lands that are not environmentally constrained.

4-P.7 Maintain an inventory of all open space lands, including sites designated as open space on the Land Use Map, sites dedicated in fee title or easement as open space, and school recreation areas.

4-P.8 Utilize the criteria developed by the Proposition C Open Space and Trails Ad Hoc Citizens Advisory Committee (approved by City Council Resolution No. 2006-294, 10/10/06) to evaluate potential future open space property acquisitions by the city.

Habitat and Open Space Conservation

4-P.9 Maintain and implement the city's Habitat Management Plan (HMP), including the requirement that all development projects comply with the HMP and related documents. Require assessments of biological resources prior to approval of any development on sites with sensitive habitat, as depicted in Figure 4-3.

4-P.10 Consider working with private foundations and organizations or designating a conservancy agency to be responsible for protection, maintenance, monitoring and liability of open space lands.

4-P.11 Ensure that the improvements recommended for open space areas are appropriate for the type of open space and the use proposed. No improvements (excluding necessary infrastructure) shall be made in environmentally sensitive areas, except to enhance the environmental value of the areas.

4-P.12 Continue participation in regional planning efforts to protect habitat and environmentally sensitive species.

4-P.13 Support innovative site design techniques such as cluster-type housing and transfer-of-development-rights to preserve sensitive environmental resources and to allow development projects to comply with the city's Habitat Management Plan.

4-P.14 Assure that development or grading on hillsides (if allowed) relates to the slope of the land in order to preserve the integrity and appearance of natural hillsides and other landforms wherever possible.

4-P.15 Maintain functional wildlife corridors and habitat linkage in order to contribute to regional biodiversity and the viability of rare, unique or sensitive biological resources throughout the city.

4-P.16 Coordinate the implementation and planning of the city's Habitat Management Plan with the North County Multi-Species Habitat Conservation Plan.

4-P.17 Seek partnering opportunities with other governmental agencies, private land owners and non-profit organizations to acquire open space; utilize grants, bonds and other funding sources to leverage local funds and reduce cost to Carlsbad taxpayers.

4-P.18 Require that, at the time of any discretionary approval, any land identified as open space for its habitat or scenic value shall have an appropriate easement and/or land use and zoning designation placed on it for resource protection.

4-P.19 Require a city permit for any grading, grubbing, or clearing of vegetation in undeveloped areas, with appropriate penalties for violations.

Parks and Recreation

4-P.20 Implement and periodically update the Parks and Recreation Needs Assessment and Comprehensive Action Plan that identifies appropriate programming for the city's parklands, prioritizes future parkland development, reflects the needs of residents at the neighborhood and citywide level and of an increasingly diverse and aging population, and in concert with the citywide trails program, creates new linkages to neighborhoods.

4-P.21 Acquire and develop park areas in accordance with the Growth Management Plan park standard of 3.0 acres of community park or special use area per 1,000 residents within each of the four city quadrants. Park acreage requirements shall be determined on a quadrant basis.

4-P.22 Maintain appropriate recreational standards (e.g. payment of park mitigation fees) for employment areas.

4-P.23 Utilize the provisions of the Quimby Act, Growth Management Plan and Planned Community Zone to ensure the timely construction of parks so that they are provided concurrent with need.

4-P.24 Prefer in-lieu fees to dedication of parkland, unless sites offered for dedication provide features and accessibility similar in comparison.

4-P.25 Consider accessibility, housing density, proximity to schools, general public access, local resident access, adjacent residential area traffic impacts, safe pedestrian access, and compatible use with the surrounding environment when determining park locations. Wherever possible, park sites should be located near schools or natural areas.

4-P.26 Locate new public or private parks, plazas, or alternative parks (such as greenways) in existing infill neighborhoods—the Village and Barrio—where new residential development is contemplated, within Growth Management Program requirements and city budgetary limitations.

4-P.27 Provide for joint-use facility agreements with local school districts to meet neighborhood and community recreational needs.

4-P.28 Require, where possible, developers of master planned communities to provide pocket parks and active recreational facilities unique

to each development. Maintenance of pocket parks shall be accomplished through homeowners' association dues. Pocket parks shall remain in private ownership.

4-P.29 Require that any development of recreational facilities on public land by developers, service clubs, civic groups, individual donors or organizations be consistent with the goals and policies of this element.

4-P.30 Consider the following during the development/re-development of parkland: protection and enhancement of sensitive natural habitat by expanding minimum buffers around sensitive resources; utilizing native plant species in park projects; incorporating plant species that provide food such as seeds, nuts and berries for wildlife and bird species; protecting and buffering drinking water sources such as small ponds and wetland areas; and limiting turf grass use to recreational areas. Use the Carlsbad Landscape Manual in landscape refurbishment and new park development projects.

4-P.31 Design parks to protect public safety by ensuring adequate lighting, signage, and maintenance.

Special Resource Areas; Lagoons

4-P.32 Where appropriate, designate as open space those areas that preserve historic, cultural, archeological, paleontological and educational resources.

4-P.33 Seek to preserve the environmental integrity, ecology, and character of special resource areas.

4-P.34 Promote expansion of recreational and educational use opportunities in areas of significant ecological value, such as lagoons, where discretionary use of the resource allows. Consider partnering with private foundations for the conservation of such lands and the development of educational programming.

- Combine historically significant sites with recreational learning opportunities, where possible.
- Utilize community parks in support of historical and cultural programs and facilities when feasible and appropriate.
- Coordinate the efforts of the Historic Preservation Commission on the siting and care of historic ruins within parks.

4-P.35 Seek funding opportunities from state, federal, and local agencies to provide additional access points or improve the recreational and educational potential of the city's three lagoons and other special resource areas.

4-P.36 Assure that, where feasible, developments near or adjacent to bodies of water provide open space that has public access to and views of the water.

4-P.37 Explore ways to increase access to the beach and lagoons from the city's eastern neighborhoods.

Beaches

4-P.38 Work cooperatively with state officials on a development plan for South Carlsbad State Beach so as to maximize public recreational opportunities.

4-P.39 Work collaboratively with the California State Parks and Recreation Department to improve and maintain high quality beaches by enhancing beach access, facilities, and services along Carlsbad's entire coastline.

Trails and Greenways

4-P.40 Prepare a comprehensive Trails Master Plan update, that expands the existing and planned 61-mile trail system, with the following objectives:

- Connectivity between off-road trails and major on-road pedestrian and bicycle routes, such that future improvements in the trail system also contribute to linkages between important sites (beaches, lagoons, schools, commercial centers, master planned communities, and others)
- Design and designate trails as multi-use to be accessible for all user groups, including walkers, bicyclists, and equestrians (as land use policy allows). Ensure that the network provides an appropriate amount of resources for each trail type or user group
- Greenway and trail linkages from major recreational/open space areas to other land use areas or activities, including, but not limited to, residential neighborhoods, places of employment, parks, schools, libraries, and viewpoints
- Linkages/multi-use trails connecting businesses and residential neighborhoods to the beaches

4-P.41 Participate with other north county communities to establish an intercommunity open space linkage program and regional trail network.

4-P.42 Locate multi-use trails and associated amenities and passive recreational features to minimize impacts to sensitive habitats and other sensitive surrounding land uses, such as residences.

4-P.43 Obtain an irrevocable offer to dedicate or a permanent easement for multi-use trails on privately owned property where feasible, and where trails are proposed as part of the Carlsbad trail system.

Agricultural Resources

4-P.44 Allow and encourage farming operations to continue within the Cannon Road Open Space, Farming, and Public Use Corridor (such as the strawberry fields) as long as they are economically viable for the landowner.

4-P.45 Ensure the existing Flower Fields remain a farming and flower production use by utilizing all available methods and programs, including grants and other outside financial assistance.

4-P.46 Utilize available methods and resources to reduce the financial burdens on agricultural land, not only to prevent premature development, but also to encourage its continued use for agricultural purposes.

4-P.47 Ensure new development adjacent to an agricultural use is sensitive to the continuation of the agricultural use by requiring appropriate design criteria, such as site layout, use of vegetation and buffers.

4-P.48 Encourage soil and water conservation techniques in agricultural activities.

4-P.49 Ensure that the grading of agricultural lands is accomplished in a manner that minimizes erosion of hillsides and minimizes stream siltation and to maintain the appearance of natural hillsides and other land forms wherever possible.

4-P.50 Prevent agricultural run-off and other forms of water pollution from entering the storm drain system and polluting the city's water bodies.

4-P.51 Prior to the approval of new development within an existing or former agricultural area in Carlsbad, require a detailed soils testing and analysis report be prepared by a registered soils engineer and submitted to the city and the county health department for review and approval. This report shall evaluate the potential for soil contamination due to historic use, handling, or storage of agricultural chemicals restricted by the County of San Diego Department of Health Services. If hazardous chemicals are detected at concentrations in the soil that would have a significantly adverse effect on human health, the report shall identify a range of possible mitigation measures to remediate the significant public health impacts.

Air Quality

4-P.52 Participate in the implementation of transportation demand management programs on a regional basis.

4-P.53 To the extent practical and feasible, maintain a system of air quality alerts (such as through the city website, internet, email to city employees, and other tools) based on San Diego Air Pollution Control District forecasts. Consider providing incentives to city employees to use alternative transportation modes during alert days.

4-P.54 Provide, whenever possible, incentives for carpooling, flex-time, shortened work weeks, and telecommunications and other means of reducing vehicular miles traveled.

4-P.55 Cooperate with the ongoing efforts of the U.S. Environmental Protection Agency, the San Diego Air Pollution Control District, and the State of California Air Resources Board in improving air quality in the regional air basin.

4-P.56 Ensure that construction and grading projects minimize short-term impacts to air quality.

a) Require grading projects to provide a storm water pollution prevention plan (SWPPP) in compliance with city requirements, which include standards for best management practices that control pollutants from dust generated by construction activities and those related to vehicle and equipment cleaning, fueling and maintenance;

b) Require grading projects to undertake measures to minimize mono-nitrogen oxides (NOx) emissions from vehicle and equipment operations; and

c) Monitor all construction to ensure that proper steps are implemented.

Water Quality

4-P.57 Work with the stakeholders in the community and region, such as but not limited to the San Diego Regional Water Quality Control Board (RWQCB), California Fish and Wildlife, US Fish and Wildlife, Coastal Commission, Army Corps of Engineers, Environmental Protection Agency, neighboring cities, counties, businesses, residents, and non-profit groups, to comply with applicable federal, state and local regulations related to water quality in our region, consistent with the city's current NPDES Municipal Storm Water Permit issued by the RWQCB or other related regulations. Prepare and implement any applicable plans such as a Water Quality Improvement Plan, Integrated Regional Water Management Plan, Load Reduction Plan or others as needed to comply with applicable regulations.

4-P.58 Require developments to incorporate structural and non-structural best management practices (BMPs) to mitigate or reduce the projected increases in pollutant loads. Do not allow post-development runoff from a site that would cause or contribute to an exceedance of receiving water quality objectives or has not been reduced to the maximum extent practicable.

4-P.59 Implement water pollution prevention methods to the maximum extent practicable, supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground or source of potential pollution) to minimize the transport of urban runoff and pollutants offsite and into a municipal separate storm sewer system (MS4).

4-P.60 Make any necessary structural control changes to the storm water conveyance system to remove or reduce storm water pollutant levels.

4-P.61 Conduct analysis of the effectiveness of the overall pollution prevention programs in Carlsbad consistent with the city's NPDES Municipal Storm Water Permit issued by the RWQCB or other related regulations.

4-P.62 Continue to implement a program to detect and eliminate illicit connections to storm drains and illegal discharges of non-storm water wastes into storm water conveyance systems.

4-P.63 Continue to implement a program for the testing and monitoring of storm water and/or non-storm water flows consistent with the city's NPDES Municipal Storm Water Permit issued by the RWQCB or other related regulations.

4-P.64 Preserve, where possible, natural watercourses or provide naturalized drainage channels within the city. Where feasible, implement restoration and rehabilitation opportunities

4-P.65 Coordinate the needs of storm water pollution management with the overlapping (and sometimes competing) habitat management, flood management, capital improvement projects, development, aesthetic, and other open space needs.