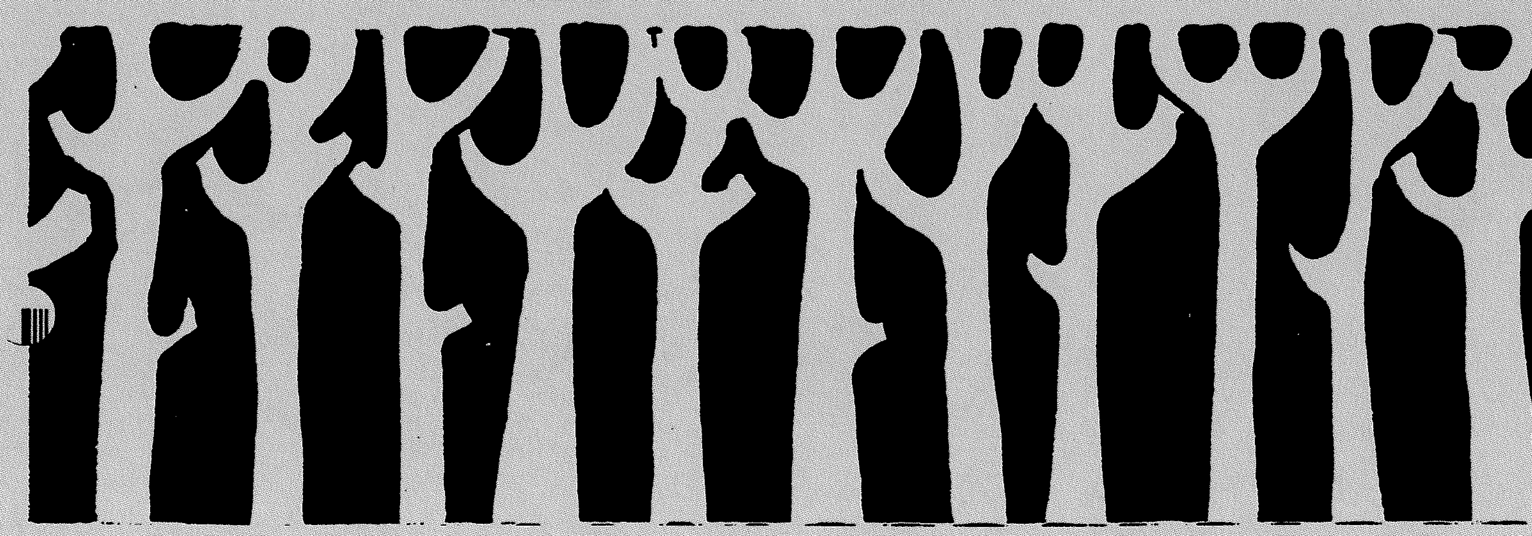
# CONSERVATION ELEMENT

## CITY OF LONG BEACH GENERAL PLAN PROGRAM



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The cooperation of the following agencies is gratefully acknowledged:

Park Commission, City of Long Beach
Citizens Environmental Committee of Long Beach
California State Department of Fish and Game
State Water Resources Control Board
Copley International Corporation
Los Angeles County Environmental Resource Committee
State Department of Mines and Geology
City of Signal Hill
City of Lakewood
Harbor Department, City of Long Beach

# LONG BEACH GENERAL PLAN PROGRAM

## CONSERVATION ELEMENT

APRIL 30, 1973

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This document is one of many which together comprise the new comprehensive General Plan for the City of Long Beach, California. The General Plan project is programmed through the period January 1, 1973 to June 30, 1975. It not only complies with California legislation regulating the preparation of official planning documents, but also is expanded beyond the legislation to meet the special needs of Long Beach.

The General Plan is subdivided into a number of different subjects entitled "elements." Some elements are mandated by State law, while others are optional. The Long Beach General Plan will contain the following elements:

- Open Space*
- Conservation*
- Seismic Safety*
- Noise
- Scenic Highways*
- Public Safety*
- Housing*
- Land Use*
- Circulation*
- Population
- Environmental Management
- Coastline
- Urban Design
- Others, as determined during the course of the program.

All of the elements are intimately interrelated; consequently, none should be evaluated without reference to the others.

The elements will be prepared and issued sequentially, on a schedule determined by mandated deadlines, manpower availability, informational needs, and other variables.

Inquiries regarding information contained in this document or related to the General Plan program should be directed to the following:

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*These elements are mandated by State Law.

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# SUMMARY

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This element is directed towards recognizing natural resources and areas of special interest in Long Beach. It serves to act as a guideline for promoting policies, standards and programs essential for the economic and environmental well-being of the City. The primary objective of using the information contained in this and other elements of the General Plan is the achievement of a realistic approach to the optimiztion of multiple uses of resources and the control of urban pressures which might otherwise threaten to degrade the environment.

The Conservation Element provides an important part of the background material needed in the preparation of a program directed toward the wise management of resources and the development of a rational plan for the allocation of land uses. The Environmental Management Element will provide this direction.

The following subject areas were considered to be of significance to the Conservation Element and are treated herein.

## Harbors

A management program is recommended for commercial and recreational development occurring in the near future which could alter the quality of harbor marine eco-systems. Specific emphasis should be placed upon the control of landfills, and the prevention of water quality degradation and destruction of habitats.

## Soils

The City should strive to regulate development in areas of potential soil erosion and should continue to monitor and control beach erosion.

## Water

The Conservation Element advocates the continued conservation of water by utilizing reclaimed wastewater, capture and control of stormwater runoff, and minimization of the impact of flood damage. Development of programs is recommended to reduce pollution from all sources and to restrict development where hazardous conditions are present. Protection and preservation of the natural qualities of the coastal zone and the ocean as a benefit to the City is recommended. Upgraded wastewater facilities and an appropriate use for waste sludge which is now dropped offshore is also recommended.

## Marine Biota

The Element recognizes the resource potential of marine life and stresses the need for continued improvement to the quality of coastal waters. Regulation of offshore discharge, implementation of measures to prevent projects that could have an irreversibly negative effect upon the marine environment, and the safe maintenance of natural watercourses open to the ocean, is recommended.

## Mineral Resources

Oil and gas extraction activities are recognized as being of economic benefit to the City. Potentially detrimental environmental impact of these activities can be prevented through proper control of operations. All oil-related activities should utilize proper buffering and landscaping techniques to mitigate their impact on surrounding areas.

Future uses of existing drill sites should also be considered. Fail-safe oil spill control systems should be instituted where not now operative.

## Wildlife and Vegetation

The continued existence of wildlife areas is important and pleasurable to an urban environment. Projects proposed within ecologically sensitive areas should require environmental impact reports measuring ecological damage and should consider alternative measures which would allow minimal degredation.

## Habitats

The City should strive to conserve all natural and man-made habitats shown on Figure 5. This can best be accomplished through the environmental review process (EIR's), through implementation of the recommendations of the Environmental Management Element of the General Plan (to be published early in 1974), and through a commitment on the part of the City's legislative body and commissions to protect these areas of importance to present and future generations.

## Planning

In addition to the interest shown in the above subject areas, the City should continue to strive to protect and enhance natural resources through review and amendment of planning and development guides as needed to achieve well planned future development. As an overall policy, the City should seek continued improvement of standards and policies promulgated by Federal, State and County Agencies, The U.S. Department of Agriculture (U.S.D.A.), California State Department of Fish and Game, U.S. Army Corps of Engineers, California Regional Water Quality Control Board, County Sanitation Districts of Los Andeles County, South Coast Regional Commission, and the U.S. Public Health Service.

# INTRODUCTION

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The conservation of our natural resources is essential if we are to maintain a quality environment for future generations. The legislature of the State of California has recognized this need and has incorporated it into a law which requires cities to prepare a General Plan. The General Plan consists of several portions, or elements, that are concerned with planning for future growth and development. These elements, when completed, will act as guidelines from which policy decisions can be made. This portion or element is concerned with the conservation of natural resources and its application to Long Beach as an urban environment.

The Conservation Element is part of the Long Beach General Plan and conforms to the provisions of the Government Code.[1] In purpose, the element strives for "the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. That portion of the conservation element including waters shall be developed in coordination with any county-wide water agency and with all district and city agencies which have developed, served, controlled or conserved water for any purpose for the county or city for which the plan is prepared."

It should be realized that the City is part of a massive metropolitan area and must be dealt with differently from rural areas. It is,however, just as necessary to review

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[1] State of California, Government Code, Section 65302 (d)

our available natural resources, including the water quality of rivers, bays and harbors; the needs of wildlife; and the management of geologic and mineral resources. This review will also point out areas of special concern or interest related to conservation issues.

All human activities are dependent upon our natural resources. In spite of this dependence, many resources have been misused and, as a result, are no longer extant or available for beneficial purposes. Many factors are responsible for this situation; they include urban sprawl, poor planning practice, resource exploitation, and blatant disregard for the environment.

Some of our natural resources can be saved if properly managed. In this regard, the Conservation Element, in addition to other elements of the General Plan, will provide recommendations for achieving a realistic approach to optimize the multiple beneficial uses of available resources.

# DEFINITION AND BACKGROUND

## DEFINITION AND BACKGROUND

Conservation means the wise utilization and management of natural resources to prevent over-exploitation, destruction, waste, and neglect. These resources include soils, vegetation, wildlife, air, water and minerals. They are not only important to man's well-being, but they also are important factors in a wide variety of ecosystems which support a diverse biota important to man.

With the advent of the industrial revolution and until the decade of the sixties, it was assumed that the environment had an unlimited assimilative capacity. It was unthinkable that the air could become sufficiently polluted to cause death and crop failure. The aquatic environment was treated in a similar manner; this resulted in declined fisheries and waters so polluted that in many cases, they could not be used for whole-body contact sports or for drinking and irrigation. Ultimately, over a period of years, many of these resources could not be beneficially utilized. Consequently, the public became alarmed and, as a result, the nation is now moving into the "environmental decade" of the seventies. The goals of present and future decades are to preserve, enhance, and wisely manage natural resources and pass on to future generations a quality environment.

It is appropriate at this point to ask how we allowed this degradation and depletion of resources to occur. Unfortunately, non-management of the environment was exemplified by the "puritan ethic" which emphasized subjugation of the land, sea, and fish and animals. The earth was subdued, species were made extinct, and waters became polluted. However, nature struck back with a vengeance. Dust bowls displaced thousand of people, epidemics of typhoid occurred, and at certain times and places, people died from air pollution. Consequently, a new ethic was formulated. It essentially recognizes that the resources of the earth are limited and that the thin biosphere does not have an unlimited capacity to assimilate wastes. There is now agreement that the biosphere is delicate and it must be managed properly to attain a quality environment and to maximize multiple beneficial uses for man.

The Conservation Element, then, examines certain needs for the City of Long Beach which will be satisified through conserving natural resources and controlling urban pressures which would otherwise threaten these resources, minimize their uses and degrade environmental quality for present and future generations.

It is important to note that virtually all the "natural resources" in Long Beach exist in a highly modified state. It has been necessary for man to intervene in the processes of nature many times since 1900 to prevent major disaster. Construction of the breakwater, channelization of rivers, and replenishment of the beach are examples of modifications made by man in response to the destructive threats of nature. Other modifications have been made to natural resources as a result of economic and social necessity, such as harbor construction, bay dredging, and filling of marshes. Additionally, new "natural resources" have been created by man where previously there were none, such as the many City parks, and the El Dorado Nature Center. These provide habitats for a rich variety of vegetation and wildlife as well as providing recreation and other amenities for the residents of Long Beach.

# CONSERVATION GOALS PROGRAM

## CONSERVATION GOALS PROGRAM

An inventory of goals related to conservation practices in Long Beach is necessary so that a framework for various action programs can be established. Goals are the ends toward which present and future planning efforts are directed.

During the preparation of this document, goals related to conservation were drawn from official documents adopted or sanctioned by the City Council. A review of these goals is necessary in order to examine those which are relevant to contemporary issues. The source of each goal is cited in brackets immediately following each statement. Those goals which are not referenced are believed to be relevant and are, therefore, included herein.

### Overall Goals of the City

1. To conserve the natural resources of Long Beach through wise management and well planned utilization of water, vegetation, wildlife, minerals, and other resources.
2. To create and maintain a productive harmony between man and his environment through conservation of natural resources and protection of significant areas having environmental and aesthetic value.
3. To revitalize and enhance areas where inadequate conservation measures occurred in the past.
4. To improve and preserve the unique and fine qualities of Long Beach and to eliminate undesirable or harmful elements. [General Plan, 1961]

5. To promote the health, safety and well-being of the people of Long Beach by adopting standards for the proper balance, relationship, and distribution of the various types of land uses, and by formulating and adopting a long-term capital improvement program. [General Plan, 1961]

6. To establish a balanced program aimed at improving the qualitative conditions of life for all segments of the population of the City. [Community Analysis Program, 1971]

Water Resource Management Goals

1. To assure adequate quantity and quality of water to meet the present and future domestic, agricultural and industrial needs of the City.

2. To enforce existing ordinances and develop new ordinances and promote continuing research directed toward achieving the required stringent water quality standards which regulate waste water effluent discharge to ocean waters, bays and estuaries, fresh waters and groundwater.

3. To assure that the waters of San Pedro and Alamitos Bays and Colorado Lagoon are maintained at the highest quality feasible in order to enhance their recreational, and commercial utilization.

4. To enforce existing controls and ordinances regulating waste discharge from vessels.

5. To maintain, upgrade, and improve waste water systems and facilities serving Long Beach.

6. To develop a comprehensive City-wide water supply and management program which utilizes water from all sources including groundwater.

7. To preserve and enhance the open space opportunities

offered by the inland waterways of the City through improved access and beautification. [Legacy of Parks Application, 1972]

## Soils Management Goals

1. To preserve and enhance lands of significant value such as beaches and bluffs.
2. To critically evaluate any proposed public improvements on the beach and any projects that would contribute to the erosion of the beaches. [Mayor's Conference, 1972]
3. To minimize those activities which will have a critical or detrimental effect on geologically unstable areas and soils subject to erosion.
4. To preserve the beach from Alamitos Boulevard to the Long Beach Marina as a unique geologic zone and to perpetuate its public use as an open entity. [Shoreline Amendment to the General Plan, 1972]
5. To continue to monitor areas subject to siltation and deposition of soils which could have a detrimental effect upon water quality and the marine biosphere.

## Goals for Management of Vegetation

1. To provide protective controls for lands supporting distinctive native vegetation, wildlife species which can be used for ecologic, scientific and educational purposes. [Mayor's Conference, 1972]
2. To perpetuate the ecological preserve in El Dorado Park. [Major's Conference, 1972]
3. To locate, define, and protect other beneficial natural habitats in and about the City. [Mayor's Conference, 1972]

## Wildlife Management Goals

1. To promote measures and plans which protect and preserve distinctive types of wildlife including mammals, birds, marine organisms and especially endangered species.

## Mineral Resource Goals

1. To manage the petroleum resources of the City in a manner that will not only maximize their economic value, but will enhance the quality of open space. [Civic Beautification Program Application, 1967]
2. To continue good management practices in the production of petroleum including aesthetics, ecological compatability and other environmental aspects.
3. To continue to take restorative measures to remedy and prevent subsidence associated with oil extraction. [Department of Oil Properties]

## Goals For Other Resources

1. To identify and preserve sites of outstanding scenic, historic, and cultural significance or recreational potential. [Legacy of Parks Application, 1972]
2. To encourage citizen participation in the identification and preservation of historic and clutural sites. [Open Space Element, 1973]

These goals may be supplemented by others as a result of the preparation and adoption of other elements of the General Plan. Additionally, other elements contain subject matter that will overlap. General Plan elements which may contain related information are cited below:

Seismic Safety Element
Public Safety Element
Noise Element
Scenic Highways Element
Open Space Element
Environmental Management Element

# PHYSICAL DESCRIPTION OF LONG BEACH

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### Topography

Long Beach lies in the southwestern portion of the geographic area known as the Los Angeles Basin. That part of the basin nearest to the ocean is known as the Coastal Plain while the beachline of the City is designated specifically as the Long Beach Plain (Figure 1).

The Coastal Plain was formed by the deposition of sand, gravel, silt and clay carried by rivers flowing to the ocean. Over a period of time the river became silted. Through this geologic aging process, some rivers became subsurface structures or deposits. These deposits are now important as water bearing aquifers.[2] The Gaspur aquifer, an ancient, subsurface river channel is now filled with sand and gravel extending from the Santa Monica Mountains to San Pedro Bay. In the vicinity of the bay, the depth of the aquifer is approximately four hundred feet and gradually tapers to two hundred feet or less towards the mountains. Large quantities of saline water are presently held in the lower elevations of these aquifers.

The topography of Long Beach is generally flat with elevations of less than one hundred feet. However, geologic uplifts occur which interrupt the plain in different areas and results in prominent folds and hills. To the southwest, for example, the Palos Verdes Peninsula rises fourteen hundred and eighty feet and extends west to mark one edge of the depositional basin. In a northerly direction, surrounded by the City of Long Beach, the City of Signal Hill rises

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[2] See Glossary of Terms.

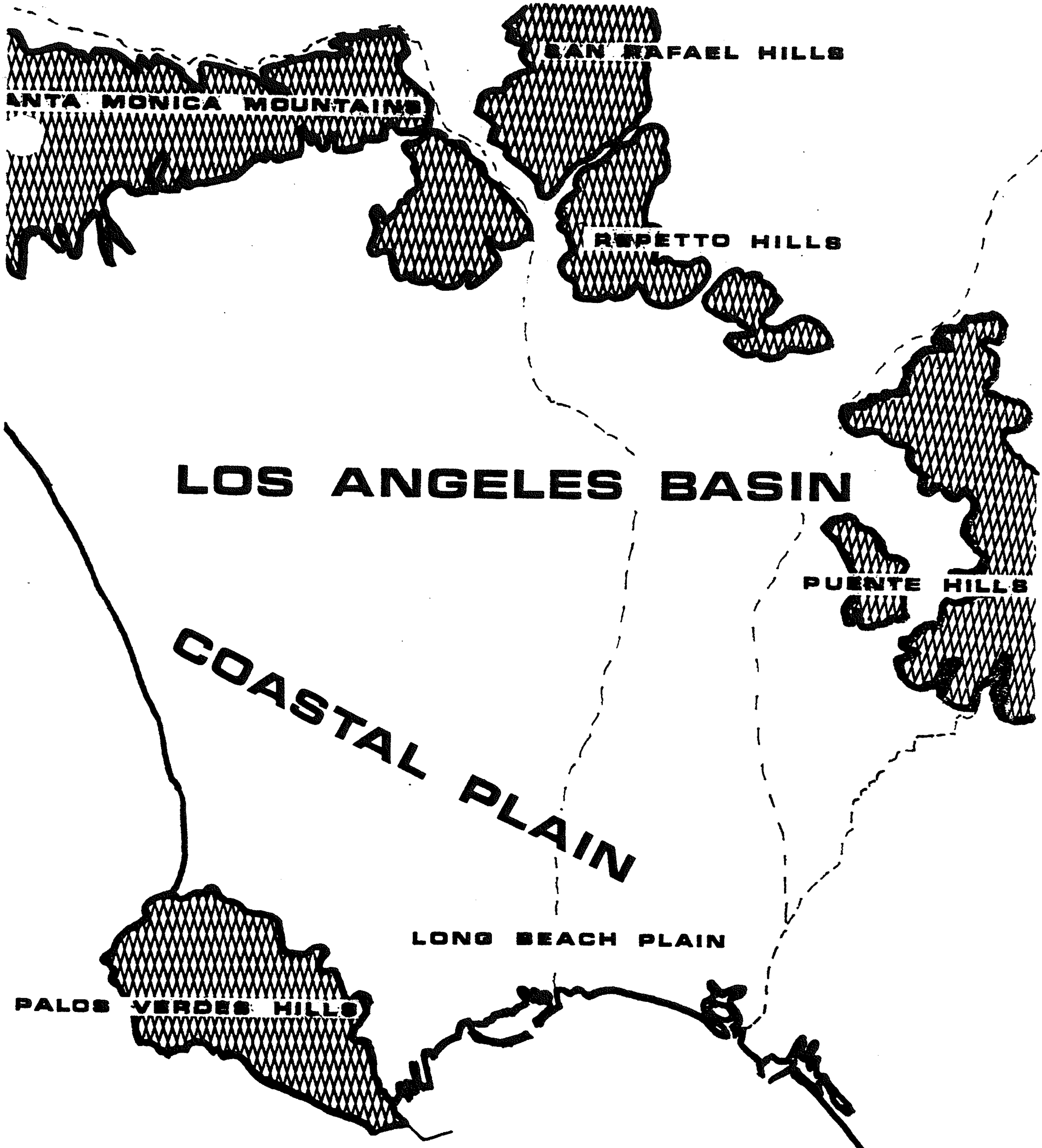



FIGURE 1

COASTAL PLAIN

to a height of three hundred and sixty feet. This topographic phenomenon has been an oil-production area since the 1930's. A smaller rise occurs east of Signal Hill and is known locally as "Water Tank Hill." These distinguishable uplifts occur in a northwest-southeast direction, along a trace known as the Inglewood-Newport fault system. There are lesser uplifts recognizable as bluffs along the shoreline, and as community names in other areas. For example, Bixby Knolls, Bixby Hills, or Belmont Heights reflect various topographic features ranging from 35 feet to 75 feet in height. In 1933 this uplift system was part of the "Long Beach" earthquake, which resulted in loss of many lives and considerable property damage.

Depressed areas or basin-like structures are also present. Near the foot of Signal Hill, an area known as "Hamilton Bowl" functions as a drainage basin. Recreational uses occupy the land during dry periods (Figure 2).

## Man-Made Alterations

Prior to filling and dredging operations for port development, the coastline included marshes, sloughs and bar beaches or sand bars (Figure 3). The piers and bulkheads used in port and shoreline developments consist of earth fill, construction rubble and dredged material. These materials were deposited behind a quarry-rock perimeter which is faced with armor rock and then filled with dredged sand. This type of construction can have an impact upon marine biota and beach stability. For the marine community, bottom habitats are removed or drastic changes in water circulation occur which can change the diversity of the aquatic organisms. These same structures can also result in severe beach erosion by preventing sand replenishment at downstream sites. However, all effects are not necessarily negative. For example, in Alamitos Bay, dredging caused clam beds to proliferate where

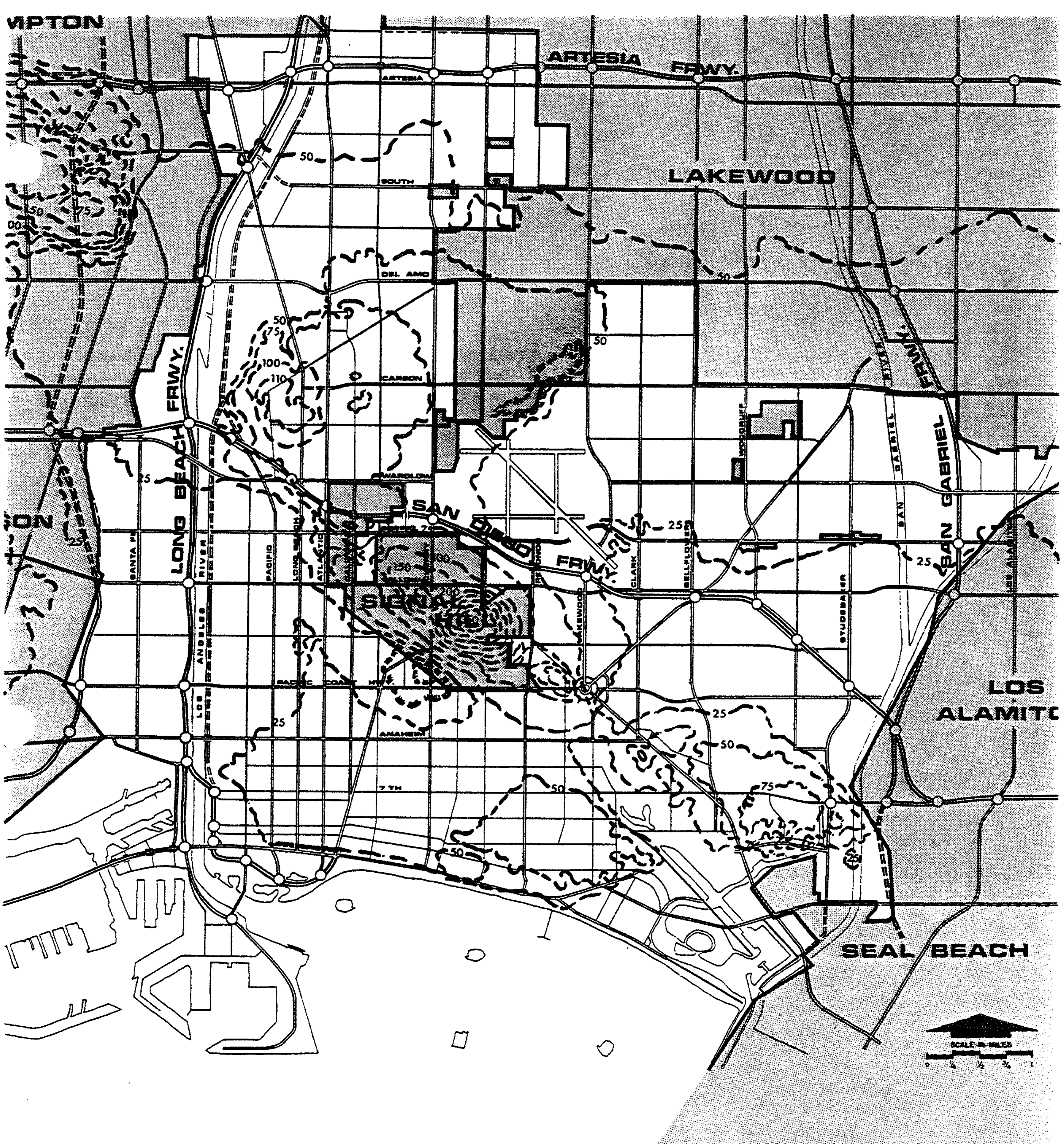



FIGURE 2

# TOPOGRAPHY

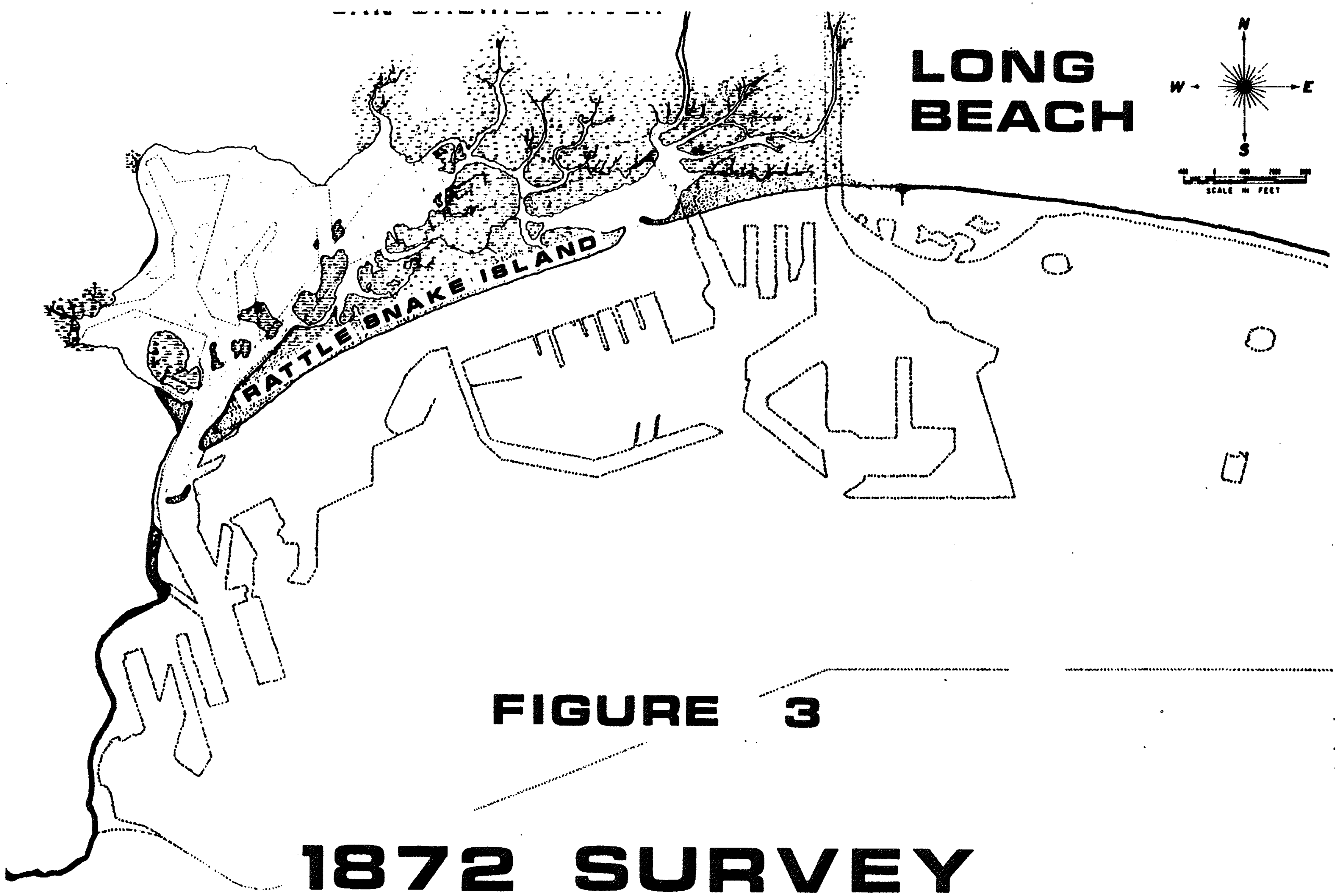



FIGURE 3

# 1872 SURVEY

## SAN PEDRO BAY SHORELINE

none had been present several years earlier. The filling operations can also create habitats for rock dwelling marine species such as starfish, fiddler crabs and mussells. These attract other numerous species of marine life and allow for a better balance of organisms.

Justification for artifical alterations of the environment is partially due to the economic needs of additional port facilities and expansion of oil operations. However, pollution problems occur in commercial and industrial operations as a result of dock and pier development. This issue will be discussed herein under the topic of Water Quality Control.

## Soils

The City of Long Beach has numerous types of soils. They are a basic issue in conservation, and thus merit some discussion. We utilize our soils as a valuable resource, sometimes without the realization that they satisfy several needs. Soils are used in the construction of buildings, roadways and port facilities. They are also essential in crop production and, at times, act as a natural filter to purify and store water. Soils are classified according to their drainage characteristics, topographic position, age, mode of formation, erodability, structure and particle size. The larger particles indicate a sandy or gravelly soil, medium size particles are loams, and fine particles are clays and silts. Today, in Long Beach, soils are not used extensively for building materials or agriculture; consequently, we sometimes tend to overlook their importance in our urban environment. The following inventory relates the types of soils present in Long Beach and describes their characteristics, depth and some uses for each. In order to understand groups of soil types which have similar characteristics, it is important to realize the way in which the soils were formed. The following groups are known as soil series. They are discussed below and are illustrated on Figure 4.

<u>Old Valley and Coastal Plain Series</u>

This series generally consists of elevated, unconsolidated, water-laid deposits. These usually occupy sloping, rolling, or hilly areas and show signs of weathering or long-term erosion. In Long Beach this series includes Ramona and Montezuma soils and are described as follows:

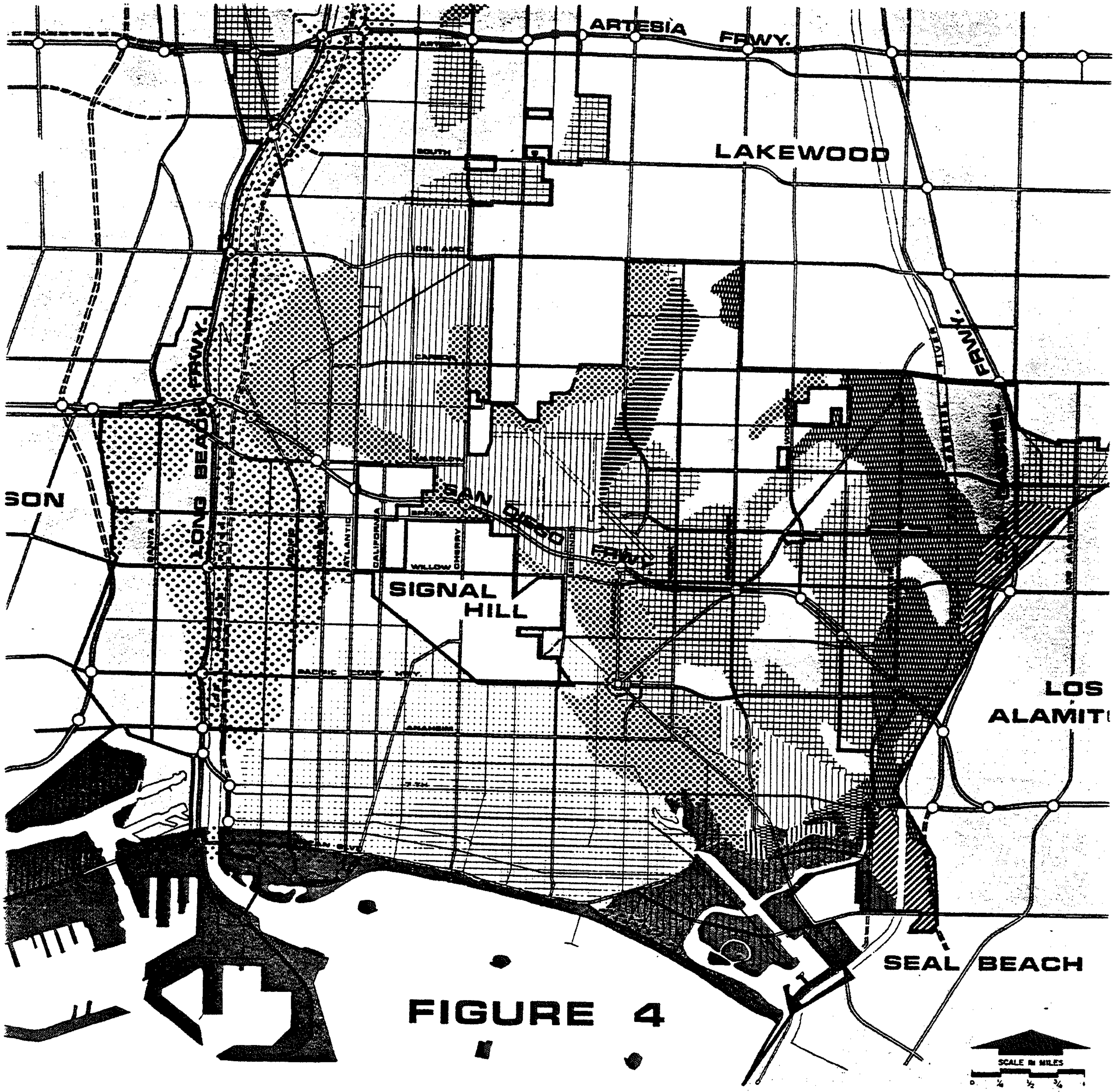
RS-Ramona Sandy Loam (12-24 inches)
Usually gray-brown or brown, this soil yields moderate crops, but does not absorb water readily. During periods of heavy rainfall, moderate erosion occurs.

RF-Ramona Fine Sandy Loam (12-24 inches)
Also gray-brown or brown, drainage is thorough with some minor erosion. These tend to offer moderate crop yields and occupy terrace areas of gentle slopes.

RO-Romona Loam (12-24 inches)
Brown, gray-brown, or dark brown, this soil is one of the important agricultural types in Los Angeles County. When water saturated, this soil produces considerable runoff. It can be found along foothills, marine terraces, alluvial fans and mesas.

RC-Romona Clay Loam (8-24 inches)
Also brown, gray-brown and dark brown, this soil is found in many areas, generally in the same areas as Romona Loam. It is also conducive to agriculture. Drainage is moderate to good.

MC-Montezuma Clay Loam Adobe (18-36 inches)
Dark gray to black, this soil assumes an adobe structure becoming hard and cracked when dry. An important agricultural soil; berry crops produce good yields. This soil is found along areas of gentle slope.




# FIGURE 4

# SOILS

## LEGEND

- AMONA LOAM
- AMONA SANDY LOAM
- AMONA FINE SANDY LOAM
- MONA CLAY LOAM
- NTEZUMA CLAY LOAM ADOBE
- ANFORD LOAM
- ANFORD FINE SANDY LOAM
- ANFORD SAND
- TUJUNGA FINE SAND
- CHINO SILT LOAM
- CHINO CLAY LOAM
- CHINO SILTY CLAY
- RIVERWASH
- TIDAL MARSH
- MUCK AND PEAT
- MADELAND
- COASTAL BEACH AND DUNESAND

Recent Alluvial Series

These are intensively developed and have a high water table. Light in color and texture, these soils have a wide range of mineral composition and are alkaline at times. In Long Beach they include Chino, Hanford and Tujunga Soils. They are described as follows:

HO-Hanford Sand (12 inches)
This soil is brown or gray-brown usually with a high water table and can be found over an extensive area. Native vegetation and truck crops are well supported by this soil which has good drainage. It is usually found on gentle slopes and level areas.

HI-Hanford Loam (12-72 inches)
Gray-brown and brown, this soil can be found in flood plain areas and streamways. Drainage is adequate and agriculutral yields are good. Similar to HF, but having less sand and gravel content.

TS-Tujunga Fine Sand (6-72 inches)
Gray or brownish-gray, this material is loose and has minor agricultural importance. It is usually found near streams. It is associated with a high water table and moderate erosion occurs.

CI-Chino Silt Loam (12-72 inches)
This soil is dark brownish gray or black and occupies gentle slopes and level areas. Drainage is good and it is important for agricultural purposes. The soil absorbs and holds water well.

CC-Chino Clay Loam (12-18 inches)
Similar to Chino Silt Loam in color, it is not as well drained. This type can be found in level or shallow areas and produces good agricultural yields despite some alkali accumulation.

CY-Chino Silty Clay (12-15 inches)
This type is dark gray and compact, found in areas of gentle slope to nearly flat. Poor drainage and alkali deposits are typical of this soil. This type of soil is poor for agricultural purposes.

Miscellaneous Series

These include soils which are non-agricultural or undergo change resulting from unnatural conditions such as dredging, fill or grading. In Long Beach, these includes riverwash, coastal beach and dunesand, tidal marsh, muck, peat and made-land. Description of these soils follows:

RY-River Wash
This consists principally of gray sand and soil particles which have been transported via water currents during peak flow periods and floods. Usually, these are found along river bottoms and mouths. During wet weather, these are in the form of sediment, which becomes loose, sand-like material during summer.

TI-Tidal Marsh
This is characterized by sediment material which has been laid down near tide level and is subject to inundation by salt or brackish water. Usually dark gray, brown or black, this type of soil supports weed-like grasses and salt water plants. Non-agricultural, due to large amounts of sodium chloride, this type occurs in low level areas and is important as a wildlife habitat.

MP-Muck and Peat
This is a silty, black and poorly drained material. A high water table and spongy organic material made of decayed plants and roots are characteristic. Usually found in distinct areas, this type permits certain

shallow root crops due to large amounts of water being present.

ME-Madeland

This is man-made and consists of dredging material, construction debris, earth from highway and oil development projects, rock and gravel. Usually used for extending port facilities or as fill for building construction.

## Erosion

Erosion of soil material occurs when water velocity is increased due to runoff or rainfall, and river channels exceed their normal carrying capacity. Areas with little ground cover or vegetation are usually susceptible. This process is not a major problem in Long Beach due to its topographic structure, except along the ocean-fronting bluffs. Erosion of coastal areas, particularly sand beaches, can occur when ocean currents are altered or wave action is deflected, or during storms.

In order to better understand the erosion problem, a brief explanation of shoreline history is necessary. Beach stability prior to the turn of the century was maintained by nature. Sand and sediment were carried down the Los Angeles River and deposited near the mouth of the river. These deposits, known as deltas, produced enough material for down-current beaches to be replenished. This materal was carried by ocean currents and wave action in an easterly direction and deposited along the downcoast beach. This process is known as littoral drift. Historically, there were few structures interfering with this natural process.

As Long Beach developed, buildings and piers began to appear along the shoreline. The early piers and breakwaters were poorly engineered and were destroyed after a few years by storms and wave action. Later, more substantial structures were built to withstand the elements and proved to be a significant factor in causing beach deterioration.

Shortly before 1900, construction was begun on the Federal Breakwater for the purpose of protecting shipping facilities. The construction led to an alteration of offshore currents. Sand began to accumulate between the mouth of the Los Angeles River and the Silver Spray Pier which was between Cedar and Pine Streets. In 1931, the construction of "Rainbow Pier" and the previous elongation of the west jetty of the Los Angeles River caused a drastic change in downcoast littoral drift. New material from the river was trapped west of "Rainbow Pier" and could not be carried east to replenish the sand carried away by waves traveling from the west. This resulted in beach erosion. The bluffs became undermined, large portions began to cave away, and buildings and residences were destroyed.

In 1939, the extension of the Federal Breakwater was increased to a length of eight miles, terminating near the San Gabriel River outlet.

It is relevant, at this point, to mention some specific developments which had an effect on the beach erosion problem. Prior to the Second World War, the City did not have a General Plan, and very little emphasis was placed on planned growth. Work along the beach stopped during the war; however, a tentative master plan for shoreline development was approved in 1945. The plan called for completion of the breakwater by 1949. The additional extension was expected to provide the Alamitos Bay peninsula with a permanent protective barrier against high tides and storm action. Also, it was early in 1945 when the San Gabriel River Channel, which had emptied into Alamitos Bay, was separated from the

Bay entrance by the construction of a levee. The same year, a new entrance to the Bay was dredged and protected by a rock entrance jetty. All of these developments interfered with part of a complex cycle of tidal action, drainage and natural currents.

In 1945, the U. S. Army Corps of Engineers dredged five million cubic yards of material from the mouth of the Los Angeles River and deposited it on the beach from "Rainbow Pier" to a point approximately one mile east of Belmont Pier. In addition, spoil from Alamitos Bay was also placed on the beaches. Since that time, Rainbow Pier has been demolished and other developments have occurred which continued to alter the shoreline. Additionally, the Long Beach Marina was completed, providing several million cubic yards of material for the beaches. This has allowed stabilization of beach erosion. Littoral drift has changed from down coast to up coast due to a counter clockwise shift in wave approach direction, so some unbalance is prevalent, particularly along Alamitos Peninsula.

## River Basins

The City of Long Beach is located in the Los Angeles River Basin which is a part of the coastal plain area. The major streams flowing to this area are the Los Angeles, Rio Hondo, and San Gabriel Rivers. Minor tributaries include Compton Creek and Coyote Creek, which originate in the Puente Hills. The Los Angeles River drains the San Fernando Valley, flowing south and entering San Pedro Bay. The Rio Hondo drains the San Gabriel Mountains and Valley, joining the Los Angeles River approximately twelve miles upstream from the ocean. Additional water courses include Dominguez Channel, a minor tributary which drains into the Los Angeles Harbor. Cerritos Channel, part of the inner portion of Long Beach Harbor, also connects with parts of Los Angeles Harbor. Generally, the quality of these waters has improved within the past decade. Strict laws such as the Porter-Cologne Water Quality Control Act (1967) and better standards mandated by Federal and State policies are responsible for improved water quality.

The channels of all the rivers have been improved by the Flood Control Districts and the Corps of Engineers. This has had a salutary effect on flooding, but a negative effect in terms of reducing the amounts of silt and sand reaching the coast and replenishing beaches. (See following section).

## Flood Control

The original course of local rivers was altered due to channelization. The U.S. Army Corps of Engineers constructed ninety miles of flood control structures along the Rio Hondo, San Gabriel and Los Angeles Rivers. Also, the Los Angeles County Flood Control District, the U.S. Department of Agriculture and the City of Long Beach constructed flood control facilities as part of an overall plan for the control and conservation of flood waters within the basin. The levees and channelization of streamways have prevented scouring, mudslides, and flood plain damage.

In 1969, the Los Angeles Basin was innundated with a phenomenal amount of rainfall during January and February. Extensive damage occurred as the result of flooding, erosion and mudslides. However, due to the flood control system, Long Beach was spared major storm damage. Because Long Beach has taken special flood control measures to "flood-proof" buildings in critical areas and allow only compatible flood plain developments to be constructed, federal flood control insurance has been made available at a subsidized rate to the citizens of the community.

## Storm Drains

The Long Beach drainage system is an extensive network of storm drains which function to collect runoff and storm water. Bond issues approved by the electorate in 1952, 1958, and 1964 provided for the construction of the storm drain system.

The System operates via a network of trunk lines, laterals and catch basins which collect runoff which is then discharged into flood control channels. Discharge of pollutants or toxic materials from commercial or industrial developments into the drainage system is regulated by City ordinances and by the California Regional Water Quality Control Board. Stringent controls during construction of new lines and facilities allow for minimal environmental disruption.

## Groundwater

When certain geologic formations, such as aquifers, become saturated with water, the water is known as groundwater. The major aquifers beneath Long Beach are known as the 400-foot Gravel, the 200-foot Sand, and the Gaspur Zone. These, for the most part, contain brine water, but the quality improves to potability farther inland. The 400-foot Gravel and the 200-foot Sand aquifers lie in a flat, blanket-like area beneath the city. The Gaspur Zone is an ancestrial, subsurface river channel filled with sand and gravel. It outcrops on the ocean floor beneath San Pedro Bay. Along the Coastal Plain, these aquifers have a capacity for storing approximately 30 million acre-feet of water. Until the 1920"s these beds contained fresh water. However, withdrawals inland, in addition to pollution by percolation of industrial wastes, caused the water to become polluted or to be replaced by seawater. The replacement process is known as salt water intrusion. In 1970, approximately thirty injection wells were put into operation in Long Beach for the purpose of fresh water injection along the Gaspur Zone. This resulted in the creation of a barrier against further salt water intrusion.

Subsequently, another problem was introduced when brine wastes were dumped into the harbor area. These brines were oxygen deficient and caused a buildup of "dead" water in which marine life could not survive. This practice was stopped in 1972 in accordance with mandates issued from the California Regional Water Quality Control Board.

## Water Quality

Long Beach and other portions of the Coastal area are serviced by three sewage treatment facilities which discharge treated effluent to marine waters. The wastewater is generated by homes, industry, and commercial operations.

The quality of the effluent is primarily measured in terms of its biochemical oxygen demand (BOD) or the amount of dissolved oxygen that is needed by bacteria to decompose the residual or remaining wastes. The marine environment (bays, estuaries and the ocean) cannot tolerate a high BOD without incurring damage to its living resources. Other methods are also utilized to measure water quality. These include trace metals, chlorinated hydrocarbons, dissolved and suspended solids, chemical oxygen demand, and nitrogenous content.

Wastewater facilities are graded by their mode of treatment. Primary treatment, which consists of removing suspended matter, removes about 30% of oxygen-consuming organics. Secondary treatment, which uses bacteria to remove waste organics, will reduce biodegradable waste by approximately 85%. Tertiary treatment can produce potable water. The following is a brief description of the plants which serve the Long Beach area in conjunction with the Los Angeles County Sanitation Districts.

1. County Sanitation Districts of Los Angeles County Joint Water Pollution Control Plant

   This is a primary treatment facility; it disposes of 390 million gallons per day (mgd) to the Pacific Ocean through a system of four outfalls extending in a southerly direction from the Palos Verdes Peninsula. They vary between 5,000 feet to 11,900 feet from the shore. Sludge is reclaimed and processed as fertilizer and soil conditioner. This plant serves an area encompassing 70 cities and receives effluent and sludge from upstream facilities. The State Water Resources Control Board "Water Quality Control Plan" calls for upgrading and expansion of these facilities at the earliest possible date.

2. Long Beach Water Renovation Plant

   This plant was recently activated. Located at the junction of the San Gabriel River and Coyote Creek, it has a secondary treatment capacity of 12.5 mgd. Effluent will be recycled for oil operations, subsidence control and irrigation for city parks and golf courses. Excess effluent is now discharged into the San Gabriel River.

3. Terminal Island Plant

   This facility presently operates as a primary treatment plant. Upgrading to secondary treatment has been mandated by law and is currently planned for June 1973. The plant processes about 11 mgd and serves San Pedro, Wilmington, the Ports of Los Angeles and Long Beach, and the Navy Base.

Other factors used in evaluating waste discharges include gross toxicity and bacteriological quality. It has been discovered that certain substances such as heavy metals and pesticides, previously considered harmless to the environment, have reduced the realization of some benefits from aquatic resources. Owing to the discharge of these materials, many species of marine plants and animals, some of them economically important, have been harmed. The compound effect of increased water use and the increasing strength and volume of municipal and industrial waste discharges caused noticeable degradation of water resources throughout the State. Past efforts to improve this situation were not effective due to lack of interest, general enforcement procedures, and technology. Indifference towards environmental deterioration has yielded to public appreciation of natural resources as an indispensable and finite life need that requires wise utilization and conservation. The creation of the State Water Resources Control Board in 1967, and the adoption of the 1970 Porter-Cologne Act recognized the need for a responsible, well-balanced plan for water quality management. As a result of environmental management, anchovies are now abundant in a great proportion of the waters within the Harbor. Scarce at one time, they have reestablished themselves due to stricter fishing laws and more acceptable water quality.

## Shoreline, Port and Harbor Areas

The Los Angeles Shoreline, including 6.1 miles of original shoreline occupied by the Ports of Long Beach and Los Angeles, is 74 miles in length. This shoreline represents sand and gravel beaches, bays and estuaries, bluff parks, tide pools, marshland or sloughs, and man-made facilities. Prior to 1900, the primary body of water in Long Beach was San Pedro Bay which extended from Point Fermin on the Palos Verdes Peninsula in an easterly direction, as far down the coast as Newport Beach. Presently, it can be defined as that water area enclosed by the Federal Breakwater easterly to the Orange County Line. An 1872 survey shows the natural shoreline to include a prominent peninsula known as Rattlesnake Island and a large marshland area or slough. Filling and dredging operations have now altered the marshes and sloughs of San Pedro Bay and changed them into a modern port. For the Conservation Element, San Pedro Bay will be separated in to three areas or parts: (1) westerly area, or the Los Angeles Harbor (2) central area, consisting of the Long Beach Harbor and U.S. Navy installations, and (3) easterly area, consisting of beach frontage along the City of Long Beach and extending to Seal Beach in Orange County.

Los Angeles Harbor (West San Pedro Bay)

The oldest of the two ports, Los Angeles Harbor, occupies 3.5 miles of shoreline between Cabrillo Beach and the Los Angeles River. The harbor facilities include deep water channels and slips, part of Terminal Island, and approximately 28 miles of water frontage.

Long Beach Harbor (Central San Pedro Bay)

Long Beach Harbor complex occupies the easterly 2.6 miles of the 6.1 miles designated as harbor by the U.S. Army Corps of Engineers. The harbor area contains the U.S. Naval Base and Shipyard, part of Terminal Island, some private lands, and port facilities for the City. The Los Angeles County Flood Control District right-of-way marks the easterly boundary north of the tideline. Protection for the port facilities comes from a detached breakwater constructed by the Federal Government approximately 4-1/4 miles seaward from the inner harbor.

Long Beach (Eastern San Pedro Bay)

The easterly shoreline of San Pedro Bay extends 5.3 miles into the City of Long Beach (not including the length of shoreline adjacent to the R.M.S. Queen Mary complex or around the four oil islands). The westerly 1.2 miles of frontage is fill which is contained by rock dikes. The remaining 4.1 miles, except for the San Gabriel River outlet, and jetty structures at Alamitos Bay, consist of a broad, sand beach. Strict controls in this area have enhanced the development of many recreational facilities. Adjacent to the San Gabriel River is a large marina, a swimming beach and recreation area. West of the San Gabriel River for about four miles, the shoreline is maintained as a bathing beach. The remaining area fronting on the bay between Alamitos Avenue and the Los Angeles River is being developed as a shoreline park and a well-planned, ocean-oriented convention and recreation center.

Alamitos Bay-Marine Stadium

A dramatic change in the course of the San Gabriel River caused an unusual phenomenon to occur between 1867-1868. Prior to that time, the San Gabriel River joined the Rio Hondo and Los Angeles Rivers to empty into the ocean at the present site of the Los Angeles Harbor. During a tremendous flood, the river cut a new channel and emptied through Alamitos Bay. It has remained in that channel since that time; periodic overflows have caused some runoff to enter the former channel. The river, after this alteration occurred, began depositing large amounts of silt, sand and gravel into Alamitos Bay. This material has since been utilized for development by dredging and filling operations. In 1954, the Los Angeles Country Flood Control District constructed jetties separating the river channel from the bay so that the deposits in the bay decreased. In 1925, work began on Marine Stadium in an area along the eastern side of the bay. The facility which is designed for recreation and competitive aquatic events was completed in time for the 1932 Olympic games. Dredged materials must continually be taken from the bay and channels and are used to construct and maintain city beaches and bulkheads. In 1954, an extensive improvement program utilizing tidelands oil funds was implemented to create a large marina with boating and associated facilities.

It is worthwhile noting the unique community in this area known as Naples. Named for the Italian City, this subdivision was created as an island subdivision surrounded by a canal system with characteristic "Old World" charm. Residents who own boats can dock them next to their homes overlooking the scenic canal.

Water quality in Alamitos Bay, Marine Stadium and the Naples Canal is generally good, however, there are some signs of degradation. Marine life (small crustaceans and fish) and waterfowl are still present due to increased enforcement of water quality standards. A major environmental concern at present relates to noise produced by hydroplanes and other high-powered craft in Marine Stadium. Additionally, some oil and gasoline wastes, as well as paper refuse and waste from nearby eating facilities are observed.

Construction of breakwaters and jetties has decreased flow in and out of Alamitos Bay, and at times the waters become sluggish. Obviously, some natural flushing action has been reduced, consequently, dilution and removal of debris has been hindered. Overall, the resources found here are managed very well and represent a good example of development

Compatible with a tideland environment, although a study of tides and currents within this area is recommended in order to assess possibilities for bettering water circulation.

# MINERAL RESOURCES

## MINERAL RESOURCES

### Oil

Oil was discovered in California during the late 1920's and operations have been underway in Long Beach since 1936. Oil deposits are abundant in the Long Beach tidelands area, and the City has benefitted from the revenue from drilling operations. The major concentration of oil is contained in a large subterranean pool known as the Wilmington Field. As with other mineral resource extraction operations, the manner in which these reserves are taken causes a certain amount of environmental impact.

#### Subsidence[3]

Subsidence was noted as oil production development boomed during the 1940's. When the oil was extracted, underground pressure dropped and the surface began to sink towards the low pressure area.

By 1952, through subsidence, a bowl-shaped "sink" was centered over the area of Long Beach Harbor. This subsidence was of major concern. Wharves and docks became inundated, rail and power lines, bridges and buildings were damaged and oil wells sheared by underground slippage. It was widely known at that time that repressurization would probably control this severe problem.

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[3]City of Long Beach, Environmental Impact Statement, Long Beach Tidelands & Unit Oil & Gas Operations: City of Long Beach Department of Oil Properties, Jan. 1973.

In 1958, areas of subsidence were injected with water and the sinking was abated almost immediately. Certain ordinances were amended by a vote of the people, State Law was enacted, and after numerous public hearings, the California Subsidence Act was passed late in 1958. Subsidence control measures were initiated and it became apparent that proper water injection programs provided for the abatement of a serious problem.

Other conservation problems began to become apparent as an offspring of subsidence control. Thousands of barrels of brine or salt water were dumped into the harbor. This resulted in oxygen depletion and marine organisms were forced out of the area. Since then, conservation laws and ordinances have caused oil production operators to remedy this situation. Practically all operations in Long Beach now utilize a "closed" system, which reclaims water to be used in oil and gas extraction and subsidence control.

Additionally, wells have been placed below eye-level in many areas and utilize electric pumps for noise control. Slant drilling has also been implemented. Long Beach maintains four 10-acre islands in the harbor which are well designed and landscaped to fit into the shore skyline. Rigid controls as to location, water pollution, air quality, aesthetics, etc., of oil operations are enforced by the City.

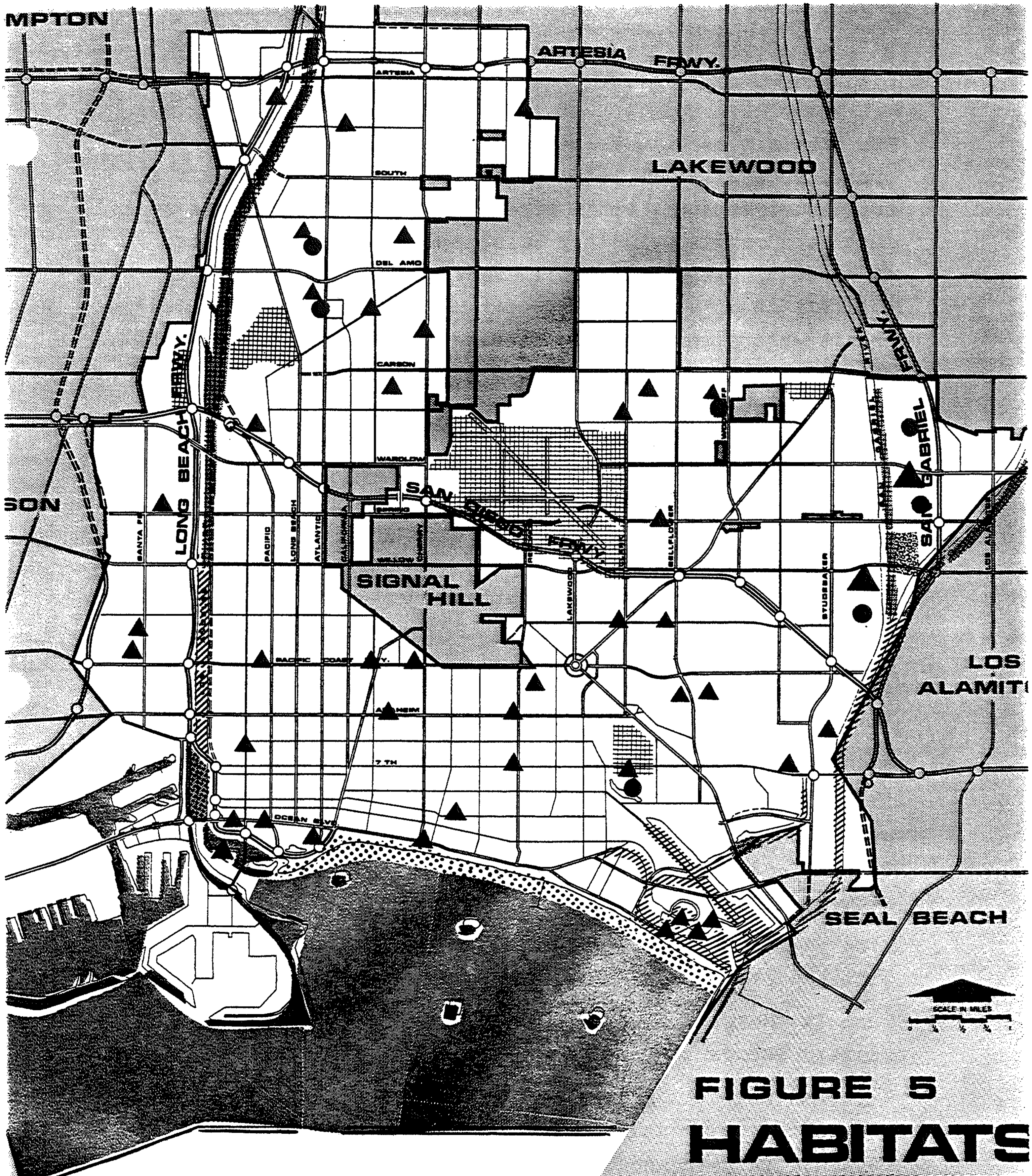
# WILDLIFE AND VEGETATION

## WILDLIFE AND VEGETATION

Each species of wildlife and vegetation is able to exist only in a certain type of surrounding, and this area is called its habitat. If the habitat is destroyed, or its environmental balance is upset, organism may not survive. Certain types of habitats are necessary to sustain various species of flora and fauna. In an urban environment, many of these habitats and resources have been depleted due to subdivision development or other man-made disturbances such as levee construction, channelization, and oil or landfill operations.

Within habitats, certain basic requirements are needed by individual animals or plants; when the basic requirements are satisfied, the species can exist. Changing the use of the land can destroy old habitats or create new ones. Cultivation practices may drive some species away from an area, but can also attract other species which may then extend the range of their predators. Similarly, irrigation of arid areas can extend the range of species such as muskrats amphibians, and certain aquatic forms.

Scientifically, the geographic distribution of wildlife is indicated by the existence of various plants or vegetation. These indicators are termed "life zones". Long Beach is part of the Lower Sonoran Life Zone. This zone extends from sea level to 1,000 feet elevation. Native vegetation in this habitat can include arrowweed, paloverde, yucca, sycamore, cottonwood, valley oak, and various man-introduced species such as birch, eucalyptus, palms and pines which thrive in the moderate climate of Southern California.




# FIGURE 5
# HABITATS

| | |
|---|---|
| RESH WATER AND RIVER ( INTERMITTENT ) | ROCKY COASTAL |
| DS AND LAKES | PARKS |
| . DORADO PRESERVE AND NATURE CENTER | OTHER OPEN SPACE |
| STUARIES ( RIPARIAN ) | SANDY COASTAL |
| DAL MUDFLAT | OPEN SEA |

The habitats in Long Beach can be categorized into certain types, some of which tend to overlap. Urbanization has all but destroyed some, while others exist only in certain areas such as airports, military bases and inaccessible areas is lated by freeways. Additionally, there are man-made habitats that fit into a special classification. The following inventory enumerates and describes habitat types found in Long Beach. They are illustrated on Figure 5.

1. Riparian Habitat

This type exists to a very limited extent along streams and flood channels, and where disturbance is minimal.

Vegetation. Some shrubs and grasses exist, possibly small saplings when water supply is abundant.

Characteristic Animals.

Insects--Western Tiger Swallowtail, Underwing Moth, Velvety Tree Ant.

Amphibians--Newt, Salamander, Foothill Yellow-legged Frog, Toad, Pacific Tree Frog.

Reptiles--Skink, Fence Lizard, Two-striped Garter snake, Pacific Pond Turtle, Striped Whipsnake, Gopher snake, Ring-Necked Snake, California Kingsnake.

Birds--Cooper hawk, Dipper, Gulls, Ducks, Terns, Yellow-billed Cuckoo, Spotted Owl, Red-Shouldered Hawk.

Mammals--Mole, Shrew, Vole, Harvest mouse, Mouse, Racoon, Weasel, Skunk.

Riparian habitats are subject to destruction by subdivision, channelization, weed encroachment and fire. They are susceptible to watershed damage and stream pollution. However they are capable of self-restoration after flood and fire damage. They can also be destroyed by recreational vehicles such as trail bikes, motorcycles, all-terrain vehicles, jeeps, etc. Maintenance of these areas requires buffering from neighboring urban land uses, especially in the case of flood plain sections.

## 2. Ponds and Lakes

These are quiet bodies of water and exist mainly in parks as man-made habitats.

Vegetation. Submerged and partially submerged aquatic plants, emergent herbs and graminoids.

Characteristic Animals.

Insects--Caddisflies, Giant Cranefly, Mayflies, Dragonflies, Water scavenger.

Amphibians--Western Toad, Pacific Treefrog, Bullfrog, Red-legged frog.

Reptiles--Two-striped garter snake, Pacific Pond Turtle.

Birds--Grebes, Ducks, Terns, Gulls (required habitat).

Mammals--Small rodents can be present, but recreational usage usually causes them to appear only at night or during "off" hours.

These areas are easily destroyed by pollution, weeds, eutrophication, and poor drainage. Because most ponds and lakes in Long Beach are man-made, it is possible that some damage occurs due to "over use" in recreational areas. Fish are present; they are "stocked" by various agencies.

## 3. Freshwater Streams and Rivers

The streams and rivers have been channelized, but they can be defined as areas having permanent or seasonal running water. Habitats have been paved over where concrete-lined channels have been utilized. This is an extension of a Riparian Habitat.

Vegetation. Some submerged plants, but mostly emergent streamside plants.

Characteristic Animals.

Insects--Mayflies, Dragonflies, Ruby Spot Damesfly, Giant Water bugs, Back swimmers, California Dobson Fly, Net-winged midges, Caddisflies, Giant Crane Fly.

Amphibians--California Newt, Western Toad, Pacific Treefrog.

Reptiles--Two Striped Garter Snake, Pacific Pond Turtle.

Birds--Red-winged Blackbirds, Sora Rail, Green Heron.

Mammals--Racoon.

Fishes--Channelization and pollution eliminated native fresh-water species in most areas.

Stream and river areas are susceptible to pollution and drainage problems. Tremendous destructive modification is present where concrete channelization has occurred.

## 4. Freshwater Marsh

These communities occur wherever shallow standing water remains for any length of time. Small areas exist along the coast around springs, or along sluggish streams.

Vegetation. Emergent reeds and water weeds; floating and submerged water plants.

Characteristic Animals.

Insects--Many aquatic, or semi-aquatic insects are present. Diving Beetles, Giant Water Bug, Toadbug, Buckmoth, Spotted Hallisidota, Rush Borer.

Amphibians--Same as Ponds and Lakes.

Reptiles--Same as Ponds and Lakes.

Birds--Red-winged Blackbird, Sora Rail, Clapper Rail (Endangered List), Green Heron.

Mammals--Shrews, Harvest mouse, Vole, Racoon, Weasel, mole.

These habitats are fragile and easily destroyed by pollution, subdivision, drainage or filling. They constitute major stopping areas for migrant waterbirds such as Bitterns, Ducks, Herons, and Marsh Wrens.

## 5. Salt Marsh and Estuaries

Tidal areas, 0-10 feet in elevation, include lagoons and marshes, inter-tidal mudflats, having low herbs and shrubs, and some perennial grasses.

Vegetation. Sparse, weeds and uniformly low vegetation, sea blite, Inkweed, Pickleweed, Salt and Cord Grass, Sea heath.

Characteristic Animals.

Insects--Saltmarsh Fly, mosquitoes, Dignity Blue, Sandhill Skipper, Wandering Skipper.

Birds--Belding Savannah Sparrow, Least Tern (rare species), Light-Footed Clapper Rail, Black Rail.

Mammals--Deer Mouse, Long-tailed Weasel, Southern marsh shrew, Southern marsh harvest mouse, Stephen meadow mouse.

## 6. Mudflat (Tidal)

This type exists to a limited extent near the mouth of the Los Angeles River. Mudflats are contiguous with Estuary Habitats. They support sparse vegetation.

Characteristic Animals.

Birds--Numerous shorebirds, Gulls, Terns, Herons, Ducks, Sandpipers.

Subject to subdivision, these areas have nearly diminished. They are extremely important as major feeding and resting area for shore and migrant birds, especially during winter.

## 7. Rocky Coastal

These exist in Long Beach only as man-made structures such as jetties, oil island foundations, or breakwaters.

Vegetation. Attached Algae, Marine Plants, Surf Grasses or Sea Lettuce.

Characteristic Animals.

Invertebrates--Other than insects include Acorn Barnacle, Beach Flea, Isopod, Lined Shore Crab, Limpets, Abalones, Sea Urchins, Rock Oysters, Sea Anemones, Sea Slugs, Sea Cucumbers, and Starfish.

Insects--Marine Midges, Intertidal Springtail.

Birds--Surfbird, Wandering Tattler, Gulls and Common Shorebirds, Black Oyster Catcher.

These structures can support wildlife if left undisturbed. Pollution and indiscriminate specimen collecting can be extremely damaging.

## 8. Sandy Coastal

Sand Beach, present along Long Beach Shoreline, but not in an undisturbed form.

Vegetation. None, except for kelp and seaweed cast upon the beach by high tide.

Characteristic Animals.

Insects--Kelp Flies, Tiger Beetles.

Invertebrates--Sand Crabs.

Birds--Shorebirds, Snowy Plover.

Additionally, this type of habitat is contiguous with shoreline Bluffs in Long Beach. Some lizards and small mammals are present. The beach and bluff areas are subject to erosion and recreational overuse. Low succulent shrubs and ground cover are noticeable along the bluffs.

## 9. Open Sea

The Open Marine environment, beyond the extreme low tide level.

Characteristic Animals.

Reptiles--Green Turtle, Leatherback Turtle.

Mammals--California Sea Lion, Harbor Seal, Gill's Bottlenosed Dolphin, Graffman's Dolphin, Gray's Porpoise, Common Dolphin, Northern Right Whale Dolphin, Pacific White-sided Dolphin, Harbor Porpoise, Pacific Blackfish, Gray Whale, Southern Fur Seal, Steller Sea Lion, Northern Elephant Seal, Sperm Whale, Pigmy Sperm Whale, Rough-toothed Proposie, Killer Whale, Grampus, Blue Whale, Fin-backed Whale, False Killer Whale, Sei Whale, Little Piked Whale.

The sea is threatened by pollution, overfishing and recreational misuse. To list all of the wildlife in this habitat would consume volumes. Those mentioned are indigenous to Southern California and Long Beach, primarily seaward of the breakwater.

## 10. Open Space

Unused land including areas absent of dwellings and devoid of native vegetation (man-planted in most cases) varies in size from vacant lots and median strips to areas of large acreage. Exists largely in the form of parks, cemeteries, military bases, agricultural and airport land. Minimal human use; except for recreation in the case of parks. (See Open Space Element of the General Plan).

Vegetation. Annuals, grasses, weedy herbs, shrubs, trees, wild oats, field mallow.

Characteristic Animals.

Amphibians--Same as El Dorado Preserve.

Reptiles--Same as El Dorado Preserve.

Mammals--Same as El Dorado Preserve.

## 11. El Dorado Preserve and Nature Center

Established as a section of El Dorado Park and as a wildlife preserve, this unique area was entirely man-made. It exists as a combination of several of the aforementioned habitats and merits considerable attention as an educational, biological and scenic resource. Planted with many species of trees no herbicides, pesticides or insecticides are used. Man-made lakes and streams enhance aesthetic value to the 80-acre preserve. In addition the area supports many types of wildlife.

Vegetation. In addition to native grasses and riparian vegetation, the following inventory lists the species of tree or shrub in the preserve: Bailey Acacia, White Alder, Atlas Cedar, Deodar Cedar, Lemon-Scented Gum, Red-Cap Gum, Blue Gum, Bushy Yate, Silver Dollar Gum, Red Ironbarll, Coral Gum, Manna Gum, Tulip Tree, Dawn Redwood, White Mulberry, Black Mulberry, Olive, Canary Island Pine, Knobcome Pine, Coulter Pine, Aleppo Pine, Monterey Pine, California Sycamore, Coast Live Oak, Black Locust, California Pepper Tree, Weeping Willow, Japanese Back Pine, Sweet Bay, Strawberry Tree, Lemon Bottlebrush, Carmel Creeper, Bright-Bead Cotoneaster, Red Clusterberry, Hop Bush, Australian Brush, Cherry, Pineapple Guava, Chinese Holly Wilson Holly, Halls Honeysuckle, New Zealand Christmas Tree, Pittosporum, Hollyleaf Cherry, Catalina Cherry, Pyracantha, Coffeeberry, Lemonade Berry, Sugar Bush, Elderberry, Viburnum, Sweet Viburnum, Leather Leaf Viburnum, Tree Tobacco, Umbrella Plant, Sedge, Blackberries, Poppies, Water Shamrock, Toyon, Mule Fat.

Characteristic Animals

Reptiles--Bull Snake, Common King Smake, Aquatic Garter Snake, Alligator Lizard, Spring Lizard, Coast Horned Lizard, Western Fence Lizard, California Side Blotched Lizard.

Amphibians--Western Bullfrog, Pacific Tree Frog, California Tree Frog, California Tree Newt, Pond Slider, Western Toad, Painted Turtle, Western Pond Turtle.

Mammals--House Mouse, Wood Rat, Raccoon, Weasel, Jack Rabbit, Cottontail Rabbit, Red Fox, Oppossum, Broad Handed Mole, Pocket Gopher, Striped Skunk, California Ground Squirrel.

Characteristic Birds

Breeders

Resident

Pied-billed Grebe
Mallard
California Quail
Ring necked Pheasant
American Coot
Mockingbird
Loggerhead Shrike
Starling
Yellowthroat
House Sparrow
Meadowlark
House Finch
Spotted Dove
Mourning Dove
Song sparrow
Anna's Hummingbird

Seasonal

Red-Winged Blackbird

## Winter Residents

(September-April)

Green Heron
American Bittern
Gadwall
Pintail
Green-winged Teal
Cinnamon Teal
American Widgeon
Shoveler
Redhead
Ring-necked Duck
Canvasback
Lesser Scaup
Bufflehead
Ruddy Duck
Red-Shouldered Hawk
Red Tailed Hawk
Kildeer
Sparrow Hawk
Sora
Common Gallinule
Common Snipe
Belted Kingfisher
Red-Shafted Flicker
Black Phoebe
Hermit Thrush
Blue-gray Gnatcatcher
Cedar Waxwing
Audubon's Warbler
Savannah Sparrow
Fox Sparrow
White-crowned Sparrow
Lincoln's Sparrow
Ruby Crowned Kinglet
American Goldfinch
Lesser Goldfinch
Gold Crowned Sparrow

## Overhead

Turkey Vulture
White-throated Swift
Tree Swallow
Cliff Swallow
Long-billed Curlew
Violet-green Swallow
Barn Swallow

## Visitors

(O) Occasional (C) Common (R) Rare

Double-created Cormorant (C)
Great Blue Heron (O)
Cattle Egret (O)
Common Egret (O)
Least Bittern (R)
European Widgeon (R)
Wood Duck (R)
Common Merganser (R)
Sharp-shinned Hawk (C)
Cooper's Hawk (C)
Osprey (C)
Whimbrel (O)
Spotted Sandpiper (O)
Willet (O)
Greater Yellowlegs (O)
Western Kingbird(C)
Ash-throated Flycatcher (C)
Empidonaz Flycatchers (C)
Gray Flacatcher (R)
Western Wood Pewee (O)
Olive-sided Flycatcher (O)
Scrub Jay (O)
Raven (O)
Crow (O)
Bushtit (O)
Wrentit (R)
Bewich's Wren (O)
Long-billed Marsh Wren (C)
Robin (O)
Water Pippit (O)

Dowitcher (O)
Marbled Godwit (R)
Black-necked Stilt (R)
Northern Phalarope (R)
Ring-billed Gull (R)
Bonaparte's Gull (R)
Forester's Tern (R)
Caspian Tern (R)
Rock Dove (C)
Barn Owl (O)
Black-chinned Hummingbird (O)
Rufous Hummingbird (R)
White-tailed Kite (C)
Garganey Teal (R)
Ban-tailed Pidgeon (R)
Allen's Hummingbird (R)
Swainson's Thrust (R)
Huttons Vireo (R)
Solitary Vireo (R)
Townsend's Warbler (R)
Hermit Warbler (R)
Yellow-headed Blackbird (R)
Cardinal (R)

Warbling Vireo (O)
Orange-crowned Warbler (O)
Nashville Warbler (O)
Yellow Warbler (O)
Black-throated Gray Warbler(O
Wilson's Warbler (O)
Tricòlor Blackbird (O)
Bullocks Oriole (C)
Brewer Blackbird (O)
Brown-headed Cowbird (O)
Western Tananger (O)
Black-headed Grosbeak (O)
Oregon Junco (O)
Hooded Oriole (O)
Lasuli Bunting (R)
Horned Grebe (R)
Western Grebe (R)
Black Crowned Night Heron (R)
Snowy Egret (R)
House Wren (R)
Cassin's Kingbird (R)
Tropical Kingbird (R)
Phainopepla (R)

## ENVIRONMENTAL INTERRELATIONSHIPS

A complex ecological system known as the food chain exists within the waters along California's coastline. The components of the food chain are very interdependent. Consequently, if one portion of the system is adversely affected, the whole complex can be drastically changed.

Plankton and other organisms form the basic portion of the food chain. These are ingested by small fishes, which in turn are fed upon by other predatory species. These organisms become part of the human food chain when man then utilizes some species for commercial gain or sport. The desire to utilize these marine resources for food and recreation becomes frustrated when pollution causes certain species to be diminished or part of the food chain is drastically altered.

Additional interrelationships occur between plant and animal communities to create a vast web of ecological balance. An example of the kind of upset that can occur may be illustrated by the history of the sea otter.

After its discovery during the mid 1700's, the sea otter became part of a booming fur trade. Early methods of hunting employed Aleutian Indians using spears and clubs. By 1840, with the use of guns, some 5,000 otters were taken annually until they were considered to be extinct by the turn of the century. A few remained, however, and were protected by law.

The diet of the otter includes the sea urchin, which in turn ingests various sea plants, particularly kelp. When the otter population dwindled, coupled with sewage which was high in nutrient content, an extensive proliferation of sea urchins occurred. The urchins, in turn, began to graze upon the kelp, which began to dwindle, causing financial loss to the community in general and to the kelp industry in particular, and the disappearance of fish habitat areas. It is obvious that a "chain reaction" results when such systems become unbalanced due to intervention by man.

The interrelationships among the many "environments" extant in Long Beach are being brought into focus by activities related to the development of the General Plan. The framework providing guidelines for conservation and management will come into existence with the completion of the General Plan Element entitled "Environmental Management" early in 1974. In the interim, the City is utilizing the environmental review process as mandated by State law to assess and mitigate possible adverse environmental effects of proposed public and private projects. This process will become more efficient while also becomming more sophisticated upon completion of the Environmental Management Element. It will then be possible to view conservation and other environmental goals in their proper perspective, and to make more rational appraisals of compromises among economic, social, and environmental needs. The assessment of matural resources contained in the Conservation Element will become a vital part of the Environmental Management Element.

# GLOSSARY

## GLOSSARY OF TERMS

The following terms are in common use in general planning practice. Definitions are offered here because many may be unfamiliar to the layman, or because special meanings may have been applied to them by planners.

ALGAE - One cell aquatic plants containing chlorophyll and having no true root, stem or leaf.

ALLUVIAL - Level or gently sloping land formed from extensive deposition of soil material by running water.

AQUIFER - Ancient, subsurface river, which contains water in suspension, often drawn upon for water supply.

BIOCHEMICAL OXYGEN DEMAND (B.O.D.) - Demand for dissolved oxygen by certain organisms created when toxic material or nutrients are introduced into a body of water.

DELTA - A deposit of sand and soil, usually triangular in shape, formed at the mouth of some rivers.

ECOLOGY - The biological science dealing with the mutual relationships between living organisms and their environments.

ECOSYSTEM - An interacting complex or unit made up of a group of individual living organisms and their environments.

ENVIRONMENT - Refers to the totality of man's surroundings, social, physical, natural and man-made.

EROSION - The wearing down of soil material by the force or velocity of water.

EUTROPHICATION - Oxygen deficiency in bodies of water caused by the proliferation of plant material when excessive nutrient levels are reached.

FLOOD PLAIN - That area adjacent to a river or stream which is low-lying and subject to inundation during flooding of the water course.

GROUND WATER - Water held in suspension in geologic sub-surface structures such as aquifers or rock strata.

LEVEE - An embankment of earth, concrete or rock built alongside a river to prevent water from flooding bordering land.

LITTORAL DRIFT - A process whereby beach sands are redeposited along the shore in a direction paralell to the flow of the prevailing current.

NATURAL ENVIRONMENT - Includes those things in man's surroundings which exist in nature, apart from and independent of man-made creations.

PERCOLATION - The filtering of water through geologic structures.

POLLUTION - The action of making inferior in quality or value any of those aspects which constitute our total natural environment. (i.e. pollution of water or air).

RIPARIAN - Areas adjacent to streams, rivers or bodies of water which can support wildlife.

SCOURING - Erosion process caused by the action of waves or ocean currents.

SUBSIDENCE - A gradual sinking of the earth's surface caused by removal of underlying oil deposits.

WATERSHED - An area drained by a system of streams and rivers.

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