
V CONSERVATION AND OPEN SPACE ELEMENT

Adopted September 2018



Table of Contents

Conservation and Open Space Element

1	Goals	COS-3
2	Policies	COS-4
3	Basic Ecological and Environmental Units	COS-7
	3.1 Topography	
	3.2 Geologic Conditions & Geotechnical Factors	
	Figure 1: Slope Gradients	
	Figure 2: Slope Stability	
	Figure 3: Coastal Setback Zone	
	3.3 Mineral Resources	
	3.4 Hydrology	
	Figure 4: Hydrology	
	3.5 Biotic Resources	
	Figure 5: Biotic Resources	
	Table 1: NCCP/HCP	
	Table 2: Reserve Areas within NCCP/HCP	
	Table 3: Sensitive Species List for the NCCP/HCP	
	3.6 Ocean Resources	
4	Resource Classification.....	COS-27
	Table 4: Resource Management Districts Code Designations	
	4.1 Areas for the Consideration of Public Health and Safety	
	Table 5: Code Designations Related to Public Health & Safety	
	Figure 6: Resource Management Districts	
	4.2 Areas for Preservation of Natural Resources	
	Table 6: Code Designations for Natural Resources	
	Figure 7: Resource Management Districts	
5	Conservation	COS-33
6	Cultural Resources	COS-33
	6.1 Paleontological, Historical, and Archaeological Resources	
	6.2 Cultural Resources Options	
7	Open Spaces and Recreational Resources	COS-36
	7.1 Open Space Resources	
	Figure 8: Resource Management Districts	
	7.2 Recreational Resources	
	7.3 Recreational Parks and Facilities	
	7.4 City of Los Angeles and Los Angeles County Facilities	
	7.5 Palos Verdes Peninsula Unified School District Facilities	
	7.6 NCCP/HCP Reserve Areas	
	7.7 Additional Public Open Space	
	7.8 Miraleste Recreation and Park District	

7.9 Parks Master Plan
 7.10 Open Space for Military Support
 7.11 Open Space for Tribal Resources

8 **References**COS-46



V Conservation and Open Space Element

The State of California requires both a Conservation Element and an Open Space Element to be included in every local government general plan. As many of the goals and policies of the City of Rancho Palos Verdes and the requirements of the State are related, these two elements have been joined into one element for this General Plan.

Open space is one of the prominent features that defines the character of Rancho Palos Verdes, and plays a large role in the City's residents' quality of life, and non-residents seek to visit. Conserving open space provides opportunities for public outdoor recreation, viewshed protection, and conservation of natural and biological resources, which provide a healthy ecosystem for vegetation and wildlife, flood and erosion control, protection of the public health and safety, buffering between incompatible land uses, and the enhancement of roads and public spaces.

The majority of Rancho Palos Verdes is developed with residential land uses; however, a significant amount of land is dedicated to open space uses, including parks, golf courses, trails, and a dedicated nature preserve. The City seeks to create a system that integrates parks, trails, natural habitats, and cultural resources into a series of networks for residents and visitors.

1 Goals

The goals of the Conservation and Open Space Element are as follows:

1. To conserve, protect, and enhance the City's natural resources; beauty; and open space for the benefit and enjoyment of its residents and the residents of the entire region. Future development shall recognize the sensitivity of the natural environment and be accomplished in such a manner as to maximize the protection of it.
2. To protect and preserve all significant archaeological, paleontological, and historical resources within the City.
3. To protect the environment by reducing environmental hazards in the community.



The basis for this Element is the environmental capabilities inherent in the land of Rancho Palos Verdes. Land "capability" is an evaluation of the basic ecological and environmental units dealing with the natural factors of land, climate, hydrology, biotic resources, geotechnical factors, and the systematic relationships that must exist among them. This Element provides a discussion of each of these ecological and environmental units as it applies individually to Rancho Palos Verdes, then in appropriate classification combinations. Each of these combinations is classified into two categories: (1) preservation of natural resources and open space, and (2) public health and safety. These two categories are combined to develop the Conservation and Open Space Element, which becomes a guide for the City's natural environmental resource management policies.

This Element also focuses on cultural resources (paleontological, historical, and archeological resources) and their conservation. Finally, this Element includes an inventory of existing open spaces within the City that are beneficial to the City's residents and the residents of the entire region.

2 Policies

This section includes those policies that result from the analysis of data, goals, and recommended relationships between people and their use of the land resource, which have been the subject of this element of the General Plan.

Conservation

Public Health/Safety and Preservation of Natural Resources

1. Permit development within the Sea Cliff Erosion Area (Resource Management, RM 1) only if demonstrated, through detailed geologic analysis, that the design and setbacks are adequate to ensure public safety and to maintain physical, biologic, and scenic resources. Due to the sensitive nature of RM 1, this area is included as an integral part of the Coastal Specific Plan.
2. Allow only low-intensity activities within Resource Management Districts with extreme slopes (RM 2).
3. Require any development within the Resource Management Districts of high slopes (RM 3) and dormant landslide area (RM 5) to perform at least one, and preferably two, independent engineering studies concerning the geotechnical, soils, and other stability factors (including seismic considerations) affecting this site following established geological industry standards.
4. Require a more detailed definition of the limits and composition of any Resource Management District when reviewing any development proposal that contains one or more Resource Management District.
5. Develop and enforce a grading ordinance with detailed controls and performance standards to ensure both engineering standards and the appropriate topographic treatment of slopes based on recognized site planning and landscape architecture standards.
6. Prohibit activities that create excessive silt, pollutant runoff, increase canyon-wall erosion, or potential for landslide within Resource Management Districts containing hydrologic factors (RM 6).
7. In addition to the State-designated Abalone Cove Ecological Reserve, establish the rocky intertidal areas throughout the remainder of the City's coastline as marine reserves and enforce all regulations concerning marine resources (Resource Management District RM 7).
8. Require developments within or adjacent to wildlife habitats (RM 8) to describe the nature of the impact on the wildlife habitat and provide mitigation measures to fully offset the impact.
9. Require developments within Resource Management Districts containing natural vegetation (RM 9) to revegetate with appropriate native plants wherever possible when clearing of vegetation is required.
10. Stringently regulate irrigation, natural drainage, and other water-related considerations in new developments and existing uses affecting existing or potential slide areas.
11. Consider development exceptions in areas otherwise precluding development for health and safety reasons, only if the development can establish that it can overcome the conditions otherwise precluding development, and is otherwise compatible with the intent of the General Plan and the Specific Plan for the area.

12. Based on current information from state and federal agencies, the City should periodically publish a list of toxic chemicals such as fertilizers, insecticides, and herbicides that are determined to be damaging to the environment, with particular concern for the marine environment. This list should be distributed to all applicants for business licenses in the City. Additionally, the City should make efforts (including brochures, pamphlets, website, and local community television) to continually inform and educate all residents and business operators about the impact of chemicals such as fertilizers, insecticides, and herbicides on the environment, and to encourage responsible use and disposal of such materials.
13. A Pest Management Plan should be encouraged to be included in Landscape Plans to avoid usage of toxic chemicals by proper plant selection, irrigation methods, establishing intervention thresholds, identifying and monitoring pests, and using prevention measures before resorting to control by using chemicals.
14. Maintain the existing natural vegetation of the City in its natural state in all existing and proposed developments, to the extent commensurate with good fire protection policies, and encourage the re-establishment of appropriate native plants, especially fire retardant natives such as saltbrush, near fuel modification setback areas.
15. Require a master landscape plan, with an Integrated Pest Management Plan, for any proposed development, demonstrating enhancement and protection of natural vegetation, selection of new complementing vegetation, and enhancement of environmental factors.

Natural Communities Conservation Plan/Habitat Conservation Plan

16. Implement the Rancho Palos Verdes NCCP/HCP.

General

17. Continue to implement the City's Natural Overlay Control District and its performance criteria.
18. Continue to implement the natural environment policies of the Coastal Specific Plan.
19. Collect baseline data for air and water quality to develop standards for evaluation of the impacts of current or proposed development in and adjacent to Rancho Palos Verdes.
20. Pursue the acquisition of rights over the offshore tidelands area related to the City's coastline. Develop proposals for grants and recognition as protected areas.
21. Encourage study of and funding to preserve native flora and fauna.

Habitat Protection

22. Work with neighboring jurisdictions to manage contiguous wildlife and habitat areas and recreational amenities such as trails.
23. Encourage the restoration of vegetation throughout the City to indigenous native plant species. Encourage use of locally native plant species in City landscaping.

Environmental Protection

24. Develop balanced programs to provide safe public access to the coastline consistent with protecting the environment.
25. Promote programs to encourage volunteer efforts to repair, protect, and improve the environment.

26. Make every effort to preserve or restore natural hydrology when projects impact canyons or other natural drainage areas when such efforts do not conflict with public safety.
27. Ensure the maximum preservation of the natural scenic character and topography of the City consistent with reasonable economic uses.

Cultural Resources

28. Seek funding for the identification, acquisition, preservation, and/or maintenance of historic places and archaeological, paleontological, and geological sites.
29. Encourage the identification and protection of archaeologically sensitive areas and sites, making such information available only to those individuals qualified under guidelines set forth by the Office of Historic Preservation.
30. Forward environmental impact reports to the California State University, Fullerton, and South Central Coastal Information Center's clearinghouse.
31. Preserve locations of archeological and paleontological significance on site where possible. Allow salvage excavation of the site where preservation cannot be implemented.
32. Attempt to acquire the Point Vicente Lighthouse property as an extension of Point Vicente Park.
33. Consider supporting the addition of appropriate historic sites in the City to the California Register of Historical Resources and National Register of Historic Places.
34. Require that any artifacts or material of interest that are uncovered as a result of a project requiring City permits be offered to the Point Vicente Interpretive Center for inclusion in its collection, as permitted by law. The Interpretive Center should work with regional entities to share items of particular significance.

Open Space and Recreational Resources

35. Provide access to all public recreational land.
36. Promote and/or sponsor recreation programs within the City.
37. Encourage local, public, non-profit recreational, cultural, and conservation activities.
38. Seek Los Angeles County, state, federal, and private funds to acquire, improve, conserve, and maintain recreational lands.
39. Work through the state and federal government in support of legislation resulting in City acquisition of land.
40. Encourage land holders to contribute lands and/or easements to the City for conservation and/or recreational use, and encourage the City to accept such contributions.
41. Encourage institutions to provide public use of its recreation facilities.
42. Encourage building additional parks and playing fields, where appropriate, for multiple uses by various recreational groups.

3 Basic Ecological and Environmental Units

This section discusses the basic ecological and environmental units that deal with natural factors affecting the City. It is these factors and the relationship between them that serve as the basis within which the environmental resource management policies are developed. The “Biotic Resources” portion describes the significant ecologic habitats associated with the land-based natural vegetation communities and ocean-related resources along the immediate shoreline. The section on geotechnical factors consists of topographic conditions, geologic hazards, and mineral resources. Hydrology covers the natural and built water drainage patterns within the City and the factors affecting them, as well as their influence on other natural environment factors.

3.1 Topography

Development on the Palos Verdes Peninsula has taken advantage of natural plateaus, but, in some areas, steep slopes have created difficulties for access, utility service, and site improvements, resulting in constrained urban development. Within the City, 40% to 50% of all land area falls into the category of steep slopes (inclines of approximately 25% and greater), and the remainder is less than 25% in steepness (Figure 1, Slope Gradients). Slope is usually expressed by a percentage equal to the number of feet of rise per 100 feet of horizontal distance. Land with average slopes of 10% or less are considered to be flat to rolling, and are most easily and generally the first lands to be developed. This pattern of development is apparent in most areas of urban development. Lands of 10% to 25% topography are hilly, but construction on this type of terrain is relatively common. Slopes between 25% and 35% become steep, and costs of mass construction begin to increase substantially. Development within these areas is often associated with extensive adverse environmental impacts, and problems of access, maintenance, and appearance. Steeper slopes within this category are generally more suitable for custom house sites and more innovative design solutions. Slopes greater than 35% are considered extreme slopes, and development is not, under all but the most unusual and individual circumstances, economically feasible.

Rancho Palos Verdes is a hillside community with slopes ranging from 5% to more than 35%, and development across the hillsides is limited. As a result, the community is developed with larger properties that offer more open space. In addition, topography and geologic conditions (see below) have created opportunities to preserve open spaces for visual and/or public recreational resources.

3.2 Geologic Conditions & Geotechnical Factors

Geologic Conditions. The Palos Verdes Peninsula bedrock is composed of a metamorphic core blanketed by sequences of younger sedimentary rock. The structure is complicated by smaller-scale folding, and schist (rocks that split into layers) and sedimentary rocks have been intruded by irregular masses of basaltic volcanic rocks. This entire block has been uplifted by movement on two sub-parallel bounding faults, the Palos Verdes Fault on the northeast and the San Pedro Fault offshore on the southwest (see figure below). A series of 13 staircase marine terraces developed surrounding the Palos Verdes Peninsula during the late Pleistocene and Holocene geologic times (the last few hundred thousand years). The sandy marine terrace deposits and overlying deposits of landward origin now occupy some of these benches. The landscape in parts of this area has also been significantly modified by the movement of massive landslides during the time between the formation of the oldest terraces and the present.

Figure 1: Slope Gradients

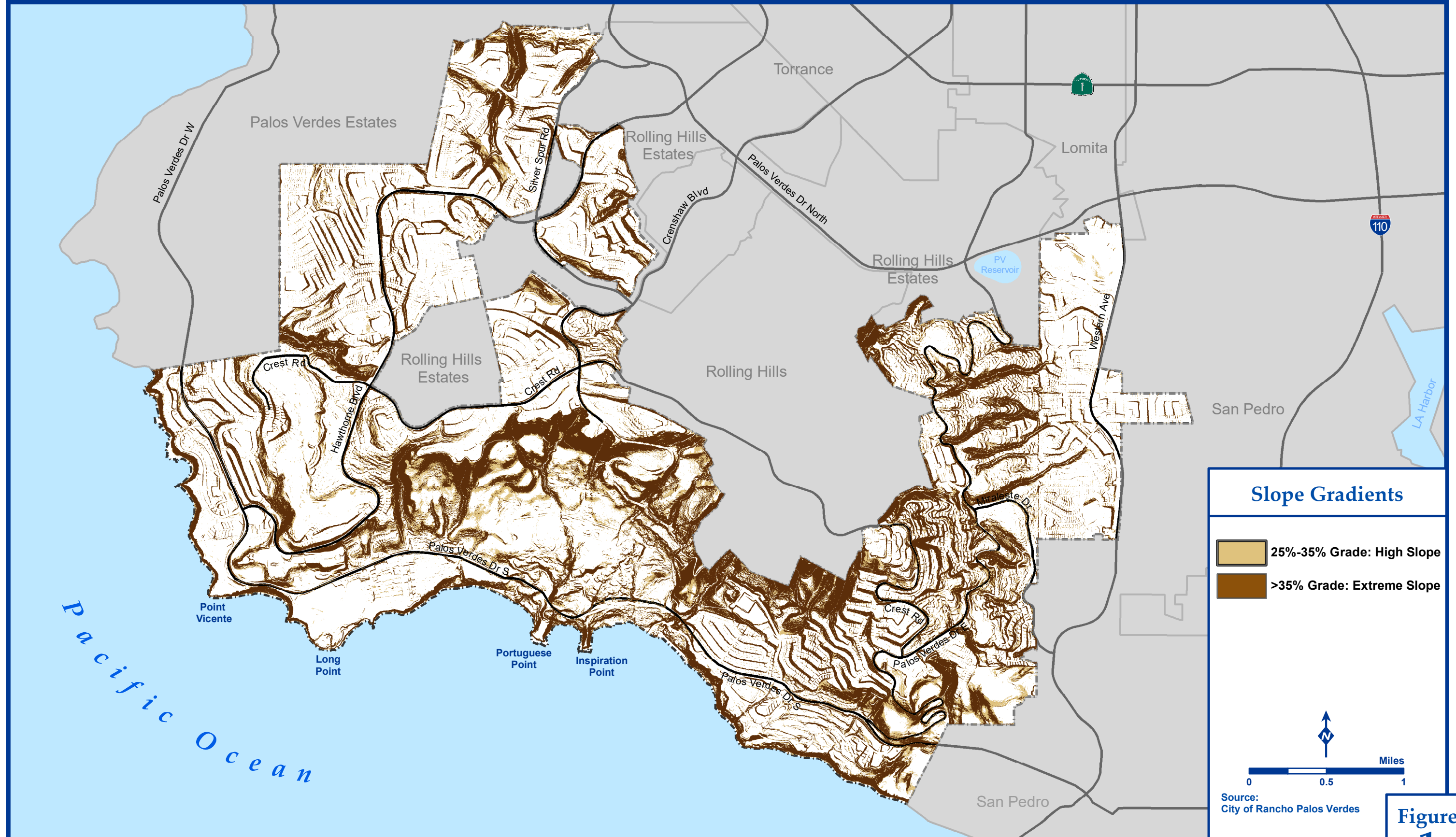
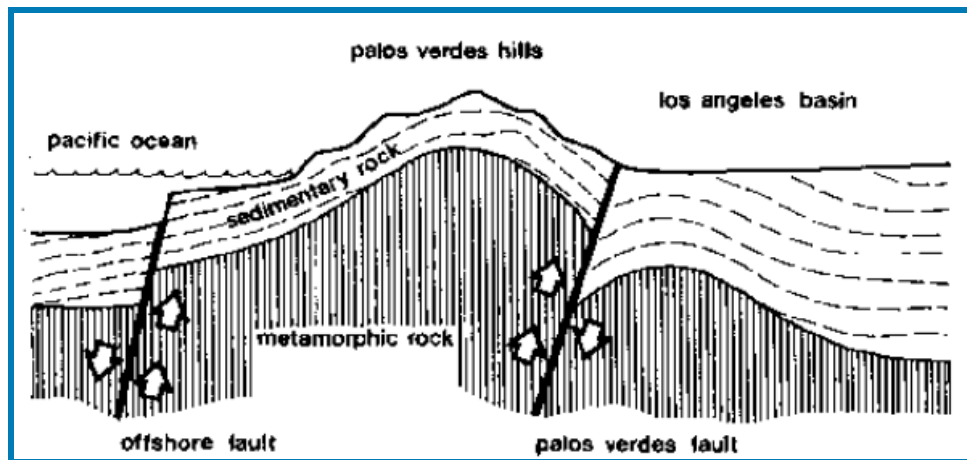


Figure
1



The schist, known as the Catalina Schist, crops out only in a small area on the north slope of the Peninsula. Basaltic rocks are exposed in several areas, and terrace deposits (although they underlie much greater areas than the two previously mentioned units) are present in only a small fraction of the total area and are relatively thin (a few tens of feet thick). By far the most widely exposed rocks and the most significant in terms of slope stability is the Miocene Monterey Formation.

The Monterey Formation is more than 2,000 feet thick on the Palos Verdes Peninsula. It has been divided into three members on the basis of rock type: the Altamira Shale, the Valmonte Diatomite (fossilized remains of diatoms, a type of hard-shelled algae), and the Malaga Mudstone (from oldest to youngest). Altamira Shale consists largely of thin-bedded sedimentary rocks formed by the deposition of successive layers of clay, along with numerous layers of tuff (volcanic ash) that have been largely altered to weak clays. Thick layers of volcanic ash deposited millions of years ago were compressed over time into bentonite. In the presence of water, bentonite becomes very slippery and has been a major contributing factor for landslides in Rancho Palos Verdes.

Rancho Palos Verdes is located in a seismically active area and is near several of the active and potentially active faults in Southern California. Active and potentially active faults within Southern California are those capable of producing seismic shaking that may cause damage to structures. There are two faults present on the Peninsula: the Palos Verdes and Cabrillo Faults. The Palos Verdes Fault is considered a source of significant earthquake hazard, and the Cabrillo Fault is a potentially moderate earthquake hazard. The hard rock substrata of the Peninsula Hills helps this area to be seismically safer than surrounding areas that have more soft sandy soils, subjecting them to ground acceleration due to liquefaction. Therefore, seismic influences are not a major factor in determining land use overall in Rancho Palos Verdes. However, it is still possible that renewed movement on some existing landslide areas could be triggered by strong seismic shaking; this would only occur if these areas are in a meta-stable condition before the earthquake.

Geotechnical Factors/Landslides. Landslides are influenced by rock type, the structure of the rock, the quantity of available water, and topographical conditions. Landslides occurred on the Peninsula during the Holocene Epoch and the Pleistocene Epoch, approximately 11,000 and up to 1.6 million years ago, respectively, along a fault that had a history of movement. The locations of these existing slides, some of which have horizontal dimensions of thousands of feet, are known from previous mapping (Vonder Linden and Jahns 1973).

The Portuguese Bend landslide complex is the most studied and publicized landslide in the area, identified as a large complex that extends from the top of the ridge of the City to the ocean. The recently active portion of the Portuguese Bend landslide began in 1956 as a result of grading operations. Stability of portions of the landslide area has been in debate for many years, and other landslides, such as the South Shores landslide system, have been at equilibrium for some time. However, development activities, heavy rain, and erosion may change the existing conditions and lead to renewed failure of certain landslides that appear stable.

The following four categories of slope stability have been mapped, shown in Figure 2, Slope Stability: Active Landslide, Old Landslide, Possible Landslide, and Non-Landslide Areas. The four categories of slope stability were developed from the landslide mapping developed as a portion of the Geotechnical and Public Safety Report for Cities of Rancho Palos Verdes, Rolling Hills Estates, and Rolling Hills (Envicom Corporation 1975). Old Landslide Areas are presently in a metastable condition and could change to Active Landslide Areas with minor changes in the natural or human-caused environment, although some Older Landslide Areas are in a stable condition and could be suitable for residential development (subject to detailed geologic investigations) and human habitation. The significance of the slope stability categories in terms of land use planning are described below (interpretations by Kling Consulting Group 2015).

- **Active Landslide Areas.** Areas now undergoing downslope movement; extremely unstable ground not suitable for residential development. Possible use as passive recreational area, parks, or area of geologic interest, but unsuitable for construction of any new permanent structures, unless the movement is stopped by some natural or human-induced force.
- **Old Landslide Areas.** Areas determined by investigative techniques by a geologist to have had past movement and/or identified in the California Department of Conservation's landslide inventory maps that portray the location of prior failure. Landslide inventory maps show existing landslides and reveal the extent of past movement. These landslides have experienced downslope movement in the past but are no longer moving. Most of these areas would not be suitable for residential development without conclusive demonstration, through detailed geologic studies, that they are stable enough to accommodate both the activities of site preparation and long-term human habitation.
- **Possible Landslide Areas.** Areas suspected to be a landslide area on the basis of topographic evidence, indicating less confidence in the landslide's existence. Some of these areas may prove to be stable areas that have not experienced sliding at all, or are very ancient slide areas that are now fairly stable. Some of these areas may be suitable for residential development, but they would require detailed engineering geologic studies to show that they are stable enough for development and human occupancy.
- **Non-Landslide Areas.** Areas where no natural landslides have been identified. A wide range of existing and potential slope stability exists within this category, and new landslides could be triggered in some areas by human activities, such as excavation. Most of the areas, however, would not be subject to slope failure if development were carried out properly. Although there is less chance of slope instability in this area, geologic and soil engineering investigations will still be required for any proposed development.

As a consequence of these geologic conditions, existing and potential slope stability must be recognized as a prime consideration in determining land use within the City. Although some types of limited development may be possible within certain landslide areas, detailed geologic investigations are necessary to demonstrate the required degree of stability. Appropriate geologic investigations often precede certain developments in Non-Landslide areas of the City, as new ground failure could well be triggered by human activities.

Figure 2: Slope Stability

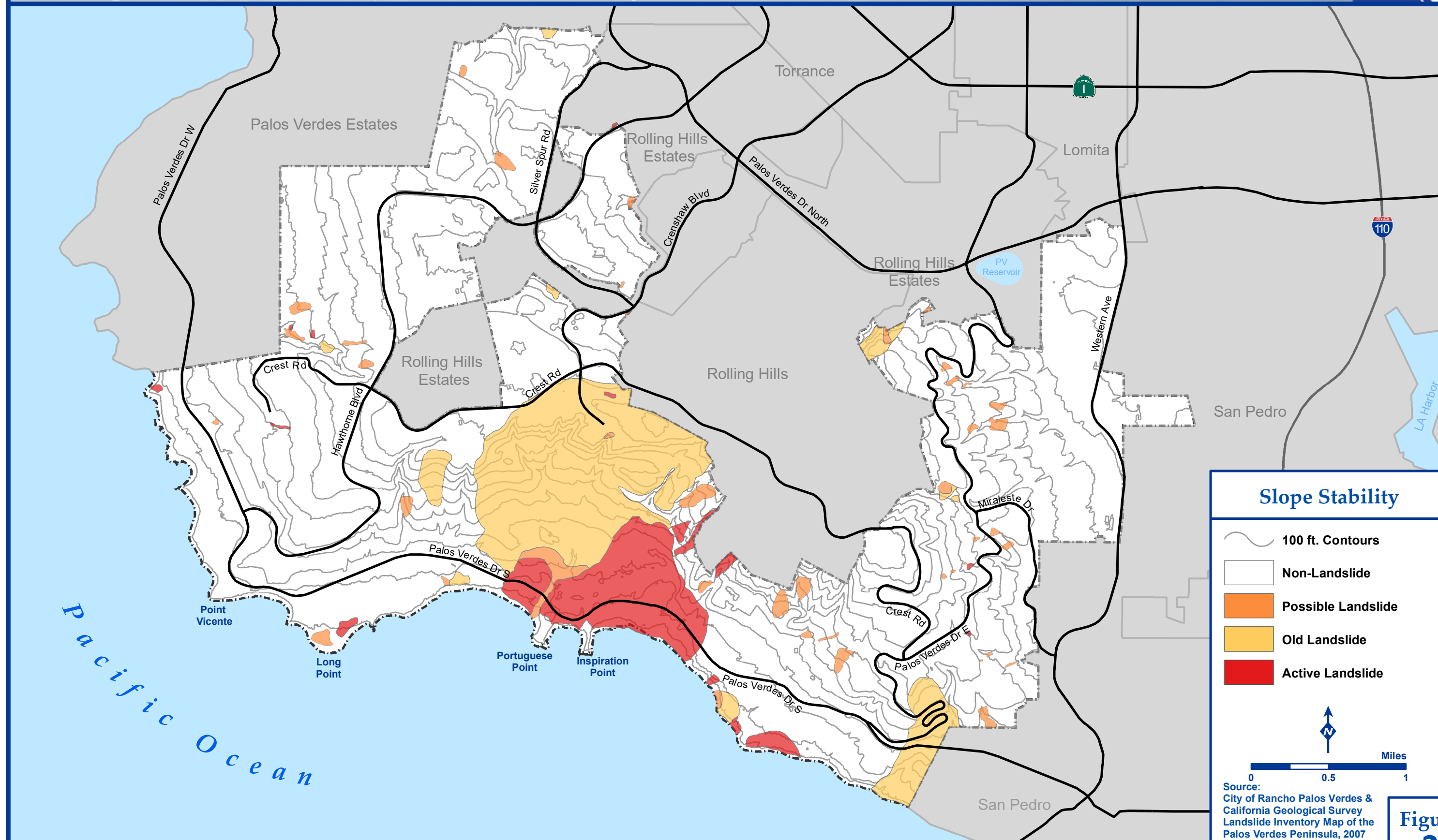


Figure
2

Coastal Setback Zone. The Palos Verdes Peninsula continues to exist as a jagged peninsular formation because the basaltic rocks underlying it are harder than the materials underlying adjacent reaches of coastline, and, hence, are more resistant to erosion by wave action. Sea cliff retreat rates in the City of Rancho Palos Verdes are probably somewhat less than the average rate of the California coastline, which is on the order of magnitude of 6 inches per year. As is the case in most stretches of coastline, a significant increment of the retreat activity takes place during heavy storms when the waves pound at the base of the sea cliff and remove material, which eventually results in a failure of a portion of the cliff. The portion of the cliff that fails may be only a thin sliver a few feet thick or may extend back from the cliff several tens of feet or more. Some of the large Rancho Palos Verdes landslide areas extending back from the cliff formations for thousands of feet may have originally been triggered by erosion at the base of the sea cliff in ancient times.

The City's 1975 General Plan indicated that the California Coastal Zone Conservation Commission (Preliminary Coastal Plan) had proposed a sea cliff hazard zone consisting of the area from the base of the cliff, extending inland to a point where a line formed by a 20-degree angle from the horizontal plane at the base of a cliff or bluff would extend out to the surface. However, subsequent to adoption of the 1975 General Plan, the City embarked on preparation of the City's Coastal Specific Plan, or Local Coastal Program (LCP). The LCP was originally certified by the California Coastal Commission with suggested modifications on January 22, 1980. The California Coastal Commission certified the resubmitted LCP on April 27, 1983, and the City assumed permit-issuing authority on August 1, 1983.

As part of that LCP, a Coastal Setback Line was established by the City in 1978, which is identified in the Coastal Specific Plan Land Use Map. The purpose of the Coastal Setback Line is to identify areas along the bluff top that have geologic concerns and to regulate development within these areas. As development proposals come forth, variances to the Coastal Setback Line have been permitted to allow development within the Coastal Setback Line areas, provided further geological studies warrant such variances. The Coastal Setback Line along the City's entire coastline was determined as a result of a comprehensive geologic study of the City's coastal zone to address possible slope erosion and other geologic concerns (Kling Consulting Group 2015).

The geologic study identified the following three significant geologic hazards within the City's coastal zone: coastal erosion, landslides, and erosion along intermittent stream channels. The combination of these geologic factors can impose significant restrictions on land-use patterns within the City's coastal zone. These geologic constraints are variable; some regions of the coastal zone are virtually free of geologic problems, and other areas are considered unsafe for practically any human activity. As a means of assessing the geologic constraints within the coastal zone for development purposes, the geologic study established a classification system based on the suitability for existing and anticipated land uses (Kling Consulting Group 2015). The category system, which was incorporated into the Coastal Specific Plan, has been historically used to determine land uses based on criteria that define the types of structures compatible with the terrain, limits on excavation and grading, and ease and safety of access.

Figure 3: Coastal Setback Zone

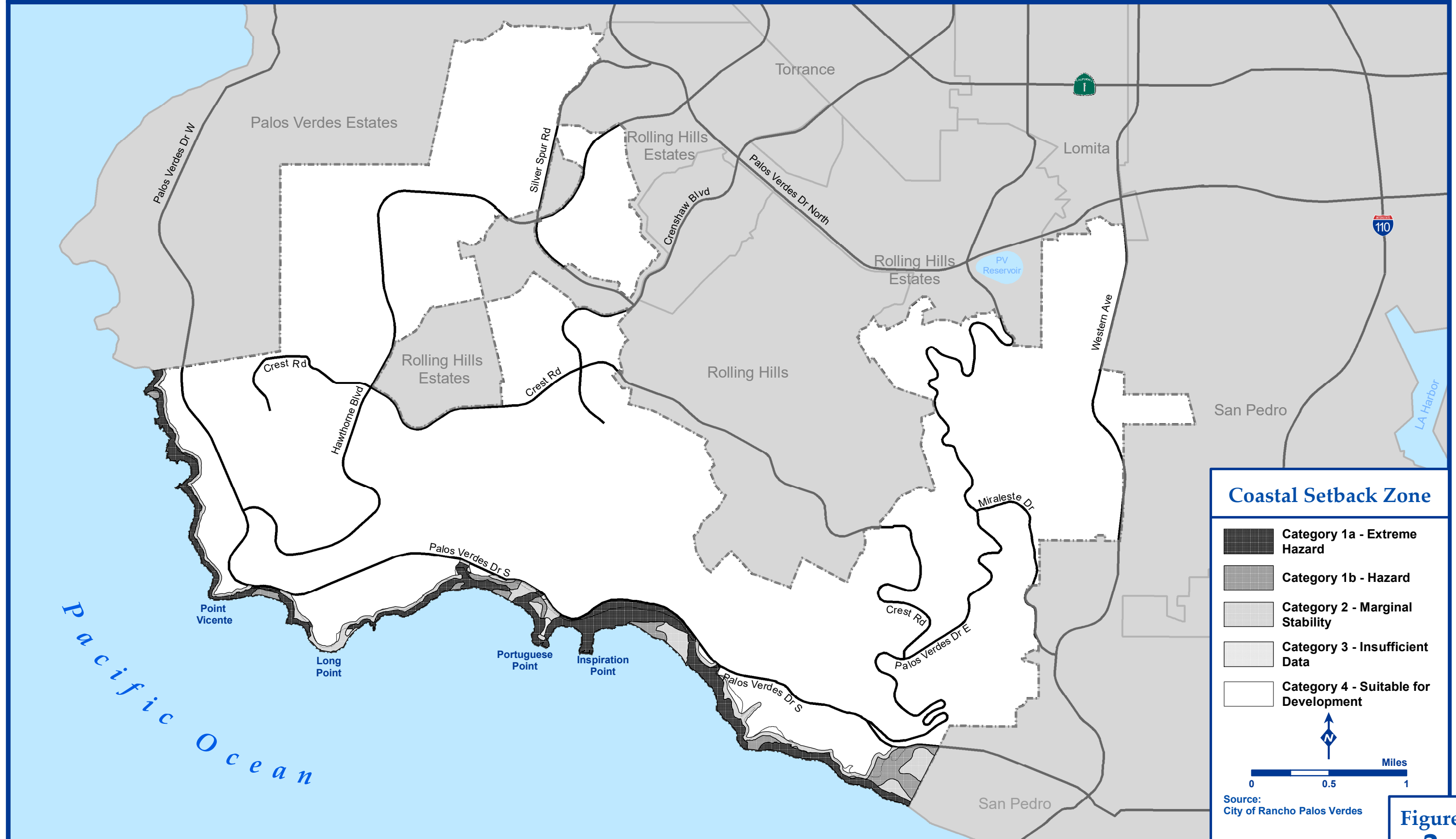


Figure 3

The five categories are briefly described as follows (Figure 3, Coastal Setback Zone):

- **Category 1a:** Areas unsuited for any permanent structures and potentially hazardous for human passage.
- **Category 1b:** Areas unsuited for any permanent structure but generally safe for human passage.
- **Category 2:** Areas suitable for light, non-residential structures not requiring significant excavation or grading.
- **Category 3:** Areas in which geologic information is not sufficiently detailed to establish suitability for construction purposes.
- **Category 4:** Areas that appear to be suitable for permanent tract-type residential structures and supporting facilities in light of existing geologic information.

On the basis of the available geologic information, the Coastal Setback Zone was established and includes all land within Category 1a, Category 1b, Category 2, and Category 3.

Notwithstanding the location of the Coastal Setback Line, development within the City's Coastal Zone requires detailed engineering/geologic studies to demonstrate site stability and suitability of development.

3.3 Mineral Resources

The City no longer has any mineral resources that are economically feasible for extraction.

The Palos Verdes Hills (two-thirds of which are within Rancho Palos Verdes) have three distinguishable subsurface components. These components of geologic time are the upper and lower Miocene, which date back approximately 25 million years, and the Jurassic, which dates back 180 million years. To give some reference to these dates, the Miocene epoch is when mammals such as dogs, cats, and horses began to acquire modern characteristics, and human-like apes appeared. The Jurassic period is that time in geologic history when the Sierra Nevada uplifted, and primitive birds appeared. Stratigraphy, in conjunction with subsurface geology, is significant when exploring for resources such as oil and gas. For instance, the Torrance oil field, in which stratigraphy is also characterized by upper and lower Miocene, has a subsurface geology in the sedimentary rock class. Sedimentary rocks are porous and capable of holding deposits such as oil and/or gas within their structure. For the most part, the subsurface geology of Rancho Palos Verdes consists of metamorphic rock with intruded igneous rock. These rock types are generally not known as sources for oil or gas. However, the area of Westmont Plaza on the east side of the City is underlain by large petroleum deposits that extend to Long Beach, Wilmington, and San Pedro (Woodring et al. 1946).

Resources Extracted Via Drilling. The first oil well was drilled by the Newton Development Company adjacent to what is now the Terranea Resort at Long Point. This well reached a depth of 4,500 feet. The stratigraphy of the well consisted of Miocene to 1,560 feet, turning into volcanic and finally hitting schist at 3,906 feet. Schist is any of a group of metamorphic rocks containing parallel layers of flaky minerals like mica. The significance of hitting schist is that the basement or bottom of the well has been reached. Like igneous rock, metamorphic rock, which is formed by heat and pressure, is a hard rock not known to house oil or gas deposits.

Three exploratory wells were drilled in what is now Rancho Palos Verdes. The Lesco Oil Corporation well was drilled in June 1947 just south of what is now 25th Street, and the McVicar well, in the vicinity of what is now the Trump National Golf Club, was drilled in 1951. All of these wells were drilled along the coast, where the Miocene layer is deepest. According to the logs filed with the State Division of Oil and Gas, nothing was found in these wells (Landers pers. comm. 1975).

Minerals Extracted by Quarrying. From 1948 to 1958, the land in Rancho Palos Verdes was quarried for basalt, diatomaceous earth, and Palos Verdes stone. The only valuable material known to exist in Rancho Palos Verdes that has not at one time or another been commercially extracted is basalt, which reportedly exists at the main branches of Agua Amarga Canyon.

Basalt is a light-weight volcanic rock that is used as a component in concrete and oil well cement, and locally as a dressing for secondary roads. The three recorded basalt quarries were just north of Forrestal Drive within the now Forrestal Reserve, a subarea of the Palos Verdes Nature Preserve, and just south of the Flying Triangle in Rolling Hills. These quarries were operated for nearly 10 years, closing their operation in 1958. The operation was run by Livingston and Graham Inc., and allegedly these quarries produced only basalt and not the decomposed granite, which appears on some early editions of the U.S. Geological Survey maps.

To the south of Westmont Plaza in the Eastview area at 29000 Western Avenue is the site of the old Hilltop Quarry. Calcium carbonate was mined at the quarry in the early 1900s. In 1946, the quarry was filled. Currently, no mineral resources are being extracted from the Eastview area.

There is some evidence that mining operations may have occurred in the Via Colinita area of Rancho Palos Verdes, probably basalt. In the early 1970s, the Los Angeles County Building and Safety Department received reported problems of some settling of homes in the area, which may have resulted from previous mining operations. Unlike oil and gas wells, mining and quarrying operations did not require permits from the State, making confirmation of these mining operations difficult, if not impossible, to substantiate.

Palos Verdes Hills housed the nation's third-largest diatomaceous earth quarry. This quarry was operated by Grefco, a subsidiary of Great Lakes Carbon. This quarry site later became the Palos Verdes Landfill, which was subsequently closed by the 1980s. The ground at the site became unstable in 1953, so the operation was moved to the Crestridge site in 1954, where it operated for almost 1 year. The Palos Verdes Landfill is now the site of the South Coast Botanic Garden in unincorporated Los Angeles County and the Ernie Howlett Park in the City of Rolling Hills Estates.

In 1972, core samples were taken on the Filiorum property just north of Narcissa in upper Portuguese Bend. The core samples, taken for a development project that was being considered at the time, appeared to contain almost pure diatomaceous earth but were not verified. Although this area has never been commercially quarried, the high probability of a diatomaceous earth deposit in this area should be noted as a mineral resource within Rancho Palos Verdes.

Diatomaceous earth is the principal substance in many filtering operations. Primary users of diatomite are the brewing industry, sugar processors, filters such as for swimming pools, and manufacturers of antibiotics. The material is also used as a filler in paper and plastics. Diatomaceous earth has more than 200 uses.

The material that occurs most commonly on the Peninsula and is most generally known is Palos Verdes stone. This is a sedimentary rock that occurs throughout Rancho Palos Verdes and the Peninsula. The stone, which is used in landscape architecture and as a decorative rock in home and office construction, is found close to the surface in sporadic locations throughout the City. Whenever subdivisions were being developed that required grading, Palos Verdes stone was often commercially exported from the construction site. Because of the sporadic nature and the shallow depth at which the stone occurs, it is not thought to be economically feasible to commercially mine Palos Verdes stone.

Considering the rather low market value of the various mineral resources in Rancho Palos Verdes relative to the land's value as residential and commercial real estate, it is highly unlikely that landowners would wish to use the

land for mining or quarrying operations. Given the community's goal of maintaining a rural atmosphere, conflicts that might arise relative to other desired land uses are not likely to occur.

Forestry. The City's predominant land uses are Residential and Open Space. The City maintains over 1,400 acres of open space, known as the Palos Verdes Nature Preserve, that have mature trees and lush vegetation.

3.4 Hydrology

Water systems are integral to all natural processes. Within the City, all surface water originates from precipitation falling directly on the land, and it is rare to find continuing stream systems. This is a result of the Peninsula being a single hill formation creating a drainage pattern that is dispersed via a number of small watershed systems. There are no major watershed systems that are totally confined within the boundaries of the City. All hydrologic systems within the City are affected by runoff from other jurisdictions or affect other downstream jurisdictions; this is an important consideration during the planning process.

The drainage pattern of Rancho Palos Verdes is divided by a central ridge causing runoff to flow in several directions (Figure 4, Hydrology). The majority of the runoff flows directly south into the ocean. This flow is primarily within the jurisdiction of Rancho Palos Verdes, with only a small portion of that flow originating within the City of Rolling Hills. Other runoff flows east through San Pedro, north through Rolling Hills and Rolling Hills Estates, or west through Palos Verdes Estates. All of this runoff eventually flows to the ocean.

Erosion, sedimentation, and siltation are part of the natural drainage processes, and are necessary for the development and transportation of sediments for beaches and replenishment.

Little downcutting of drainage canyon bottoms around the City is currently taking place due to erosion because they are already essentially in bedrock. However, Lower San Ramon Canyon is experiencing scour, which is the lowering of the canyon bottom due to erosion (Kling Consulting Group 2015). The City continues to make efforts to mitigate this issue. Erosion, however, is taking place on the canyon walls where weak rock is located or slope wash exists; this material falls, slides, or is washed into the canyon bottoms and is transported out onto the beach during periods of heavy precipitation. Far more material is carried to the sea by movement of landslides, such as Portuguese Bend, than by stream erosion. Small amounts of material deposited on the beaches by runoff remain only until the next big storm, when it is then washed away by the larger waves and carried southeast by the longshore current. The coastal shelf around the Peninsula is primarily rocky, as most of the beach sand is transported to other areas along the coast.

Soils within the City tend to be rich in clay and have poor percolation characteristics. This results in high runoff. The amount of additional runoff from increased urbanization of areas adjacent to the canyons would be slight, due to these soil characteristics (Earth Sciences Associates). However, impermeable surfaces such as roads, parking lots, and buildings reduce the amount of land area that naturally absorbs moisture, thereby accelerating runoff and increasing the amount of contaminants flowing into storm drains and subsequently the ocean.

Surface flow runoff accumulates small amounts of petroleum residue, road dust, nutrients, and pesticides associated with urban development as it flows to the ocean, impacting the marine environment. Increased surface drainage also tends to erode canyon walls at higher rates, increasing sedimentation and siltation of tide pools, although a certain amount of erosion is necessary to replenish beach sand. Generally, management at the drainage courses by maintaining natural velocities enables percolation and filtration to occur, thus alleviating some of the pollution before it reaches the ocean. The high clay content of the soils in Rancho Palos Verdes, however, does not

Figure 4: Hydrology

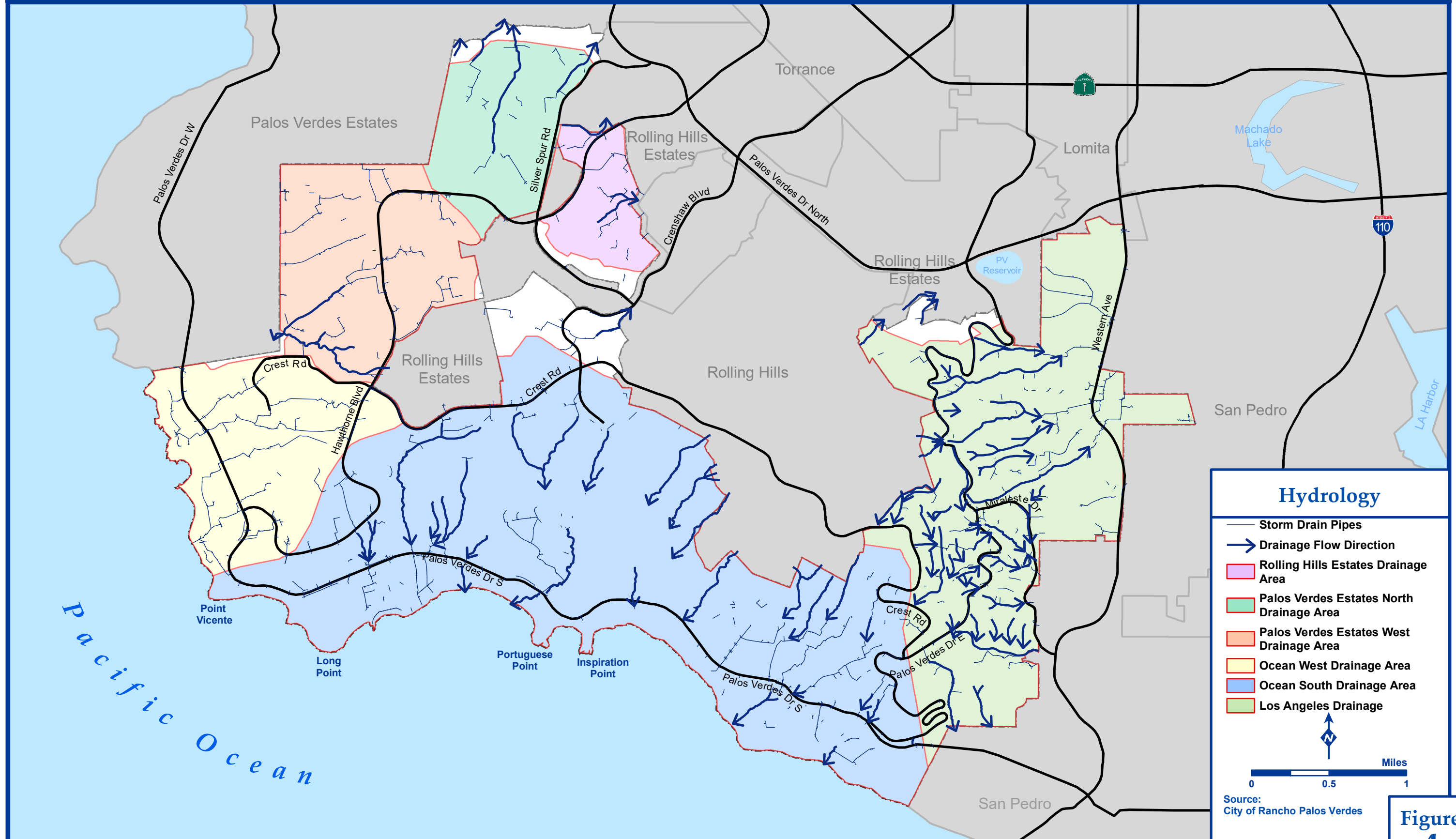


Figure
4

enable high amounts of percolation to occur, but allows runoff to continue preventing the soil from becoming overly saturated and initiating landslides. This balanced system filters pollutants, replenishes beach sand, irrigates natural vegetation, and returns water back to the ocean, but can easily be upset by changes in drainage pattern and flow characteristics.

Excessive silt-ridden erosion and runoff laden with insecticide and fertilizer from agricultural and urban land uses can have detrimental effects on marine organisms. To control erosion, lessen excessive runoff, and allow greater ground absorption, National Pollutant Discharge Elimination System (NPDES) permits are required for specific projects if the project discharges could potentially enter surface waters. The program, created in 1972 under the Clean Water Act, is responsible for controlling and regulating point sources of discharge of pollutants to waters within California to maintain, protect, and restore the water quality of streams and other navigable waterways.

The City of Rancho Palos Verdes currently implements the NPDES program as a requirement for certain development. The NPDES process requires developers to incorporate Low-Impact Development (LID) standards to minimize the amount of runoff and exposure of water to pollutants such as trash, nutrients, oil and grease, copper, zinc, lead, cadmium, and bacteria. Developers must implement best management practices to mitigate potential pollutants. Applicable projects are not issued grading, demolition, or building permits unless approval of a NPDES plan is obtained. The City also has a landscape ordinance intended to save water and reduce the amount of runoff into the ocean. Furthermore, pest management plans integrated into landscape plans minimize harmful chemicals.

A number of existing channels and storm drains have been privately and publicly developed within the City. Most have been designed to the standards of the Los Angeles County Flood Control District and have been deeded to the Flood Control District. In 2005, residents approved a Storm Drain User Fee, which was established to provide funding for the City's Storm Drain Improvement and Maintenance Program to adequately maintain facilities. The Storm Drain User Fee assist in paying for construction projects, storm drain lining, maintenance, staffing, and engineering. In 2009, the City's McCarrell Canyon Storm Drain Project was awarded the 2009 Project of the Year in the "Facilities" category by the Southern California Chapter of the American Public Works Association. This project was one of the highest-priority planning goals for the City Council for the Water Quality and Flood Protection Program. The McCarrell Canyon project was paid for with General Fund reserves and the Storm Drain User Fee. It will likely be necessary to seek and secure other funding sources to continue water quality and storm drain programs because the user fee expired in June 2016. As urban development continues, private developers may be required to construct proper storm drain facilities to accommodate the impacts of their development projects.



3.5 Biotic Resources

The vegetation communities found in Rancho Palos Verdes are coastal sage scrub, southern cactus scrub, coastal bluff scrub, saltbush scrub, and some riparian woodland. Since the Peninsula was once an island, many of the plant types are closer to Catalina Island flora than to the chaparral found in the Santa Monica Mountains.

The urban development, ranching, and farming that has occurred on the Peninsula has degraded and/or eliminated many of the natural areas that are considered significant natural plant and habitat communities and that support wildlife. In addition to on-site clearing, native plant communities can be lost due to the fuel modification setback required by fire officials.

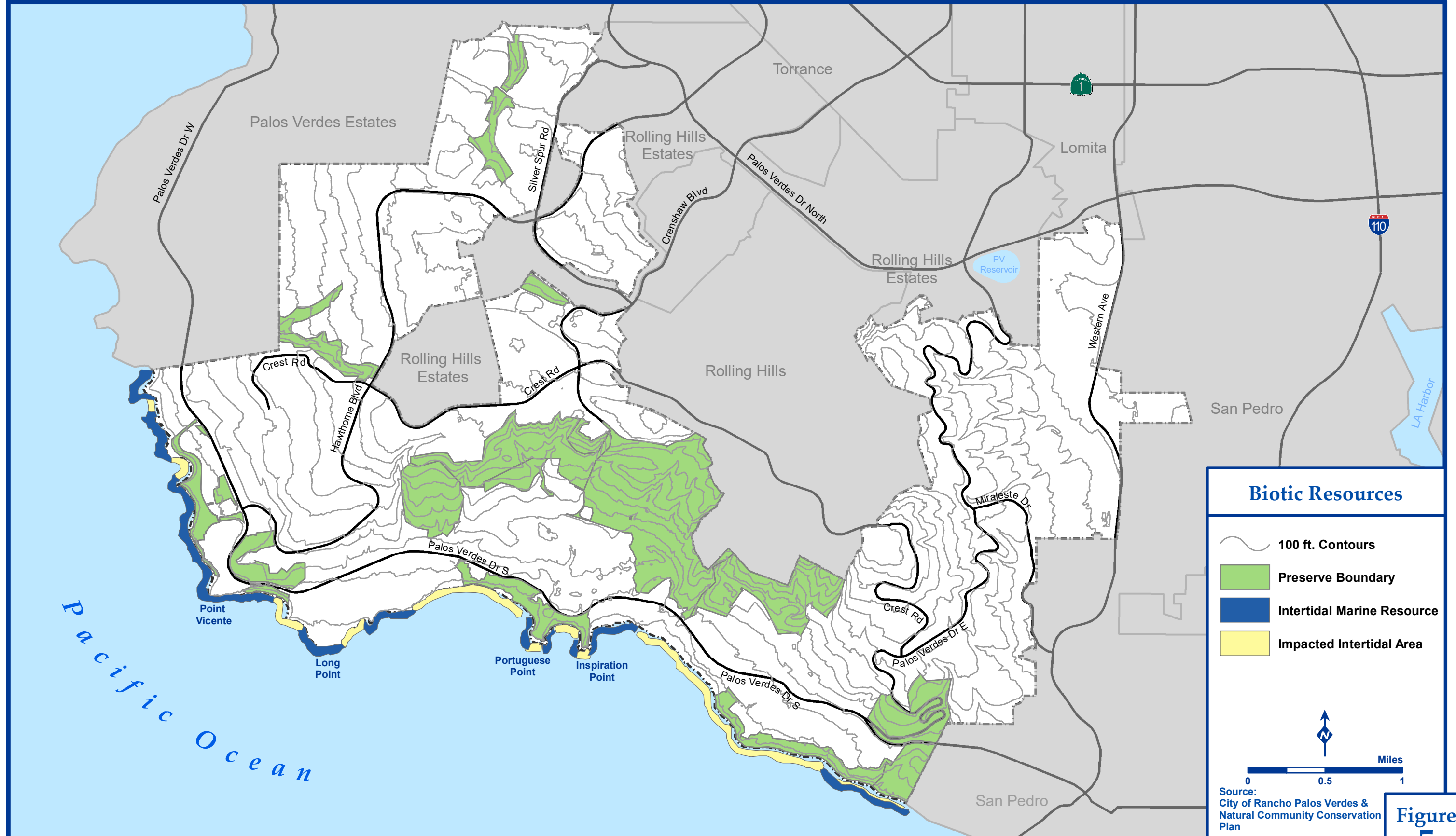
Natural Community Conservation Plan

In 1996, Rancho Palos Verdes entered into an agreement with the California Department of Fish and Game (now the California Department of Fish and Wildlife) and the U.S. Fish and Wildlife Service, collectively referred to as “Wildlife Agencies,” to take the lead in the preparation of a Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP). The NCCP/HCP covers vegetation and wildlife species for the entire City, and also created a designated nature preserve, the Palos Verdes Nature Preserve to conserve and re-vegetate sensitive native habitats and provide adequate habitat linkages between patches of conserved lands. Through a partnership with the Palos Verdes Peninsula Land Conservancy (PVPLC), the City was able to acquire upward of 1,400 acres of land through public dedications of City-owned land, private donations of land, and formal land purchases. This partnership led efforts in the various forms of land acquisitions for the designated Preserve areas, and also provided necessary support for the design and implementation of the formal NCCP/HCP. Due to the amount of land acquired by the City and the desire to ensure that sensitive, native habitats are re-vegetated and conserved over time, the City also created a new General Plan land use designation: the Open Space Preserve land use designation. These Preserve areas are shown in Figure 5, Biotic Resources.

The City’s NCCP/HCP provides for protection and management of wildlife and biological resources while allowing for compatible public use and appropriate development growth. The NCCP/HCP provides comprehensive management and conservation of multiple species, including species listed under the California Endangered Species Act and the federal Endangered Species Act of 1973. The City developed a landscape-scale database of biological resources and land-use information to allow the City and Wildlife Agencies to make informed land-use and conservation decisions for future projects. This database mapped vegetation community and sensitive species distributions, and potential habitat for sensitive species. The NCCP/HCP also provides measures for habitat restoration of disturbed areas within the Preserve, with a required minimum level of restoration and enhancement to be accomplished each year.

Vegetation Communities. Sensitive habitats within the City’s NCCP/HCP area are those that are considered rare in the region; support sensitive species of plants and animals; and/or are subject to regulatory protection through various federal, state, or local policies or regulations. Habitats in the City include wetland habitat types (consisting primarily of riparian scrub) and upland scrub habitats. Grasslands are the first plant community to dominate an area after clearing, either by fire or human intervention. Although some native plants such as needle grass, broadleaf herbs, and wildflowers will fill in these cleared areas, much of the flora is made up of non-native Mediterranean annual grasses, fennel, or mustard. If patches of native grassland are identified, this habitat should be considered sensitive. Habitats dominated by non-native plant species (e.g., non-native grassland, exotic woodland, and disturbed vegetation) are generally not considered sensitive. However, non-native grassland is considered sensitive where it occurs in large, contiguous areas because it may provide vital foraging habitat for

Figure 5: Biotic Resources



raptors and support other sensitive plant and wildlife species. Smaller patches of non-native grassland that are contiguous with larger areas of open space are also important because they contribute to a habitat mosaic that can be used by sensitive species.

Approximately 8,612 acres of vegetation are within the NCCP/HCP area, including native habitats, non-native habitats, agricultural lands, disturbed areas, and developed lands. These communities are listed in Table 1 and further described in the City's NCCP/HCP.

TABLE 1
**VEGETATION COMMUNITIES IN THE NATURAL COMMUNITY CONSERVATION PLAN/
HABITAT CONSERVATION PLAN AREA**

Vegetation Category	Preserve	Neutral Lands	Lands Outside Preserve/Neutral Lands	Grand Total
Agriculture	2.9	0.2	14.6	17.6
Cliff Face	7.4	1.3	0.0	8.8
Coastal Sage Scrub	582.2	354.6	89.8	1,026.8
Developed	51.8	967.6	4,964.9	5,984.5
Disturbed Vegetation	30.8	14.9	119.2	164.9
Exotic Woodland	37.5	14.5	23.5	75.4
Grassland	470.9	216.5	262.8	950.2
Riparian Scrub	2.3	0.1	0.2	2.5
Rocky Shore/Intertidal	7.3	39.3	12.1	58.8
Ruderal Habitat	54.5	9.8	22.7	86.9
Saltbrush Scrub	6.6	0.6	0.0	7.3
Southern Cactus Scrub	66.6	28.2	4.9	99.7
Southern Coastal Bluff Scrub	81.6	46.7	4.8	133.2
Grand Total	1,402.4	1,694.3	5,519.6	8,616.6

*Neutral Lands are not subject to NCCP/HCP management requirements.

Conservation of some non-native grasslands contributes to NCCP/HCP planning goals. Further, mitigation measures for potential impacts to non-native grasslands may be required for development projects.

Reserve Areas within the NCCP/HCP Area

A number of significant wildlife habitats in Rancho Palos Verdes are directly associated with vegetation communities. The City established the NCCP/HCP to preserve biodiversity within the City's boundaries while allowing for continued public use and economic development. The purpose of the Preserve is to identify properties where conservation will best achieve biological goals with the least detrimental effects on other land uses, property rights, economic goals, and public access. This approach involved examining opportunities and constraints, and incorporating biologically valuable lands into the Preserve. Within the NCCP/HCP area is a dedicated Preserve with specified 12 reserve areas. All of the 12 reserve areas are managed for the City by the Palos Verdes Peninsula Land Conservancy. These 12 reserve areas and their corresponding acreages are identified in Table 2.

TABLE 2
RESERVE AREAS* WITHIN THE NCCP/HCP PRESERVE

Reserve Areas	Acres
Abalone Cove Reserve**	65.2
Agua Amarga Reserve	61
Three Sisters Reserve	98.4
Vista Del Norte Reserve	16.8
Portuguese Bend Reserve	427.2
Vicente Bluffs Reserve	62.5
Forrestal Reserve	158
Ocean Trails Reserve	116.6
San Ramon Reserve	94.5
Alta Vicente Reserve	50.9
Filiorum Reserve	189.8
Malaga Canyon Reserve	61.5

Notes:

* Also referred to as Management Units

** The Abalone Cove Reserve is a terrestrial area regulated under NCCP guidelines within the City owned Abalone Cove Shoreline Park and is different from the marine Abalone Cove Ecological Reserve that is under State jurisdiction.

NCCP Sensitive Species. The City's NCCP/HCP is designed to maximize benefits to wildlife and vegetation communities while accommodating appropriate public use and economic development within the City, pursuant to the requirements of the NCCP Act (1991) and Section 10(a) of the Endangered Species Act. The NCCP/HCP is intended to provide for the comprehensive management and conservation of multiple species, including those species listed under the Endangered Species Act and identified in Table 3.

TABLE 3
SENSITIVE SPECIES LIST FOR THE NCCP/HCP

Common Name	Scientific Name	Status
Aphanisma	<i>Aphanisma blitoides</i>	CNPS List 1B
South Coast Saltscale	<i>Atriplex pacifica</i>	CNPS List 1B
Catalina Crossosoma	<i>Crossosoma californicum</i>	CNPS List 1B
Island Green Dudleya	<i>Dudleya virens ssp. insularis</i>	CNPS List 1B
Santa Catalina Island Desert-Thorn	<i>Lycium brevipes var. hassei</i>	CNPS List 1B
Woolly Seablite	<i>Suaeda taxifolia</i>	CNPS List 4
Palos Verdes Blue Butterfly	<i>Glaucopsyche lygdamus palosverdesensis</i>	FE
El Segundo Blue Butterfly	<i>Euphilotes battoides allyni</i>	FE
Coastal California Gnatcatcher	<i>Polioptila californica californica</i>	FT, NCCP Focal Species, SSC
Cactus Wren	<i>Campylorhynchus brunneicapillus</i>	NCCP Focal Species SSC

Notes:

NCCP = Natural Community Conservation Plan; HCP = Habitat Conservation Plan

FT = federally threatened

FE = federally endangered

SSC = Species of Special Concern

CNPS List 1B = Plants, rare, threatened, or endangered in California and elsewhere

CNPS = California Native Plant Society

CNPS List 4 = Plants of limited distribution – a watch list

The sensitive species identified in Table 3 can be found in various areas of the City. The first six flora species listed fall under sensitive vegetation found within the City. Aphanisma (*Aphanisma blitoides*) occurs in the City in coastal bluff scrub from Portuguese Point, along the coast to the Rancho Palos Verdes and San Pedro city limit. South coast saltscale (*Atriplex pacifica*) has been detected on Portuguese Point and along the coast between Halfway Point and Shoreline Park. Catalina crossosoma (*Crossosoma californicum*) has been detected on dry, rocky slopes and canyons in coastal sage scrub below 1,640 feet elevation. Island green dudleya (*Dudleya virens ssp. insularis*) is found mostly on the Pacific slope on sea bluffs and rocky headlands. Santa Catalina Island desert-thorn (*Lycium brevipes var. hassei*) was rediscovered on the Peninsula in 1976 and occurs on Portuguese Point within the City limits. Wooley seablite (*Suaeda taxifolia*) occurs along the Peninsula shoreline.



The last four sensitive fauna species listed in Table 3 are sensitive wildlife that have been found to thrive in the various vegetation communities within or near the City. Two populations of El Segundo blue butterfly (*Euphilotes battoides allyni*) were found during focused biological surveys conducted in 2006. One population was found just north of Point Vicente in a large patch of coast buckwheat (36 observed), and the other population was found southeast of Point Vicente at the Fisherman's access area (13 observed). Historically,

Palos Verdes blue butterfly has been observed near the "switchback" area of Palos Verdes Drive East, within the landslide moratorium area, and in Agua Amarga Canyon. Federally designated critical habitat for Palos Verdes blue butterfly includes Fred Hesse Park, Agua Amarga Canyon, and the "switchback" area of Palos Verdes Drive East. Coastal California gnatcatcher habitat is coastal sage scrub vegetation. This habitat is protected and managed throughout the NCCP/HCP area and by the Endangered Species Act. The coastal population of cactus wren (*Campylorhynchus brunneicapillus*)



nests in southern cactus scrub habitat dominated by extensive stands of tall prickly pear or cholla cacti.

All sensitive species listed above are associated closely with scrub habitats on the Peninsula. These sensitive species are described in detail in the City's adopted NCCP/HCP.

3.6 Ocean Resources

The Palos Verdes Peninsula has long been recognized for its beautiful shoreline and rich, abundant marine life. The shoreline is used by sport and commercial fishermen, hikers, divers, beachcombers, and students studying coastal and marine habitats and species. This intense activity, combined with other forces from the heavily developed Los Angeles and Orange Counties, have affected the ocean environment surrounding the Peninsula. The thousands of species of marine organisms that currently inhabit the tide pools were once depleted to dangerously low numbers due to excessive use and under-management of the intertidal shoreline area. Some species were eliminated from the area and others faced the same threat.

The once nearly crystalline water quality has been degraded by a number of water pollution factors and the lack of particle-absorbing organisms in the marine environment. The kelp beds that surround the Peninsula, providing food and shelter for many varieties of sea life, were once reduced to a few patches of seaweed. In addition, recreational fishing has been adversely affected as a result of the contamination of off-shore sediments with deposits of chemical pesticides (e.g., DDT) that occurred in the 1950s through the 1970s.

Kelp Bed. Kelp beds (*Macrocystis pyrifera*) are forests that serve as sanctuaries, nurseries, habitats, and food sources for many species of marine organisms. Kelp is also a renewable natural resource that should be carefully managed and maintained. Kelp fronds have been known to grow as much as 2 feet per day, and eventually form a thick blanket covering the surface of the water. The biomass (i.e., the amount of living matter per unit area) of a kelp forest is greater than that of a temperate land forest (California Coastal Zone Conservation Commission 1974), and in ecological terms, may be 100 times more productive than the adjacent sand bottom (Southern California Association of Governments 1972). Kelp also exerts a flattening effect on wave surges, serving as a stabilizing mechanism against shoreline erosion, which is a significant factor for Rancho Palos Verdes. Although the Rancho Palos Verdes kelp beds are not used for commercial purposes, algin extracted from the kelp plant is used as a thickener and stabilizer in food and cosmetics; additives for medicines; and components in textile products, adhesives, acoustic tiles, ceramic glazes, leather finishes, automobile polish, toothpaste, beer, seasonings, and countless other products.

The shoreline of the Peninsula once flourished with dense kelp beds that disappeared during the 1970s. The ecologic sequence creating the decline of the kelp began with mass harvesting of the brown sea otter in the late 19th century. The sea urchin was the favorite food of the otter, and for many years the population of sea urchins remained in check as a result of the otters. Due to the demand for sea otter pelts, fur traders practically eliminated the population. This action, combined with water pollution from sewage discharge, resulted in an overpopulation of sea urchins.



Sea urchins are sea-bottom dwellers that feed on kelp holdfasts (root-like, anchoring structures that hold the plants in place), causing the entire kelp plant to become uprooted, wash ashore, and die. Prior to the increase in urchin

population, the kelp was able to replenish itself as rapidly as it was depleted. As the sea urchin population increased, the replenishment process could not be maintained.

Another principal threat to the kelp beds off the Palos Verdes Peninsula was the discharge of wastewater from the Whites Point outfall on the Palos Verdes Shelf. The high volume of outfall contained a large quantity of suspended solids that most likely buried the hard bottom habitat. Other reasons for the decline may have included increased turbidity and reduced light penetration due to the discharge of total suspended solids, which may have prevented the growth of young kelp plants. Additionally, suspended solids may have also supported abnormally high densities of sea urchins.

From the mid-70s to 1997, improved wastewater treatment processes resulted in a significant reduction in the discharge of total suspended solids from the Whites Point outfall. That, along with kelp replanting efforts in the 1970s, resulted in a remarkable increase in the kelp canopy from a low of 5 acres in 1974 to a peak of more than 1,100 acres in 1989.

More recently, erosion and sedimentation have threatened the kelp beds off the Palos Verdes Peninsula. Since 1980, an active landslide at Portuguese Bend on the Palos Verdes Peninsula has supplied more than seven times the suspended solids as the Whites Point outfall (LACSD 1997). When that sediment is carried into the ocean by storm runoff and excessive erosion from the landslide areas, the potential for kelp bed decline is present.

The earliest efforts to re-establish kelp beds began in 1967 on the Palos Verdes Shelf. Initial efforts were met with little success, but efforts were re-initiated by the California Department of Fish and Wildlife in 1970 and continued through 1977. In 1974, the kelp beds off the Palos Verdes Peninsula began to show signs of recovery. During the 1980s, the kelp canopy dramatically increased. Once the beds were re-established, the California Department of Fish and Wildlife discontinued active restoration efforts.

In 1996, the environmental group Los Angeles Waterkeeper embarked on a kelp restoration project (the Kelp Project), again focused on the Palos Verdes Shelf. Giant kelp was successfully cultivated in a lab and transferred to the ocean. Since then, Los Angeles Waterkeeper has been monitoring and restoring the Palos Verdes area. In 2014, extensive surveys mapped out reef areas completely dominated by urchins. Based on this analysis, efforts have been made to clear urchins to densities found in healthy kelp forests. Once the urchin numbers are reduced, algae begins to grow on reefs, and kelp plants establish themselves. This is an ongoing kelp restoration effort by Los Angeles Waterkeeper.

Marine Life. The Rancho Palos Verdes shoreline has been a major activity area for commercial fishing of lobster, white sea bass, abalone, and crab, as well as various species of rock and kelp fish. All of these species were depleted to the point of endangerment. In addition, certain species of fish (e.g., white croaker) may have been affected by possible DDT contamination.

Recreational fishing further adds to the depletion of marine life. The average recreational fisherman fishes from the shore or, at most, a few miles offshore, and near-shore species such as rockfish, flatfish, kelp and sand bass, perch, and shellfish are the most heavily affected.

According to the South Coast Regional Commission's estimates, there are provisions for docking a very large number of private boats in the South Coast region. Many private boats are docked within 20 miles of Rancho Palos Verdes. The large numbers of fishermen and divers associated with these pleasure craft, in combination with shore fishermen and divers, contribute to the extraction of marine resources. In 1999, California Legislators passed the

Marine Life Protection Act, and creation of protected marine areas off the Palos Verdes Peninsula was one of the top priorities to maintain a sustainable level of the rare marine diversity in this area. Unless specifically prohibited, all non-extractive uses such as swimming, wading, boating, diving, and surfing are allowed in protected marine areas.

Abalone Cove Shoreline Park and Pelican Cove (formally Point Vicente Fishing Access) are two of the more ecologically diverse coastal regions in the Peninsula. The Abalone Cove features two beaches, tide pools, bluff-top viewing area, and trails. This Reserve contains a State Ecological Preserve with important natural marine resources at the bottom of the Portuguese Bend Area. To address human impacts, these two coastal regions were designated as State Marine Protection Area by the California Department of Fish and Wildlife Agency. The Abalone Cove State Marine Protection Area prohibits all “hook and line” fishing at this location, and only allows recreational take of pelagic (fish found in the open ocean) finfish. The Point Vicente State Marine Protection Area prohibits the taking of all living marine resources, including “hook and line” fishing and spear fishing. However, scientific research and habitat restoration efforts continue to be allowed through a special permit issued by Fish and Wildlife Agency.



In addition to the take of marine organisms for commercial and recreational use, many institutions use them in a broad range of applications for biomedical research. Certain species exhibit different life functions that are unobservable in other animals. For example, the brain of the octopus is the best defined brain of any known organism (California Coastal Zone Conservation Commission 1974), and medical research into brain functions has involved study of the octopus brain.

Tide pools and rock intertidal areas are prime areas for extraction of many organisms. Many schools and colleges in the area offer oceanography, marine biology, ecology, and other ocean-related classes that use the shoreline of Rancho Palos Verdes for observation and study. Specimens are collected for study purposes and taken back to school laboratories. This research and study, though further depleting marine life, helps to develop positive attitudes and management policies for proper conservation practices in the future.

Another damaging effect on tide pools and rocky intertidal areas is abuse by unknowledgeable tide pool visitors. Numerous marine organisms attach themselves to the underside of rocks for protection. Many of these rocks are indiscriminately turned over by tide pool visitors. Left in this state, the attached organisms are exposed and soon die. Fishermen also use some of these species for bait. Visitors unwittingly wade through tide pools, crushing shellfish and other plants and animals. They also collect shells, starfish, and anything else they can carry away. Picnickers discard trash and food remnants, leaving an aesthetically displeasing and hazardous environment. Because of the numerous visitors to the shore, the tidal areas of Rancho Palos Verdes have suffered severely.

As a result of the denuded tide pools and general environmental degradation, restrictions have now been placed on unwarranted collection. The California Superintendent of Public Instruction and the California Department of Fish and Wildlife Agency developed guidelines for conserving tide pool resources. State legislation prohibits the taking of any tide pool organisms without a permit from the California Department of Fish and Wildlife Agency. Permits are issued only to Los Angeles County education offices that have approved plans for conservation of tide pool life and that employ a staff biologist to conduct their



programs. The main problem is enforcement with those who are unaware of the laws or those who refuse to comply with them. The combination of Los Angeles County Sheriff personnel, Recreation Open Space Management staff, and Palos Verdes Peninsula Land Conservancy staff and volunteers who patrol, control, and educate people using the City’s beaches, parks, and trails to help ensure that sensitive areas are maintained.

The City could elect to gain control over the tidelands (area from the mean high tide line seaward 3 miles) from the State Lands Commission. In this manner, the City could regulate and control uses within this area. To gain control, special enacting legislation would need to be passed and signed by the California Legislature and Governor. The City of Palos Verdes Estates gained control of its tidelands in this manner (Statutes of California 1968, Chapter 316). Palos Verdes Estates has been authorized by legislation to use the tidelands in a variety of optional uses such as construction of wharves, docks, small boat harbors, and/or a marine aquatic playground, but its primary purpose is for the “establishment, preservation, restoration, improvement, or maintenance of intertidal and subtidal marine biological reserves.” The City of Rancho Palos Verdes, by creating this type of action, would then be responsible to enact, maintain, and enforce any regulation it would enact.

4 Resource Classification

All factors (ecological and environmental) of the natural environment inherently interact with one another. A change in one factor may have a resulting series of reactions in other factors. An example of this type of interaction is natural topography alteration resulting in a change in hydrologic patterns, which in turn may deprive natural vegetation of adequate irrigation, and thus cause degradation of wildlife habitat. An analysis of ecological units, as described above, allows identification and classification of critical areas for management considerations. The City created the following two classifications:

- 1. Areas for Consideration of Public Health and Safety
- 2. Areas for Preservation of Natural Resources

To identify the specific components making up each classification, all components determined to be critical were given a numeric code. Components are referred to as “Resource Management Districts,” since they are areas (or districts) that represent specific resources. Resource Management Districts 1 through 5 are those considered in relation to health and safety. Resource Management Districts 6 through 9 are those natural resource elements having unique values meriting consideration for preservation.

A list of the Resource Management Districts is found below in Table 4.

TABLE 4
RESOURCE MANAGEMENT DISTRICT CODE DESIGNATIONS

Resource Management District	Code Designation
Coastal Zone	RM 1
Extreme Slope (greater than 35%)	RM 2
High Slope (between 25% and 35%)	RM 3
Active Landslide	RM 4
Dormant Landslide Area	RM 5
Hydrologic Factors	RM 6

TABLE 4
RESOURCE MANAGEMENT DISTRICT CODE DESIGNATIONS

Resource Management District	Code Designation
Marine Resource	RM 7
Wildlife Habitats	RM 8
Other Natural Vegetation Areas	RM 9

4.1 Areas for the Consideration of Public Health and Safety

Areas for consideration of public health and safety include areas where the physical environment poses a significant hazard to the well-being of the public. These typically include natural hazard zones such as unstable ground conditions or seismic hazards.

The Resource Management Districts related to public health and safety and their numeric codes are found in Table 5.

TABLE 5
CODE DESIGNATIONS RELATED TO PUBLIC HEALTH AND SAFETY

Resource Management District	Code Designation
Coastal Sea Cliff Erosion	RM 1
Extreme Slope (35% and greater)	RM 2
High Slope (between 25% and 35%)	RM 3
Active Landslide	RM 4
Dormant Landslide Area	RM 5
Flood Plains	RM 10
Areas Representing High Fire Risks	RM 11

The location of these Resource Management Districts are shown in Figure 6. A description of each district and the conservation efforts needed to address public health and safety are described below.

RM 1 – Coastal Sea Cliff Erosion. The purpose of managing development within this district is to ensure public safety from sea cliff erosion and landslides, and to maintain the physical, biological, and scenic resource of particular value to the public within the City’s Coastal Zone. Any proposed development within this district requires a detailed engineering/geologic study by a registered geologist, soils engineer, and/or a certified engineering geologist. The studies need to consider historic cliff erosion, cliff geometry, geologic conditions, landslides, ground and surface water conditions and variations, and other factors affecting slope stability. The studies need to describe the possible effects of the proposed development, and must prove to the satisfaction of the City Geologist that the proposed development would conform to existing site conditions, present no significant risk to human life, and post no adverse environmental impacts before approval for any development is granted.

RM 2 – Extreme Slope. Extreme slopes are slopes of 35% or greater. The purpose of this district is to regulate use, development, and alteration of land in extreme slope areas so that natural characteristics such as land form,

vegetation and wildlife communities, scenic qualities, and open space can be maintained. This district further considers the risks to public safety from earth slides and slips, erosion, and attendant siltation. Grading requiring cutting into slopes and embankments are potential instigators of landslide, and the probability of these occurrences can be high within this district.

Practices distorting the topography of hillsides are limited pursuant to the City's Development Code. Non-structural uses such as parks, trails, and agriculture are permitted, along with minor alterations for ancillary accessory structures. Detailed engineering/geologic studies may be required for development or use to demonstrate to the satisfaction of the City that the proposed development or use will not significantly alter the existing topography, pose risk to human life, or cause adverse environmental impacts. All slope areas will be subject to the development criteria for the slope category of that particular parcel. (Note: Due to the scale of the accompanying maps depicting this district, some areas of extreme slopes may not have been plotted, just as there may be some isolated areas identified as extreme slope that are not actually 35% or greater.)

RM 3 – High Slope. High slopes are areas between 25% and 35% gradient. Although considered similar to extreme slopes, high slopes contain less degrees of slope that enables a greater degree of development flexibility. Engineering/geologic studies may be required to define existing soil and geologic stability and other pertinent characteristics necessary to certify stability and suitability of the proposed development. The existing character of the hills should be maintained by retaining, to the greatest extent possible, natural skyline at ridges, natural drainage courses, and natural outcrops. Grading should respect natural topography, and sharp geometric planes resulting from terracing or padding are to be avoided. Roads and driveways should follow natural topography to the greatest extent possible, and provision for siltation and erosion control, and re-vegetation of all cleared and/or graded areas may be required. Increase in natural runoff quantities and velocities should not be permitted, and drainage must be accomplished in a manner consistent with natural systems.

RM 4 – Active Landslide. Due to the extremely unstable ground within this district, construction of permanent structures is generally prohibited unless the area is stabilized by some natural or built force. The area may be suitable only for certain open space uses, such as a passive recreational area, agriculture with limited water usage, or an area of geologic interest. These uses must not create a situation that further aggravates the condition. Irrigation or other practices that could trigger further slippage requires regulation. Any proposed use or development requires detailed geologic and soils investigations to determine suitability or feasibility with regard to public health and safety. Existing uses and structures may be continued, transferred, sold, maintained, or restored within certain parameters. (See Chapter 3, Land Use Element, for further discussion about existing residential areas in an active slide area.)

RM 5 – Dormant Landslide Area. These areas have experienced downslope movement in the past, but are not currently active. Movement could include creep, but creep can be related to localized downslope movement due to gravity within slope areas or to expansive soils, and not necessarily due to landslide movement. To confirm that a landslide is creeping, it has to be monitored over a long period (at least 3 to 4 years) at a number of widely spaced monitoring points. In these areas, some portions have stabilized and other portions show signs of movement, which indicates a wide range of stability conditions. It can be assumed, however, that movement in certain areas could be triggered in the future by unusual rainfall, seismic shaking, human activities (development cut slopes, introduction of groundwater), or other causes. Those areas that are stable and potentially developable require detailed engineering/geologic studies for any proposed development to determine stability and development suitability to the satisfaction of the City prior to granting any approvals.

Figure 6: Resource Management Districts

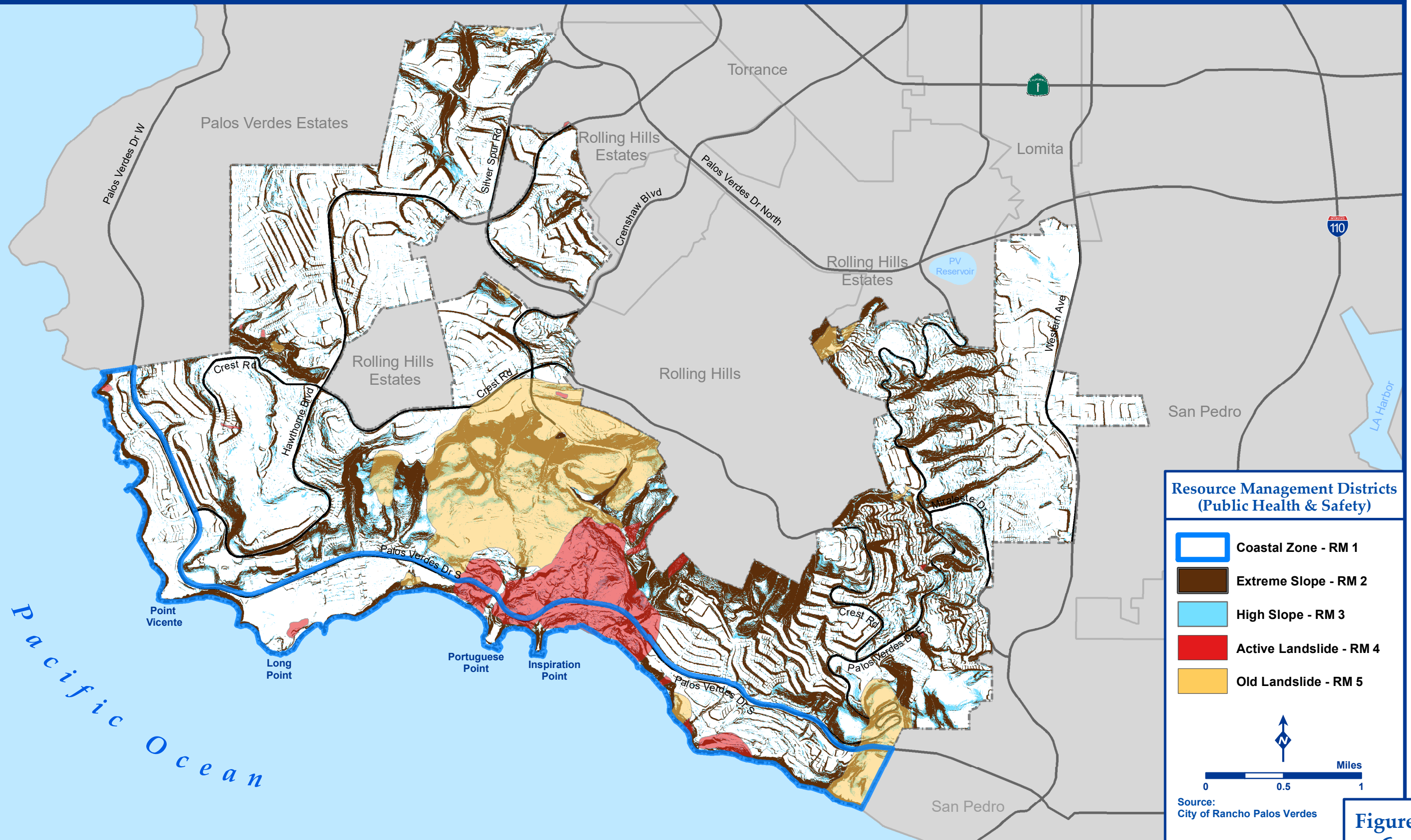


Figure 6

4.2 Areas for Preservation of Natural Resources

These areas are for conservation of plant and animal life, habitats for fish and wildlife species, areas for ecological and other scientific studies, and any other unique natural resource within the City. The Resource Management Districts for the Preservation of Natural Resources identify critical natural resources, as listed in Table 6.

TABLE 6 - CODE DESIGNATIONS FOR NATURAL RESOURCES

Resource Management District	Code Designation
Hydrologic Factors	RM 6
Marine Resources	RM 7
Wildlife Habitats	RM 8
Other Natural Vegetation Areas	RM 9

The location of these Resource Management Districts are shown in Figure 7. Following is a description of the conservation efforts needed to address preservation of natural resources.

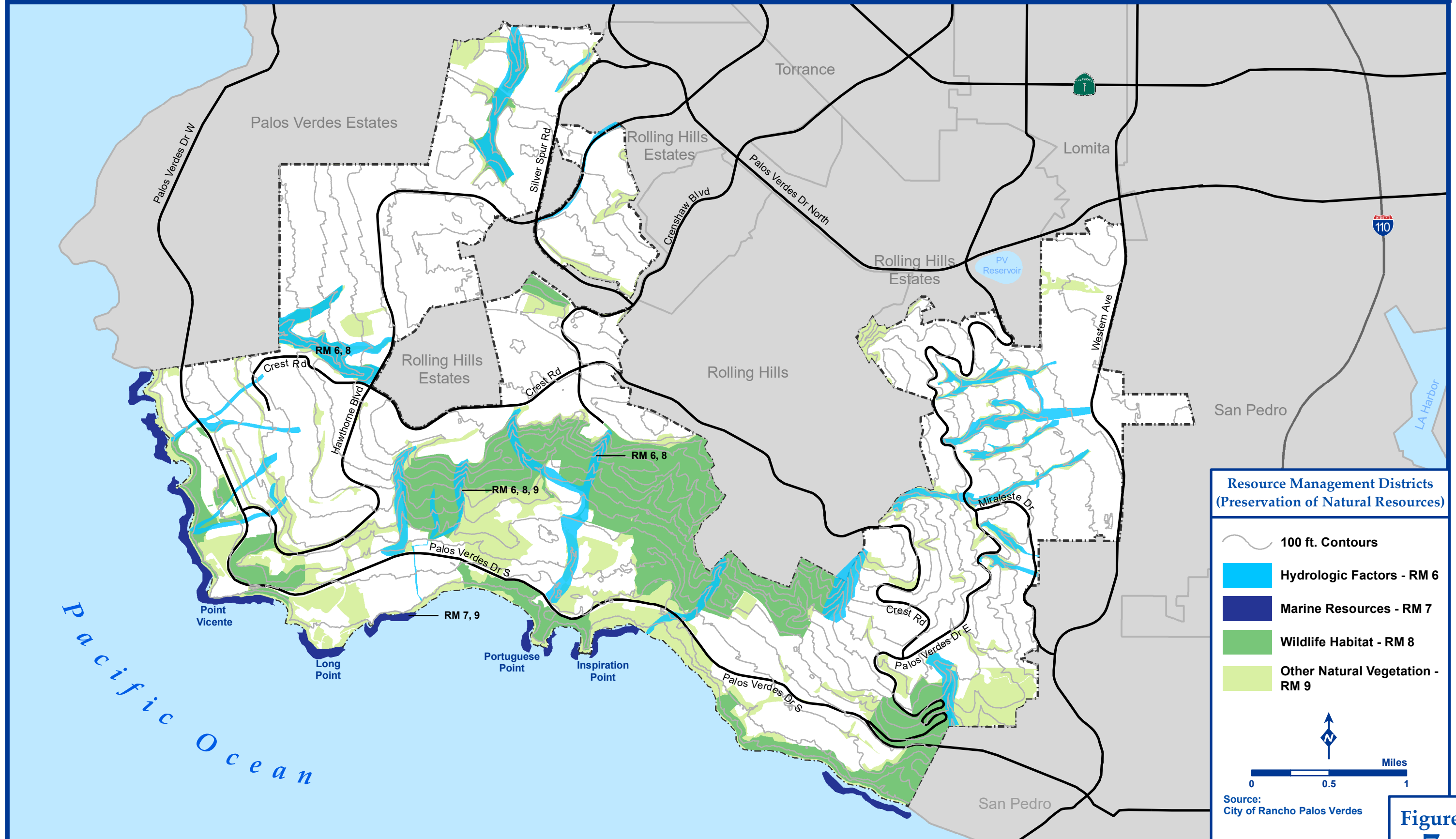
RM 6 – Hydrologic Factors. Maintaining the optimum operation of the hydrologic cycle is in the public interest, since it constitutes an important resource (water) and interacts with other resources (vegetation, ocean resources). Because all watershed systems within Rancho Palos Verdes are either influenced by or influence other jurisdictions, full regional cooperation is required for the management of these resources. Watershed management should prohibit activities that create excessive silt, increase drainage load, cause pollutant runoff, increase canyon wall erosion, or increase potential for landslide. Drainage courses are generally stable, and the characteristics of these courses should remain natural. Any substantial modification to stream flow, channel configuration, or ocean outfalls should be restricted to prevent increased erosion and coastal degradation. Development projects located near environmentally sensitive areas or waterways need to comply with NPDES requirements set forth by the state.

RM 7 – Marine Resource. Marine resources are a significant natural resource for the City, and all necessary efforts should be made for their preservation.. As a general policy, no development within the City should be approved unless adequate measures are provided to meet pollution standards relating to marine resource ecosystems. A monitoring program should further be established to measure the quality of the tide pool ecosystem, record any deterioration, and establish responsibility. Further action may then be required to regulate those developments and sources adversely impacting marine resources, both within and outside the jurisdiction of the City.

RM 8 – Wildlife Habitat. Existing wildlife habitats should remain in natural open space with vegetation and natural drainage patterns maintained to provide water and foraging material. Any proposed development within or adjacent to wildlife habitat districts must describe the nature of the impact upon the wildlife habitat and must provide mitigation measures to fully offset those impacts. Sensitive areas identified in the NCCP/HCP must follow established NCCP/HCP minimization guidelines.

RM 9 – Natural Vegetation. Existing natural vegetation is a major component of the environmental and visual character of the City. As discussed in the Visual Resources Element, open natural hillsides create an atmosphere of a hilly rural community. Wildflowers and the low coastal sage scrub, chaparral, and grassland communities should be preserved wherever possible. Any proposed development within this district should seek to re-vegetate with native material wherever clearing of vegetation is required. All areas identified in the NCCP/HCP must follow established NCCP/HCP minimization guidelines.

Figure 7: Resource Management Districts



5 Conservation

5.1 Conservation of Areas with Multiple Resource Management Districts

The Conservation and Open Space Element is a composite of those Resource Management Districts requiring consideration of public health and safety and those requiring preservation of natural resources. These districts are interrelated. All of the individual conservation efforts and development criteria described for each Resource Management District must be considered together when there are multiple districts in one area. Multiple Resource Management Districts falling in one specific area will have more sensitivity to development compared to only one Resource Management District. For example, RM 1, 2, 4, and 8 refers to a district that must consider (1) bluff setback, (2) extreme slope, (4) active landslide, and (8) wildlife habitat factors.

Consideration of Areas Outside of City. For environmental Resource Management Districts to be truly functional, consideration must be given to the management policies of adjoining resource areas located outside the City that may impact or be impacted by the management policies of the City. If these adjoining resource areas are not properly managed or coordinated with the efforts of Rancho Palos Verdes, the City's efforts to maintain natural environmental features may be negated or severely limited. The City should consider a region-wide management program to ensure the preservation of these features and development of a regional network of open space. These areas include Agua Armaga Canyon, Malaga Canyon, open space linkages at the crest of the Peninsula connecting open space canyons of Rolling Hills to open space canyons of the Portuguese Bend area, and several canyons at the east end of the City leading into Los Angeles and Los Angeles County. Wildlife corridor connections should be encouraged by coordinating private and public lands within and outside of the City limits.

6. Cultural Resources

6.1 Paleontological, Historical, and Archaeological Resources

Background. The history of Rancho Palos Verdes goes back further than the days of El Rancho de los Palos Verdes, but there are no written records of human activities from these earlier times. The only records we have of human and other life forms as they existed during this period is what is uncovered from archaeological and paleontological sites.

Through careful excavation of archaeological middens (campsites of ancient communities), it can be learned how the previous tenants lived. Analysis of archaeological sites yields insight into how people of earlier times related to one another, their god(s), and to nature. Such insight may be a key to understanding contemporary society.

The importance of archaeological sites has slowly received higher esteem and government recognition. The federal government enacted the National Historic Preservation Act of 1966, which called for the protection and preservation of sites, structures, and monuments of historical significance, including archaeological sites. Section 106 of the National Historic Preservation Act granted legal status to historic preservation in federal planning, decision-making, and project execution. Section 106 requires all federal agencies to take into account the effects of their actions on historic properties, and the Advisory Council on Historic Preservation is the federal entity created solely to address historic preservation issues through Section 106. In 1971, Executive Order 11593 was issued, which called for the "Protection and Enhancement of the Cultural Environment." The National Historic Preservation

Amendments of 1992 provided further direction for Section 110, requiring federal agencies to consider historic properties in federal and federally assisted actions.

On the state level under CEQA, archaeological sites are to be considered as resources, and the impacts of a proposed project on that resource must be assessed. If a field investigation reveals a site, building, or structure of significance, it may qualify for inclusion in the National Register of Historic Places. The California Office of Historic Preservation is responsible for administering federally and state mandated historic preservation programs to further the identification, registration, and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer and the State Historic Resources Commission.

Paleontological Resources. In addition to archaeological sites, the "prehistory" of the Peninsula is also recorded in the earth in the form of fossils. Paleontology deals, in part, with the life of past geological periods as recorded in fossil remains. The two major classes of fossils that occur on the Peninsula are Foraminifer and Mollusks. Both contain species of fauna that are marine in origin.

Because of the degree of research done in this area and the wide distribution of paleontological resources through the Peninsula, these resources are not thought to be endangered. However, should a particular site exhibit a high degree of paleontological significance, the preservation, excavation, and no action options discussed below relative to archaeological sites would be applicable.

Archaeological Resources. Within the incorporated boundaries of the City, several significant archaeological sites are known to exist. In addition to these known sites, there are areas within the City that are "probable" archaeological sites. The area around these sites should also be considered as "archaeologically sensitive."

The location of these known sites and probable sites are on file with the Community Development Department. To prevent vandalism or "pot hunters" from ruining these sites, their locations are not typically available to the public.

The most prominent of the archaeological phenomena that occurs on the Peninsula is the middens left by the Tongva-Indians who occupied what is now Los Angeles County south of the Sierra Madre, half of Orange County, and the islands of Santa Catalina and San Clemente (Kroeber 1953).

There are locations all along City's coastline where the Tongva-Indians had established campsites for many years. There are also a few locations where excavation has indicated trade centers where it is speculated that the Native Americans from the mainland traded with islanders for otter pelts, abalone shells, and other goods. For these reasons, the entire coastal area in Rancho Palos Verdes should be considered as "archaeologically sensitive," and is designated with an Overlay Control District in the General Plan.

In addition to the coastal area, areas that should be considered as archaeologically sensitive include the vacant land areas north and east of Narcissa Drive in the upper Portuguese Bend community.

There are other areas that have archaeological significance. Many of these sites have already been impacted by construction. As a result, those few remaining undisturbed archaeological sites have an increased significance and added archaeological value in that they are the remaining vestige of human history on the Peninsula.

Historical Resources. Although the land that is now the City of Rancho Palos Verdes is rich in history and past cultures, the objects, sites, and structures of true historic significance are modest in number. The grove of trees planted at Ryan Park; Malaga Cove Library; the lighthouse at Point Vicente, which has guided sailors since 1924 and was placed on the National Register of Historic Places in 1980; Portuguese Bend, which served as a pick-up

point for smuggling operations when the land was ruled by Spanish viceroys; Villa Francesca (i.e., the peppertree gatehouse to the Portuguese Bend community), which was placed on the National Register of Historic Places in 1986; the estate of Frank Vanderlip, principal founder and developer of much of the Palos Verdes Peninsula; the Harden Estate (i.e., the Portuguese Point gatehouse); the Portuguese Bend Riding Club and stables, which serves as the hub of a social sector in the area; and Wayfarers Chapel, which was designed by Lloyd Wright, son of the renowned American architectural pioneer Frank Lloyd Wright, and placed on the National Register of Historic Places in 2005. These sites and structures represent the major historical points in Rancho Palos Verdes.

Several other features, such as the Narcissa gatehouse to Portuguese Bend, are also well known, but they are more points of interest than points of historical significance, given the criteria promulgated in the National Historic Preservation Act of 1966. In recent years, mid-20th century modern residential architecture has gained favor, and the City is home to several examples of this style, such as the 190 Paul R. Williams-designed homes in the City's Seaview neighborhood and other custom, single-family homes designed by such well-known mid-century architects as Lloyd Wright, Richard Neutra, Aaron Green, Thornton Abell, and Pierre Koenig.

6.2 Cultural Resources Options

Should a pre-construction field investigation reveal a significant archaeological site, the site can be preserved, the site can be excavated, or no action to affect the fate of the site can be taken. Traditionally, a policy of non-decision by the affected governmental unit has added to the rapid depletion of the nation's archaeological resources.

Preservation. Preservation of the site can be accomplished through acquisition, development controls, site design, and zoning. The National Historic Preservation Act of 1966 does provide funds for property acquisition, but only when the project is performed in conjunction with a state plan for historic preservation. The California State Office of Historic Preservation provides information regarding potential funding for the preservation of historic property.

Development controls and site design are also effective means of preservation. Examples of this technique are The Village condominium and redevelopment project in Redondo Beach and, locally, what was proposed for site LAN-709 in the Rolling Hills Estates. In both of these cases, the midden areas became parks or open space areas. No grading was allowed that would disturb the distribution of the artifacts that lie a few feet below the surface. This is important since the location and context in which the artifacts are found are as important as the artifacts themselves.

This preservation technique is even more archaeologically desirable for land that is publicly owned, as State law prohibits "pot hunting" on publicly owned lands, but does not deal with securing known or probable archaeological sites in private ownership.

Zoning controls can facilitate preservation if the land is zoned as open space for the preservation of natural or historic resources. However, because of the legal challenge to zoning ordinances for the preservation of these resources, zoning control by itself is not the most effective technique for archaeological preservation.

Excavation. Salvage excavation of a site is the second option when a site is being considered for development. Traditionally, excavations of archaeological sites are rushed because of project budgets and schedules. As a result, the information extracted from the site is highly selective and not always complete. The cost of salvage excavation has almost invariably been from private funding, and the work has often been performed by college and university students. To date, there are no public funding sources for archaeological salvage excavations.

No Action. The option to take no action has traditionally led to the loss of archaeological resources. Such decisions have been based on the rationale that archaeological preservation is a private matter.

Identification and Protection of Archaeological Resources. The California Historical Resources Information System includes the statewide Historical Resources Inventory database maintained by the Office of Historic Preservation and the records maintained and managed, under contract, by 11 independent regional information centers. These information centers provide archeological and historical resources information, on a fee-for-service basis, to local governments and individuals with responsibilities under the National Environmental Policy Act, National Historic Preservation Act, and CEQA, as well as to the general public. The South Central Coastal Information Center, responsible for information collected in Los Angeles County, is located at California State University, Fullerton.

Once a site is identified, and the preservation, excavation, and/or no action options have been decided, the City can use one of several vehicles to implement its decisions relative to the site. As applicable to the project, the City can make its decision a condition of approval for granting the subdivision, the conditional use permit, or the variance sought by the project.

These procedures are intended to preserve and protect all significant archaeological, paleontological, and historic resources in Rancho Palos Verdes. Relative to archaeological resources, where insurmountable circumstances arise whereby some technique of preservation cannot be implemented, the City can require salvage excavation of the site so that the maximum obtainable knowledge is extracted from the site before the archaeological resource is irrevocably damaged.

The Palos Verdes Library District's Local History Center has a historical collection that includes, but is not limit to, materials related to the cities of Palos Verdes Estates, Rolling Hills Estates, Rancho Palos Verdes, and Rolling Hills. It consists of materials in a variety of print and non-print formats, including books, clippings files, early serials, maps, oral histories, historic photographs, and yearbooks.

7 Open Spaces and Recreational Resources

The City has natural open space (some privately owned and some under City jurisdiction, including the Preserve subject to NCCP/HCP guidelines) and parks that include a mix of active and passive uses. These open space and recreational areas are shown in Figure 8, Open Space Recreational Areas.

7.1 Open Space Resources

According to the State's General Plan Guidelines, Open Space Land is defined as "Any parcel or area of land or water that is essentially unimproved and devoted to an open-space use for the purposes of (1) the preservation of natural resources, (2) outdoor recreation, or (3) public health and safety." One of the founding principles of the City of Rancho Palos Verdes is to maintain its rural character, a large component of which is its expanse of open land. Consistent with the state's definition, the open space lands within the City serve a variety of purposes, including serving as an aesthetic means to provide an open feel to the City, serving to preserve natural resources, serving to create outdoor recreational opportunities, and serving to protect the public's health and safety. Open space resources are either privately or publicly owned, and serve residents and visitors in different ways.

Figure 8: Open Space Recreational Areas



School Districts

PVPUSD

- 1 - Point Vicente Elementary
- 2 - Vista Grande Elementary
- 3 - Soleado Elementary
- 4 - Silver Spur Elementary
- 5 - Cornerstone at Pedregal
- 6 - Mira Catalina Elementary
- 7 - Miraleste Intermediate
- 8 - Ridgecrest Intermediate
- 9 - Miraleste Early Learning Academy
- 10 - Palos Verdes Peninsula High

LAUSD

- 11 - Crestwood Elementary
- 12 - Dodson Intermediate

Private

- 13 - Montessori Peninsula
- 14 - Christ Lutheran Christian
- 15 - St. John Fisher Elementary
- 16 - Ascension Lutheran Preschool
- 17 - Brighter Days Montessori
- 18 - Children's World Learning Center
- 19 - Congregation Ner Tamid Preschool
- 20 - Hilltop Nursery
- 21 - Marymount College Preschool
- 22 - Mount Olive Lutheran
- 23 - Marymount California University

Open Space Recreational Areas

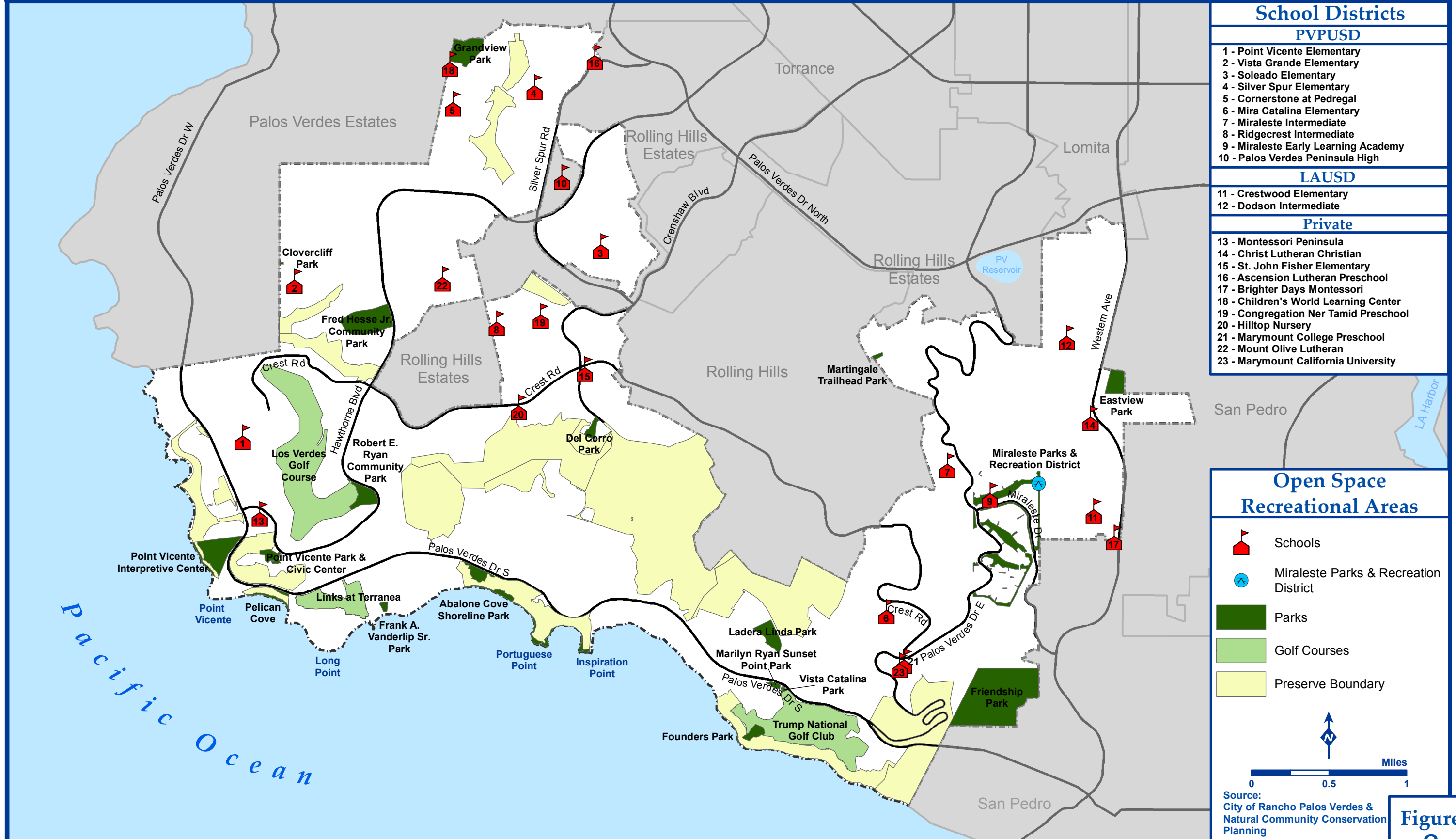
-  Schools
-  Miraleste Parks & Recreation District
-  Parks
-  Golf Courses
-  Preserve Boundary



0 0.5 1 Miles

Source:
City of Rancho Palos Verdes &
Natural Community Conservation
Planning

Figure
8



Private Open Space Areas

To serve aesthetic interests, to preserve natural resources, and to protect the public's health and safety, many of the existing residential subdivisions developed within the City as Residential Planned Developments (RPDs) include areas that are subdivided parcels dedicated to be preserved as open space, and are privately owned, typically by the subdivision's homeowner's association. These open space areas often include trails and vista points that were required as part of the subdivision and are maintained through dedicated public access easements. Some open space areas within existing subdivisions provide recreational opportunities. Within Rancho Palos Verdes, various types of private facilities (tennis courts, equestrian centers, beach clubs) are available to individuals who either pay a fee for their use or are members of the club operating the facility.

Additionally, there are many individual parcels in the City that are privately owned and, due to their topographic and/or geologic nature, may not be developable. As a result, a portion or the entirety of these parcels have a land use designation of "Hazard" or "Open Space Hillside" that prohibit most types of development. These parcels serve to preserve the aesthetic open space feel while protecting the public's health and safety. Some of these natural open spaces could be either acquired by the City or dedicated through an easement to provide wildlife corridor connections and trails.

Some of the larger non-residential projects, such as the Terranea Hotel Resort and the Trump National Golf Club, have private dedicated open space lots that serve to provide mitigation for the project's impacts to habitat and wildlife. These open space areas often include trails and vista points that were required as part of the subdivision and that are maintained through dedicated public access easements.

The City is home to eight elementary schools, three middle schools, and two high school under the jurisdiction of the Palos Verdes Peninsula Unified School District, Marymount California University, and The Salvation Army / Crestmont College. These campuses have fairly extensive open space areas used recreationally by the students and members of the community.

Public Open Space Areas

Publicly-owned open space within Rancho Palos Verdes is plentiful and is provided for by various levels of government. Although the City has acquired and dedicated a large number of parks, each with its own qualities and attributes, in recent years the City has worked extensively toward the purchase of large open space areas to create a habitat Preserve, also known as the Palos Verdes Nature Preserve, as identified by the City's NCCP/HCP. These public open space areas serve residents and visitors by providing an "open feel" to the City, preserving natural resources, and providing opportunities for compatible recreational activities.

7.2 Recreational Resources

Aside from the Preserve, active and passive recreational facilities that are publicly owned supply approximately 413 acres of recreational areas; 396 acres is developed and 165 acres is a public golf course. This total acreage does not include a significant amount of recreational areas supplied by Palos Verdes Peninsula Unified School District facilities.

Recreational resource areas include sites that have been set aside or are proposed for either active or passive use. These sites are sometimes structured to allow specific activities to take place. Many of these resource areas

provide path and trail networks for transportation or recreation, and are addressed in more detail within the Circulation Element.

Recreation sites are developed into either active or passive facilities. Active recreational facilities, as defined, are formal and highly structured, usually including improved/specialized facilities. On the other hand, most passive recreational areas are informal and unstructured that do not include improved, specialized facilities.

Most recreational sites have a specific land use designation from the General Plan Land Use Map of “Recreational-Active” or “Recreational-Passive,” clearly establishing the type of use envisioned for the site. However, a few of the sites, based on site conditions, ownership, and/or unknown future use, have multiple land use designations that also include “Institutional” and “Open Space Preserve,” or single land use designations other than “Recreational Active” or “Recreational Passive.”

The following provides a brief description of each site, including its General Plan Land Use Map designation, and groups the recreational facilities by the level of government that controls and operates the facility.

7.3 Recreational Parks and Facilities

Abalone Cove Shoreline Park – Recreational Passive/Open Space Preserve. This park features access through the Abalone Cove Reserve, which is part of the City’s NCCP/HCP area, to two beaches (Abalone Cove and Sacred Cove), tide pools, bluff-top viewing areas, and crisscrossing trails. The park is improved with trails, picnic tables, benches, and viewing nodes, and is within a State Ecological Reserve. There is direct access to a parking lot off Palos Verdes Drive South. Access to Abalone Cove Beach is by a long trail from the parking lot through the Reserve. To access Sacred Cove, users must walk along Palos Verdes Drive South to one of two trails between Portuguese and Inspiration Points, and through the Reserve to the beach. Lifeguards are on duty at Abalone Cove Beach during the summer and weekends. Views of the ocean and Catalina Island are spectacular from this park. Dogs are prohibited on the beach, but on-leash dogs are permitted in the upper picnic area and on designated trails.

Hesse Park (Upper Site) – Recreational Active. This 28.32-acre park, with its well-manicured parkland and active community center, is one of the most popular in the City. Among the features available for public enjoyment in the upper park area are baseball and soccer fields, numerous picnic areas with barbecues, playground equipment suitable for toddlers to adolescents, and a well-used 0.25-mile walking path. Most of the City’s privatized recreation classes are offered at this facility, and many activities for older adults are held here. Additionally, three rooms in the community center are available for rental for meetings and private parties, and as space for government meetings.



Hesse Park (Lower Site) – Recreational Active. The lower park site (approximately 18 acres) offers a sand volleyball court, picnic areas (no barbecues permitted), walking paths, natural play elements, and locations for enjoying panoramic views of Catalina Island north to Malibu.

Ladera Linda Community Center – Institutional Public. This former elementary school site’s amenities include a parking lot, restrooms, paddle tennis courts, tot lot, playground, and basketball court. Ladera

Linda is also the home of the Discovery Room, which features live and static exhibits of local flora and fauna. Volunteers provide educational programs for a variety of school, youth, and other groups, as well as conduct docent-led hikes in the adjacent Forrestal Preserve. This 11.21-acre property also has a multipurpose room and classroom available for rental for meetings, classes, and private parties. The site offers excellent views of the cliff face, hillsides, coastline, and ocean. Improvements at this older facility have been considered for many years. A Master Plan process for this site was included in the 2016 Parks Master Update.

Upper Point Vicente Park/Civic Center – Recreational Passive, Institutional Public, and Open Space Preserve. Formerly a World War II bunker site and Nike Missile Base, this 73.3-acre site is composed of dedicated Institutional Use, Open Space Preserve lands, and Recreational Passive park land. The site surrounds a 4.5-acre parcel that is owned by the U.S. Coast Guard.

The City owns in fee title 8.23 acres, which is not encumbered by deed restrictions or a Program of Utilization. The remainder of the site (65.12 acres) was given to the City by the federal government with a quitclaim deed that included several deed restrictions, including a Program of Utilization calling for passive use of the 65.12-acre parcel with the exception of a potential 6.6 acres to be for active recreational use. The area set aside for Institutional Use (8.23 acres) is on the relatively level hilltop and includes City Hall buildings, a telecommunications site, a multimedia studio, the City's maintenance yard, and a grassy field. A dog park, sand volleyball court, grassy field, and tennis court are located in the Recreational Passive portion of the site. There are spectacular views of the ocean, Pelican Cove, and the Point Vicente Lighthouse, and this is the site of the City's annual July 4th Independence Day Celebration.

The U.S. Coast Guard parcel within this park and overlooking the Point Vicente Lighthouse is the site of several communications towers and an abandoned WWII-era artillery bunker.

The Open Space Preserve lands sloping down the hillside, known as the Alta Vicente Reserve, are encumbered by a conservation easement, deed restrictions, and the Program of Utilization. The NCCP/HCP permits passive recreation in this Reserve, which includes trails through coastal sage scrub habitat that is actively being restored by the Palos Verdes Peninsula Land Conservancy and trails through an approximately 5-acre area that has been leased to a farming operation for many years, which is a permitted use in the NCCP/HCP and Public Use Master Plan.

Many Master Planning efforts have been pursued for this location, but the future of this site and its uses, which must comply with the Program of Utilization for the site unless an amendment is sought, remains undetermined at the time of drafting. Planning efforts are underway to improve the site with a new City Hall, public safety, and recreational facilities and activities. Any changes to the property through master planning efforts require approval by the Planning Commission and City Council through public hearings, along with review and approval of a change, if necessary, to the Program of Utilization by the National Park Service.

Robert E. Ryan Park – Recreational Active. The City's first park was transferred from Los Angeles County at the time of the City's incorporation in 1973. This 11.61-acre active recreational park features a community building with a small activity room and patio that are available for rent, a tot lot, playground, grassy fields, a baseball diamond, and picnic areas with barbecues. Views from this park are superior, and the mature trees add to the atmosphere.

Eastview Park – Recreational Passive. Facilities on this 9.9-acre site include a children’s playground, picnic facilities, jogging path, permanent restroom, landscaping, dog park, and an off-street parking lot.

Lower Point Vicente / Point Vicente Interpretive Center – Recreational Passive and Open Space Preserve. This site is approximately 27.4 acres and was acquired from the federal government with deed restrictions that included a Program of Utilization requiring passive use of the land. The main attraction of the site is the Interpretive Center, which opened in 1984. The Interpretive Center offers educational and recreational opportunities, along with dramatic coastline vistas. Its location provides spectacular opportunities to view the annual migration of the Pacific gray whale (*Eschrichtius robustus*) from December through April. The beautiful bluff-top park includes paths and trails, picnic areas, and picnic benches. The coastal bluffs are part of the City’s NCCP/HCP’s Preserve referred to as the Vicente Bluff Reserve. In addition, this is the site of the City’s annual “Whale of a Day” community event. In 2005, an expansion was completed to the Interpretive Center building and surrounding grounds, including an expanded visitor’s center and a large meeting room that is available for rental for meetings and private parties.



Clovercliff Park – Recreational Passive. This 0.17-acre vest pocket park has a path and landscaping, and seating is available on the large rocks. There is a distant ocean view.

Del Cerro Park – Recreational Passive. This 4.49-acre park features panoramic views of canyons, agriculture, coastal headlands, the ocean, and offshore islands, and offers a flat, grassy play area, as well as the Donor Recognition Overlook recognizing those who contributed towards the acquisition of the Palos Verdes Nature Preserve. The park is landscaped and has a safety fence just below the bluff to restrict access to the canyon below without blocking views. The park has a parking lot but no restrooms.

Don C. Wallace Radio Ranch Museum – Residential 2-4 D.U./Acre. This 32,000-square-foot property was originally intended as a radio museum, with funds for the improvement of the museum to be raised by the Wallace Radio Ranch Museum Foundation. When the required funds were not raised, the property became a neighborhood park maintained by the Wallace Ranch Homeowners’ Association.

Founders Park – Recreational Passive. Founders Park was formally accepted by the City on January 17, 2006, and named in honor of the City’s founders who led the effort to incorporate the City of Rancho Palos Verdes. This 5.5-acre parcel is located adjacent to the Trump National Clubhouse, and offers ocean views, picnic tables, a gazebo, nearby restrooms, coastal access, and adjacent walking and biking trails.

Frank A. Vanderlip, Sr. Park – Recreational Passive. Facilities on this 0.48-acre site include benches, a safety fence at the cliff edge, and landscaping. Unobstructed views of the ocean, headlands, and islands are the main attraction at this park.

Grandview Park – Recreational Passive. A 17-acre park purchased from the Palos Verdes Peninsula Unified School District. There are excellent views of the golf course, greenbelt, inland toward Los Angeles, the coastline, and ocean.

Marilyn Ryan Sunset Point Park – Recreational Passive. This 1.5-acre park was conveyed to the City in 2011 by VH Properties. The park provides access to a trail system near the Trump National Golf Course, and also offers picnic tables and benches for public use. A six-car parking area is located adjacent to the

park for public use. Simmons Bridge and a dolphin statue are two landmarks that can be seen at this park and from Palos Verdes Drive South.

Martingale Trailhead Park – Recreational Passive. This 1.2-acre trailhead provides access to a trails system serving the cities of Rancho Palos Verdes, Rolling Hills, and Rolling Hills Estates. Hikers and equestrians use the park, and facilities include landscaping; a tri-level drinking fountain that serves horses, humans, and small animals; a mounting block; and a seating rock.

Vista Catalina Park – Recreational Passive. This 1-acre trailhead is located adjacent to Trump National Golf Course and offers access to pedestrian trails surrounding the golf course. The park includes the monument sign for Trump National Golf Course and a drinking fountain at the trailhead. This park offers views of Catalina Island and the ocean.

Pelican Cove – Recreational Passive and Open Space Preserve. The City acquired this property from Los Angeles County through a grant deed in May 2004. This 10.5-acre site features a paved parking lot, a restroom building, an improved trail to the shoreline, and views of the ocean and Catalina Island.

Shoreline Park – Open Space Preserve. This 52.8-acre park is entirely within the Ocean Trails Reserve, a subarea of the Palos Verdes Nature Preserve. The property was acquired from the Los Angeles County by quitclaim deed in November 1997. It is a re-vegetation site for the mitigation of the adjacent Trump National Golf Club. Approximately 41 acres are being restored with native vegetation as part of that mitigation. There is a system of trails and a few tables and benches near the bluff edge.

Archery Range – Recreational Passive. The Archery Range parcel has physical and other constraints that make habitat preservation challenging and restoration almost impossible. Thus, the property is not proposed to be included in the City's NCCP/HCP Preserve, but will remain as an open space parcel. The City will probably need to grade the area and repair or replace storm drains in the future to mitigate landslide movement. Additionally, the property is encumbered by an easement that gives the adjacent Portuguese Bend Club the right to perform remedial grading on the parcel on as-needed basis.

Gateway Park – Recreational Passive. The approximately 17-acre Gateway Park is located at the southern tip of the Portuguese Bend Preserve. No permanent structures are envisioned on this property due to active land movement in the area.

7.4 City of Los Angeles and Los Angeles County Facilities

Deane Dana Friendship Community Regional Park – Recreational Passive. This 123-acre natural area park is located partially (97 acres) in the City of Rancho Palos Verdes and partially in the City of Los Angeles, and is managed by the County. The park offers panoramic views of Catalina Island, Los Angeles and Long Beach Harbors, Los Angeles, and the San Bernardino Mountain ranges. Restored native habitat areas and several hiking trails are on the property. The site also includes a 4,000-square-foot nature center with indoor and outdoor classrooms. The park also has a picnic area, barbecues, and playground.

Los Verdes Golf Course – Recreational Active. Los Verdes Golf Course is a fully developed 165-acre site that is operated by Los Angeles County. This facility contains an 18-hole, par-72 course with associated facilities (clubhouse, banquet facilities, coffee shop, lounge, pro shop, two comfort stations, locker and shower rooms, and parking for 300 cars).

7.5 Palos Verdes Peninsula Unified School District Facilities

Although Palos Verdes Peninsula Unified School District's facilities are under its own jurisdiction, the school district is one of the largest suppliers of public, active recreational facilities within the City. The school district provides these facilities for many age levels in the form of open play areas, paved court areas, and gymnasiums. Tennis courts are available on a first-come, first-served basis. All other activities, such as organized soccer, baseball, and football, must be arranged in advance. It would be lengthy to describe each facility on every school site, so this section only points out that site is designed for the age groups that use the school. It can be assumed that intermediate and high school sites contain facilities that fulfill the needs of young adults, and elementary schools provide recreational activities designed for children. It is to the City's advantage for the school district to maintain an open-school-grounds policy to help fulfill active recreational demands of the community.

Ladera Linda Fields is a former school site, owned by PVPUSD, and licensed and operated by Palos Verdes American Youth Soccer Organization for its youth soccer program. Ladera Linda Fields include upper and lower soccer fields and a parking lot.

7.6 NCCP/HCP Reserve Areas (Palos Verdes Nature Preserve)

Abalone Cove Reserve. This Reserve consists of a 65.2-acre portion of Abalone Cove Shoreline Park. The property features two beaches (Abalone Cove and Sacred Cove), tide pools, bluff-top viewing areas, and a network of designated trails. Excluded from the NCCP/HCP Reserve are the upper parking lot and picnic area, the lower parking lot and preschool/lifeguard area, and the shoreline. This Reserve also contains a State Marine Conservation Area and Ecological Reserve under state jurisdiction that protects marine and intertidal resources.

Three Sisters Reserve. This property, generally located in the vicinity of Barkentine and McCarrell Canyons, was purchased by the City from Palos Verdes Portuguese Bend Land in August 2001 for \$3,887,154; it was funded by Proposition A, County Park Bonds. The property is approximately 98.4 acres. This reserve is located on the western side of the Portuguese Bend Reserve. It contains outstanding habitat and is heavily used by hikers, mountain bikers, and equestrians. It also contains habitat corridors deemed essential for maintaining stable populations of California gnatcatcher and cactus wren.

Filiorum Reserve. This 189.8-acre parcel was purchased by the City from a private developer with a combination of funds from the California Coastal Conservancy, State Wildlife Conservation Board, and private donations, and is mostly located within the City's landslide moratorium area. The site contains outstanding habitat and is used by hikers and equestrians.

Portuguese Bend Reserve. This 427.2-acre property is owned by the City and includes a portion of an active landslide area. This Reserve serves as the most heavily used entrance to the Preserve and is used by hikers, bicyclists, and equestrians. This Reserve also includes the Del Cerro Buffer, which is owned by the City, is 17.4 acres, and consists of very steep slopes immediately adjacent to Del Cerro Park.



Forrestal Reserve. This property is owned by the City and was acquired from the Diamond Brothers Three Partnership in December 1996. The total cost of the property was funded through two revenue sources: the Los Angeles County Regional Park and Open Space District at \$4,300,000, and the California Wildlife Conservation Board at \$3,400,000. The property is 158 acres. Multi-use trails exist on the property, as well as a paved road and significant drainage structures remaining from a proposed subdivision.

Agua Amarga Reserve. This 61-acre property is partially owned by the City and the Palos Verdes Peninsula Land Conservancy, and contains two canyons – Agua Armaga and Lunada, which merge at their western ends just above the border with Palos Verdes Estates. This reserve has pedestrian and bicycle trails. Agua Armaga was acquired in 2005 and is home to many California gnatcatchers. Lunada Canyon was a gift from the E.K. Zuckerman family to the Palos Verdes Peninsula Land Conservancy. The parcel contains coastal sage scrub and willow wetland.

Alta Vicente Reserve. This 50.9-acre parcel is below the upper flat area of the Upper Point Vicente Civic Center property. It has pristine coastal sage scrub habitat for the endangered coastal California gnatcatcher and southern cactus scrub habitat for coastal cactus wren, a State Species of Concern. Johnathan Atwood did an extensive study of coastal California gnatcatcher at this site and influenced the policies for the species for the NCCP/HCP. The Palos Verdes Peninsula Land Conservancy has planned further habitat restoration and trail enhancements for this area. There is the potential to create a wildlife corridor through the northern border of Lower Point Vicente to connect this reserve to the Vicente Bluffs Reserve.

Vicente Bluffs Reserve. Approximately 62.5 acres were acquired through dedication as a condition of the development of the 79-lot Ocean Front Estates subdivision. The dedications were made under the Quimby Act. Included in the dedication, at the top of the bluff and extending the full length of ocean frontage, are open space served by a trail system and a public parking lot. A restored native habitat are also included in the project. A majority of the Pelican Cove open space lot is part of the Vicente Bluffs Reserve. The City acquired the Pelican Cove open space lot from Los Angeles County in May 2004. This site features a paved parking lot, a restroom building, an improved trail to the shoreline, and incredible views of Catalina Island and the ocean. Improvements to the site, including an expansion of the parking lot and trails that lead to the Terranea Resort, were completed as part of the Terranea Resort project in 2009.

Ocean Trails Reserve. This 116.6-acre Reserve is within the Trump National Golf Club site. Although the 5.5-acre Founders Park and some open space lots have been dedicated and accepted by the City, various other open space lots have not yet been accepted. The proposed dedication of open space includes approximately 78.8 acres of open space, much of which has been restored to native vegetation. The open spaces have walking and biking trails along the bluff, as well as access to the ocean. There are two public parking lots and public restrooms, as well as picnic benches in the parks. Shoreline Park is within the Ocean Trails Reserve.

San Ramon Reserve. This 94.5-acre Reserve was received pursuant to the Quimby Act in conjunction with development of the Seacliff Hills Tract. It surrounds the switchback roadway of Palos Verdes Drive East as that roadway heads north from Palos Verdes Drive South. The property is very steep with commanding views of the ocean and Catalina Island. Although Palos Verdes Drive East is within this Reserve boundary, parking and access to the open space areas are difficult and limited. Portions of the Reserve extend to the San Ramon Canyon bottom, which may require some erosion mitigation.

Vista Del Norte Reserve. A 16.8-acre parcel was purchased by the former Rancho Palos Verdes Redevelopment Agency for approximately \$702,000 in March 2000 in the hopes of developing affordable housing for older adults to meet the City's affordable housing needs. The purchase amount came from the Redevelopment Agency's Housing Set-Aside Fund. In 2009, the City and Redevelopment Agency approved a Parcel Map that subdivided the parcel into two parcels: Parcel 1, a 2.92-acre parcel to accommodate development of a 34-unit senior affordable housing project ("Mirandela"), and Parcel 2, which is part of the City's Preserve called the Vista Del Norte Reserve. This is a 16.8-acre steep parcel that was split off from the Redevelopment Agency Crestridge Parcel. It borders Rolling Hills Estates along Indian Peak Road and has some trails and native habitat.

Malaga Canyon Reserve. In February 2014, the City purchased open space in Malaga Canyon from private landowners using WCB and USFWS Section 6 Habitat Conservation Plan Land Acquisition grant funds. This 61.5-acres Reserve provides open space into the Preserve.

7.7 Additional Public Open Space

Cherry Hill Lots. Six Cherry Hill lots were purchased from the Redevelopment Agency when the City moved Palos Verdes Drive South back into its original easement in 1988. Since that time, additional lots were purchased, and as of 2018, the City owns 13 lots totaled 6.02 acres. Most of these lots are unimproved, but at least one lot has dewatering facilities on a portion of the property.

McKay Property. The McKay property was donated in 1994 to the City by the family that owned it. The property is 2.05 acres and is currently zoned as Commercial Professional. The property is mostly a steep hillside and has no practical use except to provide a view.

7.8 Miraleste Recreation and Park District

Open Space. The Miraleste Recreation and Park District contains 32 acres of canyon area, used as a sanctuary for native wildlife. The area is on the east side of the Peninsula and includes hiking trails.

7.9 Parks Master Plan

Adopted on October 6, 2015, the Parks Master Plan updated the previous 1989 Parks Master Plan, following almost two years of planning and extensive public outreach. The Parks Master Plan will function as a living document to help guide and respond to changes in the City's future park, open space, and recreational needs.

7.10 Open Space for Military Support

The California Military Land Use Compatibility Analyst does not identify military operations (e.g. military bases, installations, etc.) or military aviation routes and airspace over the City. However, the United States Coast Guard is located next to the Point Vicente Interpretive Center. The U.S. Coast Guard often utilize the coastal cliffs, Point Vicente Interpretative Center, and City Hall to conduct training exercises.

7.11 Open Space for Tribal Resources

There are no public land containing any Native American cemeteries, places of worship, religious or ceremonial sites, or sacred shrines in the City.

8 References

CCZCC (California Coastal Zone Conservation Commission), *The Marine Environment*. July 23, 1974.

Earth Sciences Associates. No date. Review and Analysis of Geologic Materials For EDAW Inc.

Envicom Corporation. 1975. Technical Database for Seismic Safety and Public Safety General Plan Elements, Cities of Rancho Palos Verdes, Rolling Hills Estates, and Rolling Hills. March 1975.

Gales, D.M. 1974. *Handbook of Wildflowers, Weeds, Wildlife and Weather of the Palos Verdes Peninsula*. Caligraphics Printing and Publishing.

Kroeber, A.L. 1953. *Handbook of the Indians of California*. Berkeley: California Books Company.

Kling Consulting Group. 2015. Landslide area interpretations.

LACSD (Los Angeles County Sanitation Districts). 1997. Palos Verdes Ocean Monitoring: Annual Report 1996.

Lande, D. 1975. Personal communication (interviews) with Don Lande (California Division of Oil and Gas). March 1975.

Misenheimer, No date. Personal communication (interview) with Misenheimer (Chief Engineer, Livingston and Graham Inc.

SCAG (Southern California Association of Governments). 1972. Coastline Planning Program: Inshore Waters Inventory. Vonder Linden, K, and R.H. Jahns. 1973. "Space-Time Relationships of Landsliding on the Southerly Side of the Palos Verdes Hills, California. *Geology, Seismicity, and Environmental Impact Association of Engineering Geologists*. October 1973.

Willdan Engineering. 2010. *Traffic Impact Analysis*. July 19, 2010.

Woodring, W.P., M.N. Bramlette, and W.S.W. Kew. 1946. *Geology and Paleontology of Palos Verdes Hills, California*. U.S. Geological Survey Paper No. 207.