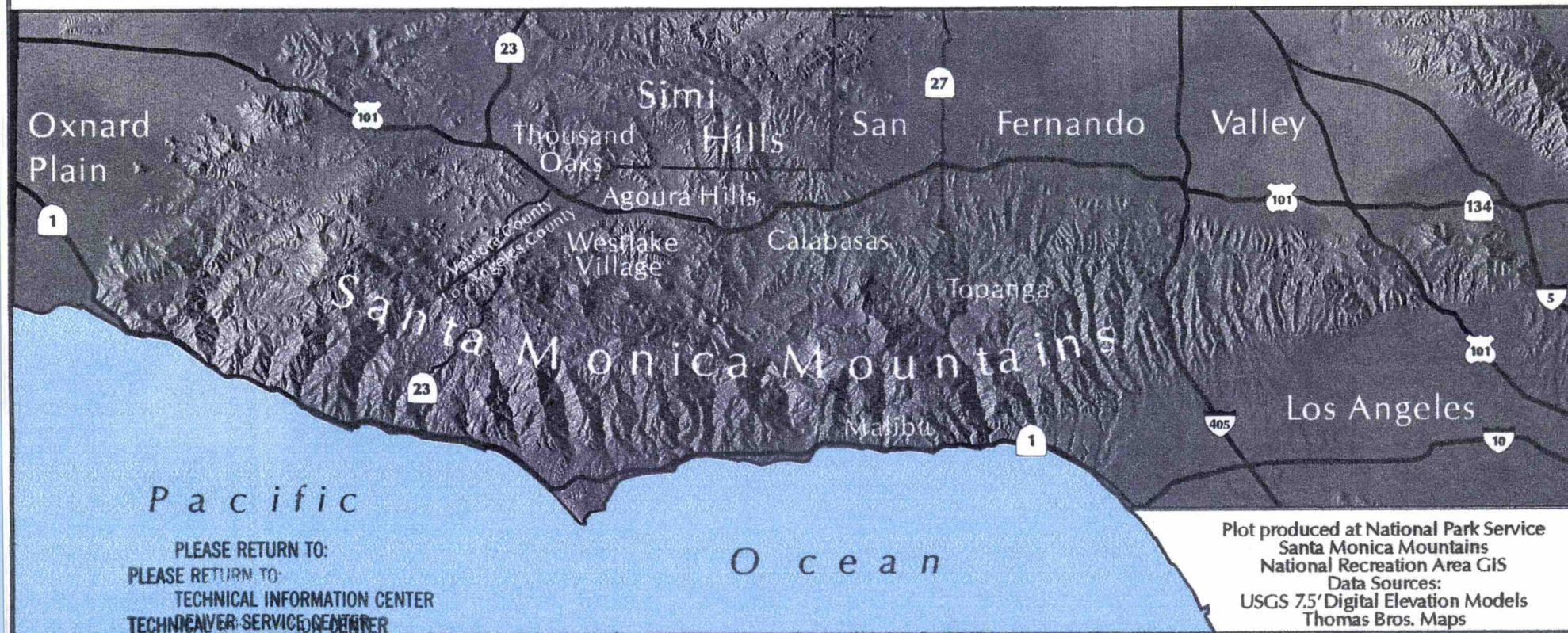


D-4A

WATER RESOURCES MANAGEMENT PLAN

Santa Monica Mountains National Recreation Area

Prepared for the National Park Service by:
Louis Levy, Ph.D., and John Korkosz, M.S.
Environmental Careers Organization, April 1997



ON MICROFILM



United States Department of the Interior

NATIONAL PARK SERVICE
Santa Monica Mountains National Recreation Area
30401 Agoura Road, Suite 100
Agoura Hills, California 91301

D-4A

IN REPLY REFER TO:

N3617(SAMO)

May 16, 1997

Dear Friends of the Santa Monica Mountains NRA:

Please find enclosed a copy of the recently approved Water Resources Management Plan (April 1997 Revision) for the Santa Monica Mountains National Recreation Area. This update represents a broad redirection of the park's water resources management program toward interagency cooperation, and watershed and ecosystem management in this unique unit of the National Park System.

If you have any questions about the plan, please contact Chief of Science and Resources Management Jim Benedict at (818) 597-1036 extension 233.

Sincerely,

Arthur E. Eck
Superintendent

Enclosure

PLEASE RETURN TO:

TECHNICAL INFORMATION CENTER
DENVER SERVICE CENTER
NATIONAL PARK SERVICE

Water Resources Management Plan

Santa Monica Mountains National Recreation Area

April 1997 Revision

Submitted By:

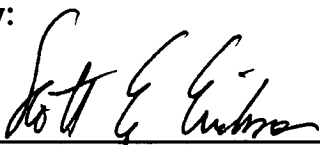


Chief of Science and Resources Management, Santa
Monica Mountains National Recreation Area

4-28-97

Date

Recommended By:

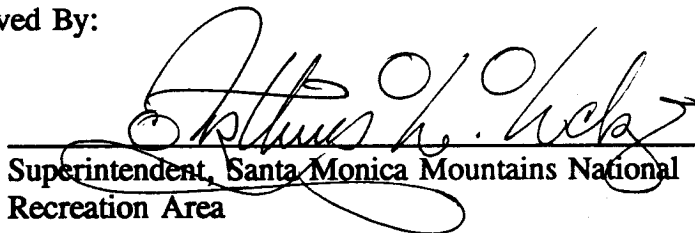


Deputy Superintendent, Santa Monica Mountains
National Recreation Area

4-28-97

Date

Approved By:



Superintendent, Santa Monica Mountains National
Recreation Area

4/29/97

Date

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PREFACE

This update of the Water Resources Management Plan (WRMP) for the Santa Monica Mountains National Recreation Area (SMMNRA) is being prepared for use by professional park staff, public and private organizations and concerned citizens who have an interest in the health of the entire ecosystem of the SMMNRA.

Many changes have occurred in the SMMNRA since the preparation of the last WRMP in 1984. There have been real estate fluctuations of recession and recovery which have altered the acquisition of park property. Development of adjacent lands and lands targeted for acquisition has also been altered with effects on the park. Fires and flooding of monumental proportions have increased our awareness of the vulnerability of the resources, natural and constructed, in the park. With an increasingly diverse population there have been increasing pressures placed on all of the recreational resources. Strong winter storms have eroded the beaches and dropped record amounts of precipitation in the park, causing major disturbances on the resources and the adjacent areas. The recent Northridge earthquake indicates that the resources are also subject to continuous tectonic activity.

In Chapter I, the WRMP planning process and pertinent legislative mandates are identified and their relationship to this document is addressed. A description of the current geographical and political boundaries with associated maps is included.

In Chapter II, the hydrologic environment of the SMMNRA is discussed. A description of the area will include watershed delineations, climate, soils and geology, and watershed management practices. Maps are provided delineating the various aspects of the aforementioned topics. The surface water sources are summarized in terms of water quantity, water quality, and floodplains. Tables and figures of the streams and lakes in the Mountains are provided to show the relationship between streams and lakes in individual watersheds. The groundwater resources, specifically, groundwater quantity and quality in the SMMNRA are discussed. The aquatic and riparian resources and habitats in the SMMNRA, including the aquatic biological resources, threatened and endangered species, and wetlands are discussed. A summary of the types of water uses that exist in the SMMNRA are described, including the status of water rights and how these rights affect management and water use in the SMMNRA.

Chapter III discusses goals, management objectives, and specific issues related to managing the park's water resources and includes delineation of specific projects necessary for managing these resources.

This document also contains 15 appendices that identify: who prepared the plan; who was consulted about the plan; a variety of detailed hydrological data specific to the park; a list of agencies with jurisdiction in the park; and a bibliography.

CHAPTER I

INTRODUCTION

Congress established the SMMNRA on November 10, 1978, with a 150,000 acre boundary. The SMMNRA now consists of over 70,000 acres of publicly owned park land, including over 20,000 acres of federally owned land; 40,000 acres owned by the California Department of Parks and Recreation; approximately 10,000 acres owned by the Santa Monica Mountains Conservancy; as well as other acreage owned by local municipalities. Approximately half of the lands within the boundary remain privately-owned. Uniquely, the SMMNRA also consists of a state and federally legislated Santa Monica Mountains Zone (Figure 1), which extends to most of the physiographic province of the Mountains to encompass an additional 75,000 acres. Public and private land is illustrated in Figure 2.

Bordered on one side by an urban environment and on the other by the Pacific Ocean, the mountain-ocean interface of the SMMNRA demands that marine impacts be considered, from such simple issues as wave action on the beaches to the quality of the offshore water and its effect on the marine biota, in order to understand park water resources. As the first continental elevated land form, the Santa Monica Mountains have a strong effect on local weather patterns. Generally, as a result of many north-south flowing creeks, water collected in the Mountains flows directly back to the Pacific. The coastal environment and the biota, including humans, are directly impacted by this interrelationship of the marine environment and the Mountains. The park's water resources cannot be addressed without including both distinct geographical entities. The lagoons, Malibu, Mugu, Zuma and others play a special role in this dynamic interaction.

As the southernmost Transverse Range, the Santa Monica Mountains rise abruptly from the Pacific Ocean to attain a maximum elevation of 3,111 feet (at Sandstone Peak) within an aerial distance of one to two miles. It is within this narrow geographic area (approximately 50 miles long and 8-10 miles wide), that private, city, county, state and federal property exist to form the unique, cooperative SMMNRA (Figure 3).

The impact humans have on ecosystem stability cannot be overstated in the SMMNRA. Urban encroachment and development, therefore, are identified in the park Resource Management Plan (1994) as the greatest threat. Development is also the single greatest threat to park water resources. Development along the beach is responsible for alteration of the natural balance of sand along the shore. Groins along Will Rogers State Beach and the Santa Monica Breakwater at Santa Monica Pier provide the most extreme examples of how sand transport is altered downshore (southeast during the winter, northwest during the summer). Increased development is also responsible for septic tank and sewage treatment facility failure, which has caused numerous beach closures in Santa Monica Bay, and elsewhere, during the past ten years.

The Mediterranean climate, combined with the urban surroundings of the SMMNRA also present unusual water resources management challenges. Because the Santa Monica Mountains exist in a semi-arid climate within a major metropolitan area, the importation and use of water greatly affects the natural water supply.

Humans consume and dispose of large quantities of water which ultimately reach and leave the SMMNRA. Additional water is brought into the SMMNRA via the California and other aqueducts for urban, agricultural and industrial uses. The importation of water has increased the amount of natural infiltration and runoff within the SMMNRA, especially in areas of high urban development and has, in some instances, changed the character of natural stream flow from seasonal to intermittent, and from intermittent to perennial.

As mentioned, because the Mountains are adjacent to the Pacific, the influence of the ocean on park water resources must be considered. Alterations to either the terrestrial or marine environment may have profound effects on this coastal interface.

In addition, since the SMMNRA is relatively young, and public lands are still being acquired, the evolving plan for the SMMNRA must consider all aspects of water use in this multi-dimensional park.

I.A) PURPOSE OF THE PLAN

The purpose of the Water Resources Management Plan is to provide a critical and detailed examination of water resources and water-related issues in the Santa Monica Mountains. The plan defines a course of action based on law and National Park Service (NPS) policy for the protection, conservation, use and management of park water resources. The plan is also a repository for information about baseline conditions of SMMNRA water resources.

Specifically, the purpose of this plan is:

- To provide analysis and direction for the current and future management of water resources.

- To update and improve the quality and competitiveness of project statements related to water resources.

- To describe and interpret the water resources and water-related environments of the park.

- To establish professional contacts and to present a management framework that will facilitate the interagency cooperation necessary to manage the park's water resources.

- To update the 1984 Water Resources Management Plan.

FIGURE 1
SMMNRA ZONE

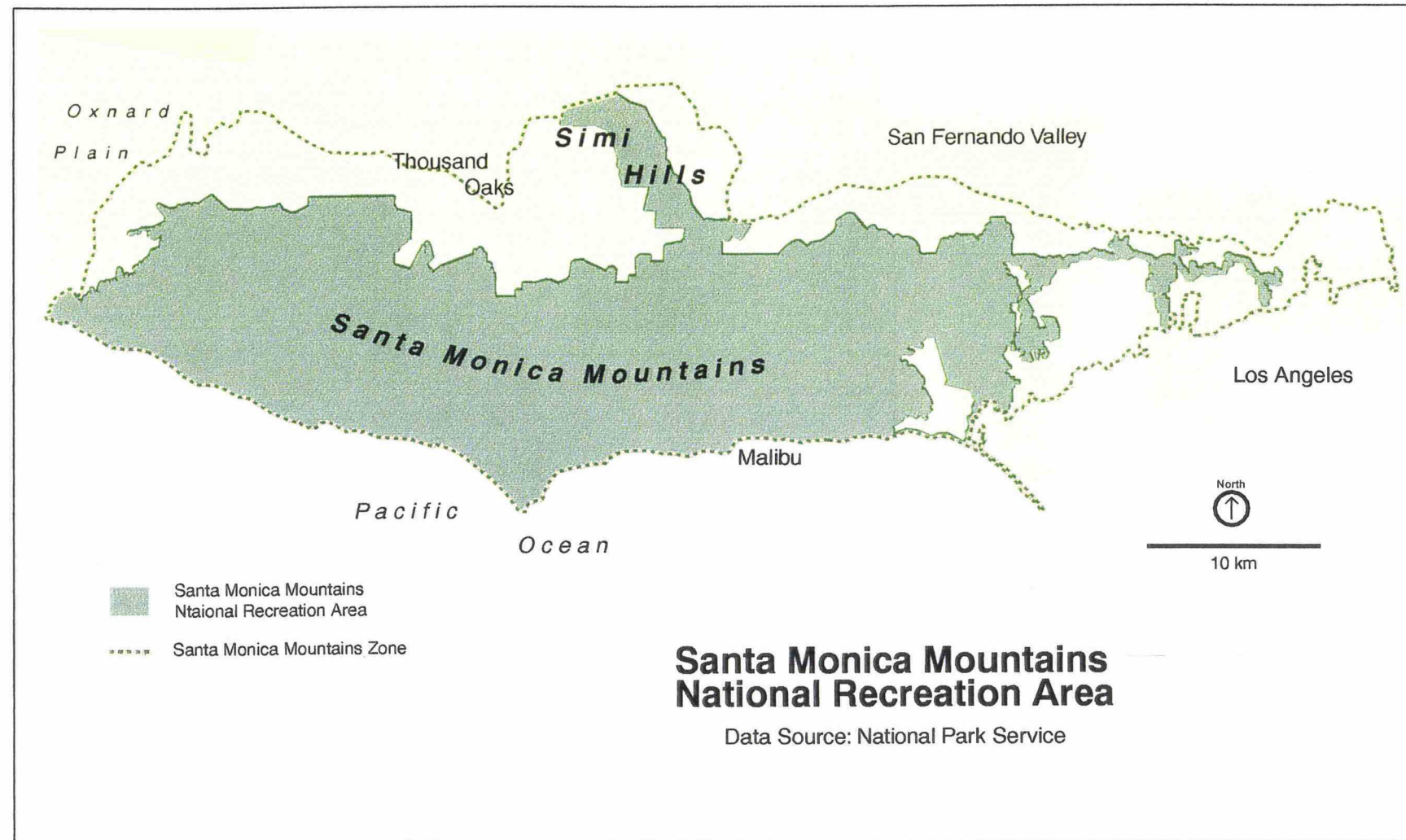


FIGURE 2
LAND OWNERSHIP

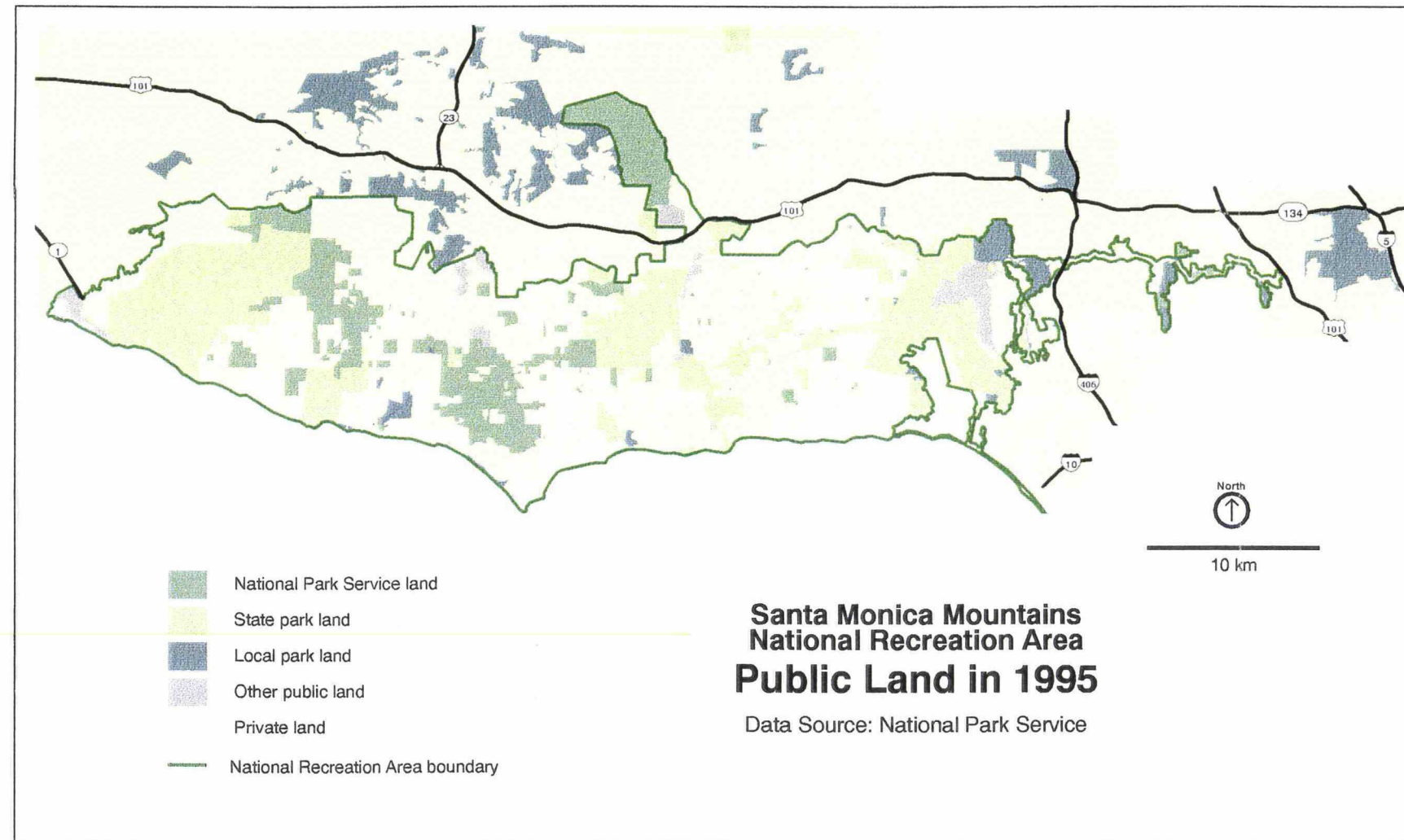
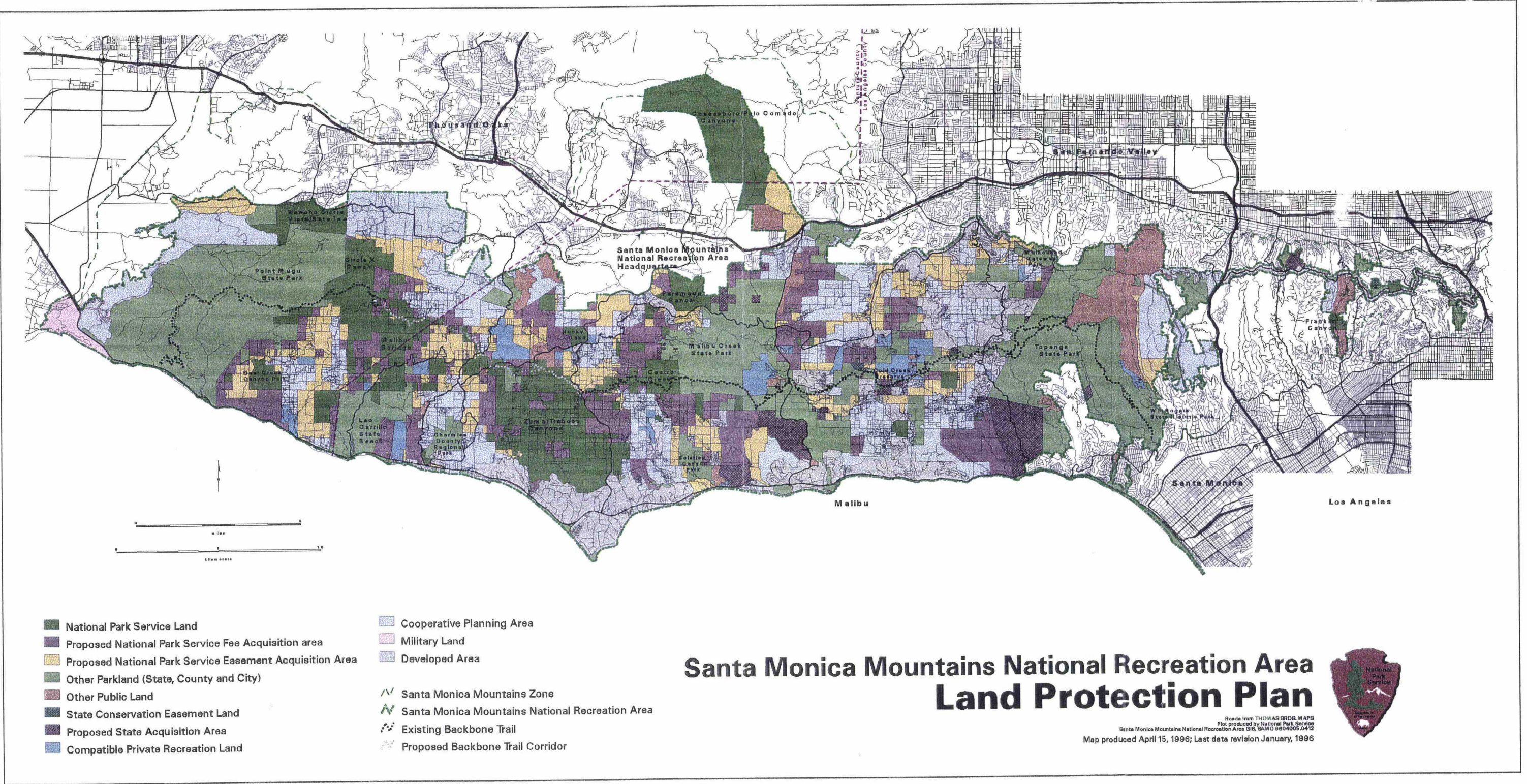


Figure 3. Public land in the Santa Monica Mountains and vicinity.

FIGURE 3
SMMNRA LAND USE PLAN



I.B) LEGISLATIVE AND REGULATORY RELATIONSHIPS

The SMMNRA, a unit of the National Park System, is located in an area that has many governing jurisdictions. Each agency has a specific agenda set by federal, state or local law. Therefore, unifying management practices and programs is difficult. As a federal agency, the NPS must adhere to all applicable federal, state and local laws.

The following federal, state, and local ordinances impact the management of water resources in the Santa Monica Mountains.

FEDERAL LEGISLATION AND AUTHORITIES

Enabling Legislation, Santa Monica Mountains National Recreation Area (P.L. 95-625, 1978)

The Santa Monica Mountains form the western boundary of the Los Angeles metropolitan area. The mountains and adjacent coastline constitute an expanse of natural landscape whose scenic, natural, cultural and recreational values are amplified because of the park's location. The contrast between the intensively developed, expanding urban complex and the Santa Monica Mountains is one of the area's most significant aspects. Overall, there is a severe deficit of recreational open space to serve the population in the Los Angeles/Ventura County region, which numbers over 10.5 million residents. The Santa Monica Mountains preserve a significant representation of a Mediterranean-type ecosystem.

Units of the National Park System were first established in or near large cities in the early 1970's to provide additional outdoor recreation opportunities for urban residents and to preserve the best remaining significant landscapes in metropolitan areas. Recognizing the natural, cultural and recreational values of the Santa Monica Mountains, Congress established the Santa Monica Mountains National Recreation Area in 1978. The enabling legislation (P.L. 95-625) instructed the Department of the Interior to "*manage the recreation area in a manner which will preserve and enhance its scenic, natural, and historic setting and its public health value as an airshed for the southern California metropolitan area while providing for the recreational and educational need of the visiting public.*" The national recreation area boundary, as stated earlier, encompasses approximately 150,000 acres in the mountains and along the coast, and the Santa Monica Mountains Zone, also designated in state and federal legislation brings the total area of interest in the Mountains to 225,000 acres.

In cooperation with other federal, state, local and private agencies and organizations, the NPS has identified strategies for the management, preservation, and use of lands within the boundary. The issues and objectives for managing the park water resources are identified by the park's General Management Plan (1982). Specifically, PL 95-625 says there should be "*preservation of beaches and coastal uplands*" and "*protection of undeveloped inland stream drainage basins*" within the SMM Zone. The legislation enables grants to the State for acquisition of lands, waters and interests therein.

Funds can also be made available to retire bonded indebtedness for water and sewer and other utilities already incurred, because if these are left outstanding they contribute to further development inconsistent with the approved park plan.

National Park Service Organic Act (1916) as Amended (1970 and 1978)

The Organic Act specifies that the NPS is responsible for the preservation and conservation of natural resources in all national park lands, united by a common preservational purpose, regardless of title or designation. Hence, all water resources in the National Park System are protected equally by federal law, and it is the fundamental duty of the NPS to protect those resources unless otherwise indicated by Congress.

National Historic Preservation Act (1966)

This Act sets forth the basic concern of the nation for the preservation of its heritage. Section 106 of this act requires comments on any project that involves any ground disturbance. Activities involving ground disturbance often impact water resources.

National Environmental Policy Act (NEPA) (1969)

This law requires a systematic analysis of major federal actions. Analysis includes consideration of reasonable alternatives and a description and synthesis of short and long-term irretrievable, irreversible, and unavoidable impacts. For any project which is determined to have significant impacts (as defined above), significantly affecting the quality of human life, federal agencies are required to prepare an Environmental Impact Statement (EIS). The primary purpose of the EIS is to ensure evaluation of impacts of proposed projects and to facilitate public review. For projects which may not have significant impacts, an Environmental Assessment (EA) may be prepared prior to the initiation of an EIS in order to determine if the preparation of an EIS is required. If the EA is determined sufficient, a Finding of No Significant Impact (FONSI) is signed.

Water Quality Improvement Act (1970)

This Act requires federally regulated activities to have state certification that they will not violate water quality standards. It is enforced by the Regional Water Quality Control Board.

Coastal Zone Management Act (1972)

The Coastal Zone Management Act provides assistance and encouragement to coastal states in the effective protection, and careful development, of the coastal zone.

The Resource Conservation and Recovery Act (1976)

This Act regulates solid and hazardous waste disposal. It protects ground water from waste disposal activities on land and provides “cradle to grave” standards for handling hazardous wastes.

Endangered Species Act (1973)

This Act provides for the conservation, protection, restoration, and propagation of selected species of native fish, wildlife and plants that are threatened with extinction. All agencies and organizations using federal funding must consult with the Secretary of the Interior on activities that potentially affect threatened or endangered flora and fauna.

Safe Drinking Water Act (1974) and Amendments (1986)

This Act sets national minimum water quality standards and requires regular testing of drinking water for developed public drinking water supplies.

Mining in the Parks Act (1976)

This Act closed any remaining NPS units to the location of mining claims and directed the Secretary of the Interior to regulate all activities within NPS units in connection with the exercise of mineral rights on claims. Current or historic mining activities may result in significant degradation of park water resources.

Protection of Wetlands (Executive Order 11990, 1977)

This order furthers the purposes of NEPA by directing federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands when practicable alternatives exist. The NPS Floodplain Management and Wetland Protection Guidelines (45 FR 35916, with minor revisions in 47 FR 36718) outline NPS requirements for complying with Executive Order 11990. All NPS actions subject to compliance with this Executive Order will be treated in an environmental document (EA or EIS). If a proposed action is located in a proposed wetland, a FONSI/Statement of Findings will be given public notice according to 40CFR 1506.6.

Floodplain Management (Executive Order 11988, 1977)

The objective of this executive order is to require agencies to avoid the long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

All NPS actions subject to compliance with this Executive Order will be treated in an environmental document (EA or EIS). If a proposed action is located in a proposed floodplain, a FONSI/Statement of Findings will be given public notice according to 40CFR 1506.6.

Federal Water Pollution Control Act [Clean Water Act (CWA)][1972]

The CWA was first promulgated in 1972 and amended in 1977, 1987, 1990 and 1994. This law was designed to restore and maintain the integrity of the nation's water. Goals set by the act were swimmable and fishable waters by 1983 and no further discharge of pollutants into the nation's waterways by 1985. The two strategies for achieving these goals comprised a major grant program to assist in the construction of municipal sewage treatment facilities and a program of "effluent limitations" designed to limit the amount of pollutants that could be discharged.

As part of the CWA, Congress recognized the primary role of the states in managing and regulating the nation's water quality within the general framework developed by Congress. All federal agencies must comply with the requirements of state law for water quality management, regardless of other jurisdictional status or land ownership. States, through best management practices and standards, implement the protection of water quality under the authority granted by the CWA. Best management practices are defined by the U.S. Environmental Protection Agency (EPA) as methods, measures, or practices selected by an agency to meet its non-point control needs. These practices include, but are not limited to, structural and non-structural controls, operational procedures, and maintenance procedures. They can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR, 1990). Water quality standards are composed of the designated use or uses made of a water body or segment, water quality criteria necessary to protect those uses, and an anti-degradation provision to protect the existing water quality.

Section 404 of the CWA further requires that a permit be issued for discharge of dredged or fill materials into waters (including wetlands) of the United States. The Army Corps of Engineers administers the Section 404 permit program, while oversight and veto powers are held by the EPA. Federal legislation and regulations are generally implemented by the states, with the EPA serving in an oversight role. A triennial review of a state's water quality regulatory program is conducted by each state's water quality agency to determine if its standards are adequate to meet federal requirements. These standards are then forwarded to the EPA for approval.

Executive Order 11987 (Exotic Species, 1977)

This Order states that executive agencies shall, to the extent permitted by law, restrict the introduction of exotic species into natural ecosystems on lands and waters which they own, lease or hold for purposes of administration; and shall encourage the states, local governments,

and private citizens to prevent the introduction of exotic species into natural ecosystems of the United States. The urban development within and adjacent to the park creates the threat of constant input of non-native species in the park. Exotic species are well established in the Santa Monica Mountains, especially adjacent to water resources.

Executive Order 12088 (Environmental Pollution, 1978)

This order requires that federal agencies, including NPS, cooperate with state, interstate, and local agencies in the preservation, control, and abatement of environmental pollution, including water pollution.

STATE LEGISLATION AND AUTHORITIES

Municipal Water District Act (1935)

This Act requires the formation of municipal water districts. This Act also provides funding through the issuance, sale, and payment of bonds for the construction or extension of water works, water systems, and water distribution systems.

County Water Authority Act (1944)

The County Water Authority Act extends the requirements of the Municipal Water District Act of 1935. This Act provides for the incorporation and government of county water authorities to provide management of the Municipal Water District Act of 1935.

Porter-Cologne Water Quality Control Act (1970)

This Act declares that the quality of all state waters shall be protected for the enjoyment by all people of the state, through conservation, control, and proper utilization. Additionally, all activities and factors that affect water quality shall be regulated in order to attain the highest water quality reasonably possible. Moreover, a statewide water quality control program is required to protect the health, welfare, and safety of the people of the state, administered regionally, within the framework of statewide coordination and policy.

California Environmental Quality Act (CEQA) (1970)

Any project, private or public, that is deemed to have a significant environmental impact in an area requires the preparation of an Environmental Impact Report (EIR) by a public agency or a negative declaration with appropriate public hearings.

California Coastal Act (the Coastal Act 1976)

The Coastal Act requires a developer to obtain a permit from the California Coastal Commission (Coastal Commission) for any development in the coastal zone (a few hundred feet in urbanized areas to five miles where significant coastal estuaries, habitat or recreational areas exist). A significant amount of the Santa Monica Mountains National Recreation Area occurs within the coastal zone.

Streambed Alteration Agreement, California Fish and Game Code Section 1603

Any development which substantially alters, diverts, or obstructs the natural flow of a stream, or changes the structure of a bed, channel, bank, or lake, must notify and receive approval from the California Department of Fish and Game.

Navigation Dredging Permit, California Fish and Game Code Section 5653

The California Department of Fish and Game requires the acquisition of a permit before using any type of suction dredge in any lake, river, or stream. The Corps of Engineers can regulate the discharge of dredged material if it is discharged into United States waters.

The Safe Drinking Water and Toxic Enforcement Act (Proposition 65, 1986)

Proposition 65 requires that businesses inform people prior to exposing them to certain amounts of any chemical listed (benzene, tobacco smoke, etc.) that can cause cancer or birth defects by the California Environmental Protection Agency (Cal-EPA). Moreover, Proposition 65 prohibits a business from discharging significant amounts of any chemical listed by Cal-EPA to cause cancer or reproductive effects into drinkable water sources or drainage areas of a drinking water source.

LOCAL STATUTES

Los Angeles County Flood Control Act (1915 & 1931)

This Act created the Los Angeles County Flood Control District. The District's primary responsibilities include for "*the control and conservation of flood, storm, and other waste waters, and for the protection of harbors, waterways.*" Additionally, the District is given the regulatory powers provided in the Municipal Water District Act of 1935 and the County Water Authority Act of 1944.

Ventura County Flood Control Act (1944)

This Act created the Ventura County Flood Control District. The Act gives the Ventura County Flood Control District the same police power given to the Los Angeles County Flood Control District, in Ventura County.

I.C) WATER RIGHTS

The United States may hold state appropriative, riparian, ground water, stockpond, and federal reserved water rights in Santa Monica Mountains National Recreation Area. Appropriative water rights are based on the Doctrine of Prior Appropriation wherein the party who first appropriates the water (applies it for a beneficial use) has a prior right to use, against all other appropriators. The doctrine is commonly called "*first in time, first in right*." Beneficial use as defined by the State of California includes municipal, irrigation, recreation, preservation, and enhancement of fish and wildlife resources, and other uses. An appropriative water right is a property right; under state law it can generally be bought and sold, and its place of use, purpose, and point of diversion may be changed without loss of priority, provided there is no injury to the water rights of others and environmental impacts are mitigated.

There are two basic types of appropriative water rights in the State of California--vested and post-1914. Water rights based on appropriation prior to the passage of the 1914 Water Commission Act are considered vested rights. Vested right holders are not required to file Statements of Water Diversion and Use with the California Water Resources Control Board (WRCB). However, without such Statements, it may be difficult to document continued use of water, which would be required if the right were to be disputed. Generally, vested water rights are claimed and documented in a water rights adjudication wherein all water users within a drainage area file claims to their right. Therefore, unless a water rights adjudication has occurred, it is difficult to ascertain all pre-1914 appropriative water right claims on a stream system.

Post-1914 appropriative water rights are ascertained under a permit system. Before appropriating water, a party must file an application with the WRCB. If there is unappropriated water available, the permit will generally be approved. Environmental studies, however, may be required to determine impacts and to establish required by-pass flows. Following approval of the permit, the applicant may commence water development. Construction must be completed within a reasonable time period; and if the appropriation is carried out in accordance with all requirements, the WRCB issues a license.

Riparian water rights apply only to riparian lands--those lands adjacent to the water body--and only for a reasonable use of water on the riparian lands. Unlike appropriative water rights, they are not lost by non-use. They can be lost, however, if the riparian land title is ever severed from the stream.

As with vested appropriative water rights, the State does not require that riparian rights be claimed or documented through Statements of Water Diversion and Use, although this documentation becomes valuable if the right is disputed.

For ground water diversions, the State of California only requires a permit for waters which constitute the underflow of a stream or are considered a subterranean stream flowing in a known and definite channel, as long as ground water is shared between users in a given ground water basin, and is limited to reasonable use.

An application to the WRCB is required for stockponds, unless the stockpond meets certain limited criteria. Upon approval of the application, which may involve a site inspection, the State issues a Stockpond Certificate.

Federal reserved water rights arise from the reservation of land by the federal government. When the federal government reserves land for a particular purpose, it also reserves, by implication, enough water unappropriated at the time of the reservation as is necessary to accomplish the purposes for which Congress or the President authorized the land to be reserved, without regard to the limitations of state law. The rights vest as of the date of the reservation, whether or not the water is actually put to use, and are superior to the rights of those who commence the use of the water after the reservation date. General basinwide adjudications are the means by which the federal government claims its reserved water rights. The McCarran Amendment (66 Stat. 560. 43 U.S.C. 666, June 10, 1952) provides the mechanism by which the United States, when properly joined, consents to be a defendant in an adjudication.

Once adjudicated by the State, the water rights of the United States--reserved, riparian, and appropriative--fit into the state administrative system along with those of all other water rights holders. In general, when it is brought into a general adjudication, the United States is given its only opportunity to assert its claim to water rights. Unless legally absent from the proceedings, it is generally understood that failure to assert a claim to water rights in such a proceeding may result in forfeiture of these rights.

Although the water rights adjudication issue is legal or administrative in nature, field dates, special studies, and literature searches may be required to support claims of the United States, when joined in a general water rights adjudication or involved in additional actions related to water rights.

Additional actions include responses to State actions to declare basins fully appropriated and to protest potentially damaging external water development proposals. Such responses usually entail the determination of the type, magnitude, and location of potential injury or benefit to the United States, and may involve the further quantification of federal water rights.

I.D) LAND STATUS, USES AND PLANNING RELATIONSHIPS

The Santa Monica Mountains represent part of one of the largest Mediterranean-type ecosystems in the world. As mentioned earlier, Mediterranean-type ecosystems occur in the mid-latitudes and are situated in limited coastal areas of the world (Mediterranean Sea countries, central Chile, southwestern Australia, and South Africa). These areas are characterized by mild, wet winters and hot, dry summers. As a unit of the National Park System, the SMMNRA contains portions of the nation's cultural and natural heritage that have remained largely under-represented in other Department of the Interior lands. In addition, more than 20 major themes identified in the 1972 "National Park System Plan" are contained in the Santa Monica Mountains (Statement of National Significance, 1995).

LAND STATUS

Management of the SMMNRA has aspects both like and unlike the management of other national parks because here in the Santa Monica Mountains, Congress created a unique experiment in cooperation by the park's enabling legislation. This legislation, along with the Santa Monica Mountains Comprehensive Plan, the General Management Plan, Development Concept Plans, and other park plans, reveal a unique complexity of organization. The creation of a national park in an area with minimal federal land ownership, at the outset, required cooperation at all levels of government. The continuing acquisition of park lands affects those neighboring properties as well. As the SMMNRA has evolved from its inception with no land holdings to its present 21,413 acres, the dependency of cooperation with its neighbors and other agencies has become more evident. At the present time, the combined park lands for all agencies, federal, state and local, constitute one-half of lands within the SMMNRA boundary. Interspersed among these park properties are residential communities and properties, other public lands and commercial/industrial ownerships. In **Figure 2** the various jurisdictions are identified.

The park is surrounded on the inland side by the City of Los Angeles, the County of Los Angeles, the cities of Hidden Hills, Agoura Hills, Simi Valley, Thousand Oaks, West Hollywood, Westlake Village, Calabasas, and Ventura county. On the ocean side the property is bordered by the U.S. Navy, the State of California, the counties of Los Angeles and Ventura, the cities of Santa Monica, Beverly Hills and Malibu. In addition to these political jurisdictions, there are a number of federal, state, county and local agencies with responsibilities for various properties and resources within the SMMNRA. Overall, the SMMNRA is the agency with broad oversight responsibility for lands, regardless of ownership. Within the park boundary, the land is a patchwork of private and public properties. Each one of these properties must be dealt with individually.

USES

Resource protection must be accomplished by cooperation with other land management agencies. There are over 60 different agencies the NPS needs to coordinate and consult with on resource management issues. In **Figure 3**, the various land uses within and outside SMMNRA are shown. There are landfills, water treatment plants, beaches, parks, residences, commercial properties, highways and cities. The uses of the resources within the SMMNRA encompass almost all aspects of human activity. The SMMNRA must be sensitive to each of these uses while it works toward fulfilling its mandate of maximizing the use of the property in the Santa Monica Mountains for natural and cultural resource preservation and recreation.

PLANNING RELATIONSHIPS

The SMMNRA is highly dependent on other agencies for management of land within the park and zone. This means that the resource database and protection program must encompass the entire Santa Monica Mountains Zone, not just NPS-owned lands. Much of the land within the park boundary will remain privately owned; therefore, all management agencies must develop cooperative stewardship programs to accomplish individual as well as common goals for the park. Even among park staff, the implications of this concept are still being explored. Because natural and cultural resources are themselves diverse and complex, the management of resources is also diverse and complex.

The State of California and its subdivisions in the counties and cities import water from northern California to serve the needs of the local citizens. The California Water Project brings water to southern California from the Sacramento Delta and the Oroville Dam into the Central Valley and the metropolitan Los Angeles area. The City of Los Angeles imports water from the eastern Sierra Nevada. The importation of large quantities of water to the Santa Monica Mountains has placed an additional burden on the natural water resources. Some of this water is contaminated by wastewater, and this compromised quality increases the need for additional monitoring. With increases in quantity and decreases in quality of the water resources, excessive demands are made on the management of these resources by the NPS and other agencies with jurisdiction in the Santa Monica Mountains.

The NPS as a partner with the public, with other public and private agencies and private landowners, shares the stewardship of the lands within the SMMNRA boundary. The NPS does not, and never will, own or manage all the lands in the Santa Monica Mountains. The NPS is building a spirit of cooperation amongst these groups to preserve and protect the natural and cultural, recreational and scenic resources in the park. The enabling legislation envisions the NPS as the lead agency in protecting these natural, cultural, scenic and recreational resources.

I.E) IDENTIFICATION OF WATER RESOURCES ISSUES

The water resources issues identified below were delineated with input from several management agencies with jurisdiction in the Santa Monica Mountains. These have been identified as priority issues by NPS and other resource management agency staff.

- * Create an Interagency Combined Water Data Repository
- * Reduce Non-point Source Pollution
- * Manage Sensitive, Threatened and Endangered Species
- * Inventory Water Resources
- * Identify Monitoring Objectives
- * Evaluate Adequacy of Monitoring Networks
- * Study Water Rights
- * Coordinate with Other Planning Efforts
- * Manage Ground Water
- * Manage Waste Water
- * Investigate Water Quantity Issues
- * Manage Exotic Species
- * Research Coastal Lagoons
- * Study Sedimentation
- * Evaluate Fire Management Impacts on Water Resources
- * Research Baseline and/or Historic Conditions
- * Implement Clean Water Act and Coastal Zone Management Act
- * Manage Floodplains
- * Identify Existing Landfills
- * Manage Fisheries
- * Identify Reservoirs, Sediment Catchment Basins, and Offshore Sediment Enhancement Projects
- * Manage Stormwater
- * Identify Landfills (Existing and Potential)
- * Research Impacts of Superfund Sites on Adjacent Lands

CHAPTER II

THE HYDROLOGIC ENVIRONMENT

II.A) INTRODUCTION

The diversity of water management concerns in the Santa Monica Mountains National Recreation Area is limitless. The physical setting of the Santa Monica Mountains as a coastal ocean-interface demands concern for the terrestrial influences on the marine environment and the marine influences on the terrestrial environment.

The Mediterranean-type climate of prolonged dry periods with intermittent periods of moderate to heavy rainfall creates major ecological and environmental impacts. The climate that exists in the Santa Monica Mountains is attractive to humans who provide an impact of greater significance than any of the naturally occurring perturbations to the environment. By their daily activities these persons have an impact upon the water resources of the SMMNRA without ever physically setting foot within the park.

Within the SMMNRA there are many federal, state and local agencies and jurisdictions which influence management of the water resources. In the Los Angeles area there are more than ten million people.

This hydrologic environment chapter will describe the physical and biological components of the hydrologic environment and then try to identify the impacts each has upon the other. Wherever it is appropriate, the influence of urban or human impacts on the hydrological environment will be explored.

II.B) DESCRIPTION OF THE AREA

The topography of the Santa Monica Mountains is characterized by steep, sparsely vegetated, unstable slopes with narrow canyons that trend north-south to the sea. The area is bordered on one side by the Pacific Ocean and by urbanized areas on the inland side. On the western side is the Oxnard Plain which supports major agricultural activities as well as urban influences. There are over ten million people in the area surrounding the park. Despite heavily pocketed development, the park is an area of minimal development within the most intensely developed area in southern California and is still ninety percent open space. Air pollution in the Los Angeles basin regularly spills into the park. The park area is a mosaic of ownerships, with California State Parks as the largest land holder, followed by the NPS. There is private ownership contiguous with the public agencies within the area.

II.B.1) CLIMATE

The mediterranean climate of the Santa Monica Mountains and much of southern California is what contributes to the remarkable "liveability" of this area. Mediterranean climates, characterized by hot, dry summers and mild, wet winters, occur in only 5 locations throughout the mid-latitudes of the world, generally on western continental margins: in the U.S., near the Mediterranean Sea, in central Chile, southern and southwestern Australia, and in South Africa. The dominant vegetation type in all of these places--the scrubby brush called "chaparral" in California, "maquis" in Portugal, "matorral" in Chile, "heath" in southwestern Australia and "fynbos" in South Africa--is also similar.

The climate in the watersheds of the southern California coastal region is warm dry summers and mild wet winters. Eighty-five percent of rainfall occurs in the winter season from November to March. Mean annual precipitation varies from about 12 inches in the valleys to about 30 inches in the higher elevations (**Figure 1**). According to data from the Los Angeles County Department of Public Works, the wettest rainfall year in the last decade was 48.6 inches recorded at the Topanga Ranger Station at 745 feet above sea level and the driest at the same station was 7.9 inches (**Table 2**).

The climate in southern California is influenced by the eastern arm of the subtropical high-pressure system, which migrates from the northeast to the southwest in the eastern Pacific. During the summer months, the subtropical high moves northeast along the California coast; this movement causes storms in the North Pacific to follow a more northerly path. The clockwise circulation of the high pressure system also brings cool, moist air from the Pacific inland, creating a coastal fog common in the Santa Monica Mountains during the summer. In winter, the subtropical high moves southwest allowing the Pacific storms to extend south into California.

Although the entire SMMNRA is located in the Mediterranean climate zone, there are large differences in temperature and precipitation throughout the SMMNRA. The coastal areas, such as Malibu, have less severe temperature changes and greater amounts of rainfall than those inland areas such as the San Fernando Valley where there are colder winters and hotter summers and less rainfall. The intervening mountains of the SMMNRA block the moderating effects of the ocean from affecting inland areas. Three types of storms produce precipitation in the SMMNRA watersheds.

(1) General Winter Storms: These storms occur during the period from December to March. They originate over the Pacific Ocean as a result of the interaction between polar and tropical Pacific air masses and move eastward over the basin. They often last for several days and are accompanied by widespread precipitation accompanied by more general flooding.

(2) Local Storms: These can occur at any time of the year and are generally associated with

frontal systems. They cover comparatively small areas but result in high intensity precipitation for durations of up to 6 hours and can cause local flooding.

(3) General Summer Storms: These occur during the late summer and early fall. These storms are not frequent and since they come near the end of the dry season, they rarely result in flooding.

The rainfall for the past ten years for four Los Angeles rain stations is illustrative of the precipitation occurring in the SMMNRA in Tables 1 & 2. The actual rainfall varies from sea level to the higher altitudes and from north to south. The monitoring station at Carbon Canyon is at 50 feet, Malibu Beach-Dunne is at 160 feet, Santa Ynez Reservoir is at 735 feet and the Topanga Ranger Station is at 745 feet. The total annual rainfall for the last ten years at each of these stations and the extremes over the last ten years for these stations are shown in Tables 1 & 2 where there is a three to seven times difference between high and low rainfall years, see Appendices D-G.

Usually the weather is mild but there are two weather-related phenomena which cause profound changes in the SMMNRA. The first is flooding from powerful and unremitting storms in the winter. In January of 1995, nine inches of rain fell in one day causing major flooding, damaging houses and resources. In the last 50 years of records for these four stations, the highest twenty-four-hour rainfall was 12.44 inches on January 22, 1943 at the Topanga Ranger Station. There have been eight days with greater than five inches of rain at the Topanga Ranger Station. The second phenomenon is drought; seven of the last ten years have been considered drought years in California.

Prior to the wet season, hot strong winds frequently appear with velocities in excess of 70 miles per hour. These winds are called Santa Ana winds and come from high pressure areas over the deserts. These winds lower fuel moisture and create dangerous fire conditions. Coming near the end of summer, Santa Ana Winds continue to dry vegetation and, combined with little or no precipitation, contribute to high fire hazards as fall approaches.

Atmospheric circulation patterns influence the intensity of smog in southern California. The development of strong temperature inversions, which inhibit vertical air mixing, occurs mostly in the summer months. In the presence of temperature inversions, visibility is greatly reduced and pollutants are trapped close to the ground. Persistent strong high inversion layers during the summer, combined with intense solar radiation, increase the photochemical reactions which contribute to the amount of ozone and smog produced. The result is lower air quality in the summer months. Weakened inversion layers in the winter provides for better air quality. The solar radiation reaches the ground in the winter, heats the ground and causes air to rise, creating convective air currents. Trapped pollutants during the summer season also contribute to contamination of surface waters.

TABLE 1
TOTAL ANNUAL RAINFALL FOR LAST TEN YEARS
(inches)

RAIN YEAR	SANTA YNEZ RESERVOIR	MALIBU BEACH	CARBON CANYON	TOPANGA RANGER STATION
93-94	9.8	8.5	9.6	15.0
92-93	37.1	23.2	28.0	48.6
91-92	27.6	17.1	16.4	32.0
90-91	10.0	10.0	11.0	17.2
89-90	--	7.2	4.7	12.4
88-89	14.3	8.1	3.8	12.8
87-88	18.4	12.4	12.9	21.6
86-87	6.2	8.2	3.9	7.9
85-86	27.9	21.6	21.9	31.9
84-85	14.2	11.6	9.2	13.2
83-84	11.3	9.3	9.4	14.1

TABLE 2
MEAN AND EXTREME RAINFALL FOR LAST TEN YEARS
(inches)

STATION	MEAN	MAX(year)	MIN(year)	MAX(mo)	MIN(mo)
Santa Ynez	19.6	37.1	6.2.	16.9	0.0
Malibu Beach	13.7	23.2	7.2	9.0	0.0
Carbon Canyon	10.1	28.0	3.8	11.0	0.0
Topanga Ranger Station	22.8	48.6	7.9	19.5	0,0

II.B.2) GEOLOGY AND PALEONTOLOGY

The Santa Monica Mountains incorporate the greatest geological diversity of all major mountain ranges within the Transverse Range Province. The mountains are a complex assemblage of marine and non-marine deposition. The topographical relief is a result of differential erosion and plate tectonics (e.g., uplifting, folding and faulting).

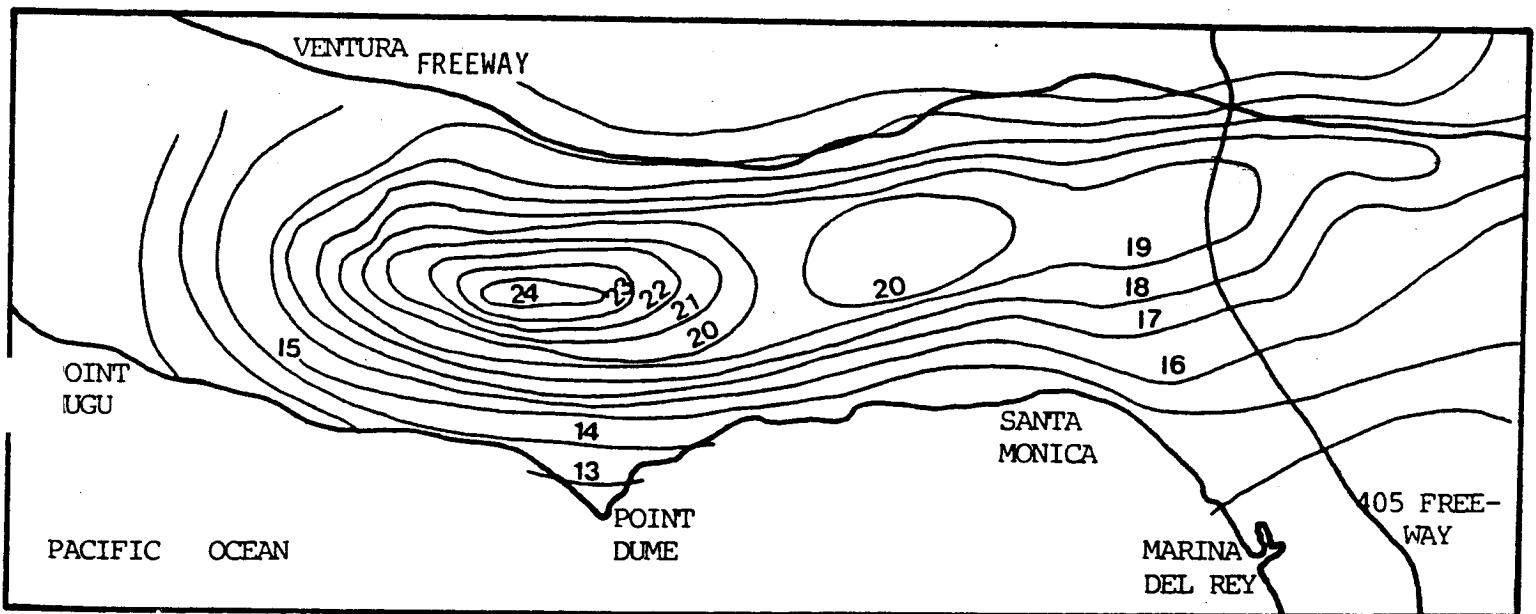
The oldest rocks in the Santa Monica Mountains are the Santa Monica slates, a metamorphic, marine sedimentary rock of mid-Jurassic origin. Marine deposited shales and greywacke were metamorphosed by granitic intrusions, forming the black slates, phyllite, spotted slate, and fine-grained schist typical of this formation. The slates make up the basement rocks for the western and central Santa Monica Mountains and are exposed extensively in the range, east of Topanga Canyon.

The granitic intrusives which metamorphosed the shales were part of the same Mesozoic event that produced the massive granitic batholiths in the Sierra Nevada (Norris and Webb, 1978). The granitic intrusions also formed the basement rocks of the eastern Santa Monica Mountains. They are exposed northwest of Hollywood and around Cahuenga Peak.

Following the granitic intrusions, the slates were uplifted and gradually eroded until the late Cretaceous. After this a period of continuous deposition began as the spreading sea began depositing conglomerates, sandstones and shales. Although this deposition was primarily of marine origin, there were short periods of terrestrial deposition. Two depositional events from this period are the Trabuco and Tuna Canyon formations. The thin Trabuco formation consists primarily of conglomerates. This fossiliferous formation also contains foraminifera, mollusks and ammonites.

The primary uplift, erosion of elevated formations and depositional sea occurred during the Cenozoic era. The Coal Canyon (Martinez) formation represents a period of extensive deposition which resulted in marine shale, conglomerate, sandstone and siltstone. These sediments accumulated to a maximum thickness of 8,500 feet. Some fossils, characterized by the gastropod *Turritella pachecoensis*, occur in the Coal Canyon formation. From the late Eocene to the early Miocene, a non-marine floodplain deposit of up to 3,500 feet thick was formed. This outcropping is characterized by the Sespe formation, or "red-beds," consisting, mainly of sandstone, siltstone, shale and conglomerates. The floodplain condition persisted until the upper Oligocene, when the seas passed over the site of the present Santa Monica Mountains. Changes in the earth's crustal behavior occurred as a result of plate tectonics (Vedder and Howell, 1980). There was a change in the Pacific and North American plate movements from convergent to right lateral shear which caused a change in the topography of southern California from a shelf comprised of depositional landforms to the ridges and basins present today.

FIGURE 4
RAINFALL ISOHYETS



SANTA MONICA MOUNTAINS AND VICINITY (Environmental Protection Agency, 1977). (Contours at one inch intervals)

By the middle Miocene, this sedimentary phase was disrupted with a period of massive volcanic deposition in the western Santa Monica Mountains. In the lower Miocene, major sedimentary deposits, including the Vaqueros formation, Simi, Lajas, Calabasas, Trabuco, Tuna Canyon and the Topanga formations occurred.

Subsequent to the Miocene deposition, extensive intrusive and extrusive volcanic activity occurred during the middle Miocene in the Santa Monica Mountains. Volcanic formations from this period are called the Conejo Volcanics and are composed of alternating layers of andesitic and basaltic flow-breccias, mudflow-breccias, flows, pillow-breccia and aquagene tuffs, overlying the Topanga Canyon formation (Raven, Thompson and Prigge, 1986, from Yerkes and Campbell 1979). The Conejo Volcanics are exposed extensively in the western part of the Mountains, and exist only in a few locations east of Topanga Canyon.

In the late Miocene, subsequent to the Conejo Volcanics, there occurred the deposition of the sandstones, siltstone and sedimentary breccias of the Calabasas formation in the western and central Santa Monica Mountains. The late Miocene also represented some of the greatest encroachment of the sea in the vicinity of Ventura and Los Angeles. During this period, 4,500 feet of marine diatomite, shale, sandstone, chert and basal conglomerate were deposited, forming the Modelo formation.

According to Yerkes and Campbell (1979), the geology of the area south of the Malibu Coast Fault differs from that of the rest of the Santa Monica Mountains. This area includes the coast west of Carbon Canyon and Point Dume. The Trancas and Zuma formations which occur here do not occur in the rest of the range, but the Monterey formation does occur elsewhere. The Trancas formation is a mixture of sedimentary marine rocks, including sandstones, mudstones, siltshale, claystone and breccia. The Monterey formation is composed of shale, and the Zuma formation is volcanic, consisting of basaltic and andesitic flows, breccias, pillow lavas, mudflow breccias and aquagene tuffs. This early to middle Miocene volcanic formation is similar to and correlates with the Conejo Volcanics.

Thick accumulation of shales, sandstones and clays continued to occur during the Pliocene. The Pico formation, characteristic of this period, has a maximum thickness of about 1,000 feet. Vedder and Howell (1980) estimate that the sea was nearly 4,900 feet deep near Ventura and up to 8,200 feet deep near southeastern Los Angeles. The Santa Monica Mountains were a chain of islands within this Pliocene sea. During this era, they were uplifted and eroded to their present form (Bailey and Jahns, 1954; Dibblee, 1982). In the Pacific Palisades, where deep canyons have been cut through the thick Pleistocene alluvium, Pliocene rocks--soft claystone, siltstone and sandstones--are exposed (**Figure 5**).

In the early Quaternary, more uplift occurred and the Mountains have been in an erosional-uplift cycle since then. In both the Pliocene and the Pleistocene, extensive alluvial fans were deposited surrounding the Santa Monica Mountains in the Los Angeles Basin, San Fernando Valley and Oxnard Plain. On the south side of the Mountains, remnant sandy marine terraces at Malibu

Creek and Point Dume represent former shorelines. Changes in sea level, crustal deformation, erosional processes and fluvial deposition, including gravels and sands accumulated.

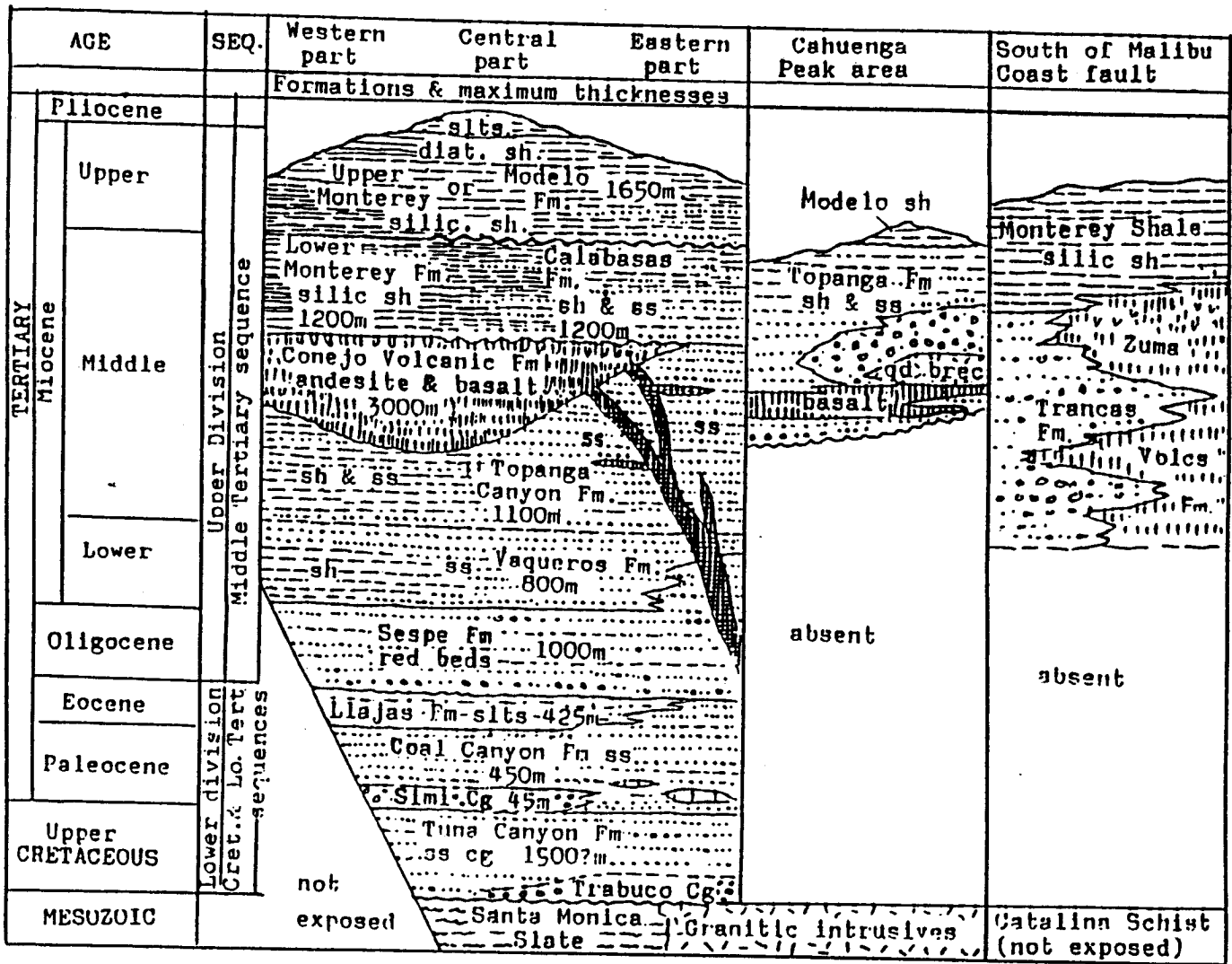
The Chatsworth and Topanga Sandstones have been recognized as the bedrock aquifers, locally capable of producing limited quantities of fair quality water. This type of bedrock aquifer stores and transmits water mainly through secondary porosity provided by fractures and other rock discontinuities. The Conejo Volcanic Formation is the main bedrock in the Santa Monica Mountains with water production also from fracture porosity. There is limited data about the Las Virgenes Canyon Alluvium and Bedrock as well as the Russell Valley Alluvial and Bedrock Aquifers.

Uplifting of the Santa Monica Mountains continues today at the rate of one inch per thousand years (measured at Point Dume). Uplift occurs as a direct result of compressional plate tectonics, manifested as numerous small and some large earthquakes throughout southern California. There have been no reported changes in the springs or seeps due to the recent tectonic activity from the recent 1995 Northridge earthquake and aftershocks.

II.B.3) SOILS

Mediterranean climates provide some of the world's highest sedimentation yields. Since this setting of climate, vegetation and topography is predisposed to high erosion rates, the land will be inordinately susceptible to any natural or man-caused changes.

FIGURE 5
STRATIGRAPHY OF THE SANTA MONICA MOUNTAINS
 Dibblee (1992)



Fourteen soil associations were mapped in the Ventura County Soil Survey (1970). These include the following:

1. Pico-Metz-Anacapa
2. Mocho-Sorrento-Garretson
3. Camarillo-Hueneme-Pacheco
4. Riverwash-Sandy Alluvial-Coastal Beaches
5. Rincon-Huerhuero-Azule
6. Ojai-Sorrento, Heavy Variant
7. San Benito-Nacimiento-Linne
8. Castaic-Balcom-Saugus
9. Calleguas-Arnold
10. Gazos-Santa Lucia
11. Millsholm-Malibu-Los Osos
12. Sespe-Lodo
13. Sedimentary Rock Land-Gaviota
14. Hambright-Igneous Rock Land-Gilroy

The Pico-Metz-Anacapa to the Riverwash-Sandy Alluvial-Coastal Beaches (numbers 1-4) can be classified as having moderate to level slopes, with excessively to poorly drained soils on alluvial fans, plains and basins. They are primarily derived from sedimentary rocks and to a lesser extent from basic igneous rocks. Annual grasses, forbs, brush and scattered oak trees are their dominant vegetation. In the Santa Monica Mountains, Hidden Valley soils match these characteristics.

The Rincon-Huerhuero-Azule and Ojai-Sorrento, Heavy Variant (numbers 5 and 6) can be described as being located on level to moderately steep slopes and being well drained to moderately well drained. Most of these soils formed from alluvium derived from sedimentary rocks on old terraces. A few derive from alluvial fans. Soils from association number 5 can be found in the Simi Hills portion of the Santa Monica Mountains NRA.

The San Benito-Nacimiento-Linne through Hambright-Igneous Rock Land-Gilroy (numbers 7 through 14) make up most of the rest of the Santa Monica Mountains and Simi Hills. These soils can be classified as being found on moderate to very steep slopes and are well drained to excessively drained upland soils. They may be shallow to very deep over somewhat consolidated sediments, sandstone, shale or basic igneous rocks.

The following additional soil associations were mapped in Los Angeles County and constitute the remaining portions of the Santa Monica Mountains (numbers are according to Report and General Soil Map, Los Angeles County, California--1969):

10. Oceano
24. Perkins-Rincon

- 28. Hambright-Gilroy
- 34. Diablo-Altamont
- 36. Altamont-Diablo
- 37. San Andreas-San Benito
- 42. Rock Land-Rough Broken Land

Soils of the Oceano Association occur on nearly level slopes, and are excessively drained and wind eroded. They are derived from wind-blown sands and have a thin surface layer (accumulation of organic matter). In the Santa Monica Mountains, these soils are found at the tip of Point Dume.

Soils of the Perkins-Rincon Association have 0-15 percent slopes, are well drained and are located on terraces to 500 feet. They occur along the Pacific Coast Highway from Leo Carrillo State Beach to Trancas Canyon.

Soils of the Gaviota-Millsholm Association occur on steep mountainous upland terrain from 100 to 3,500 feet. They are somewhat excessively drained and are derived from shattered shale or fine grained sandstone. In the Santa Monica Mountains, they occur in a band from Leo Carrillo State Beach north to Castro Crest and south to Las Virgenes and then spread out toward Topanga Canyon Road. East of Topanga Canyon, they are found in a band that includes the peaks stretching toward San Vicente Mountain and Interstate 405 south of the Encino Reservoir.

The Hambright-Gilroy Association makes up the greatest portion of Los Angeles County within the Santa Monica Mountains. These soils have 15 to 50 percent slopes, are well drained and are derived from basic igneous rock. They extend through the middle portion of the Santa Monica Mountains from the Ventura County line through Saddle Peak eastwards and occur in pockets along Topanga Canyon and Corral Canyon.

Soils of the Diablo-Altamont Association occur on rolling foothills, and are relatively deep and well drained. These soils are derived from strongly calcareous shale. In the Santa Monica Mountains, they occur beyond the tip of Point Dume.

Soils of the Altamont-Diablo Association have steep eroded slopes and, as a result, compared to those of the Diablo-Altamont Association have reduced depth and water-holding capacity. In the Santa Monica Mountains, they occur north of Highway 101 along the Ventura County line and north of the reverse association above Point Dume.

The San Andreas-San Benito Association soils occur on steep to very steep mountainous terrain up to 1,500 feet. They are somewhat deep, well-drained and are derived from sandstone. In the Santa Monica Mountains, they occur from Topanga Canyon Road east to Interstate 405, except where the band of Gaviota-Millsholm soils occurs along the peaks.

The Rock Land-Rough Broken Land Association occurs on strongly sloping to steep mountainous upland. This miscellaneous association is characterized by very shallow soils and rocky outcrops that cover 50 to 90 percent of the area. In the Santa Monica Mountains this association occurs at Brents Mountain in Malibu Creek State Park and other rocky areas near the Ventura County line and at Topanga Lookout.

II.B.4) WATER RESOURCES

INTRODUCTION

Since humans first appeared in this area, the limiting factor in all their activities has been the availability of water. Available surface waters were limited and the semi-arid conditions made most of the streams seasonal, flowing only during the rainy season. The steep terrain of the mountains prevented much ponding, and water from winter storms rapidly flowed to the sea. The watersheds shown in **Figure 6** illustrate the number of coastal canyons and the steep topography. This section will describe the physical characteristics of the water resources and their current uses.

BASIN MORPHOMETRY

The drainage network for the Santa Monica Mountains Zone is comprised of numerous major arterials and tributaries which reflect a high degree of organization (**Figure 6**). Horton (1945) and Strahler (1950) developed a methodology of ordering streams for network analysis. Through basin morphometry, stream networks can be quantified to determine drainage basin/network properties and to establish the dynamics of stream behavior within the system. This is accomplished through stream order analysis, which involves ranking tributaries within a drainage basin on the basis of total stream segments. A first order stream would have no tributaries. At the confluence of two first order streams a second order segment develops. The ordering routine continues until all streams are accounted for accordingly and the highest order stream has been determined. Streams are assigned a third order only when two second order streams join.

This procedure was employed for network analysis throughout the Santa Monica Mountains. The drainage network included all major streams and their tributaries delineated on 7.5-minute (scale=1:24,000) USGS Quads. The analysis was inclusive of both perennial *and* intermittent streams.

There are a total of 828 stream segments which can be identified from USGS Quads throughout the Santa Monica Mountains Zone. This includes 179 major streams with 49 coastal outlets (**Table 3**). Within the zone there are a total of 656 first order stream segments, 137 second order, 29 third order, five fourth order, and one fifth order stream (**Table 4**).

The first order segments are generally of short duration, flowing in a relatively straight course with origins in the higher elevations. The higher the stream order, the greater a stream's tendency to travel greater distances and increase its sinuosity (curvature).

The nature of the geometric progression for the stream courses in the Santa Monica Mountains was determined through the generation of bifurcation (branching) ratios for the drainage network. These ratios were determined through the comparison of the number of stream segments at a given order to those of the next lower designated order. Most stream networks have bifurcation ratios which range between 3.5 and 4.5 (Leopold, 1974).

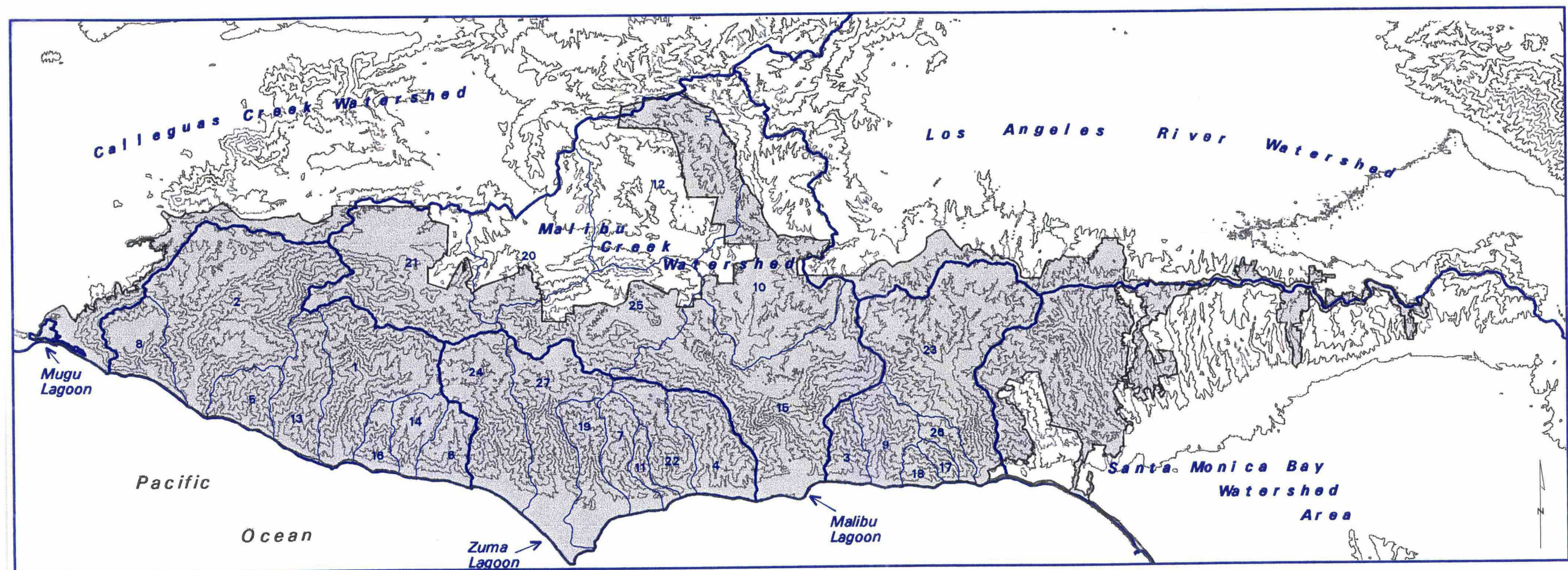
In the Santa Monica Mountains, bifurcation ratios are slightly above the 3.5 to 4.5 range (Table 4). There are 4.8 first order stream segments for every second order stream within the mountains. Likewise, there are 4.72 second order segments for every third order stream. The range of third to fourth order streams was 5.8 and fourth vs. fifth was 5.0. The higher ratios for these last two comparisons is due to the well developed and extensive dendritic drainage patterns in the Santa Monica Mountains, which are a result of active mountain building and the severity in steepness of slopes.

The linear progression of stream order for the Santa Monica Mountains can better be illustrated through semi-logarithmic plots (Figure 7). A straight line progression in decreasing stream order is apparent. The relationship between all 5 stream orders and the associated number of stream segments demonstrates that the overall character of stream patterns and flow is highly organized and tends toward efficiency of drainage. The slope of the plotted line is a function of stream order (x-axis) against the total stream segments of that order (y-axis). The straightness of fit is indicative of the constant ratio of the lower ordered streams to those of the next higher order.

Stream analysis for all watersheds in the Santa Monica Mountains was completed (Appendix C). The largest watershed located completely within the Zone is the Malibu Creek Watershed. It contains a total of 105 square miles and incorporates several major drainage basins (Medea Creek, Triunfo Creek, Cold Creek, Malibu Creek, Sleeper, Las Virgenes, and Potrero Valley). The Malibu Creek Watershed contains a total of 225 stream segments within six major drainages.

Conversely, the smallest stream courses in the Santa Monica Mountains are the "isolated" drainages. These streams represent those segments which are unnamed on USGS Quads and in most cases are only first order streams. This group comprises 17 percent of all streams which represents a total of 131 segments.

FIGURE 6
WATERSHED MAP OF SMMNRA



Watersheds and Subwatersheds **Santa Monica Mountains National Recreation Area**



II-15

Subwatershed Names

- | | |
|---------------------------|------------------------|
| 1 Arroyo Sequit | 15 Monte Nido |
| 2 Big Sycamore Canyon | 16 Nicholas Canyon |
| 3 Carbon Canyon | 17 Pena Canyon |
| 4 Corral Canyon | 18 Pierdo Gorda Canyon |
| 5 Deer Canyon | 19 Ramera Canyon |
| 6 Encinal Canyon | 20 Russell Valley |
| 7 Escondido Canyon | 21 Sherwood |
| 8 La Jolla Valley | 22 Solstice Canyon |
| 9 Las Flores Canyon | 23 Topanga Canyon |
| 10 Las Virgenes Canyon | 24 Trancas Canyon |
| 11 Latigo Canyon | 25 Triunfo Canyon |
| 12 Lindero Canyon | 26 Tuna Canyon |
| 13 Little Sycamore Canyon | 27 Zuma Canyon |
| 14 Los Alisos Canyon | |

 Watersheds

 Subwatersheds

 Santa Monica Mountains
National Recreation Area

10 miles

TABLE 3
SANTA MONICA MOUNTAINS ZONE

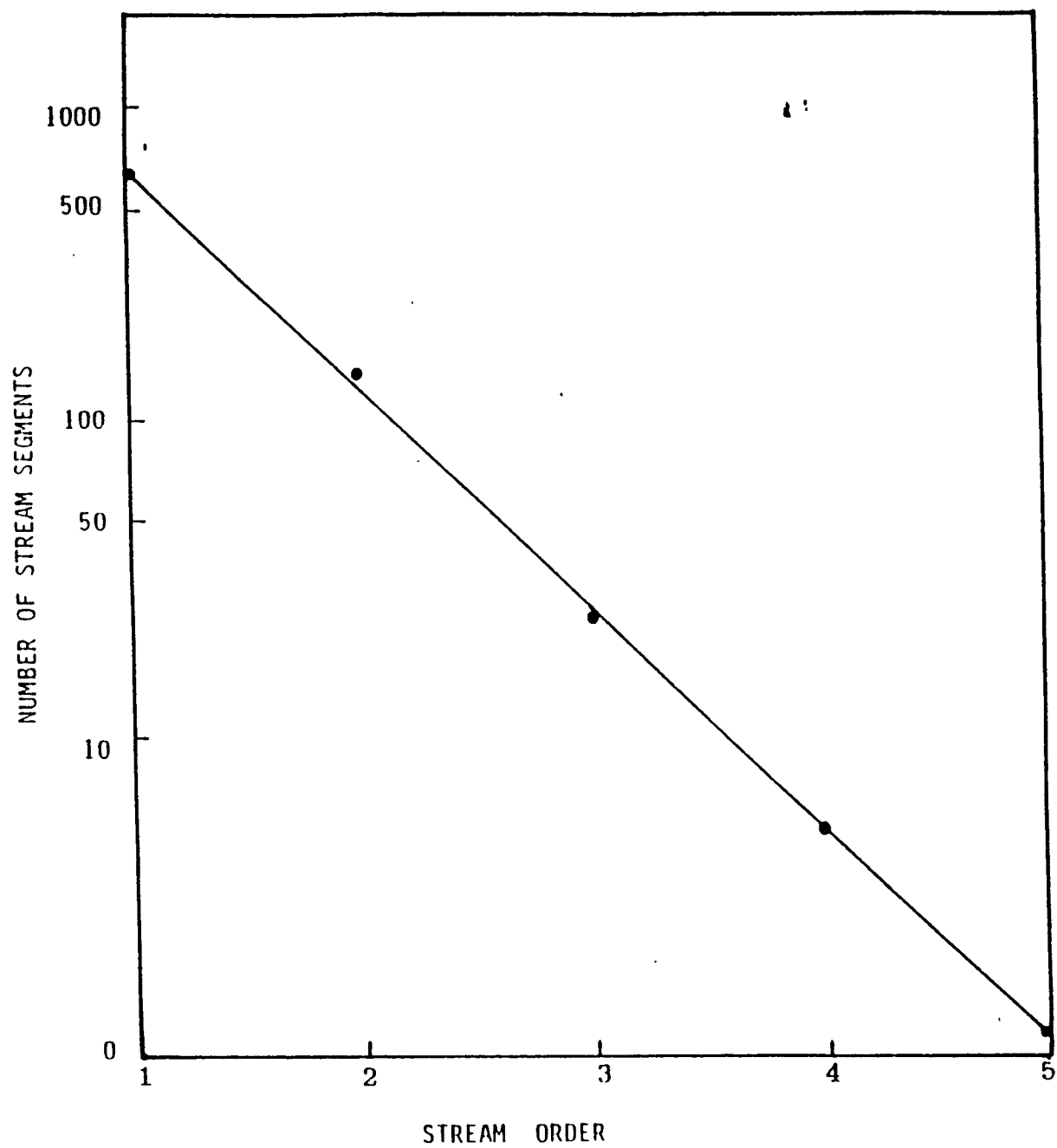
STREAM SEGMENTS	
TOTAL STREAMS:	828
MAJOR DRAINAGES:	179
COASTAL OUTLETS:	49

TABLE 4
SANTA MONICA MOUNTAINS ZONE STREAM ORDER AND RATIOS

STREAM ORDER	TOTAL	BIFURCATION RATIO
1	656	4.80
2	137	4.72
3	29	5.80
4	5	5.00
5	1	--

BIFURCATION RATIO: Santa Monica Mountains = 5.08
(from SMMNRA WRMP, 1984)

FIGURE 7
SEMI-LOG PLOT OF STREAM SEGMENTS



Linear Progression of Stream Order, Santa Monica
Mountain Zone

SURFACE WATERS, STREAMS AND LAKES

As indicated, the Santa Monica Mountains Zone contains a total of 828 major streams and tributaries (**Table 3, Figure 6**). Of the 828 streams within the Zone, less than 10 percent of the streams have formally been named and recognized on USGS quads. There are only 76 streams with formal place names. This includes four perennial streams and 73 major intermittent streams. A total of 15 streams identified on the USGS maps flow on NPS lands. Medea Creek is the only perennial stream flowing on park lands, and its continuous flow is considered to be a result of urban runoff.

There are numerous surface water sources in the Santa Monica Mountains, most being intermittent streams. There are, however, a few perennial streams in the Santa Monica Mountains (Malibu Creek, Medea Creek, and Calleguas Creek) that have garnered much attention from several management agencies in the SMMNRA.

Streams in the Santa Monica Mountains generally flow either north or south, the majority of them flowing south and draining ultimately to the Pacific Ocean. In fact, both Malibu Creek and Calleguas Creek, the two major watersheds in the Santa Monica Mountains, monitored by management agencies, drain south to the Pacific Ocean.

There are no naturally occurring lakes in the Santa Monica Mountains. This reflects the drought characteristics present in southern California during the summer months. However, within the Santa Monica Mountains Zone, there are a total of 17 lakes created by artificial means. Of these impoundments, 11 are situated within the 150,000-acre National Recreation Area boundary.

CLASSIFICATION OF SURFACE WATERS

BENEFICIAL USE

The State and Regional Water Quality Control Boards have designated beneficial uses for Inland Surface Waters, Ground Waters, Coastal Waters and Wetlands. The designated beneficial uses, together with water quality objectives, form water quality standards. The Regional Board has identified 24 beneficial uses for the Los Angeles Basin. These beneficial uses are defined below:

Municipal and Domestic Supply (MUN)

Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supplies.

Agricultural Supply (AGR)

Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering or support of vegetation for range grazing.

Industrial Processes Supply (PROC)

Uses of water for industrial activities that depend on primary water quality.

Industrial Service Supply (IND)

Uses of water for industrial activities that do not depend primarily on water quality, including but not limited to, mining, cooling water supply, hydraulic conveyances, gravel washing, fire protection, or oil well re-pressurization.

Ground Water Recharge (GWR)

Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water supply or halting saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH)

Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

Navigation (NAV)

Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Hydropower Generation (POW)

Uses of water for hydropower generation.

Water Contact Recreation (REC-1)

Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, white water activities, fishing or the use of natural hot springs.

Non-contact Water Recreation (REC-2)

Uses of water for recreational activities involving proximity to water, but not normally involving contact with water, where ingestion of water is reasonably possible. These include but are not limited to, picnicking, sunbathing, hiking, beach combing, camping, boating, tidepool and marine life study, hunting, sightseeing or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM)

Uses of the water for commercial and recreational collection of fish, shellfish, or other organisms, including but not limited to, uses involving organisms intended for human consumption or bait.

Aquaculture (AQUA)

Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance or harvesting of aquatic plants or animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM)

Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD)

Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Inland Saline Habitat (SAL)

Uses of water to support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST)

Uses of water to support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Wetland Habitat (WET)

Uses of water to support wetland ecosystems including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing food and erosion control, stream bank stabilization, filtration and purification of naturally occurring contaminants.

Marine Habitat (MAR)

Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish or wildlife (e.g., marine mammals, shore birds)

Wildlife Habitats (WILD)

Uses of water that support terrestrial ecosystems including, but not limited to, preservation or enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats (BIOL)

Uses of water that support designated areas or habitats such as Areas of Special Biological Significance (ASBS), established by refuges, parks, sanctuaries, ecological reserves, or other areas where preservation or enhancement of natural resources requires special protection.

Rare, Threatened or Endangered Species (RARE)

Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR)

Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN)

Uses of water that support high-quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL)

Uses of water that support habitats suitable for the collection of filter feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial or sports purposes.

Appendix I is a listing of the surface waters and their classification by the Regional Water Quality Control Board. In **Table 8**, the chemical, biological and other objectives of the Beneficial Uses is shown for the indicated uses. The specific Beneficial Uses for each surface water body listed by the Regional Water Quality Control Board is illustrated. These objectives provide guidance for surface water mitigation activities.

EXISTING USE

In accordance with Section 303 of the Clean Water Act providing for the establishment of water quality standards, the surface waters in the Santa Monica Mountains are classified by their existing use. The categories considered by this classification are either as a primary (P) or secondary (S) usage. This classification as listed below represents currently available information on these water courses and impoundments. However, due to the limited resource data within the Santa Monica Mountains, this classification does not reflect an inclusive categorization of all attributes for all streams and their significance for ecosystem preservation. As more information becomes available through active resource management programs, this classification will be updated to reflect these changes.

PUBLIC WATER SUPPLY

Encino Reservoir (P)

Gerard Reservoir, out of service (P)

Hollywood Reservoir: Lower (P)

Hollywood Reservoir: (P)

Las Virgenes Reservoir (P)

Lower Franklin Canyon Reservoir (P)

Stone Canyon Reservoir (P)

NON-PUBLIC WATER SUPPLY

Private Wells (P)

MAINTENANCE OF ECOSYSTEM, GENERAL

All natural water courses (P)

MAINTENANCE OF ECOSYSTEM, HABITAT OF PLANTS AND ANIMALS OF SPECIAL INTEREST, OTHER THAN THREATENED OR ENDANGERED

Coastal drainages from Latigo Point to the westernmost boundary of Point Mugu: varied and extremely rich marine and littoral biota. Designated "Area of Special Biological Significance" by the California State Water Resources Control Board (P)

All streams with *Acer macrophyllum* (Big Leaf Maple) (P)

All riparian communities (P)

Malibu Lagoon: wetlands area (P)

Mugu Lagoon: wetlands area and indicator species *Salicornia* (rare)

La Sierra Canyon (upper): *Dudleya cymosa* var. *marcesans* and *Cornus glabrata* (restricted to this location) (P)

Cold Creek: one of the most diverse botanical areas, native grasses (*Stipa pulchra*), sensitive species *Pentachaeta lyonii* (State Endangered), and *Orobanche bulbosa* (P)

Tuna Creek: pristine riparian vegetation, *Camarostaphylos diversifolia* var. *planaifolia* (rare) and *Polygala cornuta* var. *fishiae* (P)

Temescal, Rustic, Sullivan Creeks: large contiguous watersheds (P)

Encino Reservoir: some of the best undisturbed stands of chaparral, coastal sage scrub, and riparian vegetation on the inland side of the Santa Monica Mountains (P)

Big Sycamore Creek: significant sycamore woodland (P)

Deer Creek: almost pure stands of coastal sage scrub and pristine riparian area (P)

Palo Comado and Cheeseboro Creeks: one of the last examples of the classic California landscape, valley oak savanna (P)

Trancas Creek: *Lobelia dunnii* var. *serrata* (uncommon) (P)

Zuma Creek (upper): *Plagiobothrys acanthocarpus* (uncommon) (P)

Malibu Creek: *Apocynum cannabinum* var. *glaberrimum*, *Notholaena californica*, *Monolopia lanceolata*, *Senecio brewerii*, *Cornus glabrata*, *Sedum spathulifolium*, *Monardella hypoleuca*, *Vicia americana*, *Polygala cornuta* spp. *fishiae*; all considered rare (P)

Encinal Creek: *Thelypteris puberula* (rare) (P)

Las Virgenes Canyon: *Silene antirrhina*, *Silene multinervia*, all considered rare. (P).

Los Alisos Canyon: *Silene antirrhina*, *Silene multinervia*, rare (P)

Stokes Creek: *Erigeron foliosus* var. *stenophyllus* (P)

Little Sycamore Creek: *Dudleya cymosa* sp. *marcesans*, *Pholistoma racemosum*, State rare (P)

Topanga Creek: *Camarostyphlos diversifolia* var. *planaifolia*, *Monardella hypoleuca* and *Orobanche bulbosa*, rare (P)

Rustic Canyon: *Camarostaphylos diversifolia* var. *planaifolia* (P)

Arroyo Sequit: *Oetiotlieria hookeri* sp. *grisea* (rare) and *Festuca pacifica* (P)

Laurel Canyon: *Orobanche grayana*, rare (P)

Temescal Canyon: *Festuca octoflora*, rare (P)

Latigo Canyon: *Lycium californicum*, rare (P)

MAINTENANCE OF ECOSYSTEM, HABITAT OF LISTED, THREATENED OR ENDANGERED SPECIES INDIGENOUS TO PARK

Mugu Lagoon: *Cordylanthus maritimus* var. *maritimus* (endangered) (P)

AESTHETICS

All natural water courses (S)

MAINTENANCE OF HISTORIC SETTING

All natural water courses (S)

RECREATIONAL PURPOSES, BODY CONTACT (SWIMMING, WADING BY CHILDREN, WATER SKIING)

Pacific Ocean beaches (P)

Limited water courses (S)

RECREATIONAL PURPOSES, NON-CONTACT (FISHING, BOATING, NATURE STUDY)

All natural water courses (nature study) (S)

AGRICULTURAL SOURCE FOR IRRIGATION SUPPLY

Calleguas Creek (S)

Malibu Creek

AGRICULTURAL, SOURCE FOR LIVESTOCK WATER SUPPLY

None.

DISPOSAL OF SEWAGE EFFLUENT

Zuma Creek (S)

Malibu Creek (S)

Calleguas Creek (S)

FLOODPLAINS

Within the Santa Monica Mountains most of the 100 and 500 year floodplains have not been delineated because the watersheds have not been extensively developed. In areas with the greatest development, however, floodplains were delineated for the FIRMS program (Flood Insurance Rate Maps); see **Figure 8**. Most of these maps for Los Angeles and Ventura Counties have been acquired and are currently on file at park headquarters. The coverage for Ventura County is extremely limited, and those areas where delineations were made are mostly in the preliminary phase of the project. Those panels which are completed and printed, have been acquired. The FIRM maps do not take into account debris flows, which can exceed the elevations of water-based flows and rapidly change channel geometry.

Debris flows are a type of stream flow that occurs with some regularity in the Santa Monica Mountains, where sufficient sediment mixes with the water flow to form a thick slurry of water, soil and rock with great destructive power. With water content of about 450%, these debris flows have tremendous weight, and are so viscous that they can carry boulders several feet in diameter. The necessary ingredients for debris flows are a relatively steep stream channel, a generous supply of sediment from the stream bed or adjacent slopes, and sufficient rainfall to mobilize them. The management significance of debris flows are that they commonly exceed the levels of predicted floods (because they have up to 2.5 times the volume of floods consisting of water alone), and they tend to drop sediment in inopportune places such as culverts, buildings, stream channels and roads. Though naturally occurring in the Santa Monica Mountains, debris flows are aggravated by any disturbance of slopes, soils or vegetation, including roads, housing pads, fire lines and fires. The Los Angeles County Department of Public Works (LACDPW) considers flooding conditions to be the occurrence of a fifty-year rainfall. In the Santa Monica Mountains, this is 12-15 inches of rain in a 24-hour period. Isohyetal maps of this area, in **Figure 4**, show this occurs at the higher elevations and this amount of rainfall requires a longer time span to occur at the lower elevations. Flooding, however, is not only a factor of the amount of rainfall. Fires, construction projects, previous rainfall immediately prior to a heavy rainfall and other factors can contribute to flooding. The FIRM maps do not give any indication of the sequelae (resultant conditions) of flooding such as erosion, silting or debris flow; in contradistinction to L.A. County, they only deal with 100- and 500-year rains. However, the LACDPW in its *Hydrology and Sedimentation Manuals*, 1991, identifies the soil types and debris and sedimentation formation relative to the rainfall zone. Computer programs are available from LACDPW to calculate storm flows in various watersheds. Calculations for storm flow can consider a burned or non-burned watershed as well as the soil types in the subwatersheds. Each of the soil types has a unique infiltration rate relationship with the degree of saturation of the soil and represents the runoff coefficient for a given rainfall intensity. This coefficient is simply the proportion of the rate of runoff produced compared to the rate of rainfall collected for a given area. Capital Floods usually occur on the fourth storm day.

ILB.5) VEGETATION

There are twenty-six vegetation communities identified by the California Natural Diversity Database including the following seven broad vegetation communities. Over 944 plant species have been identified within the SMM Zone.

Coastal Salt Marsh

Coastal salt marsh occurs nearest the ocean where perennial water flows from inland sources. Plants in this community are adapted to a high concentration of salt, very little wave action and oxygen-depleted soils. Succulence, usually thought of in relation to desert vegetation, is a common characteristic of plants growing in the Coastal Salt Marsh. Some representative plants include: dodder (*Cuscuta salina*), salt grass (*Distichlis spicata*), pickleweed (*Salicornia sp.*), and sea blite (*Sueda californica*).

There are 133 species recorded thus far at Malibu Lagoon. Of these, only 5.3 percent are native estuarine species. The majority (65 percent) are introduced and self-seeding exotics. Only 29.7 percent are native to California (Manion and Dillingham 1989).

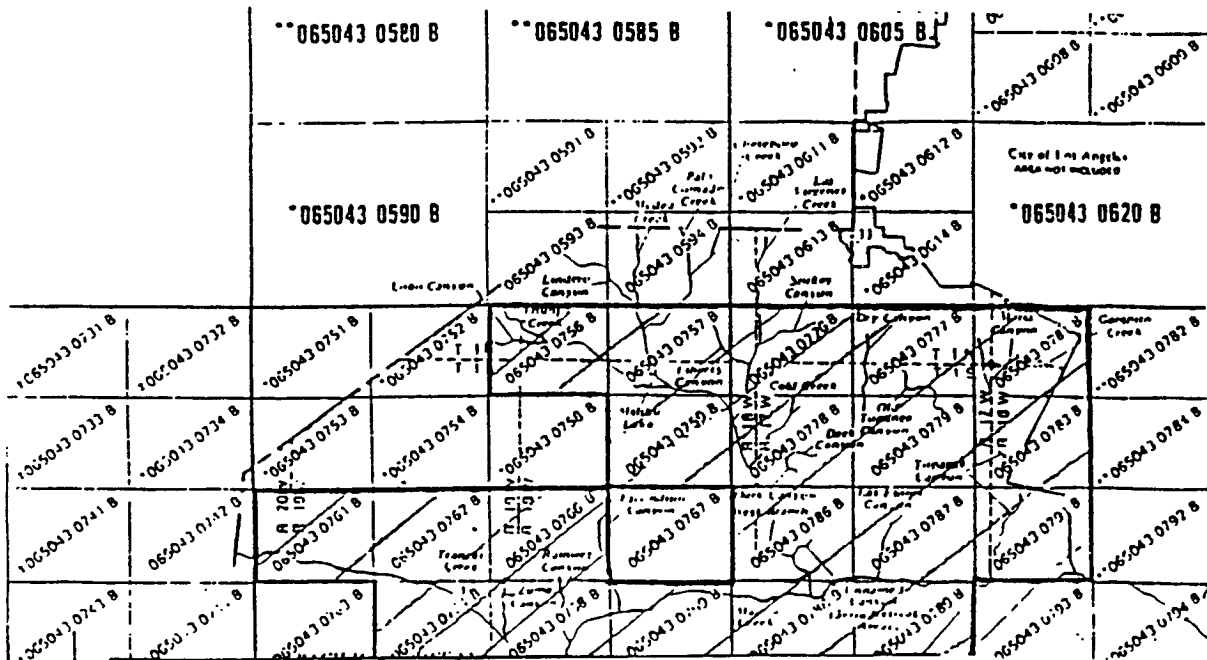
Encompassing 1400 acres, Mugu Lagoon is the largest coastal wetland outside the San Francisco Bay Area. Both Mugu Lagoon and Malibu Lagoon (13 acres) are important stopovers for birds migrating along the Pacific Flyway. Characteristic wildlife includes brown pelicans, American avocets, willets, marbled godwits and various other shorebirds.

Of an estimated 26,000 acres of original coastal wetlands, occurring from Santa Barbara to the border with Mexico, approximately 8,500 acres remain. This represents a 67 percent reduction in this community type (NRMP, 1982). This dramatic reduction makes this community especially important in the Santa Monica Mountains.

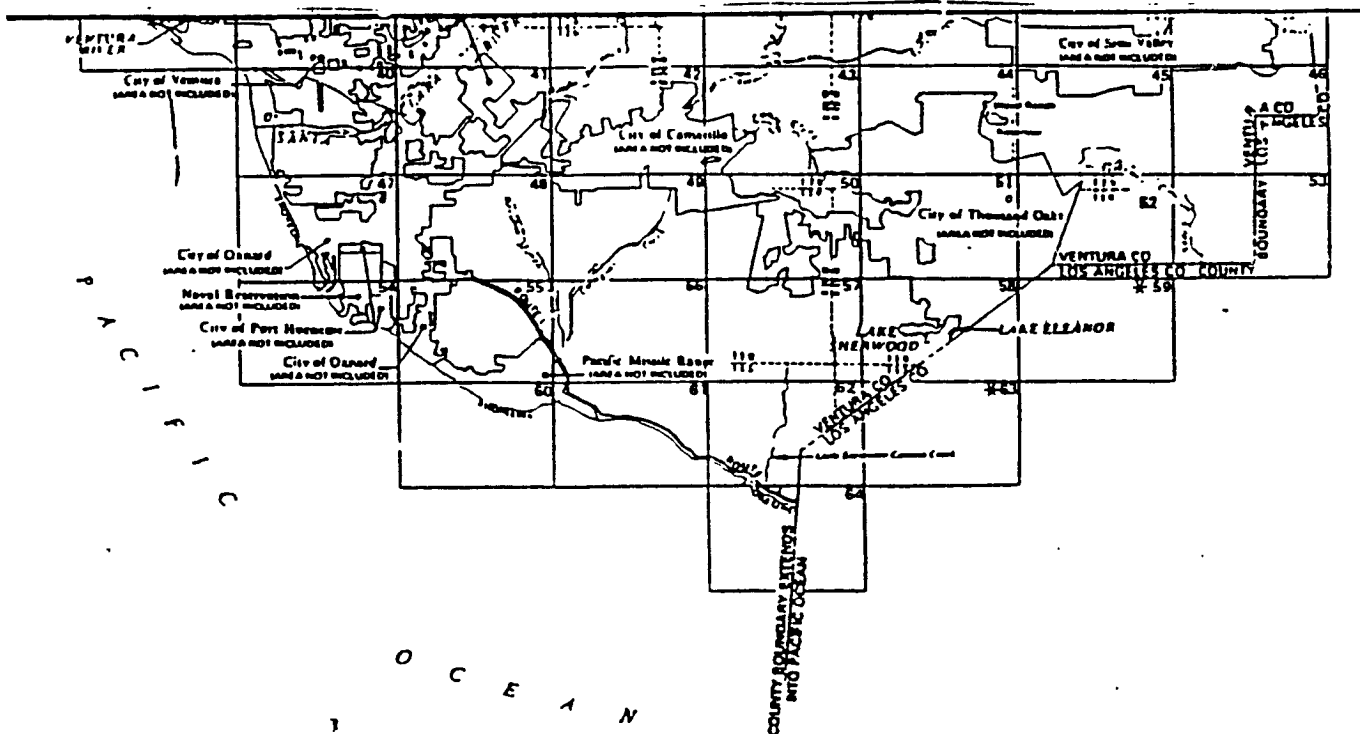
Coastal Strand

Forty-six miles of scenic California coastline, with exposures ranging from sandy beaches to rocky tidepools and lagoons are within park boundaries. Much of this community has been changed by development or converted to encompass recreational uses in coastal areas.

**FIGURE 8
FLOODPLAIN MAPS**



Floodplain Maps (100 and 500 Year Floods), Los Angeles County



Floodplain Maps (100 and 500 Year Floods) For Ventura County.

Characterized by strong winds, salt spray, fog, intense solar radiation, drought conditions and an infertile, unstable substrate (sand), this community extends from the high tide zone inward in a narrow band. Many of the plants in this community have adapted to shifting sands, with stems that lay prostrate over the sand, or leaves that curve downward and lay flat along the sand. Some leaves have sticky or hairy surfaces, which gather sand grains to act as ballast, holding them down during high winds. Many of these plants reproduce and spread by rhizomes. Salt spray, slow nutrient cycling and desiccating winds contribute to a desert-like environment. This plant community occurs along the southwest edge of the Mountains, east of Point Mugu.

Characteristic plants include: sand verbena (*Abronia maritima*), silver beachweed (*Ambrosia chamissonis*), saltbush (*Atriplex sp.*), beach morning glory (*Calystegia soldanella*) and the alien iceplant or hottentot fig (*Mesembryanthemum sp.*). Characteristic wildlife include: willets, sanderlings, western gulls and a variety of other species adapted to shifting sands.

Coastal Sage Scrub

In the Santa Monica Mountains, this community occurs on drier sites and lower elevations than chaparral, especially on coastal south-facing slopes. Often occurring in recently eroded areas, this community also plays an important role in soil stabilization. Many of its characteristic plants produce soil-holding, fibrous shallow roots. Soils underlying Coastal Sage Scrub tend to be low in nutrients and subject to rapid erosion, comprised as they are of a high percentage of sand and gravel.

The Coastal Sage Scrub community has been referred to as "soft chaparral" since the widely spaced vegetation is characterized by soft-leaved, grayish green, aromatic shrubs. Characteristic plants include: purple sage (*Salvia leucophylla*), California sagebrush (*Artemisia californica*), coast goldenbush (*Haplopappus venetus*) and coastal buckwheat (*Eriogonum cinereum*) and is usually dotted by larger laurel sumac (*Rhus laurina*) or lemonadeberry (*Rhus integrifolia*) shrubs. Many species in this community, particularly the sages, are summer or drought deciduous (dropping larger leaves during mid-summer to conserve moisture).

Good examples of coastal sage scrub can be found in the mouth of Zuma Canyon and in coastal Point Mugu State Park. Characteristic wildlife include: Anna's hummingbirds, rufous-sided towhees, California quail, greater roadrunners, Bewick's wrens, coyotes and coast horned lizards.

Chaparral

Chaparral, the dominant vegetation community in the Santa Monica Mountains, is characterized by deep-rooted, drought- and fire-adapted evergreen shrubs growing on coarse-textured soils with limited water-holding capacity. Unlike other plant communities, in chaparral, a nearly impenetrable vegetative wall of stiff stems and leathery leaves is formed by the 4- to 12-foot high plants.

Underneath, the ground is devoid of herbaceous vegetation, except for an occasional clump of foothill needlegrass (*Stipa lepidota*) or cluster of wildflowers. This lack of herbaceous plants may be due, in part, to the fact that several chaparral plant species may produce toxins or allelopaths, which inhibit the growth of other plant species.

The drought-adapted leaves of chaparral plant species are often small, leathery, thick, fuzzy and/or waxy. Depending on the species, after a fire, chaparral plants may reproduce--either by seeds, by root-crown sprouting, or both.

Coast Live Oak Woodland

This community is found on north slopes and in shaded ravines or canyon bottoms and is characterized by Coast Live Oak (*Quercus agrifolia*), Hollyleaf Cherry (*Prunus illicifolia*), California Bay Laurel (*Umbellularia californica*), Coffeeberry (*Rhamnus californica*) and Poison Oak (*Toxicodendron diversilobum*). Coast Live Oak is more tolerant of salt-laden fog than other oaks and thus can be found relatively near the ocean. This community is often found on the well-drained soils of coastal plains and protected bluffs. Groves are formed across valleys and along streams and intermittent watercourses. Live Oaks, as their name suggests, are evergreen. Preferring permanent water, the deep tap roots of Live Oaks can reach to the water table.

Well-developed oak woodlands can be found at Trippet Ranch in Topanga State Park and at Rocky Oaks. Characteristic wildlife include acorn woodpeckers, plain titmice, northern flickers, Cooper's hawks, western screech owls, mule deer, gray foxes, ground squirrels, jackrabbits and a variety of bats.

Riparian Woodland

Riparian Woodlands occur along canyon and valley bottoms with perennial or intermittent streams in nutrient rich soils, or within the drainage of steep slopes. Of all the plant communities in the Santa Monica Mountains, the riparian community contains the greatest species diversity. Unlike other communities, Riparian Woodlands have multi-layered vegetation, with both an under- and overstory. Dominant species may include arroyo willow (*Salix lasiolepis*), California black walnut (*Juglans californica*), Sycamore (*Platanus racemosa*), Mexican elderberry (*Sambucus mexicana*), California bay laurel (*Umbellularia californica*) and mule fat (*Baccharis salicifolia*). The Riparian Woodland is one of the most endangered plant communities in California. It is estimated that less than 10 percent of the original 200,000 acres of Riparian Communities remain in California (see RMP, 1982). Four kinds of Riparian Communities are easily identifiable in the Santa Monica Mountains.

Valley Oak Savanna

Valley Oaks (*Quercus lobata*) reach the southernmost extension of their range in Malibu Creek State Park. Endemic to California, Valley Oaks were once widely distributed from the Sacramento and Pit River Canyons, 500 miles south to the Santa Monica Mountains. These trees, which reach truly majestic proportions, originally spread over the native grasslands in the wide valleys of central and coastal California. Valley Oaks reach ages of 400-600 years and may have trunks six or seven feet in diameter. They present a graceful appearance on the landscape, widely spaced with branches that may drape to touch the ground.

Over the last 150 years, Valley Oaks have succumbed to widespread agricultural and residential development which has focused on their prime habitat--alluvial valleys. Although thousands of acres of Valley Oak Savanna remain, they are vastly changed. The savanna, or grassland understory, was formerly comprised of dozens of species of native grasses and forbs and which blossomed in an array of wildflowers in the spring. Now the grassland understory is comprised mainly of alien European annual grasses which have crowded out the native species over the decades since they were introduced.

Where once a multi-layered composition of valley oaks of different ages existed, now only the large trees remain. Many years of non-seedling growth and thus non-replenishment have resulted in low to no recruitment of young or medium-aged trees to the valley oak savanna.

Aside from Valley Oaks, characteristic native grasses which dominate Valley Oak Savanna include purple needlegrass (*Stipa pulchra*), and alien grasses such as wild oats (*Avena fatua*) and ripgut brome (*Bromus diandrus*) as well as black mustard (*Brassica nigra*) and intermittent wildflowers, such as Mariposa lilies (*Calochortus catalinaea*) and coast goldfields (*Lasthenia chrysotoma*). Characteristic wildlife includes American kestrels, scrub jays, acorn woodpeckers, gray foxes and mule deer.

Grassland

There are two types of grassland which occur in the Santa Monica Mountains: native perennial and alien annual grasslands. Perennial bunch grasses are considered to be the original native grassland of California, while annual grasses were those introduced by the European and Spanish settlers for their livestock. The golden rolling hills of California are largely a result of the introduction of these annual grasses, since bunchgrasses often remain green even during summer drought.

Perennial bunch grasses differ from annual grasses in the fact that they put much of their energy during their first several years into establishing a well-developed root system that will sustain them through regular summer drought. Their roots penetrate deeply into the soil, providing nutrients and water and holding soil particles firmly in place, thus decreasing the erosive effects of wind and water.

Unlike annual grasses, they don't produce seeds the first year, but rather as the years continue, produce an abundance of seed at maturity. The tufted parent increases in size every year. Perennial grasses are long-lived. In fact, Crampton, in Grasses of California (1974), states, *"Perhaps the oldest living things in the world are not the redwoods [sic] or bristle-cone pines, but such lowly grasses as these that live infinitely in their native habitat by continual vegetative reproduction."*

Over 100 years of livestock grazing in California, some very intense, has converted former native perennial grassland to alien annual grassland. Native perennial grasslands historically covered nearly 20 percent of California, but today they cover less than 0.1 percent. Today, approximately 18 million acres or 17 percent of California is considered valley grassland (containing both alien annual and native perennial species) (Keeley, 1990). The California Natural Diversity Database (CNDDB) identifies Purple Needlegrass Grassland as a community needing priority monitoring and restoration. The CNDDB considers grasslands with 10 percent or greater cover of *Nasella pulchra* to be significant, adding that these should be protected as remnants of California prairie. Characteristic wildlife include: turkey vultures, horned larks, western meadowlarks, long-tailed weasels and badgers.

Critical Habitats. The Nature Conservancy, in cooperation with the California Department of Fish and Game and the California Native Plant Society, developed the California Natural Diversity Data Base for "Special Plant Communities of California." Ten of these communities for special consideration are found in the Santa Monica Mountains. These include: mainland giant coreopsis scrub, native grassland, rare plant enclaves, southern coastal chaparral and sage scrub, southern coastal salt marsh, disjunct communities, freshwater marsh, southern California walnut communities, sycamore woodlands, and valley oak savanna.

Wildlife. Over 60 mammals, including mountain lions, bobcats and gray foxes, have been identified in the Santa Monica Mountains. Other wildlife include over 300 bird species, with 13 nesting raptor species, including golden eagles; over 30 species of amphibians and reptiles; and a variety of fish, including the now proposed endangered steelhead trout. Point Mugu contains perhaps the largest array of rare and endangered bird species within the Mountains, including the Snowy Plover, Clapper Rail, California Black Rail, Least Tern, and the Brown Pelican (Resource Management Plan, 1994).

II.B.6) WATERSHED MANAGEMENT PRACTICES

The Los Angeles Regional Water Quality Control Board (RWQCB) regulates all the waters in the SMMNRA under the authority of the Porter Cologne Act and the Clean Water Act. Two of the hydrological units, the Santa Clara-Calleguas Hydrological Unit and the Malibu Hydrological Unit, constitute most of the areas of concern in the Santa Monica Mountains. The RWQCB jurisdiction includes all coastal waters within 3 miles of the continental coastlines.

Under the California anti-degradation policy for surface and ground water, water quality cannot be adversely affected. The RWQCB has established a large number of monitoring procedures and stations to maintain and enforce this policy. Beneficial uses form the cornerstone of water quality protection together with water quality criteria. To achieve and maintain water quality objectives to protect the beneficial uses of the waters of the region, one must control point source and non-point source pollution and remediate existing polluted ground and surface waters. The State encourages the reclamation of water for beneficial uses associated with any surface water, ground water or wetlands.

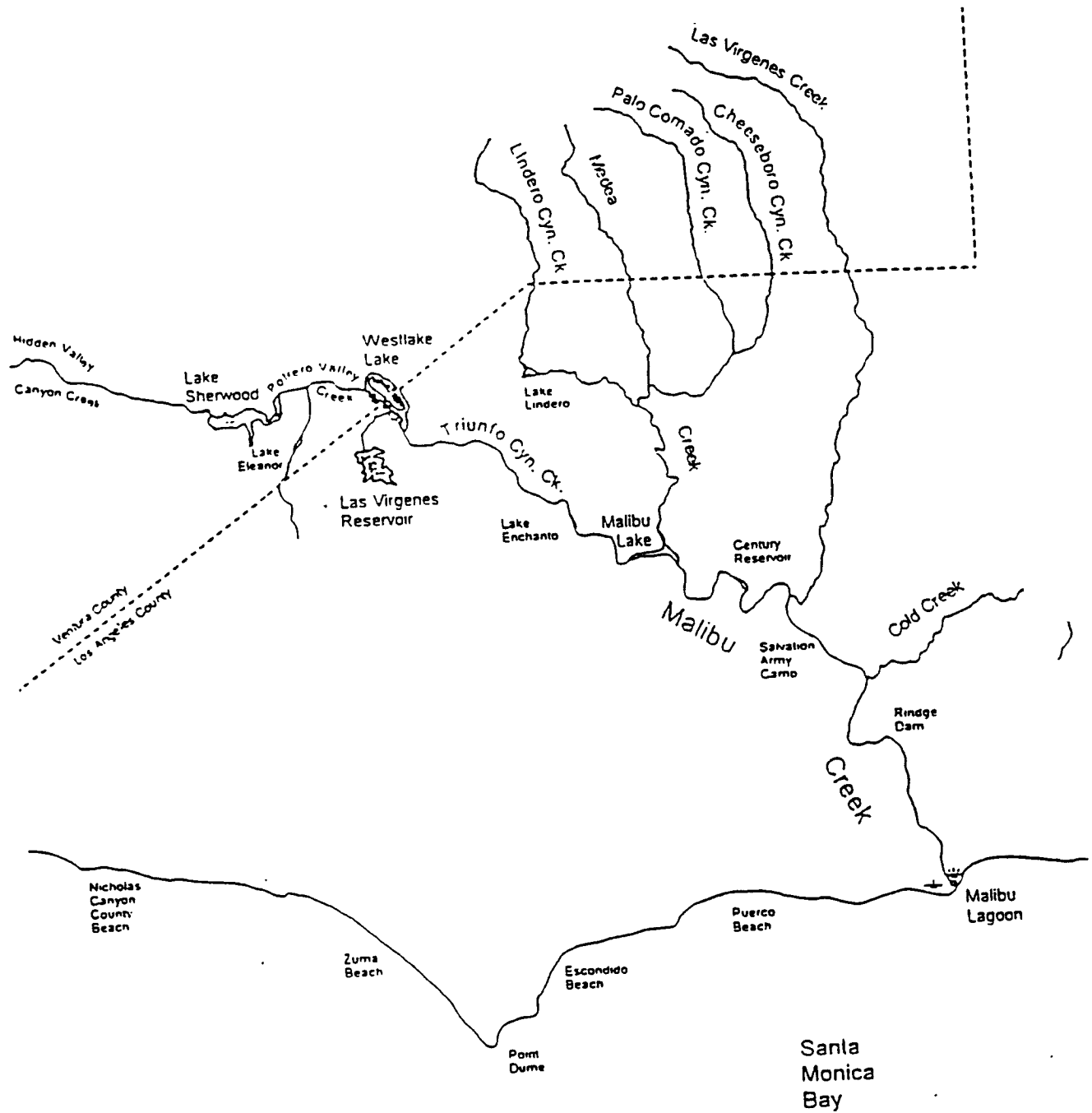
Although there has been extensive monitoring of Calleguas Creek and Malibu Creek, the monitoring of Malibu Creek will be used as an example of the types and locations of monitoring as well as of the agencies doing the monitoring. All of the Malibu Creek watershed is within the SMMNRA and better reflects the activities within the park. In **Table 5** the location and agencies monitoring Malibu Creek are illustrated. In **Table 6** the types of tests performed by these agencies are shown.

CURRENT STATE OF MONITORING IN THE MALIBU CREEK WATERSHED

A substantial amount of surface water, ground water, sediment and fish tissue monitoring occurs in the Malibu Creek Watershed. Seven agencies conduct ten monitoring programs which include samples from over 40 surface water or sediment stations and 70 ground water wells. Overall, samples are analyzed for a complete suite of chemical constituents ranging from physical pollutants such as dissolved solids to organic chemicals, pesticides, bacteria and viruses. It is estimated that these major programs cost roughly \$1,170,000 in 1993. The majority of money was spent for self-monitoring programs by the Las Virgenes Municipal Water District (LVMWD) and the County Sanitation Districts of Los Angeles County. A map of sampling stations and the results of a year's sampling by LVMWD is shown in **Appendix J**. In addition, many other monitoring programs focus on a variety of environmental aspects of the watershed, including water levels in the lagoon, brush and weed clearance compliance and water quality.

Water quality sampling stations are concentrated in the lower Malibu Creek Watershed and Malibu Lagoon, although the LVMWD samples above the Cross Creek station and above the Tapia Treatment Plant. There is some duplication of sampling by different agencies, most notably in Malibu Creek at the Cross Creek station, which is sampled by 4 different agencies. In the Malibu Creek watershed, rain gauges are maintained by 5 different agencies and one individual. These are: California Department of Parks and Recreation, L.A. County Department of Public Works, L.A. County Fire Department, County Sanitation District of L.A. County, Ventura County Public Works Agency and (prior to the recent fires) Tim Thomas, a former park ranger and now an employee of the Fish and Wildlife Service.

FIGURE 9
MAJOR SURFACE WATERS OF THE MALIBU CREEK WATERSHED



II-33



Area represented
 by the figure

TABLE 5
AGENCIES MONITORING MALIBU CREEK WATERSHED

Agency	General Locations of Stations*
Las Virgenes Municipal Water District (LVMWD)	Malibu Creek-middle and lower Malibu Lagoon Ocean shoreline Las Virgenes Creek Sludge Farm (near Las Virgenes Creek)
Topanga-Las Virgenes Resource Conservation District (TLVRCD)	Malibu Lagoon
Regional Water Quality Control Board-Planning Division (RWQCB-P)	Malibu Creek-lower (Cross Creek Road) Malibu Creek-middle (Salvation Army camp) Medea Creek Triunfo Creek
Regional Water Quality Control Board-Mussel Watch Program (RWQCB-MW)	Malibu Lagoon
Regional Water Quality Control Board-Toxic Substances Monitoring (RWQCB-TSM)	Malibu Creek-lower (just above stream gauge)
Regional Water Quality Control Board-Compliance Monitoring (RWQCB-C)	Tapia Water Reclamation Facility effluent
Los Angeles County Department of Public Works (LACDPW)	Malibu Creek-lower (Cross Creek Road)
County Sanitation District of Los Angeles County-Calabazas Landfill (CSDLAC)	Calabazas landfill and just offsite (near Agoura, Las Virgenes and Lindero canyons)
Los Angeles County Department of Health Services (DHS)	Ocean shoreline Malibu Creek-lower (Cross Creek) Malibu Creek-middle (Salvation Army Camp) Cold Creek
City of Los Angeles, Department of Public Works, Bureau of Sanitation, Environmental Monitoring Division-Hyperion STP (LA-EMD)	Ocean shoreline at Big Rock Rd Ocean nearshore/offshore off Coral Beach Ocean nearshore/offshore off Las Flores Beach

* For purposes of this report:

Upper Malibu Creek is defined as the creek above Malibu Lake

Middle Malibu Creek is defined as the reach from Malibu Lake to Cold Creek

Lower Malibu Creek is defined as the reach from Cold Creek to the estuary.

**TABLE 6
TESTS PERFORMED**

Agency	Number of Stations	Constituents monitored	Approx. Costs (\$)
Las Virgenes Municipal Water District (LVMWD)	23 surface water, sludge, sediment, soil, fish tissue, effluent, influent and 8 groundwater	Conventional Nutrients Bacteria/Viruses Metals Organic Chemicals Pesticides Visual observations EPA priority pollutants Chronic Toxicity Other	500,000 (annual) 112,000 enhanced* * projected costs for 1993 one year enhanced program
Topanga-Las Virgenes Resource Conservation District (TLVRCD)	8 surface water	Conventional Visual	4,310 (1993)
Los Angeles County Department of Public Works (LACDPW)	1 surface water	Conventional Nutrients Bacteria Metals Organic Chemicals Pesticides Other	8,000 (annual)
Regional Water Quality Control Board-Planning Division (RWQCB-P)	4 surface water	Conventional Nutrients Organic Chemicals Visual observations	1,305 (1992)
Regional Water Quality Control Board-Mussel Watch Program (RWQCB-MW)	3 sediment	Metals Organic Chemicals	6,000 (1992)
Regional Water Quality Control Board-Toxic Substances Monitoring (RWQCB-TSM)	1 fish tissue, sediment	Metals Organic chemicals	7,000 (1992)
Regional Water Quality Control Board-Compliance Monitoring (RWQCB-C)	Tapia effluent	Conventional Metals Organic chemicals	1553 (1992)
Los Angeles County Department of Health Services (DHS)	7 surface water	Bacteria Visual Observation	30,000 (annual)
City of Los Angeles, Department of Public Works, Bureau of Sanitation, Environmental Monitoring Division-Hyperion STP (LA-EMD)	5 surface water, sediment, fish tissue	Conventional Nutrients Bacteria Organic chemicals Visual observations EPA priority pollutants Other	59,636 (1992)
County Sanitation District of Los Angeles County-Calabasas Landfill (CSDLAC)	70 groundwater wells 3 surface runoff stations (Storm Water NPDES permit)	Conventional Nutrients Metals Organic chemicals EPA priority pollutants Other	400,000 (1993-94)

II.C) SURFACE WATER RESOURCES

II.C.1) WATER QUANTITY

Sources of Surface Water

In the Santa Monica Mountains there are three sources of surface water: precipitation, importation and reclamation. The water from precipitation occurs primarily in the winter months from November to March. The annual range of rainfall varies from year to year with some years as low as 3 inches and others as high as 30 inches, depending, in part, on where the measurements are made. The highest rainfall is always in the highest elevations.

Imported water entering the Los Angeles basin comes from the Los Angeles Aqueduct which draws water from the east side of the Sierra Nevada Mountains; the California Aqueduct which draws water from northern California; and the Colorado River Aqueduct which imports water from the Colorado River. These aqueducts can bring about 3 million acre-feet per year into the Los Angeles basin. This importation of water since 1913 contributes significantly to the water flowing to the Santa Monica Mountains in the form of runoff, waste water and increased ground water. In 1992, 20,000 acre-feet were imported into the Malibu Creek Watershed alone. This importation of water changes the characteristics of the streams, converting some intermittent streams to perennial streams and increasing the flow of water in Malibu Creek throughout the year.

The main contributor to this source of reclaimed and treated water in the Malibu Creek Watershed is the Tapia Wastewater Treatment Plant. This facility treats about 7.7 million gallons a day (MGD). With approved expansion it will have the capacity to handle 16 MGD. The reclaimed water is used for irrigation throughout the watershed. Overflow is discharged directly into Malibu Creek near the facility, through percolation ponds at Tapia Park or into the creek as overflow from the MWD reservoir. The outflow from the treatment plant has been treated to tertiary standards. The discharged waters are high in nitrates, sulfates and chlorides. Anions contribute to the high nutrient values for the discharged waters. For irrigation, these high nutrients are desirable, but in the creek, they create significant problems. There is an increase in water flow through the Malibu Creek Watershed, which reflects imported waters, reclaimed waters and the discharge from the Tapia Treatment Plant. The dotted line in **Figure 10** shows the water flow in the 1950's during the dry season, before there was any discharge from the Tapia Treatment Plant. At this time, there was no major amount of imported water in the watershed, and the Creek was practically dry during the summer months. The 1980's water flow during the dry season, shown in **Figure 10**, depicts the background flow in the bottom line, and the total with the treatment plant contributions in the top line. The 1980's baseline reflects the increased amount of imported water in the watershed, creating a more perennial stream. In **Table 7** the increases in water in the two major watersheds in the SMMNRA are shown. In the last sixty years due to imported water, in the Mugu Watershed in Calleguas Creek at the Simi

gauging station, there has been a ten-fold increase in water flow; at Cross Creek, in a comparable period of time, in the Malibu Creek Watershed there has been an increase of about 15,000 acre-feet per year. The LVMWD, which administers the Tapia Treatment Plant, has recently received approval to increase its capacity of the Tapia Treatment Plant to sixteen million gallons per day; the consequences of this change have not been evaluated for the Malibu Creek Watershed and the lagoon. The LVMWD has been surveying possible underground storage facilities for all the water that will be discharged when they increase the permitted capacity. The storing of this excess water underground will have an unknown effect on the ground water in the basin.

Sources of Ground Water

Ground water emanates from the alluvium in the canyons and bedrock aquifers in the Lower Topanga Formation. Outcroppings of the Lower Topanga Formation appear along the crest of the Santa Monica Mountains, the southern boundaries of the basin, and where the strata are cut by streams. Ground water flow is impacted by faults and folds which act as dams in bedrock, and conversely by faults, fractures or cracks which act as conduits in the rock material.

Infiltrating surface water, percolating ground water and septic tanks affect the ground water with a variety of contaminants. With the exception of Malibu Valley, ground water along the southern slopes of the Santa Monica Mountains is not considered to comprise a major ground water basin by the California Department of Water Resources. The ground water taken from wells in the alluvium in Trancas and Zuma Canyons over a fifteen-year period has great variation due to the differences in precipitation for each of these years (see **Figure 11**, and **Appendix H**). In the Malibu Creek Watershed, during the summer months from June to October, the water from the Tapia Treatment Plant is either sold or used for recharging the ground water. This discharge water meets tertiary standards for body contact or recreation use. The percolation ponds used are adjacent to Malibu Creek and when functioning correctly, allow water to slowly seep into the ground water and then join the creek through subsurface flow in the alluvium.

--- BACKGROUND FLOW, 1950's _____ BACKGROUND FLOW, 1980's
 TAPIA FLOW - - - TAPIA +
 BACKGROUND FLOW, 1980's

10 YEAR MONTHLY AVERAGE



FIGURE 11
GROUND WATER LEVELS IN ZUMA CANYON
 (Well at 55.5 feet above sea level)

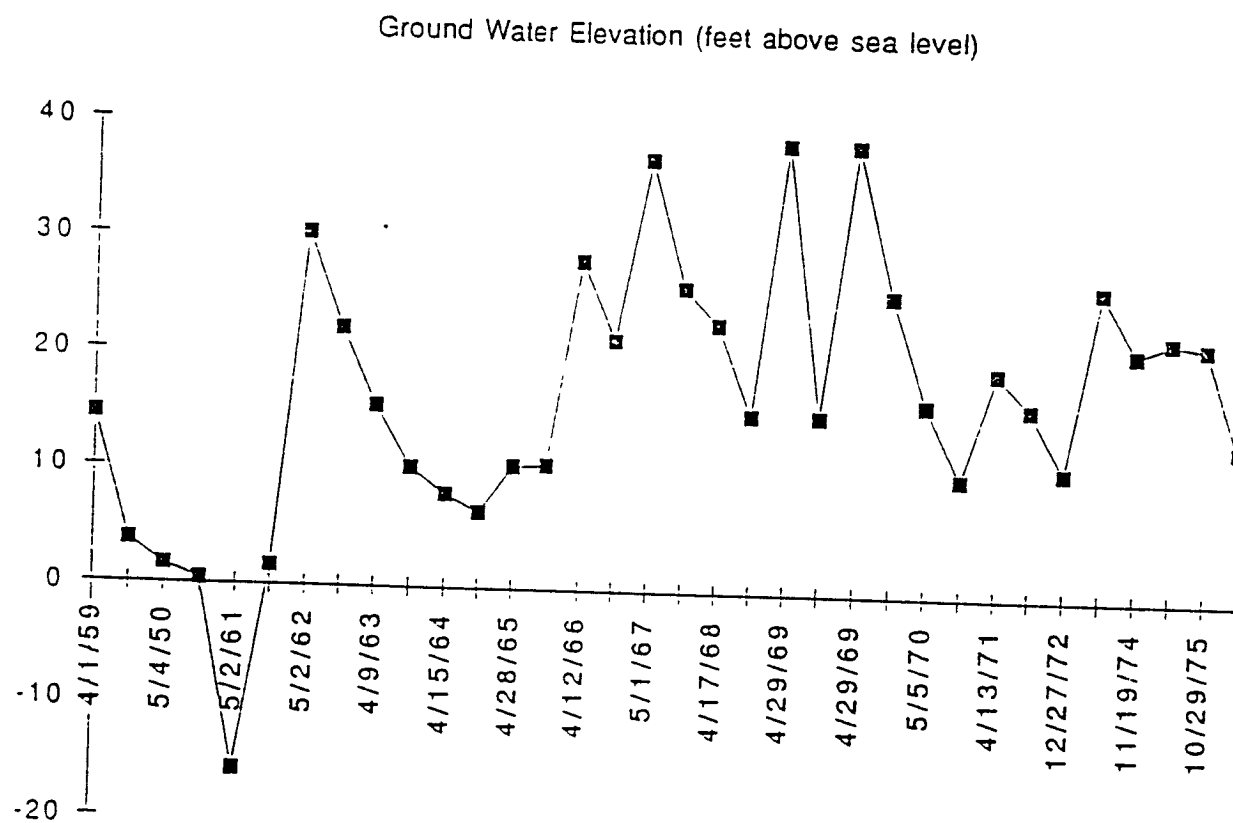


TABLE 7
ILLUSTRATIVE AVERAGE CHANGES IN WATER FLOW

	<u>1934-1963</u>	<u>1964-1990</u>
Calleguas Creek	699 acre-feet	6,750 acre-feet
Malibu Creek	12,100 acre-feet	27,050 acre-feet

II.C.2) WATER QUALITY

The California Water Code defines water quality objectives as *"the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specified area."*

Thus water quality objectives are intended: (1) to protect the public health and welfare and (2) to maintain or enhance water quality in relation to the designated existing and potential beneficial uses of the water. Tests for all these criteria are used for inland surface water quality evaluation. Wetlands use the same criteria with the addition of evaluation of salinity, hydrology and habitat of flora and fauna. Potentially potable ground water must meet these criteria at levels that meet the beneficial use criteria and cause no health problems in humans (Table 8).

Water quality data is available for the two major watersheds in the Santa Monica Mountains, Malibu Creek (Table 9) and Mugu Lagoon watershed (Table 10). In Table 9, "Ranges of Parameter Concentrations Found in Malibu Creek Watershed," indications are that the pH, DO, NO₃-N and Fecal Coliform measurements reach unacceptable levels at various monitoring stations (Appendices I & J). Table 10, "Comparison of Constituents in Calleguas Creek Watershed Tributaries to Recommended Objectives," indicates that measurements of Sodium, Calcium, Chloride, Sulfate, Nitrate TDS, DDE, and PCBs are all exceeded at most of the monitoring sites. More detail is given in Appendix I where a complete annual monitoring for ten monitoring stations in Malibu Canyon, provided by the Las Virgenes Municipal Water District (LVMWD), is shown. The data in Table 10 are not the result of a consistent monitoring program but they do show the extreme ranges and concentrations of certain parameters found in the watershed.

The watershed constituents illustrated above all flow into the lagoons and compromise the water quality of these lagoons. Most of these constituents are from non-point sources such as agriculture, urban runoff and horse ranches. The effects of the first rainfall of the season (Oct. 11, 1993) of 0.5 inches is shown in Appendix K where the coliform and enterococci levels increased at least ten-fold after this first rain. In Appendix I, it is apparent all the contributing tributaries to Malibu Creek are contaminated with coliforms and enterococci. The discharge from the Tapia Treatment Plant has no coliform or enterococci present; but just below the plant, at monitoring point R-13, at the junction with Cold Creek, the coliforms are very high. These waters flow into Malibu Lagoon and the public beaches, contributing additional bacterial contamination to the shore birds, and making these waters frequently closed to recreational activity.

The presence of indicator chemicals such as pesticides and nitrates indicates the increased presence of human activities, including land development in and around the SMMNRA. These activities can only increase the levels of pollution unless a major awareness and behavior modification program is put in place. Although this is normal, development to intense use of Malibu Creek or Calleguas Creek, it can be expected that the kinds of

problems that exist in the Calleguas and Malibu Creek watersheds, to a greater or lesser degree, exist in all the watersheds within the SMMNRA (**Appendix L**). Development continues unabated throughout the park area and affects even the most remote canyons and ridges, as can be seen in all the tributaries of both the Malibu and Calleguas Creek watersheds, where there are high levels of contamination. An extensive evaluation of each of the watersheds in the SMMNRA has not been conducted.

The NPS owns only 14% of the area within the SMMNRA boundary and can never be expected to own all the property; this fact significantly influences decisions about activities not on NPS property. Other agencies have regulatory powers over the uses of the properties in their jurisdictions, but prevention of non-point pollution is not a high priority.

Despite all the monitoring currently being undertaken, there is a great need to identify additional monitoring areas and systems which indicate the health of the waters for organisms. A bioassay and/or chemical/physical monitoring method which is fast, simple and inexpensive could help in identifying the adverse changes before they become manifest. Early warning would save more of the resources and minimize costs.

TABLE 8
WATER QUALITY OBJECTIVES FOR INLAND SURFACE
WATERS WITH IDENTIFIED BENEFICIAL USES

AMMONIA

Function of water temperature

BACTERIA, COLIFORM

MUN - less than 1.1/100ml

REC-1 - 200/100ml

REC-2 - 2000/100ml

SHELL - 70/100ml

CHLORINE, TOTAL RESIDUAL

0.1 mg/100ml

COLOR

Free of coloration that causes nuisance or adversely affects beneficial use.

EXOTIC VEGETATION

Does not cause nuisance or affect beneficial uses.

FLOATING MATERIAL

No floating materials including liquids, foams, and scum at concentrations that cause nuisance or adversely affect beneficial uses.

METHYLENE BLUE ACTIVATING SUBSTANCES (MBAS)

MUN - MBAS no greater than 0.5 mg/L

MINERAL QUALITY(TDS)

MUN - 500

PROC - 50-1500

AGR - 450-2000

NITROGEN (NITRATE, NITRITE)

10 mg/L Nitrogen as Nitrate-Nitrogen plus Nitrite-Nitrogen

45 mg/L as Nitrate

10 mg/L as Nitrate-Nitrogen

1mg/L as Nitrite Nitrogen

OIL AND GREASE

No visible film or coating on the surface of the water or cause nuisance to that adversely affects beneficial uses.

OXYGEN, DISSOLVED (DO)

WARM - 5 mg/l

COLD - 6 mg/L

COLD & SPWN - 7/ mg/L

PESTICIDES

MUN - Title 22, CCR

pH

6.5 - 8.5

POLYCHLORINATED BIPHENYLS (PCBs)

14 - 30 ng/L, daily average

RADIOACTIVE SUBSTANCES

MUN - Title 22, CCR

SOLID, SUSPENDED OR SETTLEABLE MATERIALS

None in concentrations that cause nuisance or adversely affect beneficial uses.

TASTE AND ODOR

None that impart undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance or adversely affect beneficial uses.

TEMPERATURE

WARM - No more than 5 degrees Fahrenheit above normal temperature but never above 80 degrees Fahrenheit.

COLD - Not altered by more than 5 degrees Fahrenheit above normal temperature.

TOXICITY

All waters shall be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses to human, plant, animal or aquatic life. There shall be no acute toxicity in ambient water including mixing zones.

TURBIDITY

Waters shall be free of turbidity that causes nuisance or adversely affects beneficial uses.

TABLE 9
RANGES OF PARAMETERS OF CONTAMINANTS IN
THE MALIBU CREEK WATERSHED

Location	Dates tests Performed	Flow (cfs)	pH	Water Temp(^o F)	DO (mg/l)	NO ₃ -N (mg/l)	Fecal Coliform (MPN/100 ml.)
Medea Creek @ Paramount	3/82-8/92	0.3-2.0	7.9-8.2	51.8-84.2	7.0-10.6	---	---
Malibu Creek Below Century Reservoir	1/90-12/92	1.0-527	6.7-8.5	47.1-74.7	2.8-10.9	.08-1.7	20-7,275
Las Virgenes Cr. above LVMWD	1/90-12/92	0.68-0.71	7.3-7.5	52.5-66.7	4.2-7.4	1.4-9.1	120-3,000
Malibu Cr. Below Tapia	1/90-12/92	2-971	6.5-8.1	55.0-72.3	5.2-10.0	0.2-16.1	40-500
Malibu Cr. Above Tapia	1/90-12/92	1-1,440	7.7-8.6	47.3-69.8	5.5-10.8	0.03-6.2	17-300
Malibu Cr. Below Cold Cr.	1/90-12/92	1-1196	6.8-9.0	57.9-72.3	6.1-9.9	1.2-15.7	40-300
Malibu Cr. @ Cross Cr. Rd.	5/88-12/92	0-1018	7.3-8.8	46.0-75.9	7.5-14.8	0.5-11.3	8-19,000
Malibu Cr. @ PCH	1/52-5/88 1/90-12/92	4-400 3-21	--- 7.0-9.0	41-85 57.2-87.1	0.8-24.3 7.3-87.1	--- 0.4-16.8	--- 170-18,000
Lindero Cr.	5/93 & 9/93	0.14-3.7	7.7-8.1	59-77	---	.06-1.1	1,700-50,000
Triunfo Cr.	5/93 & 9/93	12-13	7.3-7.8	60-75	---	0.1-0.2	<20-80
Palo Comado Cr.	5/93 & 9/93	0.6-9.1	7.8-8.0	61-72	---	0.6-9.4	220-9,000

FIGURE 12
SURFACE WATERS OF CALLEGUAS-CONEJO CREEK WATERSHED

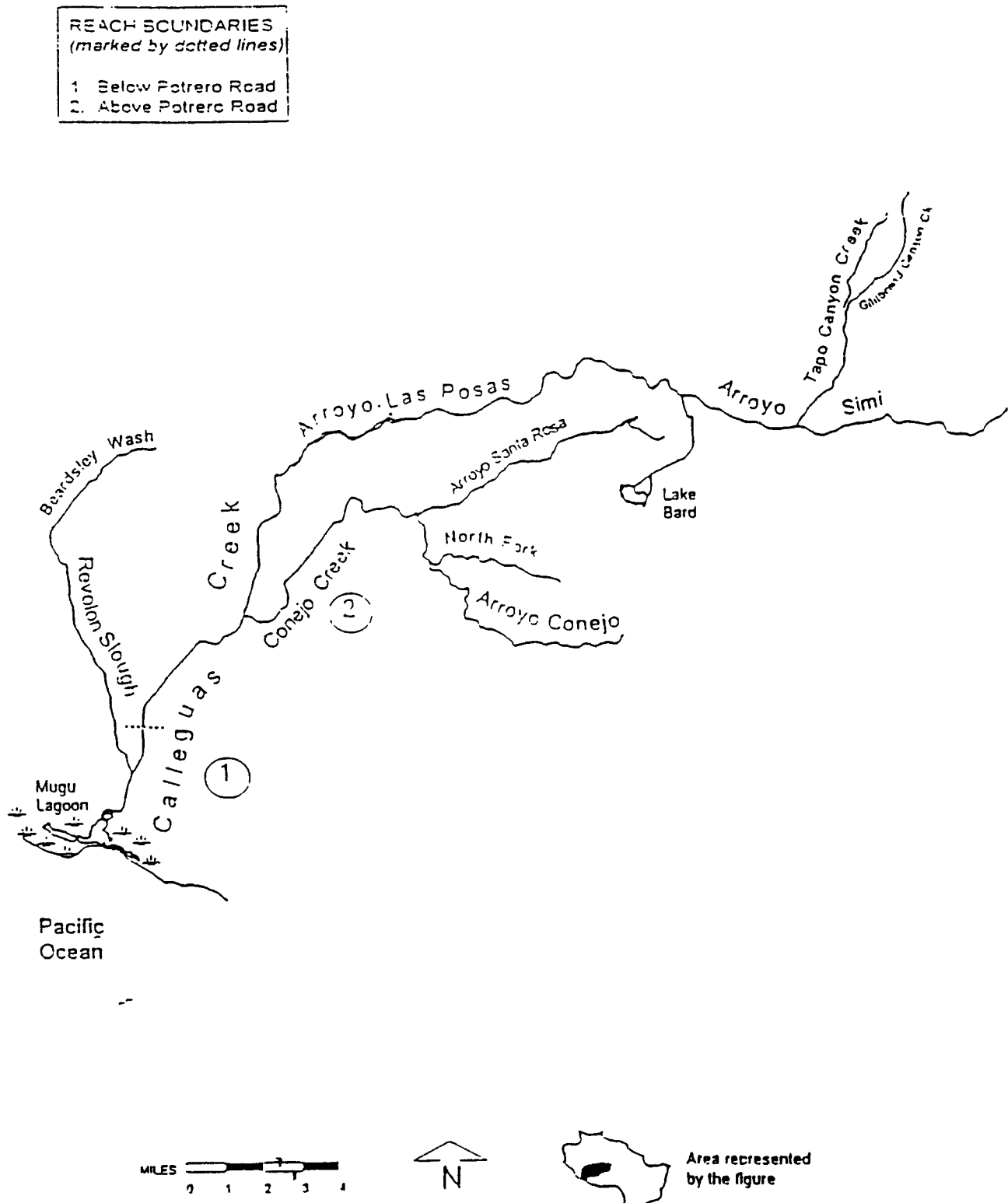


TABLE 10

RANGE OF CONSTITUENTS IN CALLEGUAS CREEK WATERSHED
TRIBUTARIES TO RECOMMENDED OBJECTIVES

Constituents	Recommended Objective mg/l	Calleguas Creek mg/l	Revolon Slough mg/l	Beardsley Wash mg/l	Arroyo Las Posas mg/l	Arroyo Simi mg/l
Sodium	100	10-126	372-600	9-155	180	9-270
Calcium	50-150	56 +	225-466	21-185	130	24-300
Magnesium	50-200	2-33	73-180	6-58	43	4-100
Chloride	250	20-200	131-835	18-96	5-190	9-205
Sulfate	250	54-1550	1083-2325	45-627	20-440	18-1100
Nitrate	45	N.D.-35	0.4-248.	39-57	N.D.-50	6-20
pH	6.5-8.5	7.0-8.2	7-8.1			6.6-8.4
Total Dissolved Solids	500	118-702	2160-4623	49-1370	1180	156-227*
DDT, DDD, DDE	1.0	2.0	2.0			
Toxaphene	0.5					
Dieldrin	1.9	2.0	2.0			
Endosulfan	5.6	5.0	5.0			
PCB	14	30	30			

Recommended concentrations from the Regional Water Board's Basin Plan and E.P.A. Water Quality Criteria

II.C.3) ESTUARIES AND LAGOONS

In the Santa Monica Mountains NRA there are two existing lagoons with perennial streams and three with intermittent streams. The largest of the lagoons, Mugu Lagoon, is owned by the U.S. Navy and is the largest relatively undisturbed salt marsh in southern California. The other lagoon, Malibu Lagoon, is the recipient of 105 square miles of drainage within the SMMNRA. Topanga Canyon, Trancas Creek and Zuma Creek have degraded estuarine areas periodically, depending on the seasonal water flows.

In 1992, the California Water Quality Assessment attributed more than 80 percent of impairment problems for coastal lagoons, harbors and wetlands to non-point source pollution. The Mugu Lagoon watershed is about 30 miles long and 14 miles wide. It is located in southern Ventura County with a small portion in Los Angeles County. Only a small part of this watershed is within the SMMNRA. Calleguas Creek is the major drainage in the watershed and its tributaries drain an area of 343 square miles from 37 subwatersheds. The lagoon is a vital stop on the Pacific Flyway, a nursery ground for many marine fish and mammals and a vital habitat for several threatened and endangered species (see **Appendix L**). Some of these include: the California least tern, light-footed clapper rail and Belding's savanna sparrow. Although Mugu Lagoon has not been affected as much as other lagoons and estuaries in southern California, it has not been left unaltered. The effects of agriculture, urbanization and the U.S. Navy have resulted in significant changes and loss of habitat.

The estuarine wetlands of Malibu Lagoon and salt marsh are estimated to cover 58 acres. There have been many alterations, from stream channelization to using fill to construct baseball fields. Disturbance by humans, off road vehicles, horses and domestic pets are ongoing problems. The large watershed contributes a number of pollutants. In the highly urbanized parts of the watershed, non-point source pollution comes from runoff of roads, and other impervious surfaces such as roofs, parking lots, driveways and sidewalks. The importation of water is approximately 17,000 acre-feet per year primarily used for domestic purposes. Some of this waste water is treated at the Tapia Water Reclamation Facility, and either discharged to Malibu Creek or sold for landscape irrigation. Between October and June, 5-10 million gallons per day are discharged to the creek. This increased amount of water in a stream poses major problems to the flora and fauna of the lagoon. When the lagoon mouth is closed, freshwater becomes ponded within the system, creating a more brackish environment than is found typically in most coastal lagoons. The low stream flows and the southerly littoral sand flows in the ocean close off the lagoon in the summer months. If the ponded water gets too high in Malibu Lagoon, the septic tanks in the homes adjacent to the lagoon do not work and the lagoon has to be breached to lower the lagoon water level. The California State Parks are responsible for making the decision to breach, and for conditioning the breaching. The mechanical breaching of the lagoon required at specific water levels causes the release of lagoon water into the ocean. If there is any pollution of the lagoon water when it gets released, it can affect swimmers and surfers. The rapid release of these waters can affect significant osmotic change affecting the biota in the lagoon. The

lagoon provides habitat to a number of migratory waterbirds, supports a dense riparian forest and supports the southernmost steelhead run in the U.S. It also provides recreational access and educational opportunities for many school children.

Where Topanga Creek discharges into the Pacific Ocean, a berm has been built across the mouth of the creek by littoral drift and wave action, and a lagoon has formed due to the backwater effect of the berm. The main channel of Topanga Creek is 6.6 miles with an average channel slope of approximately 70 feet per mile. Topanga Creek is a tightly constrained creek due to steep canyon walls, and broadens into an alluvial plain as it leaves the canyon. Exotic flora such as nasturtium, as well as abandoned cars, houses and shacks are found in the floodplain.

Trancas Lagoon drains a watershed of 6,233 acres and is almost entirely within the SMMNRA, with little development. The lagoon is a 9-acre coastal lagoon at the mouth of Trancas Creek. It is an ephemeral creek fed by waters which drain off the southern flanks of the Santa Monica Mountains and flow through the 6-mile-long reach of Trancas Canyon. The mouth of the creek is closed by sand bars caused by wave action and littoral transport of sand. Water ponds behind the berm and has to be breached mechanically. The creek has been impacted with concrete channelization and a concrete and boulder debris basin.

Zuma Creek drains a 9-square-mile watershed. Lower Zuma Creek and Lagoon are heavily impacted by a variety of alien plants, as well as heavy sediment loads. This perennial stream creates a 2.3-acre wetland at the mouth of Zuma Creek. An interagency plan for the restoration of this area is currently being developed.

II.C.4) FIRES

Both the coastal sage scrub and the southern California chaparral vegetation are fire adapted. Grasslands and oak woodlands usually have less fuel available but will also burn fiercely during the right conditions. All of these types become even more fire prone as the terrain becomes steeper. Add to this hazard the complexity of human development and the vagaries of the weather, and the fire risks in the park can be severe. Since the days when early Native Americans set fires to improve their gathering of acorns, up to the present, natural fires have not been a major contributor to the fires in these mountains.

In their undeveloped condition without any fire protection, these areas can burn at natural intervals of between 10 to 50+ years depending on a combination of local conditions. Studies of charcoal in sediments show longer fire intervals, while studies of vegetation ages or burn records give medium to short intervals. Minnich (1983) conducted a study which compared similar areas in northern Mexico and southern California to gauge the influence of fire suppression in chaparral vegetation. Wildfires are routinely suppressed in southern California, but generally left to burn in northern Baja. During the eight-year study period,

both areas had fire burn over eight percent of the acreage, or one percent per year; in California, 203 fires burned an average of 12,950 acres each, while in Baja 488 fires burned an average of 48 acres each. In California over 70 percent of the fires occurred after September 1 versus only 20 percent in Baja. The implication is that even though both areas burned about 1 percent of the acreage each year, California's fires were less frequent, burned larger acreage and usually burned during the worst fire conditions. In addition, the weather and development patterns in California leave watersheds and property prone to severe post-fire flood damages. This well documented series of events is referred to as the fire/flood sequence, therefore the complete impacts of a wildfire can only be seen over a period of several years. The well-being of the area residents is closely reliant upon the overall condition of the watershed.

Because study results differ, and the best fire regime is undetermined, fire planners usually aim at managing scrub and chaparral vegetation types in 20-year cycles, 5 percent of an area affected by fuel treatment each year, avoiding the heavy build-up of dead fuel that can lead to large fires with high burn intensities. Prescribed burning is very useful for treating large areas of hazardous fuels; but the more developed an area becomes, the more difficult and expensive prescribed burning becomes. Thus the more important it is to have fire-resistant landscaping and building construction. There is one thing that is becoming obvious: it is not whether an area will burn but when it will burn. This is illustrated in **Figure 13** which shows the fire history in the last seventy years. There is rarely a simple solution to a complex problem; in this case the only reasonable thing to be done is to implement a mix of land management, fire/fuel management, and development controls, as well as use management responsive to the reality of the fire regime.

The effects of fire upon the watersheds result indirectly from the removal of the stabilizing influence of vegetative cover on the hydrologic parameters. These effects cause changes in both the quantity and quality of the water within the watershed.

The effects on the water quantity result from increased storm runoff due to removal of the vegetative cover, and creation of water repellent soils and additional soil layers. This results in increased base flows of streams during low flow periods because of the elimination of vegetation and the consequent lower levels of evapotranspiration. It has been shown that the peak storm flows increase three hundred to five hundred percent on a burned chaparral watershed during the first rainy season following a fire. The large fires (greater than 10,000 acres) that characterize the Santa Monica Mountains' history, create a "fire/flood" scenario where substantial damage is done. Residential areas in the canyon bottoms are affected by peak flows and sedimentation produced within the burned areas. During combustion of vegetation, particularly in chaparral, organic residues in the form of oils, fats, etc., are exuded from plant tissues and fall to the surface of the soil. This decreases the porosity of the soils and increases storm runoff.

The elevated levels of nutrients from the soil are primarily from inorganic components.

There are organic component contributions from the plant biomass being volatilized during combustion. In 1993 the Old Topanga and Greenmeadow fires consumed 55,000 acres; neither was contained until reaching the ocean. **Figure 14** shows the extent of the 1993 Old Topanga fire and its rate of engulfment. The frequency of fires in the SMMNRA varies from year to year, but as seen in **Figure 13**, a historical illustration, there are very few years when the area does not have a significant section burned, with subsequent effects on the watershed. The quality of the water with the increased stream sediment causes increases in turbidity, temperature and dissolved organic nutrients. Increased stream temperature can affect stream biota by increasing algal blooms and by decreasing the oxygen content of the stream water.

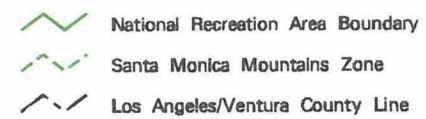
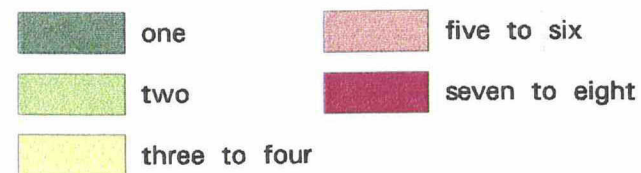
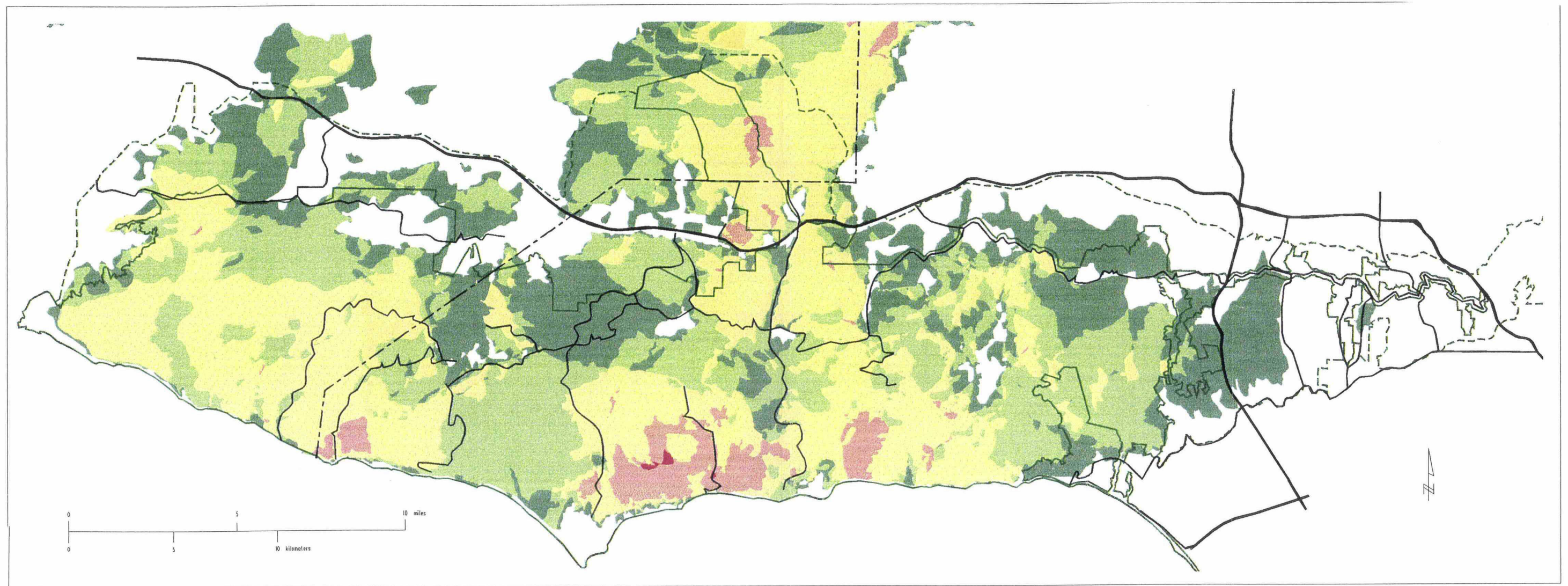
Sand Transport in the Shore

Southern California beaches generally experience progradation during summer months and retrogradation during the rest of the year in response to the changing wave regime. Longshore currents on the more northerly trending part of the coast, from Santa Monica south, commonly experience reversals of current direction with a net flow to the south. Along the more westerly trending part of the coast, essentially along the northern side of Santa Monica Bay, current reversals are less common with a consequent predominant flow to the east.

It is established that some sand enters the shore zone from around Point Conception and that this material is supplemented by the Ventura and Santa Clara Rivers which provide by far the most sand of any of the streams draining to the coast. Generally, it is agreed that some sand passes Point Mugu, but that most is intercepted by the Hueneme and Mugu Canyons. At Point Dume, a similar situation is thought to exist with most of the sand transported eastward along Zuma Beach being intercepted by Dume Canyon. In eastern Santa Monica Bay, all transported sand must be intercepted by Santa Monica and Redondo Canyons because no sand is believed to pass around the Palos Verdes headland.

To date, a satisfactory method for the direct measurement of the drift rate, that is, the volume of sand moving along the shore in response to the longshore current, has not been developed. Accretion or erosion rates behind obstructions or merely the change of the shore profile are used for estimates; both methods give minimum values. Ingle's (28) measurements of from 117 to 1,671 cubic yards per day at Trancas Beach, 75 to 1,376 cubic yards per day at Santa Monica Beach, and 75 to 2,875 cubic yards per day at Huntington Beach may be representative for the study area. The restriction to a higher range of rate of movements at Trancas as compared with the broader range of rate of movement at Santa Monica and Huntington Beaches indicates a markedly higher

**FIGURE 13
FIRE HISTORY**



Fires mapped by Los Angeles & Ventura County Fire Depts.
 Plot produced by National Park Service August 1994
 Santa Monica Mountains National Recreation Area GIS
 (818) 597-1036 ext. 236

Fire History

Number of Fires since 1925

Santa Monica Mountains National Recreation Area



incidence of wave energy in the northern part of the study area. This agrees with theory which maximizes wave energy transfer along shores where wave orthogonals most closely parallel shore normals. Average rates for all Ingle's test sites except Goleta Point Beach decreases consistently southward; this raises the interesting possibility that in a general way, we may be able to predict comparatively, rates at any point along the shore of the study area.

II.C.5) BEACHES

Beaches found on the semi-open coast of Southern California are very dynamic in terms of physical stability, for they accrete and erode on a seasonal basis. The natural extent of the mobility of the shoreline will vary by local terrain, according to the severity of the annual weather cycles and the littoral flow of the sand. The shoreline may be further effected by artificial influences such as jetties that either increase or decrease stability of the beaches. Southern California beaches generally experience progradation during the summer months and retrogradation during the rest of the year in response to the changing wave regime. Along the westerly trending part of the coast, the northern side of the Santa Monica Bay current reversals are less common, with a consequent predominant flow from the east.

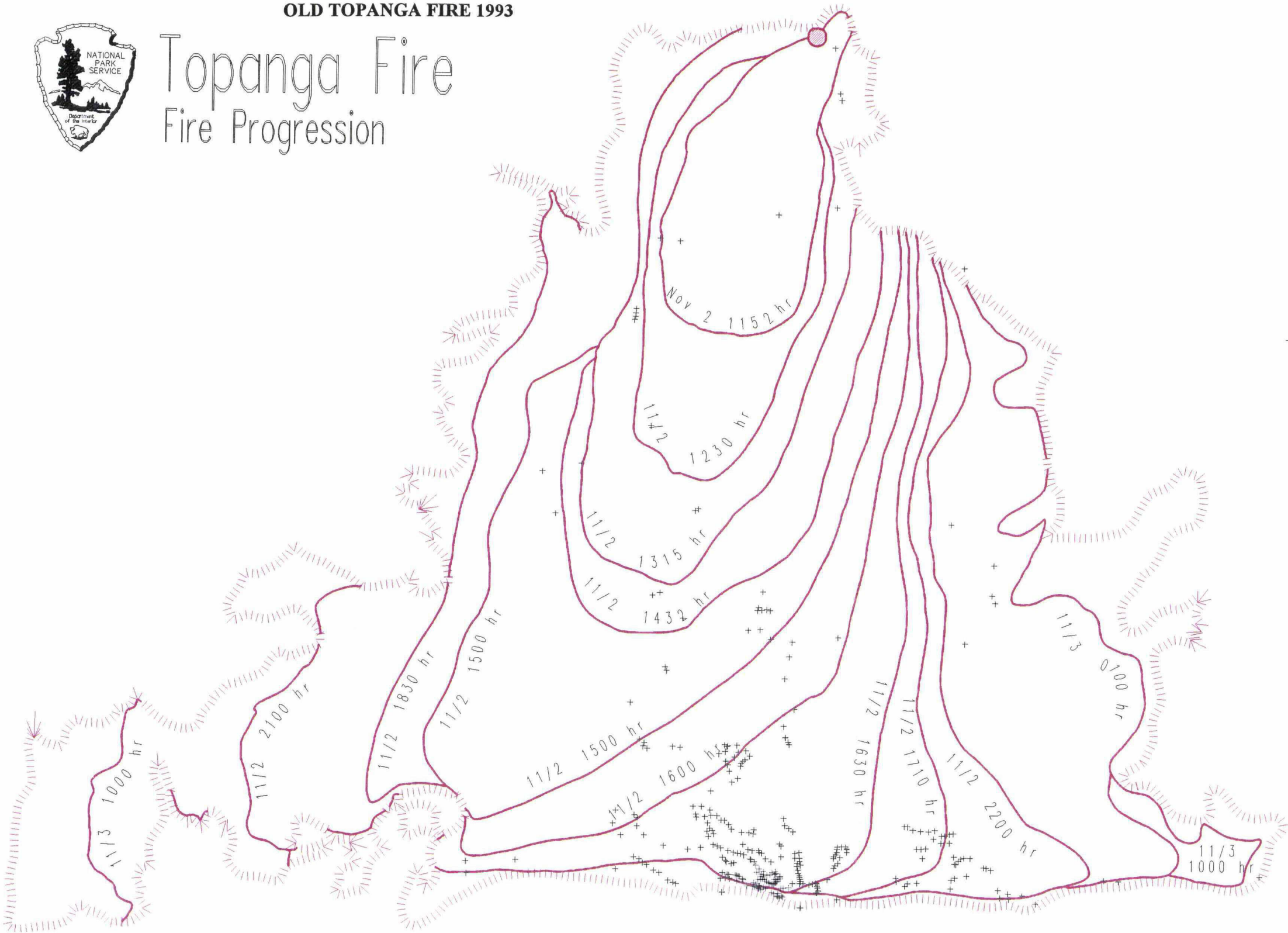
Sand enters the shoreline around Point Mugu but is intercepted by the Hueneme and Mugu canyons. At Point Dume a similar situation is thought to exist, with most of the sand transported toward Zuma Beach being intercepted by Dume Canyon. The sediment transportation from the southern California watershed delivered to the ocean during the last million years has been about 7.7 million tons annually, of which about 0.8 million tons was sand. It is doubtful if any estimates of the past are useful today except for historical purposes. The rapidly altering conditions in the watershed by dams, debris and development reduces the amount of sediment transported to the ocean. These alterations can lead to major effects on the beaches. This is essentially a socio-political problem and involves a basic conflict between the desire to develop the coast and the need to preserve its natural character. The only complete sand beaches left in mostly undisturbed condition are some of the beaches within Point Mugu State Park, Leo Carrillo State Park, Nicholas Canyon, Zuma Beach and the other side of Malibu Point.

The biota of the intertidal zone exhibits great diversity, and consists of interstitial fauna, such as sand crabs, pismo clams, olive snails and sand dollars, as well as perch, corbina, shovelnose sharks, thornback rays, hermit crabs, an occasional halibut and a host of other organisms. Beyond the surf zone, there is still more diversity, with beds of sand dollars, and at deeper depths, brachiopods, worms, sea pens, various snails, mantis shrimp, starfish and flatfish, etc.

FIGURE 14
OLD TOPANGA FIRE 1993

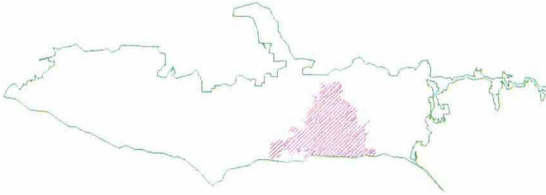


Topanga Fire Fire Progression



- Fire Origin
November 2, 1993 1040 hr
- - - Final Fire Perimeter
November 3, 1993 1800 hr
- + Burned Structures

Date	Hour	Time Interval	Acres Burned
11/02/93	1152	1 hr 12 min	1,080 acres
11/02/93	1230	38 min	776 acres
11/02/93	1315	45 min	1,256 acres
11/02/93	1432	1 hr 17 min	856 acres
11/02/93	1500	28 min	2,074 acres
11/02/93	1600	1 hr	1,041 acres
11/02/93	1630	30 min	1,460 acres
11/02/93	1710	40 min	612 acres
11/02/93	1830	1 hr 20 min	1,212 acres
11/02/93	2100	2 hr 30 min	875 acres
11/02/93	2200	1 hr	700 acres
11/03/93	0100	2 hr	1,865 acres
11/03/93	1000	9 hr	821 acres
11/03/93	1800	8 hr	2,400 acres



Santa Monica Mountains NRA
Location of Fire

The beaches are a major recreation resource of the area, and sport fishing takes place on and offshore. The western continental shorelines are upwelling coasts and thus very fertile. For example, 50 percent of the fish taken from the sea each year are from upwelling areas, but only 0.1 percent of the area of the ocean are considered upwelling areas; thus 99.9 percent of the surface area is about a thousand times less productive than the upwelling areas. The beaches provide contact recreation for tens of millions of visitors each year in the form of swimming, surfing, casual water play and sunbathing. It is probably the single greatest attraction for all of southern California. In a sociological sense, it is the one venue where all the different racial and ethnic communities share a natural resource at the same time.

ILD) GROUND WATER

Historically, until World War II, the lands in the Santa Monica Mountains were used primarily for grazing livestock and dry farming. After the war, more wells were constructed for irrigation and development causing a decline in ground water levels. This decline in ground water levels was accelerated by urban development and the drought between the late '40's and early '60's. Beginning in 1913 (when the Owen's Valley Aqueduct was completed), imported water has been available in the Los Angeles Basin. In 1963, this water was brought to the mountains and the ground water levels have risen to predevelopment levels. This suggests that there is a limited storage capacity in the ground water basins.

The ground water in this area occurs principally in consolidated sedimentary rock and secondarily in the unconsolidated alluvial deposits that thinly veneer canyon bottoms and fill alluvial basins. Within the bedrock formations, ground water typically deposits in fractures, joints and along bedding planes. While alluvial deposits are periodically saturated during and after periods of precipitation, due to their limited thickness these deposits are not considered significant sources of ground water. Ground water is contained principally within conglomerate and sandstone strata of the Topanga and Chatsworth Formations and is also in the more porous breccias, tuffs and conglomerates of the Conejo Volcanic Formation. The direction of the ground water flow within the unconfined aquifers is controlled by geologic structures within the Chatsworth, Topanga, and Modelo Formations. The ground water continues with a downstream gradient along the valleys toward the ocean, emerging as a gaining stream, with water appearing at the surface close to the ocean. Ground water levels in recent years indicate an upward trend due to decreased extraction and increased recharge, because of the importation of state water and more recently, the use of reclaimed water. Recharge to the bedrock aquifers is provided by infiltration of precipitation, although lesser amounts of recharge result from percolation of stream water and excess irrigation water. Typically, five to ten percent of the annual precipitation becomes available for deep percolation and bedrock storage (Las Virgenes Municipal Water District). Urbanization has a direct effect on the natural recharge that occurs. Urbanization decreases the recharge by increasing the impermeable surface area and increasing the rate of runoff. This recharge reduction varies, but it can be as much as 25 to 40 percent.

The quality of the groundwater varies in the alluvial basins where there has been repeated flushing from rainfall. The quality ranges from good to poor in the bedrock ground water because of the characteristics of the bedrock. The ground water in the Topanga and Chatsworth Formations have total dissolved solids (TDS) values between 1,500 and 3,000 mg/l with high concentrations of sulfates, manganese and hydrogen sulfide. Some of the deep seated ground water is circulated back to the surface where it emerges as springs or artesian wells with 70 to 80 degree Fahrenheit water.

The water which percolates into the ground water below the Tapia Treatment Plant contains additional chemicals other than those which are naturally occurring. Elevated levels of nitrogen, sulfates, chlorides and sodium have augmented naturally occurring chemicals below the Tapia Treatment Plant. The effects of these additional nutrients may alter the normal growth of the biota within the Malibu Creek watershed.

II.E) WATER USES

The uses of the water resources in the SMMNRA are extremely varied. There is contact recreation at the salt water beaches, which includes swimming, surfing, scuba diving, snorkeling, bathing, tidepool visiting and water play. In the fresh water resources, there is contact recreation with swimming and water play as the main activities. The non-contact water recreation for salt water areas includes fishing, boating, sailing, whale watching, surf fishing, sun bathing, picnicking, and beach sports such as volleyball. Fresh water non-contact activities include fishing, nature walks, picnicking, birding and sailing model boats. The warm freshwater habitats, including wetlands, are productive habitats for sedges, tules and cattails. The wildlife using these wetlands include: the great blue heron, peregrine falcon, red-winged blackbird and western aquatic garter snake. The riverine fresh water habitat contains steelhead and rainbow trout, and introduced species such as bluegill, green sunfish and large mouth bass. Other species in this system are southwestern pond turtle, California slender salamander, California newt, Monterey ensatina, arboreal salamander, California toad and Pacific tree frog. There is barrier free access to the ocean at the mouths of many of these riverine habitats. The salt wetlands such as Malibu Lagoon and Mugu Lagoon are breeding grounds for many small fish, and the tidewater goby resides in Malibu Lagoon. Mugu Lagoon additionally is a breeding ground for the harbor seal. The California least tern, brown pelican and Belding's savanna sparrow are among the residents of these areas. The mammalian wildlife use the fresh water for drinking. There are carnivores such as mountain lions and bobcats. Coyotes, deer and many other wildlife are also present in this area. Rodents, reptiles, amphibians and insects, too numerous to mention, survive in the SMMNRA on the fresh water springs, seeps and surface waters. Reclaimed water is used for irrigation of hay and alfalfa fields as well as golf courses and other lawn areas. The ground water is recharged in percolation ponds near the reclamation plant. Some of the reclaimed (tertiary treated) water is discharged directly into Malibu Creek.

In the summer there are tens of millions of people using the southern California beaches. The health and safety of these people are of primary concern. Upland contamination can affect the beach goer, creating an unaesthetic, unhealthy experience. Unsafe beach use occurs when there is minimum water coming down the creeks to the ocean, and persons playing in the stagnant water in the lagoons may be exposed to high concentrations of harmful substances.

During the remainder of the year, upland areas get far more use than the beaches. Visitation in the fall, winter and spring months is not as great as in the summer, but there is never a time when visitors are absent. Therefore, both the individual and cumulative effects of visitation, such as litter and erosion, must be regularly monitored and mitigated.

CHAPTER III

WATER RESOURCES MANAGEMENT PROGRAM

This section of the Water Resources Management Plan provides an overview of the existing activities related to water resources in the SMMNRA and an overall vision for future water resources management in the park. The overall mission statements and management objectives are identified in the park's legislative mandates and the Resource Management Plan. This section of the plan will address water resources issues derived from what has been described in the preceding chapters. The mission statements and mandates provide for general guidance. Following the described goals, the objectives to be applied to the specific issues will be followed by the "project statements" which are utilized by the National Park Service for planning and budgeting. Potential staffing needs will also be identified to fulfill the needs for accomplishing the funded projects.

III.A) MISSION STATEMENTS AND MANDATES

In 1978, Congress established the Santa Monica National Recreation Area and found that *"there are significant scenic, recreational, educational, scientific, natural, archeological and public health benefits provided by the Santa Monica Mountains and adjacent coastline areas and there is a national interest in protecting and preserving these benefits for the residents of and visitors to the area; and the State of California and its local units of government have authority to prevent or minimize adverse uses of the Santa Monica Mountains and adjacent coastline area and can, to a great extent, protect the health, safety and general welfare by the use of such authority."*

The 1978 Act also specified that the Santa Monica Mountains National Recreation Area would be administered as a unit of the National Park System in accordance with the National Park Service Organic Act of 1916 as amended and supplemented (16 USC1 et seq.). The National Park Service is thereby committed in the Santa Monica Mountains National Recreation Area *"to conserve the scenery and the natural and historic objects and wild life therein and to provide for their enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

According to Section 1a-1 of Title 16, of the U.S. Code, *"recreation areas in every major region of the United States ...though distinct in character....that, individually and collectively, these areas derive increased national dignity and recognition of the superb environmental quality through their inclusion jointly with each other in one national park system preserved and managed for the benefit and inspiration of all people of the United States....The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in the light of the high public value and integrity of the National Park System*

and shall not be exercised in the derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Here in the Santa Monica Mountains, the Secretary of the Interior was directed "to identify the lands, waters, and interests within the recreation area which must be acquired and held in public ownership for the following critical purposes: preservation of beaches and coastal uplands; protection of undeveloped stream drainage basins; connection of existing state and local government parks and other publicly held lands to enhance their potential for public recreation use; protection of existing park roads and scenic corridors including such right-of-way as is necessary for the protection of the Mulholland Scenic Park Corridor; protection of the public health and welfare; and interpretation of historic sites and recreation areas in connection therewith, to include but not be limited to, parks, picnic areas, scenic overlooks, hiking trails, bicycle trails and equestrian trails."

III.B) RESOURCE MANAGEMENT GOALS

The Resource Management Plan (1994) identifies the greatest influence on the integrity of the park's natural resources as urban development occurring within and adjacent to the park. All natural resource activities, including water resources activities, are influenced by the pervasive development pressures from within and adjacent to the park. In order to address the threats from development influences, five general goals were identified in the RMP.

- 1) Identify, Protect and Restore Significant Biological Communities
- 2) Identify and Mitigate Resource Threats
- 3) Identify Significant Lands Not in Public Ownership
- 4) Establish the Santa Monica Mountains as a Clearinghouse on Information for Managing Natural Areas Adjacent to Urban/Developed Areas, with Emphasis on the South Coast Mediterranean Ecosystem
- 5) Identify and Protect Significant Cultural Resources

Overall, the RMP emphasized that the NPS does not, and never will, own or manage all the lands within the park, and therefore it is necessary to work cooperatively with all the responsible agencies and the public to manage the park resources. These RMP goals with the defined issues were the management objectives used to create and classify the projects for the WRMP. Because the water resources have the ability to affect public health, and the enabling legislation states that the "protection of public health and welfare" is one of the park's responsibilities, this was included as a management objective. A goal of the SMMNRA is to take a leadership role in all activities which affect the natural and cultural resources within the Santa Monica Mountains. Consistent with the clearinghouse goal in the RMP, the NPS will assume the role of an "umbrella agency," through which information, and/or location of information, pertinent to the Santa Monica Mountains will flow. This will provide a central, single source for

information to be available to all interested parties while assisting the park's role in fulfilling its legislative mandates.

III.C) MANAGEMENT OBJECTIVES

1. Acquire Baseline Data. The National Park Service through planning efforts does not intend to obtain in fee all the properties within the park boundary, and therefore will work with all the jurisdictions that may influence the natural resources. The SMMNRA encompasses many private and public lands, so acquisition of baseline data for the park's interests will depend on cooperating with these agencies and individuals. With the large number of neighbors, we will share data we have with those interested parties.

Some specific objectives identified are:

Identify the role the park open space contributes to maintaining ground water recharge for the San Fernando, Oxnard and Malibu basins.

Conduct thorough resource inventories of Malibu, Mugu and Zuma lagoons to identify the degradation and remediation requirements for restoration.

Monitor airborne pollutants and determine their effects on the aquatic flora and fauna in the watersheds.

2. Protect and Restore Existing Water Resources. Where impacts to water and water-dependent resources are identified, specific actions will be developed to protect and, where necessary, restore them. Areas of concern occur throughout the recreation area and include wastewater discharge (legal and illegal), oil spills, landfill seepage, barriers to fish migration, erosion and sedimentation, and non-point source pollution. Other projects that protect or remediate the more obvious impacts to the water environment are also included. Protection of the water resources from further degradation and restoration of degraded areas include: the identification of non-point source pollution; animal and human waste release; campground contamination; and development causing alteration of water quality or quantity. Through protective actions, preservation of natural areas can be accomplished. Restoration of those water resources that have already been degraded will also be the subject of other projects. Resource protection goals guide the activities involved in all the projects listed in this section. The SMMNRA will act as a facilitator and leader to encourage cooperating agencies to contribute to the protection of the resources.

Some specific objectives identified are:

Establish acceptable water quality standards to protect the resources in the park.

Identify and correct human impacts, such as development, roads, etc., which can or will create significant erosion problems.

Identify and control point and non-point source pollution.

Remove alien plant species and plant native species in riparian areas and surface waters.

Reduce watershed erosion from catastrophic wildfires by conducting prescribed burn fire management.

Review road building cut-and-fill methods used for vehicular access near streambeds.

Protect the marine California "Area of Biological Significance" adjacent to the SMMNRA.

3. Establish SMMNRA as an Information and Data Clearing House

As a recently established park, created within a mosaic of public and private properties which influence the natural and cultural resources and activities of the park, it is necessary to identify and collect information which preceded the park's presence and which is being accumulated presently by all the relevant agencies about water quality, quantity, use and disposal. Collection of pertinent information related to the Santa Monica Mountains National Recreation Area will be assembled and evaluated by park employees and other interested parties. In its role as an "umbrella agency" the acquired data will be shared and made available to all the responsible parties, both agencies and the public.

Some specific objectives identified are:

Establish collegial relationships with sister agencies in and around the Santa Monica Mountains.

Promote public awareness of the interrelationship of the health of the SMMNRA ecosystem with adjacent coastal areas, other public and private lands, and recreational park lands.

Continue to contribute to the decision-making process on any and all developments in the SMMNRA and adjacent areas that could have an impact on the water resources in the SMMNRA.

4. Management of Water Resources for Educational/Recreational Activities.

Protection and preservation of the natural, cultural, recreational and scenic resources is a major concern of the National Park Service because of the ramifications of the park's intense visitor use.

The proximity of the SMMNRA to tens of millions of persons who use these resources regularly requires maintaining non-consumptive use of resources while serving visitors. Water resources in Southern California are limited and are a most valuable and vulnerable resource because of their great attraction for recreational use. The tremendous pressures put upon the water resources by the recreational users presents a major challenge. One must provide and maintain the availability of the recreational activity without compromising the natural and cultural resources or scientific value of the basic water resources. The resources of the marine environment are subject to the same impacts affecting the terrestrial water resources and need to be protected at the same level. It is necessary to keep visitors informed about water resources in the SMMNRA to establish a knowledgeable public that will be more sensitive to saving the park's resources. As the only agency with the overall responsibility for the entire Santa Monica Mountains' natural resources, educational products to be produced include interpretive walks and lectures to visitors and institutions; brochures describing the natural and historical aspects of the role of water in the Santa Monica Mountains; recommendations for responsible or best management practices for agencies and developers; and guidance pamphlets for residents and developers about the role of water in the mountains.

Some specific objectives will be:

Provide interpretive programs and literature that focuses on water resources.

Protect the quality and quantity of the beaches for natural, historic, recreational and scenic values.

5. Protection of Public Health. The need for this activity is clearly stated in the park's enabling legislation. The influence of the urban, agricultural and suburban environments on the water resources provides point and non-point sources of pollution. Human activities are the greatest sources of these contaminants. Identification and mitigation of these sources of pollution must be done in cooperation with the appropriate regulatory bodies. Although many of these threats to public health are within the park boundary, the National Park Service is not a regulatory agency and thus will primarily have to coordinate its activities with those agencies who have the jurisdiction to enforce and establish regulations. Projects concerned with this objective will address activities such as monitoring water to maintain its designated beneficial use. Recreational users such as swimmers, surfers, waders, hikers, bikers, riders should not be exposed to waterborne health threats. The wildlife, as well as the humans, in the park should not be exposed to contaminants and must also be protected. Activities to be performed in cooperation with other agencies will include: finding early assays for water degradation; controlling runoff from altered ground surfaces such as parking lots, lawns and golf courses; monitoring and preventing leakage from treatment plants, including septic systems; and determining the effects of increased imported freshwater supplies in the watersheds on the existing flora and fauna.

One specific objective identified is:

Evaluate and monitor water in the SMMNRA to ensure health standards are constantly met.

III.D) IDENTIFICATION OF WATER RESOURCES ISSUES

The purpose of identifying water resources issues is to focus on implementing the goals and objectives of the Water Resources Management Plan. The goals and objectives provide the broad-based guidance as to what should be done while the issues narrow the scope and provide more specific ways to accomplish these goals and objectives. The identification of water resources issues was established at a scoping session held August 1993 with input from ten management agencies that have jurisdiction in the Santa Monica Mountains. The attendees are listed in **Appendix B**. The following were found to be high priority issues:

*** Information Repository**

There is widespread support by the agencies with responsibilities within the Santa Monica Mountains for the National Park Service to provide a repository of natural and cultural information for the park and zone. The NPS is the only agency in the Santa Monica Mountains with broad natural resources mandates and GIS capability. The many agencies and private organizations collecting information need a single agency, like the NPS, to be a central source for water resources information.

***Non-point Source Pollution**

The NPS will support and cooperate with the efforts of regulatory authorities and agencies to address the non-point sources of pollution. In the areas within our boundaries there are few major sources of pollution and those present are regulated by appropriate jurisdictions. All agencies with jurisdiction within the SMMNRA have some plans for addressing non-point source pollution. The NPS can contribute significantly because it takes a more global view of the problem in these mountains.

***Endangered, Threatened and Sensitive Species Management**

The park contains many state and federally listed species. Information on their current distribution and status is lacking. Shrinking habitats are placing increasing numbers of species at risk. Animals do not respect political boundaries. An inventory of these species and their critical habitats is needed. The NPS is in the unique position to work on the entire park area to formulate a useful management plan.

*** Water Resources, Rights and Issues Inventory**

Compilation of existing information on surface and ground water, and in some cases new inventories, is needed to identify the water resources of the park and their associated water rights. Part of our data inventory collection will address this problem. Real estate in this area

changes hands frequently and it is not always apparent whether the water rights are included in each land transfer.

*** Lack of Coordination of Monitoring Programs**

Uncoordinated monitoring by individual agencies is not conducive to good resource protection or a cost effective monitoring program. Creation of a data repository for all to see and evaluate will allow agencies to determine the value and rewards of coordination.

*** Ground Water Management**

Information is needed about ground water conditions in the area and about the relationship of ground water to surface water resources in the park. Acquisition of data and scope of monitoring of ground water resources is needed. The direction and quantity of the flow of ground water in areas of high seismic activity is very difficult to predict. Recharge areas need to be identified along with the fate of this recharge.

*** Waste Water Management**

Knowledge of the impacts of waste water disposal from private residential developments in the park is minimal. There are several waste water treatment plants in the park and many individual septic systems. These waste water systems have increased stream flow and elevated concentrations of nutrients, and pose potential health risks. Evaluation of these effects in all the park watersheds is needed. For those regulated waste water treatment facilities there is good data, but non-point source contributors have few or no regulations, and collectively they make a major contribution to the amount of wastewater released.

*** Water Quantity**

Augmentation of summer flows from imported waters and waste water discharges have resulted in the survival of exotic species. Information is needed to determine the ramifications of introduction of perennial flows on stream ecology. This semi-arid area did not have water in most of the streams prior to the major influx of development and the importation of water. The stream environments have changed and have changed the balance between indigenous species and exotic species.

*** Alien Species Management**

The status and impacts of alien species and changing ecology affecting the aquatic and riparian communities need to be examined. Opportunistic plants and animals now occupy a significant area in the SMMNRA at the expense of native species. Appropriate measures need to be taken to manage this situation.

*** Coastal Lagoon Management**

There is a need to understand the physical and biological elements of the lagoons within the park and their upland watersheds. Over the years, the lagoons within the SMMNRA have been altered by man. Although they can never be brought back to the time of pre-European man's

appearance, the dynamics of the lagoons needs to be understood for productive management of this valuable wetland resource.

*** Sedimentation and Erosion**

The anthropogenic influences in the Mountains significantly increase sedimentation and erosion. Cooperation with land use agencies to control unnatural erosion will be implemented.

Construction and road building have altered the landscape to increase the erosion potential. The ramifications of these activities upon water resources is tremendous.

*** Fire Management and Water Resources Impacts**

Identify and use better fuel management tools to minimize adverse effects on the water resources at the urban/wildland interface. In this climate, rainfall routinely follows the fire season.

Uncontrolled wildfires expose the land for subsequent flooding, erosion and landslides. Preventing major conflagrations with a sensible fire management policy would help save a large part of the watershed.

*** Education and Interpretation**

The critical role that water resources play in the physical and biological processes of the park is a message that needs to be communicated to the public. Ultimately the health of all the watersheds will depend on the informed public recognizing the need for watershed programs that address the physical and biological aspects of the problem.

The following table identifies the natural resources project statements which address the issues identified in the scoping session for this plan.

TABLE 11

**RELATION OF ISSUES FROM SCOPING SESSION WITH
OBJECTIVES AND PROJECT STATEMENTS**

ISSUE	OBJECTIVE	PROJECT STATEMENT
Information Repository	Acquire Baseline Data Use of Water Resources for Educational/Recreational Activities	301.00, 301.03, 301.04, 301.07, 311.01, 400.04, 504.014, 504.08, 315.010, 316.01, 317.010, 318.01
Non-point Source Pollution	Protect Public Health Protect and Preserve Existing Resources	313.010, 313.020, 306.010, 308.010
Endangered, Threatened and Sensitive Species Management	Acquire Baseline Data Protect and Preserve Existing Resources	311.01, 301.014, 504.080, 312.010, 401.010, 402.015, 313.020
Water Resources, Rights and Issues Inventory	Acquire Baseline Data	301.010, 301.031, 301.070, 400.010, 300.011, 313.020
Lack of Coordination of Monitoring Programs	Acquire Baseline Data Protect Public Health	301.010, 301.070, 400.040, 300.011, 313.020
Ground Water Management	Acquire Baseline Data Protect Public Health	301.070, 400.040, 313.020
Waste Water Management	Protect Public Health Protect and Preserve Existing Resources	301.070, 311.010, 504.014, 504.080, 304.060, 307.010, 313.010, 313.020, 402.015, 306.010, 308.010

Water Quantity	Acquire Baseline Data	301.030, 301.040, 301.060, 301 070, 300.011, 313.020
	Protect and Preserve Existing Resources	
Alien Species Management	Acquire Baseline Data	311.010, 504.014, 504.080, 312.010, 313.020
	Protect and Preserve Existing Resources	
Coastal Lagoon Management	Protect and Preserve Existing Resources	304.010, 304.020, 304.060, 307.010, 312.010, 312.020
Sedimentation and Erosion	Acquire Baseline Data	301.040, 300.011, 305.010, 313.010
	Protect and Preserve Existing Resources	
Fire Management and Water Resources Impacts	Acquire Baseline Data	301.010, 301.070, 400.040 300.011, 304.040, 305.010, 313.020, 304.030, 320.010, 302.010
	Protect and Preserve Existing Resources	
	Protect Public Health	
Education and Interpretation	Use of Water Resources for Educational/Recreational Activities	315.010, 316.010, 317.010, 318.010

III.E) SUMMARY OF RESOURCE MANAGEMENT PROJECT STATEMENTS

The water resources management project statements listed below are grouped according to the management objectives described above. Most of these projects, though, cannot be limited to any specific management objective. However, the major thrust of each project listed lends itself to the management objectives classification listed below.

TABLE 12

TITLES OF PROPOSED PROJECTS ACCORDING TO MANAGEMENT OBJECTIVES

Acquire Baseline Data

SAMO-N-301.010	Conduct Inventory and Assessment - Water Resources
SAMO-N-301.030	Inventory Water Rights
SAMO-N-301.040	Identify and Manage Floodplains
SAMO-N-311.010	Inventory and Evaluate Alien Fish Species in the Lakes and Ponds in the Santa Monica Mountains
SAMO-N-400.040	Inventory Extent of Wetland Associated Terrestrial and Aquatic Vertebrates: Monitor Reptile and Amphibian Population Status and Trends
SAMO-N-504.080	Conduct Inventory and Assessment - Terrestrial and Aquatic Insects

Protect and Restore Existing Water Resources

SAMO-N-304.010	Conduct Zuma Lagoon Restoration Project
SAMO-N-304.020	Cooperate with the U.S. Navy and Other Agencies to Restore Mugu Lagoon and Associated Uplands
SAMO-N-304.040	Develop and Implement Hazardous Waste Management Plan
SAMO-N-304.050	Satwiwa Pond Dredging Project
SAMO-N-304.060	Increase National Park Participation in Response to Oil Spills
SAMO-N-304.070	Restoration of Water Resources for Equine Program at Rancho Sierra Vista
SAMO-N-305.010	Long-Term Monitoring and Evaluation of Sediment Yield in Areas Reseeded After a Wildfire
SAMO-N-307.010	Monitor Terrestrial Impacts on the Off-Shore Area of Special Biological Significance
SAMO-N-312.010	Develop an Interagency Fish (Steelhead/Pacific Lamprey/Arroyo Chub) Management Plan for the Santa Monica Mountains

- SAMO-N-313.010 Identify Impacts from Existing and Planned Golf Courses on
1) Trancas Creek and 2) Malibu Creek
- SAMO-N-403.015 Potrero Creek Restoration Project

Establish SMMNRA as an Information and Data Clearing House

- SAMO-N-301.070 Create NPS Information Management Repository for
Water Resources Within and Surrounding the SMMNRA

Management of Water Resources for Educational/Recreational Activities

- SAMO-N 315.010 Use Docent-Lead Bus Tours of Mugu Lagoon
- SAMO-N-316.010 Establish Visitor Facilities at Mugu Lagoon
- SAMO-N-317.010 Prepare a Water Resources Brochure
- SAMO-N-318.010 Inventory and Assess Handicapped Access to Water Resources
- SAMO-N-402.015 Monitor Health and Status (Changes over Time) of Native
Plant Communities - Develop a Riparian Community Monitoring Handbook

Protection of Public Health

- SAMO-N-304.030 Rocky Oaks Dam Stabilization
- SAMO-N-306.010 Monitor Water Pollution From Visitor Use
- SAMO-N-308.010 Mitigate Non-Point Source Pollution From Livestock
- SAMO-N-320.010 Evaluate Impound Water Quality at Rocky Oaks Pond, China Flats,
Satwiwa Pond and Franklin Canyon Lake and Other Areas as Needed
- SAMO-I-102.050 Calabasas Landfill EA/Special Use Permit

Implementation of Projects

It is recognized that the SMMNRA will always be a natural area within a growing urban metropolis. This places a special responsibility on the SMMNRA to implement these projects to preserve and protect the natural resources for this urban community. The NPS will not be alone, as there will be other land management agencies, such as California State Parks and the Santa Monica Mountains Conservancy, also protecting natural resources. It would be presumptuous to believe that NPS will be the largest land owner in the mountains and that the SMMNRA could manage the resources in a manner that would return the resources back to a pre-European contact state. With the increasing encroachment of development, the projects described depend on cooperation with existing agencies, groups and the public within and adjacent to the SMMNRA as

an essential part of the cooperative effort that will influence all the projects and activities within our boundary.

III.F) STAFFING NEEDS

Presently, the SMMNRA does not have any water resources management specialists on staff. To effectively implement this plan, there is a need to have water resources expertise for the guidance and evaluation of the projects just indicated. Because cooperating agencies have many experts on staff, the NPS in a park of 150,000 acres requires comparable expertise if it is going to be credible in its role as an oversight agency for the entire Santa Monica Mountains. Technical judgments and decisions about water resources in the park made by other agencies based on their mandates, methods and sampling plans have to be evaluated from the perspective of the park's legislative mandates and the goals of the National Park Service. Interpretation of the water resources to serve both the interests of the park as well as of the visitors, requires specialists in water resources. The NPS Natural Resources Management Assessment Program (NR-MAP) was designed to identify total FTE needed to bring Natural Resources Management Programs up to the basic minimum operating level to adequately ensure that parks will meet the challenges of the 1990's and beyond. The NR-MAP analysis performed for the SMMNRA identifies 2.4 FTEs for water resources management programs. The recognition of the additional activities identified in this WRMP calls for the expansion of FTEs above existing levels as shown in **Table 14**.

III.G) PROJECT PRIORITIES

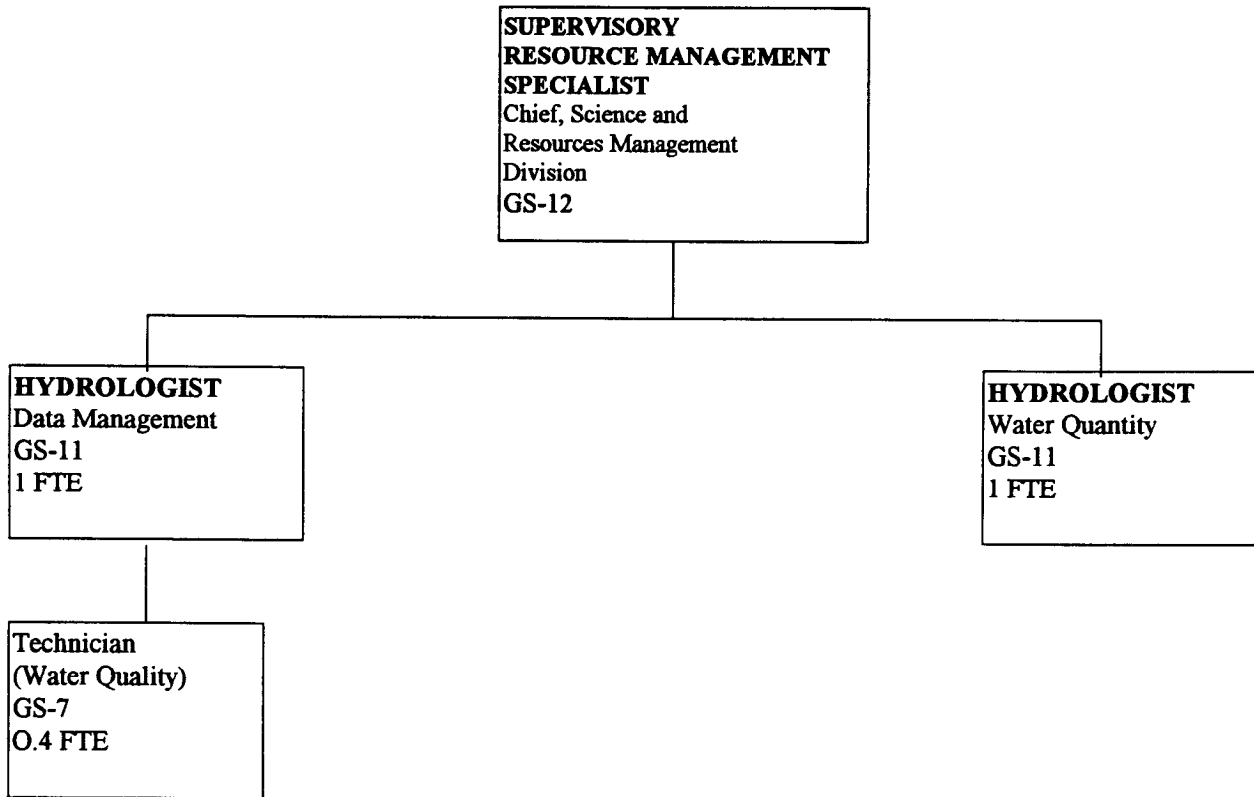
Projects are assigned specific priorities shown in **Table 13**, to reflect the needs of the park. The numerical sequence in **Table 13** should not be taken as a requirement to complete a higher priority project before obtaining funds to work on a lower priority item.

TABLE 13**PROJECTS LISTED BY PRIORITY AND PAGE NUMBER**

1. SAMO-N-304.030	Rocky Oaks Dam Stabilization.....	50
2. SAMO-I-102.050	Calabasas Landfill EA/Special Use Permit.....	17
3. SAMO-N-304.010	Conduct Zuma Lagoon Restoration Project	38
4. SAMO-N-300.012	Participation in Wetland Mitigation Bank Program.....	20
5. SAMO-N-301.010	Conduct Inventory and Assessment - Water Resources	23
6. SAMO-N-301.030	Inventory Water Rights.....	27
7. SAMO-N-301.040	Identify and Manage Floodplains.....	31
8. SAMO-N-301.070	Create NPS Information Management Repository for All Water Resources Within and Surrounding the Santa Monica Mountains National Recreation Area	34
9. SAMO-N-312.010	Develop an Interagency Fish (Steelhead/Pacific Lamprey/Arroyo Chub) Management Plan for the Santa Monica Mountains	85
10. SAMO-N-304.020	Cooperate with the U.S. Navy and Other Agencies to Restore Mugu Lagoon and Associated Uplands	45
11. SAMO-N-304.040	Develop and Implement Hazardous Waste Management Plan.....	53
12. SAMO-N-304.060	Response to Oil Spills.....	61
13. SAMO-N-304.070	Restoration of Water Resources for Equine Program at Rancho Sierra Vista.....	64
14. SAMO-N-305.010	Long-Term Monitoring and Evaluation of Sediment Yield in Areas Reseeded After a Wildfire	67
15. SAMO-N-306.010	Monitor Water Pollution From Visitor Use	71
16. SAMO-N-307.010	Terrestrial Impacts on the Off-Shore Area of Special Biological Significance.....	74
17. SAMO-N-308.010	Evaluate Non-Point Source Pollution From Livestock.....	77
18. SAMO-N-311.010	Inventory, Identify and Evaluate Alien Fish Species in the Santa Monica Mountains	81
19. SAMO-N-313.010	Identify Impacts from Existing and Planned Golf Courses on 1) Trancas Creek and 2) Malibu Creek.....	89
20. SAMO-N-315.010	Use Docents to Lead Bus Tours of Mugu Lagoon	93
21. SAMO-N-316.010	Establish Visitor Facilities at Mugu Lagoon	96
22. SAMO-N-317.010	Prepare a Water Resources Brochure.....	100
23. SAMO-N-318.010	Handicap Access to Water Resources	104
24. SAMO-N-320.010	Evaluate Water Quality at Rocky Oaks Pond, Satwiwa Pond and Franklin Canyon Lake and Other Areas of Standing Water	107
25. SAMO-N-400.040	Inventory Extent of Wetlands	110
26. SAMO-N-402.015	Monitor Health and Status (Changes over Time) of Native Plant Communities: Develop a Riparian Community Monitoring Handbook	114

27. SAMO-N-504.014	Develop Inventory and Monitoring Guidelines for Terrestrial and Aquatic Vertebrates: Monitor Reptile and Amphibian Population Status and Trends	122
28. SAMO-N-403.015	Potrero Creek Restoration Project	118
29. SAMO-N-504.080	Conduct Inventory and Assessment - Terrestrial and Aquatic Insects	125
30. SAMO-N-304.050	Satwiwa Pond Dredging Project	57

TABLE 14
ORGANIZATION CHART FOR WATER RESOURCES PERSONNEL



**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-I-102.050

TITLE: Calabasas Landfill EA/Special Use Permit

FUNDING STATUS: Funded

SERVICEWIDE ISSUE CODES:

N06 Land Use Practices

N11 Degradation of Park Water Quality Due to External Activities

CULTURAL RESOURCES CODE: COMB

RMAP PROGRAM CODE: E00 Environmental Planning and Compliance

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Protection

PROBLEM STATEMENT:

According to 36 CFR Part 6, Section 6.5(c)(1) the Field Director must approve the continued action of a solid waste disposal site after considering various environmental criteria. The Field Director will make his decision on the basis of the results of an Environmental Assessment (EA). The Calabasas Landfill has been in operation over thirty years and started as a municipal landfill (1961-1965). From 1965-1980 the landfill was allowed to accept Class I & II wastes and since 1980 has only accepted Class III wastes. To continue or expand operations of this landfill a Special Use Permit is required from the Field Director.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The NPS Denver Service Center will have an Environmental Contractor prepare an EA to evaluate the issues related to the issuance of a Special Use Permit for the continued operation of the Calabasas Landfill, which is entirely within the boundary of the Santa Monica Mountains National Recreation Area, a unit of the National Park System.

The scope of work done by the Contractor will include the following tasks:

- 1) preliminary meetings and discussions to establish schedules and responsibilities,
- 2) preparation of a description of the proposed action and alternatives (DOPAA),
- 3) public and agency scoping,
- 4) field studies and analytical work required to document existing conditions and impacts,
- 5) preparation of a preliminary and final Draft EIS, response to NPS comments,
- 6) publication of the Draft EIS,
- 7) response to comments received on the circulated Draft EIS,
- 8) revision of the Draft EIS to incorporate new data,
- 9) publication of the Final EIS, and
- 10) preparation of the Record of Decision.

Additionally the Environmental Contractor will participate in meetings and public hearings on the Draft and Final EIS and project meetings with NPS staff and other organizations as required.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. The Calabasas Landfill was in operation prior to the creation of the Santa Monica Mountains National Recreation Area and is a household waste landfill. Recent legislation explicitly states that landfills cannot be on National Park Service property without a Special Use Permit. In order to comply with the law, evaluation of this site requires the preparation of an Environmental Assessment prior to any permitting process. The No Action alternative does not exist as an option in this case.

2) Implement Recommended Project. Preparation of an Environmental Assessment will reveal any and all environmental ramifications of the presence of the Calabasas landfill. This information is necessary to make any judgement as to whether a Special Use Permit will be given to the landfill to continue operations, continue modified operations or close down. The process requires the public to be involved through public meetings throughout the process. According to 36 CFR Part 6, Section 6.5(c)(1) the Regional Director can approve a permit for the continued operation of a solid waste disposal site if the Director finds that adverse effects resulting from leachate, noise, odor, vehicular traffic, litter, and other activities upon natural and cultural resources will be adequately mitigated.

Therefore, full evaluation of the environmental impacts and mitigation measures must be assessed before the Director may approve or disapprove the permit request.

COMPLIANCE:

This project requires preparation of an EA and perhaps an EIS depending on the results of the analysis of the EA.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	TOTAL
Contract preparation of EA with the DSC		NSTA	52	52
Contract oversight	0.1	POF1	5.3	5.3
TOTAL	0.1		57.3	57.3

RELATIONSHIP TO OTHER PROJECTS:

This project is related to all other natural resources statements contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-300.012

TITLE: Participation in Wetland Mitigation Bank Program

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

**N20 Lack of Basic Data: Insufficient Understanding of Park
Ecosystems and Threats to Them**

N24 Other Issues

CULTURAL RESOURCE CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER:10-238

ACTIVITY TYPE Mitigation/Treatment:

PROJECT STATEMENT:

In California, 91 percent of the original wetlands in the state have been lost. Until recently, wetlands were considered to be wastelands with little productive use and no direct economic benefit. In fact, the Swamp Lands Act in the mid-nineteenth century encouraged the destruction of wetlands. More recently we have become aware of the significant role wetlands play in the lives of fish, birds and mammals, insects, people, etc.

The Bush Administration proposed no "net loss" of wetland acreage and function. The Clean Water Act, Section 404 (the permit) program requires mitigation of adverse effects on wetlands. The Federal Register provides federal guidance for the establishment, use and operation of mitigation banks of wetlands (Volume 60, Number 43, pages 12286-12293, March 6, 1995). Mitigation banking has been defined as "*..wetland restoration, creation, enhancement, and in exceptional circumstances, preservation undertaken expressly for the purpose of mitigating unavoidable wetland losses in advance of development actions.*" The mitigated units of wetlands are expressed as "credits" which may be withdrawn to offset "debits" incurred during development.

The National Park Service mandates preservation and restoration of natural areas within its boundaries as responsibilities of high concern. The SMMNRA encompasses natural and developable areas containing wetlands. Mitigation of the wetlands within the SMMNRA will provide developers an opportunity to obtain credits to offset later debits from the adverse effects of development on wetlands. Mitigation would be done by private parties and these groups would provide the necessary maintenance of the restored or created wetlands. There are banks which deal with wetland credits and debits to facilitate the mitigation process. These banks identify buyers and sellers of wetlands and adjust credits and debits so that there is no net loss of wetlands as indicated in the federal guidelines cited above.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Establish SMMNRA wetland inventory. Identify priorities for SMM wetland enhancement or restoration. In cooperation with the other public land management agencies in the SMMNRA, the National Park Service will contact organizations in the business of banking wetland mitigation credits. Park personnel will identify and prioritize wetlands in consultation with regional experts according to a pre-approved formula for establishing priorities and credit value. Upon completion of a contract with a wetland bank, close oversight will be maintained on the mitigation measures taken and on the maintenance program.

ALTERNATIVE ACTIONS AND THEIR IMPACTS:

1) No Action. Without a plan in place to restore and/or enhance wetlands in the SMMNRA, the opportunity to have valuable wetlands will be a vanishing resource in the park. The critical role that wetlands provide to the natural environment will be lost without a Wetlands Mitigation Bank.

2) Implement Recommended Project. With no out-of-pocket cost, identified wetlands and riparian areas will be restored to enhance the natural resources of the SMMNRA. Aggressive restoration of wetlands and riparian areas will expand plant and animal communities that depend on functioning wetlands more rapidly than without the wetland banking program.

COMPLIANCE:

As individual wetlands are restored, close cooperation between the NPS, the Army Corps of Engineers, California Regional Water Quality Control Board, U.S. Fish and Wildlife Service, California Department of Fish and Game and other groups will be required. Preparation of an EA or EIS for each project will be needed.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Natural Resource Specialist GS-11	0.5	RNPR	18.0	18.0	36.0
Travel		RNPR	0.5	0.5	1.0
or Contract out the Entire Project		RNPR	18.5	18.5	37.0
TOTAL	0.5		18.5	18.5	37.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained within the park's Resource Management Plan and the Water Resources Management Plan.

ANNUAL PROJECTS' STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-301.010

TITLE: Conduct Inventory and Assessment -- Water Resources

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality due to External Activities

N16 Visual and Biological Impacts of Urbanization

N20 Insufficient Understanding of Park Ecosystems and Threats

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Research

PROBLEM STATEMENT:

Water is an extremely significant resource in the highly xeric Mediterranean-type environment located within the SMMNRA. As a result of urban development, the park's water resources face extreme threats from pollution and use. The ability of the park ecosystem to remain viable under this siege is threatened. Urban development of the Mountains continues to occur at a rapid pace, with subsequent pressure on surface and ground water resources.

SMMNRA lacks a definitive description of its water resources. Park managers need information on the status and location of water resources. Wetlands, floodplains, ponds, streams (intermittent and perennial), reservoirs, springs, seeps and lakes (human constructed), waste water outfalls and water diversions are not adequately mapped and their status or condition is unknown.

The ability of the National Park Service to inventory significant water resources and to identify threats to them will enable park management to present strong arguments when confronted with development plans and pressure. Park management will be able to defensibly argue for stronger regulatory enforcement, permitting conditions or other land use management options.

According to the park's Water Resources Management Plan (1984), there are 828 major streams and tributaries. Of these, 76 have formal place names. There are 73 major intermittent streams, four U.S. Geological Survey identified blue line streams, and nine partially perennial streams (WRMP, pages 23-26). There are no naturally occurring lakes in the Mountains. However, there are 11 reservoirs/lakes within the legislated boundaries and an additional 6 within the Santa Monica Mountains Zone. An additional unknown number of springs and other water resources exist in the Mountains.

With 38 separate watersheds located in the Mountains and an active land acquisition program, park management needs to be able to: 1) quantify water resources; 2) show the geographic distribution of water resources; 3) compare present distribution of water resources to historic maps and photographs; 4) delineate areas where significant land protection is needed; 5) make informed comments on development proposals; and 6) provide a framework for research.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

- 1) Compile existing mapped data, employ repeated field reconnaissance to inventory and sample water resources, to create new maps identifying the locations of SMMNRA water resources, including, but not limited to, seeps, springs, ponds, lakes, reservoirs, streams (perennial and intermittent), and wetlands. These water resources data will become a theme for the park's Geographic Information System. Seeps and springs are important water sources in this semi-arid climate for the wildlife in the SMMNRA. The location, rate of flow and chemical composition of the water influences the natural environment. The seeps and springs can act as an early indicator of ground water contamination.
- 2) Provide a qualitative assessment of the most significant remaining water resources located within the SMMNRA.
- 3) Make management recommendations regarding purchase, rehabilitation, monitoring, etc. for those water resources not adequately protected within the SMMNRA.
- 4) Gather information for an informative brochure on water and its importance to the Santa Monica Mountains.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. Under this alternative, park managers will continue to make decisions based on relatively few concrete data. The SMMNRA will have no complete inventory of its water resources. Information gathering will be accomplished on a project-by-project basis, with no concerted effort made towards full knowledge of park water resources.

2) Implement Recommended Project. Knowledge about the water resources of the SMMNRA will be available to park and resource managers, and it will be possible to build upon this base through subsequent projects. Knowledge of the location of the available water resources in the park provides an additional means for monitoring the wildlife and biological health of the area.

COMPLIANCE:

This project is categorically excluded from NEPA [516 DM, Chapter 6, Appendix 7.4 A (9)].

FUNDING REQUIREMENTS

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Hydrologist GS-09 (field)	1.0	SNWR	24.5 6 mos	24.5 6 mos	49.0
GIS Tech. GS-1399-07	.4	SNWR	8.0 4 mos.		8.0
Biological Technician Site Survey GS-5	1.0	SNWR	30.0	30.0	60.0
Contract: Digitize Water Resources Not Currently Mapped		SNWR	5.0		5.0
Supplies and Materials		SNWR	3.0	3.0	6.0
Travel/ Training		SNWR	5.0	2.5	7.5
Printing		SNWR	5.0		5.0
Or Contract Out the Entire Project		SNWR	80.5	60.0	140.5
TOTAL	2.4		80.5	60.0	140.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other water resources project statements identified in this Resource Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects are reported in the annual RMP Update and the Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS RECREATION AREA NATIONAL
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-301.030

TITLE: Inventory Water Rights, Uses, and Requirements

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N13 Lack of Secure Water Rights

CULTURAL RESOURCES CODES: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER:10-238

ACTIVITY TYPE: Research

PROBLEM STATEMENT:

No comprehensive inventory of water rights, uses, and requirements has been done for SMMNRA. Within the legislative boundary of the park are private holdings and state lands with associated water rights. With the acquisition of these lands by the United States, water rights may be conveyed or reserved from conveyance. Generally, such rights include state appropriative, riparian, ground water and stockpond rights.

No estimate of water uses and requirements has been made on a parkwide basis. The park needs estimates of water to serve consumptive administrative needs, such as visitor services, as well as identification of areas where water is or may be needed in the future for nonconsumptive purposes, such as recreation, and wildlife preservation and maintenance. Without this knowledge, it is difficult to plan how best to utilize the park's water rights.

A comprehensive inventory of water rights, uses and requirements becomes particularly important when the United States is joined in general basinwide water rights adjudications. Considering SMMNRA's location at the edge of a large urban metropolitan area requiring a sizeable municipal water supply, such adjudications are probably inevitable. Aside from adjudications, it is important for the preservation of future management options, to have assessed the park's water needs and availability of water to meet these needs.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

On a watershed basis the National Park Service will inventory, water rights, uses, and requirements in the SMMNRA. Water rights obtained by the United States through land acquisition will be inventoried, as well as the locations and purposes to which federal reserved water rights may apply. Water rights of others within the watershed will also be summarized.

The SMMNRA's existing water needs and how these needs are presently met will be summarized. In addition, future consumptive water requirements will be quantified using existing information, and areas where water is needed to fulfill other park purposes will be identified and prioritized. For all state water rights acquired, actions needed to maintain and utilize such rights to best meet park uses and needs will be prescribed.

With this inventory, and following the actions prescribed in the inventory, future management prerogatives will be preserved, and the need to purchase additional rights (if such rights are available) will be minimized. The park will have a comprehensive water rights data base, on a watershed basis, which will allow quick analysis of threats due to water right applications of others. State water rights will not unnecessarily risk forfeiture, and the park's water rights could be applied to best meet its needs. Additionally, when general water rights adjudications occur, the National Park Service will have a comprehensive inventory in-hand, saving considerable time and effort by park staff.

This alternative enables a comprehensive solution to the problem. To the degree feasible, the inventory will be computerized on a system compatible with park and NPS Water Resources Division computer systems. For each water right of the United States identified, a folder, or docket, containing all pertinent water right information will be developed. Actions will be recommended to best utilize the water rights to meet park needs.

The following will be researched to formulate the inventory:

- a. Water rights records on file with the State of California.
- b. Water rights dockets in the NPS Water Resources Division office.
- c. Deeds and other records documenting land and water transfers available from park files, Pacific Great Basin System Support Office and county clerk offices.
- d. Land status records and maps indicating acquired, reserved, and private lands.
- e. Estimates of existing consumptive water demand and future requirements to meet administrative water needs.
- f. Identification of areas where additional water is required to meet park needs.

- g. Measures required to avoid the possibility of forfeiture of water rights under State law.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1. No Action. Without an inventory, it is likely that future management prerogatives and the future expenditure of funds (to acquire water rights should they become necessary) will be effected. If the United States' water rights remain uninventoried, steps cannot be taken to protect the United States' rights from forfeiture or abandonment. Additionally, the National Park Service will be unaware of the water rights available to meet park needs. The potential impact to the United States' water rights from actions of water users outside of SMMNRA lands will remain undetermined.

2. Implement Recommended Project. Under this alternative the National Park Service will be aware of those state appropriative, riparian, stockpond, and ground water rights acquired through acquisition of state, federal, and private lands. This will provide management with some idea of water rights available to meet park needs and provide an inventory which might be useful in determining impacts of future development and use.

Additional actions may be required to maintain the United States' acquired rights, and to transfer them to areas where water is needed. The inventory will be used to identify needs to file change applications to protect and secure acquired water rights and to meet the conditions of water right permits and licenses. No inventory of water uses, requirements and rights, will be made for water rights outside the legislative boundaries of the SMMNRA. Another assessment of alien water rights may be required at some time in the future to adequately assess the impacts in cultural and natural resources in and near the SMMNRA.

COMPLIANCE:

This project is categorically excluded from NEPA [516 DM6, Appendix 7.4.B (1), (4), (10), E (2)].

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Hydrologist GS-09	1.0	SNWR	24.5 (6 mos)	24.5 (6 mos)	49.0
GIS Tech GS-1399-07	0.4	SNWR	8.0 (4 mos)	8.0 (4mos)	16.0
Contract: Digitize data		SNWR	5.0	5.0	10.0
Supplies and Materials		SNWR	1.5	1.5	3.0
Travel and Training		SNWR	5.0	5.0	10.0
Or Contract project		SNWR	44.0	44.0	88.0
TOTAL	1.4		44.0	44.0	88.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other resources project statements identified in this Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects are reported in the annual RMP Update and the Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-301.040

TITLE: Identify and Manage Floodplains

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N12 Alteration of Natural Flow Regimes

N16 Visual and Biological Impacts of Urbanization

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Protection

PROBLEM STATEMENT:

As a young, and constantly growing park, the SMMNRA has an active planning program. In 1993, two Development Concept Plans and over a dozen site plans were completed by the park's Land Use Planning Division. In the Draft Outline of Planning Requirements for the park, another 6 DCP's are identified as an immediate need, as updates to the park's Land Protection Plan, and General Management Plan. In addition, park staff lend significant efforts to local and private planning efforts on adjacent land. This park policy serves to reduce, minimize, or mitigate impacts from activities on adjacent private and public lands. A critical need exists to support these planning efforts with accurate data.

As a result of the issuance of Executive Order 11990 (Protection of Wetlands), the NPS developed Floodplain Management and Protection of Wetlands Guidelines. Section 6.B (Procedures) of these guidelines states, *"Inventory - Floodplain, flood hazard and wetland areas subject to or potentially subject to public use or development, where the magnitude of hazard and impact of human activities is likely to be greatest, will be inventoried prior to or during the preparation of the General Management Plan or other planning documents."* In an attempt to comply with this order the park acquired the available Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency.

Unfortunately, these maps have several problems: 1) they cover only about 50 percent of the NRA; 2) they were produced prior to much of the urbanization in the area and as a result, they underestimate flood hazard areas; and 3) they are depicted in such a way, and at such a scale, so as not to be easily used with other mapped information. An accurate, easily useable, floodplain data base is not available for park, or adjacent land, planning.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The Los Angeles Department of Public Works is preparing digital (AutoCAD based) maps of the floodplains, and flood control features, for the county. This data set is based upon FIRM data that has been field checked and augmented by additional modeling. This information is digitized with an accuracy measured +/- 10 feet, or better. The NPS will purchase this data set and import it into the park's GIS for use in the park planning and development monitoring programs. In addition, Ventura County Department of Regional Planning has prepared floodplain maps that need to be digitized. These maps will be acquired and added to the GIS by park staff.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Floodplains will be identified on a case-by-case basis, from FIRM maps, as needed to meet park planning and management needs. In all likelihood, this information will not be incorporated into the park's GIS, and the NPS will not use this information to comment on development activities on adjacent land. In the long run this will be more costly since each project will have to budget the resources needed to use a small segment of floodplain data. This will also decrease cooperation between NPS and local planning agencies.

2) Implement Recommended Project. By acquiring the digital floodplain data from the Department of Public Works, the NPS will have accurate, up-to-date information needed for park, and adjacent land, planning. By working with a common data base, we will foster cooperation with local planning agencies.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Total
Purchase Floodplain data from Los Angeles County Department of Public Works		SNWR	5.0	5.0
GIS Tech. GS-07	0.2	PNR1	7.33	7.33
Supplies and Materials		PNR1	0.5	0.5
or Contract Project			12.83	12.83
TOTAL	0.2		12.83	12.83

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project plays a critical role in the park planning program (SAMO-I-102.020), the Development Monitoring Program (SAMO-I-102.010), and in Development of a GIS-based Development Monitoring Program (SAMO-N-140.020).

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

The information gathered under this project will be summarized in the annual RMP Update and Superintendent's annual report. The digital data will be incorporated into the park's GIS and will be used on a routine basis for the purposes of park planning and adjacent land use planning.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER SAMO-N-301.070

**TITLE: Create an NPS Information Management Repository for Water Resources Within
and Around the SMMNRA.**

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities

N12 Alteration of Natural Flows

N13 Lack of Secure Water Rights

**N20 Lack of Basic Data: Insufficient Understanding of Park Ecosystems and
Threats to Them**

CULTURAL RESOURCES CODE: N/A

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring/ Mitigation

PROBLEM STATEMENT:

The creation of the SMMNRA in 1978, established a National Park where the federal government had little or no actual land holdings. Subsequently, the acquisition of land and cooperative agreements with other public agencies has created a viable and identifiable entity. Superimposing a National Park in an area as politically complex as Los Angeles and Ventura counties with their many municipalities and districts, the State of California and other federal agencies created a major information acquisition problem.

In the Malibu Creek Watershed alone (Review of Monitoring and Response Protocol for the Malibu Creek Watershed, 1994) there are 42 surface water and sediment monitoring groups and over 70 ground water monitoring wells. Some samples are analyzed for a complete set of chemical constituents ranging from conventional pollutants to organic chemicals, pesticides, bacteria and viruses while others have a more limited scope. In addition, many other monitoring

programs focus on a variety of environmental aspects, including water levels in the lagoon, brush and weed clearance compliance and less formalized water quality. This is only one watershed of many within the park boundary. Calleguas Creek which flows into Mugu Lagoon is another major drainage where many agencies are involved with water resources. Information collected is available at each individual agency. Presently, there is no single agency that acts as a clearinghouse where one can find specific information about where the data for a particular test or information regarding this test is located. The water resources information as it is now collected is accessible only if one knows what data to ask for and where these data are located.

The quality of the data being collected may vary between the agencies. The frequency and locations also vary by agency. Comparable information and quality control is needed for intelligent analysis of the data. The data which presently go into STORET are not given quality control screening prior to their entry into this data base. Using this repository, one can screen data before they become immortalized in the data base.

The NPS has responsibility for the overall health of the natural resources within the park boundary. To provide a healthy environment for the biota and park visitor, it is essential that available sources of information on water resources within and around the park are accessible. Many non-park agencies include the park within their areas of responsibility and jurisdiction, and collect data to satisfy their mission. These data are also frequently relevant to obtaining the goals of a healthy park environment. Many of these agencies have been collecting information about these subjects over many years, and it is essential that the location of these data is known and that information derived from these data be used in decision making.

DESCRIPTION OF RECOMMENDED PROJECT OR STATEMENT:

The National Park Service will work with other agencies to create a clearinghouse of water resources information at the SMMNRA. This project will identify all the agencies that collect data on water resources which could affect the park. After all agencies are identified, the tests they perform, the location of testing sites, and the frequency and availability of data will then be ascertained. The particular department within each agency or group and contact persons will be identified. All this information will be put on spread sheets for ready accessibility. As new agencies or data become available, they will be added to this data base. Knowing where to find the necessary information will enable the park to use the data without having to collect or archive additional raw data. Acquired data will be analytically reviewed periodically to assess data gaps that may exist and to provide public access to all the water resources data. Reports summarizing this information will be prepared and distributed to all agencies with water resources in the SMMNRA.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Fragmented collection of water resources data in the Santa Monica Mountains will continue to be collected by all the responsible agencies. No central location will be available to find out who is collecting what data and where, when or how often. The ability of the park and other interested parties to acquire these data will continue to be complicated by the total number of agencies in this geographical area. Research and cooperative activities will continue to be time-consuming as a result of fragmented and dispersed information. Park water resources may suffer unknown degradation due to lack of knowledge because of information gaps in water resources data collection.

2) Implement Recommended Project. A single reference source will be available for not only SMMNRA staff, but all persons with an interest in water resources will be able to access the available data. Agencies could identify redundancy and work out cooperative arrangements for data collection for greater economy without loss of effectiveness. The park will be able to search data repositories to identify pertinent information and may be able to contribute to the data collection. Monitoring the many parameters involved in water quality and quantity will be greatly simplified.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2,1,6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Hydrologist GS-09	0.5	SNWR	25.0	25.0	50.0
GIS tech. GS-O7	0.5	SNWR	12.0		12.0
Supplies and Materials		SNWR	2.0	2.0	4.0
Publish and Distribute Report		SNWR		6.0	6.0
Or Contract Project			39.0	33.0	72.0
TOTAL	1.0		39.0	33.0	72.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statement contained within the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and the Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.010

TITLE: Conduct Zuma Lagoon Restoration Project

FUNDING STATUS: Partially Funded

SERVICEWIDE ISSUE CODES:

N17 Loss of Biological Diversity

N16 Visual and Biological Impacts of Urbanization

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Mitigation/Restoration

PROBLEM STATEMENT:

Lower Zuma Creek and Zuma Lagoon offer a tremendous potential for a multi-agency restoration project. In the incremental steps taken by the park in gathering interested participants, it has involved the L.A. County Department of Beaches and Harbors (landowner), the Santa Monica Bay Restoration Project, Heal the Bay, the California Department of Parks and Recreation (adjacent landowner), the City of Malibu, the California Department of Fish and Game, the U.S. Environmental Protection Agency, the University of Southern California Sea Grant, the Santa Monica Mountains Conservancy, staff from the University of Southern California, and the Topanga-Las Virgenes Resource Conservation District.

Local agency planning documents indicate an awareness of the restoration potential for the Lower Zuma Creek and Zuma Lagoon. A letter (dated October 22, 1992) indicated awareness on the part of L.A. County regarding the potential for restoration: "*As the plan (Zuma-Trancas DCP) indicates, a restorable wetland area remains at the mouth of Zuma Creek (letter from Chief, Planning Division Lawrence Charness to park superintendent dated 10-22-92).*" The Malibu Local Coastal Plan (1986) states that the Zuma Creek wetlands:

shall be protected as an educational and ecological reserve. Measures to enhance this small wetland should include at a minimum, diverting foot traffic from the area, prohibiting grading except for health and safety reasons, removal of introduced weeds, and posting of the area as a sensitive wetlands habitat.

Interagency participants envision a riparian zone free from alien vegetation, trash and debris; a boardwalk alongside the creek which leads down to the lagoon, where a recontoured and healthier lagoon is surrounded by natural sand dunes. Interpretive exhibits lining the boardwalk would offer educational and aesthetic enjoyment of the ecosystem, while controlling pedestrian traffic and eliminating the current homeless and criminal uses of the area.

Lower Zuma Creek has been heavily impacted by alien plants and increases in sedimentation partially as a result of the urbanization which has occurred in the Bonsall/Busch area of Zuma Canyon and partially as a result of other factors. The increased sedimentation has contributed to a decreased water holding/storage capacity in the lagoon and alteration of its historic drainage; and has also contributed to likely alteration in the occurrence of natural breaching processes.

The banks of Lower Zuma Creek leading into the lagoon are piled with alien English ivy, honeysuckle, tree tobacco (*Nicotiana glauca*), castor bean (*Ricinus communis*), *Myoperum*, *Nasturtium*, brush, garbage piles and accoutrements of the transient homeless inhabitants of the area. In addition, an unnecessary service road crosses the project area and an adjacent area has been used as a staging/maintenance storage site.

In Fall 1993, the L.A. County Sheriff's Department asked the landowner, the L.A. County Department of Beaches and Harbors (DBH), to clear vegetation along the creek since it attracted transients and unlawful activities. The DBH's application to the California Department of Fish and Game to remove the creekside vegetation alerted park agencies to the possible destruction of this valuable wetland and precipitated interagency planning efforts for a restoration project. An interagency meeting held on site in January 1993 demonstrated that alien plant removal alone would likely accomplish the objectives of the Sheriff's Department.

Initial actions by the L.A. County Department of Beaches and Harbors (DBH) are planned as a result of the two interagency meetings held on site in early winter 1993. The Department will proceed in the following manner to address the public safety issues on Lower Zuma Creek and to aid potential interagency restoration efforts:

- 1) Obtain a permit from the California Department of Fish and Game to conduct regular maintenance activities on Lower Zuma Creek.
- 2) Remove alien vegetation using paid staff, Heal the Bay volunteers and supplies funded in part by the SMBRP and provided by the NPS and the CDPR. Interagency staff will supervise the alien plant removal, marking alien vegetation and project area boundaries for the work crews.
- 3) Re-evaluate the need for additional removal of dead/downed brush to facilitate patrols by the L.A. County Sheriff's Department. A meeting will be re-convened on site with resource advisors from the interagency group.

- 4) If necessary, remove dead/downed brush.
- 5) Re-evaluate need for trimming of native vegetation in light of public safety issues.

In addition to the alien plant removal detailed above, other components of the Zuma Lagoon Restoration Project will consist of the following: 1) a feasibility study to determine the extent to which restoration of the lagoon can occur; 2) preparation of a restoration plan (including a breaching plan that meets the DBH's needs); 3) removal of debris and fill material formerly deposited in creek bed; 4) restoration of the adjacent dunes; 5) supplemental planting of native riparian/wetland vegetation; and 6) design and construction of a boardwalk; and 6) design and construction of interpretive exhibits.

The goal of this project is to preserve and restore the dune, wetland and riparian communities at Zuma Beach County Park through an active interagency resource stewardship plan. The restoration project will result in enhanced resource values, visitor use and educational/interpretive opportunities for visitors to the SMMNRA. The L.A. County DBH, the SMBRP, and the NPS shall be the co-lead agencies, working in cooperation with the L.A. County Board of Supervisors, and the other agencies listed above.

Other goals include: to eliminate the site's potential contribution to the pollution of Santa Monica Bay caused by the stockpiling of debris (including asphalt and sediment) adjacent to and within the wetland restoration zone; to eliminate the public safety hazards posed by this unmanaged area; and to serve as a model for and to spur the pursuit of other wetland restoration projects within the boundary of the SMMNRA.

Support for this project from the National Park Service is critical at this time since it will build on other planned cooperative funding efforts. The Santa Monica Bay Restoration Project (SMBRP) has received a Environmental Protection Agency grant of \$126,000 to begin implementation of this project. The SMBRP is in the process of preparing a Scope of Work to allocate this funding.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

ZUMA LAGOON RESTORATION PROJECT

Education and Public Safety

- 1) Create a public access boardwalk through the riparian, wetland and dune zones with passive interpretive exhibits, to create a regular, yet managed, public presence in the area.
- 2) Solicit volunteer or local college participation to manage the area as an outdoor classroom.

Habitat Enhancement and Restoration

- 1) Analyze historic aerial photographs, U.S.G.S. topographic and other maps and photos to determine extent and historic boundaries of the restoration zones.

Riparian Zone

- 1) Eliminate alien vegetation.
- 2) Do supplemental planting with native riparian vegetation.
- 3) Educate upper creek homeowners regarding garden invasive exotics.

Wetland Zone

- 1) Remove formerly deposited debris and fill material.
- 2) Conduct a study to determine the feasibility of restoring Zuma Lagoon to functional proportions, including a) hydrological analysis; b) water quality analysis; and c) flood maintenance considerations.
- 3) Implement recommended project.
- 4) Do supplemental restoration of wetland vegetation.

Dune Zone

- 1) Remove alien vegetation.
- 2) Revegetate and restore dunes.

NATIONAL PARK SERVICE PARTICIPATION IN ZUMA LAGOON RESTORATION PROJECT

- 1) Continue to work with the L.A. County Department of Beaches and Harbors, the Santa Monica Bay Restoration Project, Heal the Bay, the California Department of Parks and Recreation, the City of Malibu, the Topanga-Las Virgenes Resource Conservation District and other agencies to implement the components of the Zuma Lagoon Restoration Project.
- 2) Fund Interagency Restoration Plan/Environmental Assessment for Lower Zuma Creek/Zuma Lagoon.
- 3) Fund feasibility study for Zuma Lagoon restoration.
- 4) Contribute Landscape Architect's expertise to design boardwalk.
- 5) Contribute staff time to assist with planning for interpretive exhibits and boardwalk.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. Lower Zuma Creek and Zuma Lagoon will continue to decrease in natural biological diversity and may be harmed by unintentional actions. The Santa Monica Bay Restoration Project will allocate funds to a partial restoration project. Interagency support for the full restoration project may not be secured.
- 2) Implement Recommended Project. The development of an Interagency Restoration Plan and its implementation will enable the multi-agency participants to work cooperatively on preserving

an important resource in an unprecedented effort. The restoration project would complement a similar effort at nearby Point Dume Natural Preserve being conducted by the California Department of Parks and Recreation. The SMMNRA will gain an important boost to its public image by participation in this interagency project. Similar efforts may be carried out at other places within the park boundary.

COMPLIANCE:

Implementation of a restoration project will require an environmental assessment. Planning for the restoration project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.5) but will require consultation with U.S. Fish and Wildlife Service the California Department of Fish and Game and the Army Corps of Engineers. This project will also require compliance with Section 106 of the National Historic Preservation Act.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Funded Exotic Species Removal/ Revegetation		SMBRP (NPRF)	7.25 20.0	0	0	27.25
Debris/Fill Removal		SMBRP (NPRF)	20.0	0	0	20.0
Dune Restoration		SMBRP (NPRF)	0	10.0	0	10.0
Riparian Restoration		SMBRP (NPRF)	0	20.0	0	20.0
Funded Landscape Architect GS-807-11	.1	PNR1	(5.0)	(5.0)	(5.0)	15.0
Funded Resource Mgt Specialist GS-401-09	.3	PNR1	(13.2)	(13.2)	(13.2)	39.6
Funded Volunteer labor (Heal the Bay/SMBRP/NPS)		NVOL	(13.2)	(6.6)	(6.6)	26.4
Feasibility Study to Restore Lagoon/ Restoration Plan (Contracted to Psomas and Associates 9-94 -- Preliminary report completed by Phillip Williams and Associates 9-94)		SNWR NPRF	22.5 48.8	0	0	71.3
Debris/Fill Removal		SNWR	0	15.0	0	15.0
Partially Funded Lagoon Restoration		SMBRP (NPRF)	0	19.0	20.0	
Interpretive Exhibit Design/Construction		SMBRP (NPRF)	0	25.0	10.0	35.0

Boardwalk Construction		SMBRP (NPRF)	0	25.0	15.0	35.0
Supplies and Materials		SNWR	2.5	2.5	0	5.0
Funded Travel/Training		PNR1	(1.0)	(1.0)	(1.0)	3.0
Funded Project		NPRF SNWR	76.05 22.50	0	0	98.55
Total Additional Funds Needed		NPRF		86.5	45.0	131.5
TOTAL REQUESTED FROM NPS WRD	0.4	SNWR	0	17.5	0	40.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following projects contained in the Resource Management Plan:

SAMO-N-120.010	Conduct Cooperative Resources Management Program
SAMO-N-301.020	Conduct Inventory and Assessment -- Water Resources
SAMO-N-400.010	Produce a Vegetation/Land Cover Map of the Santa Monica Mountains Zone
SAMO-N-400.040	Inventory Extent of Wetlands
SAMO-N-402.015	Develop and Implement Riparian Monitoring Handbook
SAMO-N-403.010	Conduct Native Plant Community Restoration
SAMO-N-421.010	Increase Public Awareness and Information about Alien Species
SAMO-C-200.040	Conduct Archeological Resources Inventory (ARI)

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects are reported in the annual RMP Update and in the Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.020

TITLE: Cooperate with the U.S. Navy and Other Agencies to Restore Mugu Lagoon and Associated Uplands

FUNDING STATUS: Unfunded

SERVICEWIDE CODES:

- N00 Impact on Fish/Degradation of Fisheries**
- N06 Disruption of Native Plant Communities and Accelerated Erosion Due to Past Land Practices**
- N09 Disruption of Natural Coastal Dynamics**
- N11 Degradation of Park Water Quality Due to External Activities**
- N15 Noise, Visual, and Biological Impacts Related to Aircraft Overflight**
- N17 Loss of Biological Diversity**
- N20 Lack of Basic Data: Insufficient Understanding of Park Ecosystems and Threats to Them**

CULTURAL RESOURCE CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Protection/Mitigation

PROJECT STATEMENT:

Mugu Lagoon is the largest remaining relatively undisturbed salt marsh in southern California. It is a vital stopover for migratory birds on the Pacific Flyway and a nursery ground for many birds, fish and mammals. The lagoon harbors a rich diversity of plankton, benthic macroinvertebrates, plants, fish, birds and mammals including endangered species such as the light footed clapper rail, California least tern and Belding's savanna sparrow.

The lagoon has been heavily effected by urban and agricultural runoff and past land use practices. Point Mugu Naval Air Weapons Station owns the property, however a portion of the lagoon resides within the NPS boundary but is managed by the Navy. A Memorandum of Understanding

is being negotiated for NPS to cooperate with the Navy on remediation, interpretation and scientific inquiry of Mugu Lagoon.

The U.S. Navy has contracted with an environmental consultant to propose plans to remediate the lagoon. A remedial investigation has been performed to identify and quantify hazardous substances on the soil and in the lagoon at a number of sites. The results indicate that there is a minimal threat to human health, and that the site is safe for visitation, but threats to wildlife are indeterminate. Remediation of the environmental threat is being evaluated.

There are numerous additional factors contributing to the health of the lagoon. The agricultural interests in the late nineteenth century extended Calleguas Creek into Mugu Lagoon to drain the Oxnard Plain and thereby changed the hydrodynamics of the lagoon, allowing many land based materials to enter the lagoon. Therefore, many of the anthropogenic impacts come from Calleguas Creek, which feeds the lagoon. This creek receives its runoff from both urban and agricultural areas. In the past, many pesticides, metals and petroleum products entered the lagoon and became part of the sediment. Some of these impacts still exist. The problem of disturbing the sediment to remove the toxics and thus releasing some of these toxics into the environment is being considered at this time.

A significant natural change affecting the lagoon is the movement of an undersea trench moving on shore. The wave action and the movement of the trench is changing the topography of the shore. When the shore is breached by the trench and the waves, a new set of hydrodynamics will exist in the lagoon. A consultant group is now modeling the water movements and characterizing the natural resources of the lagoon. These are being plotted on GIS to visualize various remediation options.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

With the signing of the Memorandum of Understanding (MOU), the NPS in cooperation with the U.S. Fish and Wildlife Service and other interested parties will prepare an inventory and management plan on the natural and cultural resources of the lagoon and associated uplands and will administer research programs related to these activities.

In cooperation with the U.S. Navy, the NPS will prepare an inventory of and a management plan for the historical, cultural and archeological resources of the lagoon and associated uplands, and to administer these resources. Prior to the changes in the hydrodynamics of the lagoon due to breaching Calleguas Creek in the nineteenth century, the lagoon and salt marsh was home to an indigenous population that lived in the salt marsh. There are still some sites in the Mugu Lagoon area from these early people. A thorough study is needed to identify the numbers of sites and the lifestyles of these residents.

In cooperation with the U.S. Navy, the NPS will promulgate rules and regulations needed to preserve the biological and other natural and cultural resources of the lagoon and associated

uplands. Protective measures consistent with federal and state law will not be inconsistent the operation of the Pacific Missile Test Center.

In cooperation with the U.S. Navy, U.S. Fish and Wildlife Service, California Department of Fish and Game and other concerned agencies and citizens groups, the NPS will promote the recovery, restoration and preservation of endangered species and assist with their management. All activities will be done in cooperation with the Design and Planning Team of the Pacific Missile Test Center, Point Mugu.

It is anticipated that the NPS will manage the visitor services, research and remediation or restoration of the lagoon. Currently, there is an attempt to expand the boundaries of the National Park to include the west arm of the lagoon within the NPS boundaries. When this is accomplished, the NPS will be able to manage the entire lagoon and the upland areas in a manner consistent with NPS policy and sensitive to the needs of the U.S. Navy.

Security of the naval base has kept many persons from visiting and disturbing the area. However, the navy, the farmers and others prior to the U.S. Navy taking over the area have altered the lagoon and salt marshes. The extent of damage to the lagoon is not thoroughly known and it is necessary to inventory the natural resources in the lagoon and remediate, where possible, to bring the lagoon to a healthy ecosystem. Changes in agricultural practices and anticipated further urbanization of the peripheral area are factors which will create new impacts on the lagoon. It is necessary to identify the demographic changes going on around the naval base to determine the short- and long-term effects on the lagoon. The naval base was considered for closure during the recent military down-sizing. It was decided that the Point Mugu Naval Weapons Station would not be moved or closed. This provides a stable environment for cooperative activities with the U.S. Navy.

The inventory will identify alien species which are affecting the native species of flora and fauna. Revegetation projects, some already started by the navy, will be instituted to return the area to a more natural state.

There is a healthy population of seals living in the lagoon. Their continued survival and growth are essential elements of the management plan. The continued presence of the various endangered species of birds would indicate that they are not threatened at the lagoon. These indicators are signs that the conditions of the lagoon are favorable to expand a healthy environment.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS

1) No Action. The U.S. Navy has invited the National Park Service to cooperate in restoring and managing Mugu Lagoon and the associated uplands. This cooperative effort to preserve one of the last significant wetlands in southern California presents an opportunity for the NPS to contribute to this restoration effort. Not to participate in this project could deny the NPS future

access to the lagoon and any opportunity to influence the natural and cultural resources at the lagoon now and in the future.

2) Implement Recommended Project. The ramifications of the opportunity to cooperate with the U.S. Navy are many. Protection and restoration of natural and cultural resources will be done with the NPS priorities being considered as a full partner. A continuing relationship creates the opportunity for research, preservation of endangered species and appropriate visitor use. The natural and cultural wealth of the lagoon will be catalogued and any changes that take place will be identified to prevent any further degradation to the lagoon and associated uplands.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6 and 1.7).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Restoration Specialist GS-12	1.0	RNSR	64.0	64.0	64.0	64.0	64.0	320.0
Biotech (2) GS-5	2.0	RNSR	60.0	60.0	60.0	60.0	60.0	300.0
Cultural Resources Specialist GS-12	0.5	RNSR	32.0	32.0	32.0	32.0	32.0	160.0
Supplies and Materials		RNSR	5.0	5.0	5.0	5.0	5.0	25.0
Travel and Training		RNSR	5.0	5.0	5.0	5.0	5.0	25.0
or Contract Project			164	164	64	164	164	830.0
TOTAL	3.5		164	164	164	164	164	830.0

Mugu Lagoon is a living laboratory; comparable areas in southern California have vanished or are severely compromised. Resource and Cultural Specialists are needed to critically evaluate the resources and to plan non-destructive experiments in order to generate information and guidance for remediation and interpretive activities. The site is so large that a five-year proposal will merely introduce us to its value. It is anticipated at the end of this five-year proposal that new proposals and a renewal of this proposal will be requested to provide adequate protection to the resource.

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained within the park's Resource Management Plan and the Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER : SAMO-N-304.030

TITLE: Rocky Oaks Dam Stabilization

FUNDING STATUS: Funded

SERVICEWIDE ISSUE CODES:

N12 Water Flow - Alteration of Natural Flow Regimes

C13 Cultural Landscapes - Emergency Stabilization

CULTURAL RESOURCES CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Mitigation/Protection

PROBLEM STATEMENT:

The Rocky Oaks Dam is an homogenous earthfill embankment about 20 feet high and about 270 feet long. The reservoir has a surface area of approximately 3 to 5 acres with the water at the spillway crest elevation. The Rocky Oaks Dam is classified as a HIGH hazard facility because a failure from this dam has the potential to result in lives-in-jeopardy in the picnic ground just below the dam, and for occupants in 5 residences as well as individuals on or along a developed reach of Zuma Canyon, 5-6 miles downstream (Santa Monica Mountains National Park Service California, Evaluation of Dams, 1995). The dam is overgrown and contains numerous ground squirrel burrows.

The dam fits the classification code of POOR because of poor design, steep slopes, rodent and root damage and no outlet works. The failure potential is considered moderate.

The water in the Rocky Oaks Dam is seasonal; in heavy rain years there is water in the reservoir throughout the summer, but the reservoir is dry when there is minimal rain. The reservoir supports a waterfowl population for most of the year, and all year during wet years. As an all-year park, visitors are attracted to the water, and they hike and picnic in the dam area. An

interpretive area is located in an oak grove just below the dam. The park is used by L.A. County students in a park information program to learn about the importance of wetlands.

It is necessary to upgrade the dam from POOR to more acceptable MODERATE or NEGLIGIBLE. Another option is to breach the dam, but this is unreasonable due to its current use by visitors and wildlife. The Corps of Engineers in their safety report have identified two mitigation options which will upgrade the dam to satisfactory standards.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The National Park Service will cooperate with the Corps of Engineers, Water Resources Control Board, U.S. Fish and Wildlife Service and California Department of Fish and Game in developing alternatives to stabilizing the Rocky Oaks Dam. One way to reclassify the dam according to the Corps of Engineers as a LOW-hazard facility is that the structural height of the dam will be reduced to ten feet with modifications and that the spillway will be replaced to carry the flow of a 100-year storm. A second way to achieve a LOW-hazard rating is to flatten the downstream slope and provide a drain in the embankment without changing the height of the dam. The first option decreases the capacity of the reservoir, but it is less expensive than the second option, which leaves the capacity the same.

The low-cost strategy developed by the Bureau of Reclamation and the National Park Service Water Resources Division to mitigate the "High Hazard" classification of the Rocky Oak Dam is twofold: first, the conveyance of the emergency spillway would be improved by lowering the spillway elevation by four feet. This action would increase the freeboard between the hydraulic height of the design flood and the top of the dam, thus increasing the overall safety of the dam. Second, the toe drain structure would be incorporated into the dam design to mitigate further foundation seepage. This action would upgrade the dam structure to meet "High Hazard" design standards as identified by the Bureau of Reclamation Safety Dam Program. After final decision is reached about the stabilization of the Rocky Oaks Dam, the Water Resources Division should evaluate the impact on water rights.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. This is an unacceptable alternative because the Rocky Oaks Dam is currently classified as being in POOR condition and a HIGH HAZARD facility. Risks to the safety of visitors, downstream property owners and park resources dictate that mitigative measures be undertaken as soon as alternative actions can be evaluated and the funding obtained to implement them.

2) Implement Proposed Project. Either of the proposed project alternatives will protect the health and safety of visitors, park personnel and neighbors. The existing wildlife habitat currently supported by the dam will be maintained as well as the interpretive programs using the Rocky Oaks dam. The NPS will be fulfilling its legal and ethical responsibilities.

COMPLIANCE:

EA for DCP approved 1984. Prepare environmental assessment to evaluate alternatives for protecting public health, safety, endangered species and protect recreation values.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Option 1. Lower the dam and put in a spillway		PDR1	25.0	35.0	60.0
Personnel Services	0.1	PNR1	5.3	5.3	10.6
Personnel Services	0.2	NFED	6.0	6.0	12.0
or Contract Project			36.3	46.3	82.6
TOTAL	0.3		36.3	46.3	82.6

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained within the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendents Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

REFERENCE CITED:

Santa Monica Mountain National Park, California, Evaluation of Dams, 1995.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.040

**TITLE: Develop and Implement Hazardous Waste Management Plan: Survey for
Underground Tanks**

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities

N16 Visual and Biological Impacts of Urbanization

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Protection

PROBLEM STATEMENT:

Routine management of a National Park Service unit requires the handling of hazardous materials. Maintenance, Fire Management, and Resource Management personnel may routinely work with paints, solvents, fuels, pesticides and other common substances that are classified as hazardous by the Environmental Protection Agency. Currently the proper use, storage, and disposal of these materials is not monitored.

Situated within a large metropolitan area, and with an ongoing land acquisition program, SMMNRA has some unique exposures to hazardous materials. Highly toxic chemicals (acids, cyanide, chlorine, etc.) have been, and continue to be dumped illegally on park land or private property immediately adjacent to park land by illegal drug manufacturers. There are major roads passing through the park (Highway 101, Pacific Coast Highway, Topanga Canyon Boulevard, Kanan-Dume Road, and Las Virgenes/Malibu Canyon Road) that routinely have truck traffic transporting large quantities of hazardous materials. Although no major incident has yet occurred in the park, unknown smaller spills are common. Along with to the park's active land acquisition program comes the requirement to survey all parcels in escrow for the presence of hazardous materials. The acquisition cannot take place as long as a hazardous substance exists on the parcel. It is suspected that the park has unknowingly acquired land with underground storage tanks.

A survey of properties where hazardous chemicals are suspected needs to be completed. If tanks are discovered, their status needs to be evaluated and appropriate actions need to be taken.

The Western Regional Office Emergency Operations Plan specifies:

A release of a hazardous substance, pollutant or contaminant on NPS property, or off NPS lands, but affecting park resources is the responsibility of the spiller. However, if the spiller cannot be located the NPS is generally financially responsible for the cleanup of the site.

Spill response is usually handled at the lowest government level capable of response; first the park, then the county, then the state, and finally the EPA or coast Guard. Protection of park resources is the responsibility of the park superintendent. Each area and park, through contract or agreement, shall prearrange for emergency spill response and site cleanup services.

Given the nature of hazardous spill incidents to date, and the fact that the lands fall within proprietary jurisdiction, hazardous spill response falls to either Los Angeles or Ventura counties. The Chief Branch of Law Enforcement has developed a good, though informal, cooperative working relationship with these county agencies.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

As stated in the Western Region Emergency Operations Plan, the superintendent has designated a Park Hazardous Spill Coordinator. This person serves as the park's Safety Officer, a 1/3-time position. (The park is investigating the option of a shared position with Channel Islands National Park.) The Safety Officer is responsible for monitoring the use, storage, and disposal of all hazardous materials used by the NPS, NPS contractors, or Special Use Permit holders. The Safety Officer is responsible for preparing a Hazardous Substance Pollution Contingency Plan containing the elements outlined in the Western Region Emergency Response Plan. The Safety Officer is also responsible for working with designated patrol rangers and for conducting hazardous materials surveys on both lands targeted for acquisition and lands already under NPS ownership.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Use, storage, and disposal of hazardous materials used by the NPS will not be monitored. Incidents involving hazardous materials (spills, dumping, and site surveys) will continue to be handled on an informal basis by the Chief Branch of Law Enforcement. The park will continue to react to the county agencies' lead in dealing with the incident. The NPS may not be aware of all of the incidents occurring adjacent to or even on park land. As a result, public safety and resource protection may be jeopardized. Surveys for hazardous materials on proposed

acquisitions will continue; however, a systematic survey of current NPS land will not occur. As a result, hazardous materials already on NPS land may go undiscovered until a person or resource is harmed.

2) Implement Recommended Project. The park has designated a 1/3-time Safety Officer who serves as the Park Hazardous Spill Coordinator. The Safety Officer develops and implements a Hazardous Material Management/Contingency Plan in accordance with Western Region and NPS guidelines.

COMPLIANCE:

This project is Categorical Excluded from NEPA (516 DM Chapter 2, Appendix 2, 1.5). Contingency plans should include consideration of the potential effects on cultural resources.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Total
Park Ranger (Safety Office) GS-025-12	50.3	POF1	5.42	5.42	5.42	5.42	21.68
Park Ranger GS-025-07	0.1	POF1	3.66	3.66	3.66	3.66	14.64
Supplies and Materials		POF1	1.0	1.0	1.0	1.0	4.0
Travel/ Training		POF1	3.0	3.0	3.0	3.0	12.0
or Contract Project			13.08	13.08	13.08	13.08	53.32
TOTAL	0.4		13.08	13.08	13.08	13.08	52.32

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project relates to the responsibility the National Park Service has to protect public health and safety, and to protect resources from the degradation resulting from human activity.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

A Hazardous Waste Management/Contingency Plan will be prepared and updated periodically. Program accomplishments will be reported in the annual Resource Management Plan Update and Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.050

TITLE: Satwiwa Pond Dredging Project

FUNDING STATUS: Funded: \$111,000.00

SERVICEWIDE ISSUE CODES:

N12 Water Flow - Alteration of Natural Flow Regimes

C13 Cultural Landscapes - Emergency Stabilization

CULTURAL RESOURCE TYPE CODE: COMB

RMAP PROGRAM CODES: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Mitigation

PROBLEM STATEMENT:

The fall 1993 Greenmeadow wildfire burned 100 percent of the Satwiwa Pond's watershed. Due to the fire, the Natural Resources Conservation Service and Ventura County Flood Control District requested that the National Park Service dredge the pond in order to protect downstream flood control structures and property. This project is being funded using emergency fire rehabilitation money. The pond is located at Rancho Sierra Vista/Satwiwa within SMMNRA near the City of Thousand Oaks.

A 200+ -foot long earthen dam was erected across the South Branch (Middle) of Arroyo Conejo in the mid-1920's to create a two-acre farm/stock pond. Since its construction, the pond has been maintained periodically by the private landowner through the dredging and disposal of accumulated sediments. The area became public park land in 1982 when it was acquired in fee by the National Park Service.

Satwiwa Pond was last dredged in 1985 by the National Park Service. At that time, the Natural Resources Conservation Service evaluated and recommended reducing the size of the dam, and impounded water to reduce downstream hazards in the event of catastrophic failure. The dam was completely graded away, rebuilt and recompacted with a new spillway. The spillway was

stabilized using concrete in the fall of 1992. The pond has been greatly reduced in size because of heavy siltation since 1985, especially following the 1993 wildfire.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The Satwiwa Pond dredging project is composed of four interrelated tasks. Approximately 2900 cubic yards (c.y.) will be dredged from Satwiwa Pond and used as fill on site without the need to transport the material out of the park. This 2900 c.y. of sediments dredged from the pond will be used to: (1) flatten a powwow arena (1000 c.y.) immediately adjacent to the pond; and (2) replace soil eroded from paddocks at Rancho Sierra Vista Ranch. Four culverts will be installed under the Satwiwa Loop Trail; underground water and electric lines will be installed to the powwow arena; and the prehistoric stream alignment above the powwow arena will be restored. Tule, cattail and willow will be replanted in the project area after dredging and filling. Areas receiving fill and disturbances from construction activity will be stabilized with mulch, and reseeded with native grasses and herbs.

The pond will be dewatered using a small pump; water will be returned to the drainage approximately 20 yards downstream from the pond after the suspended sediments have been removed by filtration. Exotic and native reeds will be removed from the dredging footprint. Native reeds will be restored following the dredging operation. Pond sediment will be excavated using a mechanical excavator, i.e., backhoe or small drop-bucket crane. Excavated material will be dewatered and then used to construct the powwow arena, and stockpiled and used to replace soil eroded from paddocks at Rancho Sierra Vista Ranch.

The Satwiwa Pond dredging project specifications and construction drawings were submitted to Western Region Chief of Maintenance and Engineering Jack Williams on March 17, 1994. On April 11, 1994, we were informed that region had approved the specifications and drawings, provided we had completed all required compliance necessary. The \$105,000 Satwiwa Pond dredging project has now been put out for competitive bid.

A Section 404 permit for this project has been obtained from the U.S. Army Corps of Engineers. A Section 401 permit has been obtained from the California Regional Water Quality Control Board. A Stream or Lake Alteration agreement has been obtained from the California Department of Fish and Game. The U.S. Fish and Wildlife Service has been informally consulted. Restrictions put on the project to protect threatened species during the nesting season by state and federal agencies mean that the work cannot begin until late July or early August 1996, and finish by early 1997, prior to the onset of winter rains.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Without implementation of the Satwiwa Pond dredging project, the pond will continue to rapidly fill up with sediment and no longer function as wetland habitat for riparian plant and animal species. The value of this extremely rare habitat in this semi-desert environment

for interpretation, environmental education, Native American Indian programs, and enjoyment by the general public will be severely compromised or eliminated. The dredged soil from this project will not be used to correct a number of serious erosion problems at Rancho Sierra Vista (identified as a critical need in the Ranch Management Plan, 1993). The dredged soil will also not be used to flatten a powwow area near the pond (as approved in the DCP for the area). Implementation of this alternative will be contrary to Santa Monica Mountain NRA's legislative purposes, National Park Service policies and guidelines, and management objectives for the park, because it will not meet current and future anticipated natural and cultural resource needs.

2) Implement Recommended Project. With implementation of the Satwiwa Pond dredging project, the sediment that has accumulated in the pond since it was last dredged in 1985 will be removed and used on site as fill. The pond will continue to function as wetland habitat for riparian plant and animal species. The value of this extremely rare habitat in this semi-desert environment for interpretation, environmental education, Native American Indian programs, and enjoyment by the general public will be greatly improved. The dredged soil from this project will be used to correct a number of serious erosion problems at Rancho Sierra Vista (identified as a critical need in the Ranch Management Plan, 1993). The dredged soil will also be used to flatten a powwow area near the pond (as approved in the DCP for the area). In the future (10+ years), as the pond fills with sediment, it will need to be dredged again. Implementation of this alternative will be fully consistent with Santa Monica Mountain NRA's legislative purposes, National Park Service policies and guidelines, and management objectives for the park, because it will meet current and future anticipated natural and cultural resource needs.

COMPLIANCE:

An environmental assessment and Finding of No Significant Impact for the Rancho Sierra Vista/Satwiwa Development Concept Plan (DCP) was approved by the Western Regional Director in 1984. The need for maintaining Satwiwa Pond by dredging and creating a powwow arena were proposed in the approved DCP. This project is categorically excluded from NEPA (516 DM6, Appendix 7.4 C(4)). The CEQA categorical exemption which applies to this project is 15304(g): *"Maintenance dredging where the spoil is deposited in a spoil area authorized by all applicable state and federal regulatory agencies."*

FUNDING REQUIREMENTS:

FUNDED COMPONENT	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Personal Services	.1	PNR1	6.0	0.0	0.0	6.0
Dredge Satwiwa Pond		SFIR	105.0	0.0	0.0	105.0
TOTAL			111.0	0.0	0.0	111.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following resources management project statements contained within the Resources Management Plan:

SAMO-N-300.010	Update Water Resources Management Plan
SAMO-N-301.020	Conduct Inventory and Assessment - Water Resources
SAMO-N-301.040	Identify and Manage Floodplains
SAMO-N-304.040	Develop Hazardous Waste Management Plan
SAMO-N-400.040	Inventory Extent of Wetlands
SAMO-N-450.013	Riparian/Hillside Restoration
SAMO-C-600.040	Stabilization or Rehabilitation of Historic Resources at Rancho Sierra Vista/Satwiwa

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects are reported in the annual RMP Update and in the Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.060

TITLE: Increase National Park Service Participation in Response to Oil Spills

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

- N11** Degradation of Park Water Quality Due to External Activities
- N16** Visual and Biological Impacts of Urbanization and Other Near Park Development on Park Resources
- N20** Lack of Baseline Data; Insufficient Understanding of Park Ecosystems and Threats to Them

CULTURAL RESOURCE CODES: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Protection/Mitigation

PROBLEM STATEMENT:

Both the terrestrial and the marine environments of the SMMNRA are adjacent to major oil shipping routes. On the land, U.S Highway 101 and California Highway 1 parallel the north and south sides of the Santa Monica Mountains, while the Interstate 405 bisects the eastern Santa Monica Mountains. Ships carrying crude oil from further north pass close to the shore on their way to Los Angeles Harbor and local refineries. The Santa Monica Mountains are riddled with oil and gasoline pipelines running to and from the various refineries in Los Angeles. There have been oil line breaks in the Mountains, tank trucks have had accidents and released oil on the local highways and there have been ship spills of oil within the Los Angeles area. A portion of the marine environment off the Santa Monica Mountains has been designated by the state as an Area of Special Biological Significance and is relatively pristine which makes it particularly vulnerable to oil spills.

When oil spills occur on land, frequently some of the oil finds its way into surface waters or

percolates into the ground water. Oil spills can migrate great distances, and have the potential to significantly degrade both biotic resources and scenic values. The responsibility for emergency response generally resides with the first responders such as the local fire department. As the emergency expands, other agencies become involved to offer assistance and protect their interests. The California Department of Fish and Game, Office of Oil Spill Prevention and Response and the U.S. Coast Guard are the designated responsible agencies for all coastal oil spills. Within the Incident Command structure, there is a Wildlife Recovery and Rehabilitation Unit and there is a Natural Resource Damage Assessment Unit in the Planning Section. The interests of the SMMNRA are not currently represented in the Planning section. The infrastructure for responses already exists and the NPS needs to be involved in the priority setting, staging and response activities in areas within the SMMNRA.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The National Park Service will become part of the Planning Section within the Incident Command Structure, relaying information and concerns regarding National Park Service areas of responsibility by regular attendance at these Planning Section meetings. Designated members of both the National Park Service Resource Management Division and Ranger Division will participate. Appropriate contacts that provide the greatest protection to the SMMNRA will be maintained. The NPS is not presently listed as a primary responder, but there are human and material resources within the SMMNRA which can be utilized, if needed, by those with the responsibility for responding to oil spills. The NPS will prepare an Oil Spill Contingency Plan that will be consistent with the California Department of Fish and Game, California Highway Patrol, local fire departments, U.S. Coast Guard and other groups in the Incident Command structure. The Contingency Plan will include identifying most sensitive areas, potential water resources that could be effected, and options of mitigation measures to be taken in cooperation with the other agencies.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Not availing the National Park Service of its access to planning and contributing to the responses to an oil spill denies the National Park Service to the furtherance of its mission to the protection of resources in the SMMNRA. Extensive damage to the park's resources may occur without official park notification.

2) Implement Recommended Project. As a contributing member of the Planning Group to the Interagency Oil Spill Response Team, the interests of the National Park Service will be protected. Collaborative programs with other land management agencies provide the greatest protection in the event of an oil spill. A significant Oil Spill response and command structure of local and state agencies is available, and the NPS presence can bring major benefits to the park.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.7).

FUNDING REQUIREMENTS:

FUNDING NEEDS	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Chief Resource Management GS-12	0.1	SNWR	6.4	6.4	12.8
Travel		SNWR	0.5	0.5	1.0
TOTAL	0.1		6.9	6.9	13.8

RELATIONSHIP TO OTHER PROJECTS:

This project is related to all other natural resources project statements contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred are reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-304.070

TITLE: Restoration of Water Resources for Equine Program at Ranch Sierra Vista

FUNDING STATUS: Unfunded

SERVICEWIDE CODES:

N12 Alteration of Natural Flow Regimes
N22 Overuse/Impacts and/or Landscaped Zones
N06 Disruption of Native Plant Communities and Accelerated Erosion Due to Past
Land Practices
C56 Rehabilitation/Restoration/Reconstruction
C70 Environmental Impact

CULTURAL RESOURCES CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Mitigation

PROBLEM STATEMENT:

The Development Concept Plan (DCP) and the Ranch Management Plan (1994) for Rancho Sierra Vista/Satwiwa describes programs and actions for interpreting the ranch and its heritage as a self-sufficient operation, and protecting and enhancing site resources. The DCP describes the land use zones to include a grazing pasture. Grazing zones include both irrigated pasture and non-irrigated pasture. The water for the irrigated pasture will be obtained by reactivating a well formerly used on the property.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Approximately 1.4 million gallons of water will be drawn from an existing well at Satwiwa to irrigate the pasture. This water will irrigate approximately 1.5 acres of pasture to sustain grass production during the summer months. Water will be drawn from the well using an appropriate

solar pump. The drawn water will then be stored under pressure in a cistern for future use. The pasture will be irrigated with separately valved sprinklers controlled by an automatic solar-powered clock. Pasture zones will be managed to prolong the life of desirable forage species: to maintain or improve the quality and quantity of forage; and to reduce water loss. Grazing pasture zone rotation will be employed by the ranch manager to ensure that an adequate percentage of grass is maintained in each of the zones. The following grass species may be supplemented and supported with periodic irrigation: Needlegrass (*Stipa lepidota*), Nodding needlegrass (*Stipa cernua*), Purple needlegrass (*Stipa pulchra*) or California Brome (*Bromus carinatus*).

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. The inability to reactivate the well for pasture irrigation will either cause the use of imported water for the purpose of irrigation or the elimination of an irrigated pasture for the livestock. Not having an irrigated pasture will require the NPS or its contractor to bring in hay and other food to feed the horses.
- 2) Implement Proposed Project. A solar-powered pump to obtain well water on the site will provide readily available cheap energy, along with an energy conserving system, to irrigate a summer pasture. The DCP includes this pasture to restore the historical use of the property.

COMPLIANCE:

The Environmental Assessment for the Final RSV/V Development concept Plan was approved in 1984.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Contract to construct fence, plant grass, install irrigation system and reactivate the well		POF1	24.0		24.0
Maintenance GS-7	0.04	POF1	1.2	1.2	2.4
Materials		POF1	0.5	0.5	1.0
TOTAL	0.04		25.7	1.7	27.4

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained within the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishment for each applicable project for which implementation has occurred are reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-305.010

TITLE: Long-term Monitoring and Evaluation of Sediment Yield in Areas Reseeded After Wildfire

FUNDING STATUS: Funded :\$27,000.00 Unfunded: \$138,300

SERVICEWIDE ISSUE CODES:

N05 Degradation of Park Resources Due to Exotic Species
N07 Disruption of Natural Fire Regimes
N17 Loss of Biological Diversity
S10 Visitor Health/Safety

CULTURAL RESOURCE CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management
 D00 Disturbed Area Rehabilitation
 F03 Wildfire Long-Term Management
 V01 Native Terrestrial Plant Management

PACKAGE NUMBER: 10-238

ACTIVITY CODES: Monitoring/Mitigation/Research

PROBLEM STATEMENT:

During late October and early November of 1993, two large fires burned more than 55,000 acres in the Santa Monica Mountains. In the central part of the Santa Monica Mountains, following the Old Topanga Fire and Green Meadow Fire, the County of Los Angeles and the City of Malibu proceeded with an aerial reseedling program within their jurisdictions. The National Park Service and the California Department of Parks and Recreation did not allow reseedling of the approximately 9,880 acres burned on their properties.

This situation provided an opportunity to compare the long-term effects of reseedling in a controlled manner and to evaluate the impacts of post-fire erosion and sedimentation processes. In addition to the direct effects of erosion and sedimentation, other ecological parameters could also be measured. Immediately after the fires, as well as before and after the extreme rains of

1994-1995, measurements were made by a team of A. J. Orme, California State University, Northridge with K. Schwarz and A. Stege, University of California, Los Angeles on the effects of this initial rainfall on the first year after a fire. We are entering the subsequent years, and the initial dramatic effects are now recorded. It is essential that the continuing recovery of the areas after the fire and the first and subsequent rainfalls be recorded. Determining the long term-effects of reseeding burned areas with respect to native and alien species is a necessary step in ascertaining the natural regrowth in the watershed and evaluating the merits of reseeding.

Reseeding was the previously accepted activity after a wildfire. Municipalities and county fire departments have been generally supportive of reseeding activities. This support is frequently driven by the desire to prevent subsequent mud slides and/or immediate erosion when the winter rains come after the fires.

Rye grass (*Lolium sp.*) or mustard (*Brassica sp.*) have been used in the past because of the short germination time and good coverage. Recently, there has been a growing body of evidence that the temporary covers created by the reseeding with rye and/or mustard can actually cause a greater fire hazard than if the land were left to return on its own with native plants. (The reseeding with rye and/or mustard can also prevent the return of native plants.) And, as is shown by the current study, reseeding may have little to no significant effect.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The National Park Service will continue to fund the research started by Orme, Schwarz and Stege on post-fire sedimentation and recovery in the Santa Monica Mountains. The initial activities of site selection, plot layout and measurement of individual study plots, along with aerial photographs for hydrological measurements and monitoring, are completed. During the spring, summer and fall of 1994, inventorying and monitoring of the various plots was performed. The Winter and Spring of 1994-95 monitoring of shrubs, erosion plots and analysis of sediment composition and locations also occurred and some analysis of the data was made. The initial stages of this project were funded by various agencies.

Continued measurements of plant succession and the effects on the sedimentation patterns in the watershed will be made. Variables such as steepness of slopes, north or south facing, fire intensity, species diversity, geomorphology, and proximity to streams as well as a host of other tangential issues such as previous fire history will be evaluated. The vegetation ecology part of the study requires continuous measurement of the growth of individual species of representative plants as well as evaluation of regeneration appearing in the assigned plots. Both herbaceous and woody species are being studied. There are different plant communities in different parts of the Mountains that will be studied, including chaparral, coastal sage scrub and riparian areas. Concomitant with the vegetation studies, measurements of sediments and stream siltation will be made to assess any correlations. The details of these studies have been reported in the part of this study already completed. Continued monitoring and data analysis of the comparison of the seeded versus the non-seeded areas is the thrust of this project.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. The information collected to date has only limited usefulness in the long-term management of the park's natural and cultural resources. The Santa Monica Mountains are continually subjected to the fire/flood process and it can be expected that this will continue. Without the long-term information, it will be impossible to remediate the effects of wildfires, to preserve the watershed ecology and protect the streams and creeks from the continued effects of erosion. Seeding will continue, at high cost, without evidence of its effectiveness in erosion protection.

2) Implement Recommended Project. Continued monitoring and measuring of the return of the affected parts of the Mountains after a wildfire provides information about fire succession of plants as well as about the ongoing erosive processes. The opportunity to do a controlled study of seeded versus non-seeded areas and their recovery offers an unusual chance to contrast and compare two forms of remediation which have not been studied in the Santa Monica Mountains. Similar studies done in other areas and the lessons learned here will lend themselves to a broader interpretation when reviewed in light of the other studies. An additional benefit, already underway, is to conduct interpretive walks in the recovering areas, thereby making a living classroom from these contrasting remediations.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Continue the contract with the local universities		RNSR	30.0	31.5	33.0	34.6	36.2	165.3
TOTAL			30.0	31.5	33.0	34.6	36.2	165.3

RELATIONSHIP TO OTHER PROJECTS:

This project is related to all other natural resource project statements contained in the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred are reported.

REFERENCES CITED:

Orme, A.J., Schwarz, K. and Stege, A. Post-Fire Erosion and Recovery in the Santa Monica Mountains. Unpublished Report. 1995.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-306.010

TITLE: Monitor Water Pollution from Visitor Use

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities
N16 Near Park Development
N20 Baseline Data
S10 Visitor Health/Safety
S12 Visitor Recreation

CULTURAL RESOURCE CODE:

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring/Mitigation

PROBLEM STATEMENT:

The proximity of the Santa Monica Mountains to an urban area of greater than ten million persons makes the beaches, campgrounds, hiking trails, riding trails and picnic areas places of intensive use. Much of the SMMNRA is within a two-hour drive for people in Los Angeles, Ventura, Orange and Santa Barbara counties. In the summer, visitor use of the beaches numbers in the tens of millions. There are city, county, state and federal park lands scattered throughout the Mountains. Despite the fact that there is little water visible during the high use periods of the spring, summer and fall, water resources are very important and subject to pollution. Any material discarded improperly could find its way into the surface waters during the next rain. Some recreation sites, such as campgrounds, picnic areas and beaches are adjacent to year-round surface waters. Contamination of these areas has an immediate effect on surface water quality.

The range of materials that find their way into the surface water covers the range of human

activities. Diapers, garbage, automobile crankcase oil, health and sanitary products, animal and human excrement are a few of the more obvious ones. In addition to the recreational public there are also homeless persons who reside near surface waters and who contribute their wastes to the waters. An inventory of these contaminants and their impacts needs to be made. The overall goal of maintaining water requires knowledge of the types of contaminants, their effects, and their sources. Anthropogenic contamination can be controlled once the sources are identified. Many of the recreation sites in park lands are not on NPS property, so cooperation amongst a variety of government jurisdictions will be needed to ensure success.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Initially, using existing maps, public park lands and private recreation sites with a high potential for water pollution from visitor use will be identified. These sites will be evaluated to determine which will be monitored during periods of high use. Activities which contribute unique or excess contaminants will be identified. As the sources of contamination are identified, appropriate public education will be instituted to help reduce problems.

There will never be enough persons available to supervise recreation areas sufficiently enough to prevent all pollution; however, installing appropriate signage with available and visible trash receptacles, in sufficient quantity and placement, can help alleviate this problem. People will control their wastes if it is convenient for them to do so and if the facilities are readily accessible. Creative means for educating some of the public may be needed; examples, such as the way commercial theme parks manage their trash, may give us ideas on managing trash in the parks.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Continued pollution of our park waters by the visiting public will lead to greater degradation of the water quality in the SMMNRA and seashore. Public health and aesthetic problems will worsen. The resource will deteriorate and the value of the park and public recreation sites will decrease significantly.

2) Implement Recommended Project. Identification of the types and sources of contaminants of surface waters will provide a strong tool for instituting remediation measures. These measures can be accomplished without major capital outlays and the rewards of controlling these wastes are incalculable. Healthy beaches, creeks and river banks enable the public to have a pleasant, risk-free experience while protecting the natural resources in the many park areas available in the SMMNRA.

COMPLIANCE:

This project is categorically exempt from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Site Surveys Biological Technician GS-5	1.0	RNSR	30.0	30.0	60.0
Educational Signs, Programs		RNSR	15.0	15.0	30.0
Supplies and materials		RNSR	20.0	20.0	40.0
Travel/ Training		RNSR	1.0	1.0	2.0
or Contract the Project			66.0	66.0	132.0
TOTAL	1.0		66.0	66.0	132.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources project statements contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred are reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-307.010

TITLE: Terrestrial Impacts on the Offshore Area of Special Biological Significance (ASBS)

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N00 Impacts on Fish/Degradation of Fisheries
N09 Disruption of Natural Coastal Dynamics
N17 Loss of Biological Diversity
N20 Lack of Basic Data: Insufficient Understanding of Park Ecosystems & Threats to Them

CULTURAL RESOURCE CODE:

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Monitoring

PROJECT STATEMENT:

In 1979, the California State Water Resources Control Board designated the coastal area from Laguna Point in Ventura County to Latigo Point in Los Angeles County as an "Area of Special Biological Significance" (ASBS) for its outstanding and diverse biotic communities and exemplary water quality. This ASBS is adjacent to the boundary of the SMMNRA and is impacted by anthropogenic activities on the land as well as in the ocean.

The National Park Service does not own any specific property contiguous with the ASBS, but drainage from creeks within the park boundary to areas on the seaward side of the park flows into the ocean at the location of the ASBS. The flows to the ocean occur primarily during the winter rainy season, and continually when there is a heavy winter rainy season. During the summer and fall months, there is limited or non-existent flow from most of the streams in the park. The first heavy rains of the year scour the creek beds and bring accumulated contaminants and detritus to the ocean. Most of the creeks in the Santa Monica Mountains are intermittent and have surface flow into the ocean for only a short time; however, they may have a year's accumulation of natural and anthropogenic waste.

This brief and concentrated terrestrial flow of various constituents occurs without any evaluation on the ASBS. The ASBS exists because it has been protected by existing away from the development of sewage outflow areas. This ASBS is an anachronism in the midst of a highly urbanized area, valuable beyond its natural attributes. The unique circumstances which allowed the ASBS to be naturally created are fragile. Any constituents leaving the mountains to go into the ASBS may compromise its unique nature.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

There is a no information about how the effluent from the Santa Monica Mountains to the sea affects the Area of Special Biological Significance. Monitoring activities on the land and the sea must progress simultaneously. The ASBS will be monitored for biological and chemical indicators of its health. Potential offshore contaminants will be measured on the land.

Cooperation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service will be requested to provide the expertise needed to identify the sensitive indicator species and chemicals and the locations where these can be measured. Local universities with marine biology/oceanography departments will also be asked to contribute their skills. The number, timing and frequency of samples will be determined in consultation with these experts.

The terrestrial potential source of contaminants will be surveyed and monitored for materials which may cause environmental damage. Surveying the canyons during the late summer and fall for possible contaminants contributes to the evaluation of the type and kind of contamination which can cause degradation of the ASBS. This evaluation of both the ASBS and the potential sources of contaminants will be evaluated continually to account for the variable weather and rainfall. While it is assumed that greatest impact to the ASBS may be from terrestrial sources, air and water sources may be also contribute to some of the changes observed. Relevant water and air measurements will be also be made.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. The ASBA contiguous with the SMMNRA has been recognized for its natural resources and beauty. Without appropriate monitoring, we will not know if this resource is retaining its viability. Lack of knowledge or control of the real and potential threats to the ASBS can lead to its demise and the loss of one our rare natural resources.

2) Implement Recommended Project. The biological health of the ASBS will be protected through assessment of change. The acquisition of these baseline data are essential to preserving this natural resource. The evaluation of the contents of the canyons within the SMMNRA and their waterways for potential harmful substances to the ASBS will also be useful beyond their impact on the ASBS.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Research Scientist GS-12	1	RNSR	64	64	64	64	64	320
Site Survey Biological Technician GS-5	1	RNSR	30	30	30	30	30	150
Analysis, Supplies and Material		RNSR	25	25	25	25	25	125
Travel/ Training		RNSR	2	2	2	2	2	10
Oceanographer GS-12	0.5	RNSR	32					32
or Contract Project			153	121	121	121	121	637
TOTAL	2.5		153	121	121	121	121	637

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resource project statements contained in the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-308.010

TITLE: Mitigate Non-Point Source Pollution from Livestock

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities

N16 Visual and Biological Effects of Urbanization

S10 Visitor Health/Safety

S12 Visitor Recreation

CULTURAL RESOURCE CODE: C73 Adjacent Land Use

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Monitoring/Mitigation

PROBLEM STATEMENT:

Within the SMMNRA and Zone there are thousands of acres of private property, ranging from intensive urban development to undeveloped open spaces. The rustic nature of the area attracts many who want to be close to nature and to live on small ranches. Many of these ranches have horses for recreational riding. It is common practice to ride through streams and gullies as well as on the trails along the sides of the Mountains. Horse droppings are a common site on all trails in the Mountains. Horses are often stabled without regard to whether they are close to a stream or drainage area. Each horse owner handles animal wastes in their own way. There is no uniform code for this activity. Sometimes it is hosed off into a convenient area or gathered into a pile until it can be disposed in an appropriate manner. In almost all cases, inadvertent animal wastes leave the property. During the rainy season much of this waste ends up in the waterways adjacent to the properties or it percolates into the ground water.

Sampling within the Malibu Creek Watershed has demonstrated exceptionally high levels of coliforms and enterococci in the upstream branches of Malibu Creek. The coliform levels exceed

all public health standards. After the first rains, in the fall, the levels of coliforms and enterococci exceed measurable levels (see Appendix K of WRMP). A significant source of this contamination is probably the widespread presence of animal wastes.

In addition to uncontrolled animal wastes, there are significant inputs of fertilizers and pesticides from the drainages flowing into Malibu Creek. While there is no single source for these substances in the Santa Monica Mountains, the aggregate from all the residents is represented in the final drainage of the watershed.

Identification of non-point pollution throughout the Santa Monica Mountains is necessary to ensure unpolluted water for resource protection, public recreation and ultimately for water consumption.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

In cooperation with a variety of agencies, the National Park Service will expand monitoring to identify the sources and the substances contributing to the degradation of the water in the Malibu Creek Watershed and in other selected watersheds in the Santa Monica Mountains. The greatest effort and experience on monitoring in the Malibu Creek Watershed has been the Las Virgenes Municipal Water District and the Regional Water Quality Control Board. The experience gained in Malibu Creek Watershed monitoring will be applied to other effected watersheds. Coliforms, nitrates, ammonia, pesticides and metals will be analyzed. An evaluation of the increased numbers of substances analyzed, a wider area, and more frequent monitoring will be instituted. Based on the findings, monitoring may be discontinued or expanded.

The monitoring, which includes the upper reaches of the Malibu Creek Watershed and other watersheds, will include a panel of analysis agreed upon by these lead agencies. Additional sampling locations and times will be determined by the agencies and NPS. The data will be plotted using the NPS GIS capability to identify the potential sources.

Concomitant with the monitoring, a survey of animal waste, fertilizer and pesticide practices in the watersheds will be made. This will be accomplished through questionnaires and on site inspections where possible.

Determining where the pollution is coming from and what type of pollution exists both provide a basis for mitigation measures to be undertaken and helps determine the success of any mitigation measures.

The mitigation measures will consist of a cooperative livestock owner educational program as well as a remediation program. These two approaches are contingent on the findings of the earlier monitoring studies in collaboration with the Southern California Regional Water Quality Control Board (SCRWQCB), the Las Virgenes Municipal Water District (LVMWD), Heal the Bay, Topanga-Las Virgenes Resource Conservation District (TLVRCD) and other interested

parties. A mitigation plan will be designed based upon the monitoring data accumulated by these agencies.

As various segments of the monitoring program are completed, specific residences will be informed of the problem and attempts to work out mitigation will be explored. Copies of "Backyard Ranches: A Horse Management Program for Malibu Creek Watershed" prepared by the TLVRCD and the Natural Resources Conservation Service will be provided to homeowners and target groups, and attempts to implement the suggestions in this document will be made. Community workshops, demonstration ranches and school programs will also be used to ensure that the information is made available to all residents. The member agencies of the Malibu Creek Watershed Project have started the monitoring program and are publishing an informational booklet. The NPS will join these other groups in the Malibu Creek Watershed and use this platform as a point of departure for the other areas of non-point source pollution in the SMMNRA. The lessons learned in this Malibu Creek Watershed cooperative project will be applied throughout the SMMNRA.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Some monitoring of the Malibu Creek Watershed currently occurs; however, it is insufficient to determine solutions to this problem. Other watersheds in the Mountains have not been studied. Future recommendations on the basis of the existing data would not be adequate to mitigate the sources of non-point pollution. In the absence of the recommended project, the contamination of park watersheds will continue.

2) Implement Recommended Project. There is a great concern for the health and safety of visitors exposed to the water in the Santa Monica Mountains. Identifying and removing these potential health threats fulfills the NPS mission to protect the public from health/safety hazards. The high levels of nitrogen compounds and pesticides also affect the natural flora and fauna, with algae blooms and subsequent decreased oxygen in the water. There can be no restoration of any of the areas in the drainages to their natural state if the source of the contaminants that continue to pollute the watersheds are not identified and remediated.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEEDS	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Site Surveys Biological Technicians GS-05	1.0	RNSR	30.0	30.0	30.0	90.0
Supervisory Hydrologist GS-025-11	0.5	RNSR		30.0	30.0	60
Supplies and Materials		RNSR	5.0	5.0	5.0	15.0
Travel and Training		RNSR	0.5	0.5	0.5	1.5
or Contract Project			35.5	65.5	65.5	166.5
TOTAL	1.5		35.5	65.5	65.5	166.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources project statement contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred are reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-311.010

TITLE: Inventory and Evaluate the Status of Alien Fish Species in the Lakes and Ponds in the Santa Monica Mountains

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N00 Impacts on Fish/Degradation of Fisheries
N00 Degradation of Park Resources Due to Exotic Animals
N20 Lack of Basic Data: Insufficient Understanding of Park Ecosystems
and Threats to them

CULTURAL RESOURCES TYPE CODE: N/A

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring/Mitigation

PROBLEM STATEMENT:

Prior to and subsequent to the establishment of the SMMNRA, fish were stocked in surface waters throughout the Santa Monica Mountains. Some of these fish were added to improve sport fishing where the sport fishing was poor or non-existent. Other waters were dumping grounds for discarding unwanted fish. Impounded waters, as well as streams, contain non-native bass, blue gill, crappie and other panfish as well as crayfish. The effect of these non-native species on native species is not known. The distribution of these non-native species throughout the Santa Monica Mountains has not been studied.

Over the years, many human-caused changes in both the quality and the quantity of the surface waters in the Santa Monica Mountains have occurred. The effects of these changes on fish habitat and survival is not well understood. There are questions as to whether native species can compete successfully with non-native fish for habitat within these waters. Prior to trying to restore native fish or aquatic life, a baseline inventory of the status and distribution of existing

aquatic species is required. Attendant to this baseline inventory, water quality and quantity needs to be sampled concurrently. Watersheds in the Santa Monica Mountains are frequently isolated from each other and may not be cross-contaminated with exotic fish species. The possibility of isolated and relatively pristine areas provides an opportunity to restore native species if the conditions are favorable. Swift et al. (The Status and Distribution of Freshwater Fishes of Southern California, Bull. Cal. Acad. Sci: 92:101-167, 1993) studied Big Sycamore Canyon, Arroyo Sequit, Zuma Canyon, Malibu Creek and Topanga Canyon in the Santa Monica Mountains for native and exotic fish. Swift states (loc. cit.) that there are at least 100 non-native species in southern California, which exceeds all other areas of the state in numbers of aliens established. Crayfish, which have been planted, are believed to be reducing the numbers of amphibians.

It is the objective of SMMNRA to control or remove exotic fish wherever they are found to be adversely affecting native species. With this in mind, the objective of this project is to provide the information necessary to determine the status of exotic and native fish in order to evaluate the impacts to native fish and the practicality of removing exotics. This project will also provide a baseline for comparison with future monitoring of native and exotic fish.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The National Park Service will cooperate with the California Department of Parks and Recreation, California Department of Fish and Game, U.S. Fish and Wildlife Service, and other public land management agencies to inventory and evaluate the status of alien fish species in the Santa Monica Mountains. Field studies will be designed to identify and confirm the existence of different species of fish within the different watersheds in the Santa Monica Mountains. Comparisons to the data in the literature as it relates to the type and quantity of fish found in each of the watersheds will be made. Evaluation of the compatibility of native fish with alien fish and of the water quality and quantity will be made to determine the feasibility of possible restoration of the original fisheries in the Santa Monica Mountains. The initial project will concentrate on those permanent and intermittent permanent streams and standing bodies of water.

Although it is probably impossible to prevent all disposal of alien species and the removal of all the existing alien forms in the waters in the mountains, information obtained from an inventory will assist us in making knowledgeable judgments on how to manage the problem. A public education program in written and spoken communications will inform the visitors of the park that alien species are harmful to the resource. At each venue where the visitor enters public lands containing water resources, the extent of the problem will be explained, along with instructions on how to limit the introduction of more alien species.

Identification of the impacts of alien species on the indigenous flora and fauna will help to assign priorities regarding which of these species are creating the greatest damage. Knowing this, appropriate mitigation measures can then be instituted as another project or projects.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Ignorance of the present fish inhabitants and environmental conditions of the waters in the SMMNRA precludes any successful restoration efforts. Incompatible species and conditions will prevent any habitat restoration and may result in continued degradation of native fish, amphibians and insects.

2) Implement Recommended Project. The information collected on the present conditions of the water resources with respect to the aquatic populations and water conditions will enable the NPS, other public agencies and the public to make informed and intelligent decisions on the merits and probable success of restoration projects in the SMMNRA. Remediation based on this information will save money and time.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Wildlife Biologist GS-11	0.3	RNSR	16.3	16.3	16.3	48.9
Biotechnician GS-5	2.0	SNWR	59.2	59.2	59.2	177.6
Supplies and Materials		SNWR	5.0	5.0	5.0	15.0
Travel/ Training		SNWR	6.0	6.0	6.0	18.0
or Contact Entire Study			86.5	86.5.0	86.5	259.5
Total	2.3		86.5	86.5	86.5	259.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resource management projects statements contained within the park's Resource Management Plan and the Water Resources Management Plan.

ANNUAL PROJECTS STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-312.010 (194 RMP RM-11 revised)

TITLE: Develop an Interagency Fish Management Plan and Environmental Assessment

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

- N19 Loss of Park Resources Due to Consumptive Uses
- N20 Insufficient Understanding of Park Ecosystems and Threats

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Mitigation

PROBLEM STATEMENT:

The Anadromous Fish Conservation Act of 1974 authorizes the Secretary of the Interior to conduct biological surveys to improve stream habitat and spawning conditions for the protection of fish and their migration. The Act was passed to conserve, enhance and develop the anadromous fisheries of the nation. Title I of the Conservation Programs on Government Lands Act (September 15, 1960) directs the Secretary to plan, develop, maintain and coordinate programs for the conservation and rehabilitation of wildlife, fish and game, which shall include habitat improvement projects.

Native steelhead trout (*Oncorhynchus mykiss*) occur in several coastal streams within the Santa Monica Mountains, including Malibu Creek (the southernmost run), Arroyo Sequit Creek and possibly in Little Sycamore Canyon (RMP, 1984). It may be likely that they also spawn in other drainages, but more research is needed to verify their occurrence.

Steelhead trout have highly diverse life histories with both anadromous and freshwater resident individuals derived from the same population. They were formerly distributed from Alaska to the United States/Mexican border according to a report for the California Department of Fish and Game (Shapovalov, Leo and Taft, Alan C., 1954. The Life Histories of Steelhead Rainbow Trout (*Salmo gairdneri gairdneri*) and Silver Salmon (*Oncorhynchus kisutch*) with Special Reference to Wadell Creek, California, and Recommendations Regarding their Management).

Native fish historically occur in other Santa Monica Mountains creeks. Several accounts of silver salmon (most likely silver-colored steelhead) in both Trancas Creek and Topanga Creek exist. Bernie Neumann, who was raised in Trancas Canyon, caught fish during the late 1930's, and Leo Bourget caught steelhead "up to six pounds" near the mouth of Trancas Creek (currently a residential area) (Manwaring, 1993).

In a preliminary survey of Arroyo Sequit Creek, steelhead of the following measurements were caught and released: 2-6.25", 1-7.5", 1-6.75" and 1-15". From each a tail fin and scales sample was taken and sent to Jennifer Nielsen, at the University of California, Berkeley, Department of Molecular Cell Biology, for genetic analysis. Nielsen recently discovered that the fish in Malibu Creek may be more closely related to steelhead found in Mexico, than to their northern California counterparts. She is working to analyze the fish found in Arroyo Sequit Creek. The steelhead found from Malibu Creek north to Santa Rosa Creek potentially represent a relict wild population with a special adaptation to warm summer water temperatures. They are possibly derived from a Mexican trout population. In addition, odolith specimens are going to be collected from the trout in Arroyo Sequit Creek in an effort to further determine that they are steelhead rather than residential rainbow trout (Tibbets, pers. comm.).

A similar preliminary survey of Trancas Creek revealed no fish and few aquatic insects. The water, unlike that of other Santa Monica Mountains streams, was tea-colored. In a previous survey (September, 1992) largemouth bass, goldfish and bluegill were photographed. More detailed surveys are needed to determine the effects of an upstream golf course on the creek.

Santa Monica Mountains fish populations are threatened by alien fish and a lack of fishing regulations on the streams they inhabit. Malibu Creek, however, after a recent study of its steelhead population, was closed to fishing by the California Department of Fish and Game. The National Park Service, the California Department of Parks and Recreation and members of the Izaak Walton League will work to impose similar restrictions on Arroyo Sequit Creek and any other creeks where steelhead are confirmed, until populations are sufficient to withstand fishing pressure.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

- 1) In cooperation with the California Department of Fish and Game, the California Department of Parks and Recreation and other park land management agencies in the Santa Monica Mountains will conduct stream habitat and fisheries surveys of selected creeks to identify aquatic resources, assess habitat conditions and assess impacts from development.
- 2) An Environmental Assessment will be written specifically on the activities needed to restore the steelhead in Malibu Creek and other historical steelhead creeks and rivers in the Santa Monica Mountains.
- 3) The National Park Service will work with the California Department of Fish and Game, the

California Department of Parks and Recreation, local fisheries groups and interested volunteers to develop a cooperative plan to conserve and perpetuate other native fish populations of the SMMNRA.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Studies to determine if and where native fish, such as additional steelhead exist within the SMMNRA will not be carried out. This continued lack of knowledge and research on the steelhead will lead to their continued extirpation from additional streams within the Santa Monica Mountains.

2) Implement Recommended Project. Steelhead and other native fish, valuable resources in the Santa Monica Mountains due to their continued persistence despite development, would be studied and protected through the efforts of agencies such as the National Park Service. Knowledge of the aquatic resources of the Santa Monica Mountains would increase.

COMPLIANCE:

Collecting data for this project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6) but would require consultation with other agencies, such as the California Department of Fish and Game. Any habitat modifications would require consultation and an environmental assessment. Ground disturbance would require an archeological clearance.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Fisheries Biologist GS-11	1.0	RNRM	54.2	54.2	54.2	162.6
Biotechs (four) GS-401-05	4.0	RNRM RNSR	118.4	118.4	118.4	355.2
Supplies and Materials		RNRM RNSR	20.0	5.0	5.0	30.0
Travel/ Training		RNRM RNSR	10.0	10.0	10.0	30.0
or Contract the Project			202.6	187.6	187.6	577.8
TOTAL	4.5		202.6	187.6	187.6	577.8

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

SAMO-N-110.050	Establish Liaisons with Universities for Research and Monitoring Activities
SAMO-N-120.010	Conduct Cooperative Resource Management Program
SAMO-N-142.010	Develop a History of Scientific Studies for the Santa Monica Mountains Zone
SAMO-N-301.020	Conduct Inventory and Assessment -- Water Resources
SAMO-N-301.050	Cooperate with Other Agencies Engaged in Monitoring Water Quality
SAMO-N-304.010	Engineer the Development of an Interagency Plan to Restore Zuma Wetlands
SAMO-N-313.010	Monitor Threats to Aquatic Resources
SAMO-N-510.010	Inventory and Map Distribution of Special Wildlife Taxa
SAMO-N-504.014	Monitor Reptile and Amphibian Population Status and Trends
SAMO-N-504.010	Determine Status, Location and Extent of Alien Animals
SAMO-I-100.010	Identify Significant Lands Not in Public Ownership

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for each project for which implementation has occurred will be reported in the annual RMP Update and Superintendent's Annual Reports.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-313.010

TITLE: Monitor Threats to Aquatic Resources

**SUBPROJECT: Identify Impacts from Existing and Planned Golf Courses on 1) Trancas Creek
and 2) Malibu Creek**

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N02 Impacts on Threatened, Endangered and Sensitive Animals

N11 Degradation of Park Water Quality Due to External Activities

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Mitigation

PROBLEM STATEMENT:

With over 300 golf courses (124 in L.A. and Ventura Counties), southern California is a golfer's mecca. The Santa Monica Mountains are no exception. The legislative boundaries of the Santa Monica Mountains encompass at least two existing and two proposed golf courses. In addition, there are another half dozen courses located within the Santa Monica Mountains Zone. Despite the idealized concept of cooperative land use/management that permeates the park General Management Plan and the enabling legislation, land uses like this, within the boundaries of the park, adversely affect park resources. Irrigation, fertilizers, pesticides and non-native plantings affect both the quantity and quality of natural resources (water, land, wildlife, plants) located adjacent to and downstream from the golf courses. Percolation of pesticides and fertilizer salts into ground water is a source of pollution. In Hewlett Harbor, New York for example, a flock of more than 700 brant died after feeding on a fairway that had been treated with Diazinon. On another course in Bellingham, Washington, 85 widgeon died after feeding on a course that had been heavily watered after pesticide application. Amongst golfers, pesticide reactions seem commonplace, varying from symptoms such as blurred vision to mild allergic reactions. In one

instance, a Navy Lieutenant experienced a severe allergic reaction and died after playing on a course sprayed with Daconil.

The ability to quantitatively define the effects of golf courses on park resources is necessary to defend park positions on development proposals. In addition, the results of such a study will serve to assist (in varying degrees) to alter the management of these facilities, at least within the park boundaries. At the present time, there is no information available about the maintenance practices of the golf course within the drainage of Trancas Creek. It is evident that the constant irrigation of the golf course increases the water in the creek, but this has not been quantified. This golf course is located within Tranca canyon so that nearly all fugitive chemicals will flow into the creek during rainy season and become part of the irrigation system.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

- 1) Complete a literature review to assess the impacts of golf courses on wildlife, water quality and surrounding lands. There are many chemicals used in the maintenance of golf courses; it is necessary to know their biological effects to determine what signs or symptoms to look for and to identify the impacts on the natural environment.
- 2) Quantify the impacts of the Malibu Country Club golf course on Trancas Creek watershed/Canyon and the surrounding lands. The Country Club will be requested to provide a list of chemicals that have been used and are presently being used for the park service to monitor. Sampling will be done in and around the golf course in the water, soil and tissue samples from indigenous species to determine the presence of any offending chemicals which can affect the environment. Constant sampling or monitoring will be required as long as the golf course is operational to be certain that there are no harmful fugitive chemicals affecting park land.
- 3) Assess the impacts of the proposed golf courses on the Malibu Creek watershed. Based on the identification of the chemicals in the watershed, allegedly from the golf course, and the biological effects identified from the literature search, evaluations of the natural flora and fauna will be made.
- 4) Recommend management strategies to lessen the impacts of this and other proposed golf courses on water quality and wildlife. In cooperation with the golf course management and other appropriate public agencies, changes in materials and methods will be identified that protect the environment and cause minimum economic or operational disruption of the golf course.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. Impacts associated with golf courses in the Santa Monica Mountains will continue to be unknown, with likely detrimental effects on visitors and the resources of the park.

2) Implement recommended project. Park management will be able to make informed comments and decisions on mitigating potential adverse effects of existing and future golf course development within the Santa Monica Mountains.

COMPLIANCE:

This project is categorically excluded from NEPA [516 DM 6, Appendix 7.4 A (9)].

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Literature Search Resource Mgt Specialist GS-401-07	.2	PNR1	5.0		5.0
Contract: Assess impacts of 1) Malibu Country Club on Trancas Creek 2) Proposed Golf Courses on Amundsen Ranch on Malibu Creek		SNWR	15.0	10.0	25.0
Supervisory Hydrologist GS-025-11	.8	SNWR WRD	30.0		30.0
Bibliographic/ Library Access		SNWR	.3		.3
Travel		SNWR	2.0		2.0
or Contract Project			52.3	10.0	63.3
TOTAL	1.0		52.3	10.0	63.3

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to other project statements which address water quality and restoration of riparian areas.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects will be reported in the annual RMP Update and Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-315.010

TITLE: Establish Docent-Led Bus Tours of Mugu Lagoon

FUNDING STATUS: Unfunded

SERVICEWIDE CODES:

S04 Visitor Use
S12 Visitor Recreation
S13 Visitor Services

CULTURAL RESOURCE CODE: COMB

RMAP PROGRAM CODES: Q01 Water Resources Management
QI00 Interpretation of Natural Resources Issues

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Interpretation/Protection

PROBLEM STATEMENT:

A Memorandum of Understanding with the Navy, soon to be signed, will provide for limited public access to Mugu Lagoon, one of the largest remaining tidal salt marshes in southern California. The park proposes to use this opportunity to interpret this rare and valuable environmental education site by conducting docent-led bus tours of the area.

Mugu Lagoon is one of largest remaining salt water marshes in Southern California. It is a vital stopover for migratory birds on the Pacific Flyway and a nursery for many birds, fish and mammals including endangered species such as the light footed clapper rail, California least tern and Belding's savanna sparrow. The lagoon harbors a rich diversity of plankton, benthic macroinvertebrates, plants, fish and marine mammals. The eastern arm of the lagoon is within the boundary of the Santa Monica Mountains National Recreation Area (SMMNRA). The property is owned by the U.S. Navy and is located within the Point Mugu Naval Air Weapons Station, responsible for the management of the lagoon. The public may soon have access to the lagoon for research, restoration, interpretive and visitor use. Currently there is no NPS presence at the

lagoon and the Navy has strict security procedures which limit access to the lagoon. These conditions are likely to change with the signing of a Memorandum of Understanding (MOU) between the U.S. Navy and the NPS, which gives the NPS access for limited but explicit purposes.

Under the new MOU, there will be controlled visitor use of the lagoon. To provide the control needed for the security of the naval station, visitors will have to be escorted while they are on the base. The long distances between interpretive sites are too far to walk and require transportation. To accomplish the goals of a thorough interpretive tour, while maintaining the appropriate naval security, it would be best if passenger vans (12-15 passengers) were used. Van drivers trained in interpretative techniques could lead these tours.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

To accomplish a visitor program which protects the resource while involving the community, it will be necessary to establish a docent program. The SMMNRA and the U.S. Navy and other groups will cooperate in the development of van tours of Mugu Lagoon, using docents. Docents will be trained to manage the proposed visitor center and conduct bus (van) tours of the lagoon. This will involve an expanded Volunteers in Parks (VIP) program. This program will build on the VIP program already functioning in the SMMNRA. Training of the VIPs will be provided by the NPS, the U.S. Navy and other experts. Van tours will enable control of the visitor group while providing the public with an opportunity to see and understand the greatest area possible.

Prior to instituting any tours, planning sessions between the navy and the park service with other contributing parties will be held to decide on the modes of transportation, frequency, locations and other logistical considerations. It is anticipated that the tours will be year-round except when the tour may affect the resource. There are a number of options concerning the vehicles to be used. The vans could be obtained from the Navy, purchased outright, leased, or donated from a local car agency. If an elephant train is used, fewer vehicles will be needed but funding will still be necessary. The drivers of vans or elephant trains must obtain a commercial driving license and must be trained. It is anticipated that the life of the vans will be four years, so the budget contains the purchase of new vans in the fifth year with an appropriately calculated inflation factor.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. There are currently no visitor services at Mugu Lagoon. The Navy will continue to permit only visitors who have business with the Navy, and entertain a few specific requests by groups such as the National Audubon Society's request for birding. If this plan is not implemented, few visitors will see/understand the significance of Mugu Lagoon.

2) Implement Recommended Project. The use of docents (VIPs) and vans to provide interpretive tours of Mugu Lagoon will enable visitors to have the opportunity to see and experience a wonderful and vanishing natural resource. Dedicated VIPs have a significant role in this activity

and could assist the park because they would not consume scarce park personnel resources and because they would help develop community pride and support for the lagoon, the park and the mission of the NPS.

COMPLIANCE:

This project will require an environmental assessment.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Interpretive Ranger GS-7	0.5	RNRM	13.5	13.5	13.5	13.5	13.5	67.5
Vans (2)		PDF1	60				80	140
Supplies, Material and Maintenance		PDF1	10	10	12	12	12	56
Volunteer Labor (Docents)		NVOL	(20)	(20)	(20)	(20)	(20)	100
TOTAL	0.5		103.5	43.5	45.5	45.5	125.5	363.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained in the park's Resources Management Plan and the Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-316.010

TITLE: Establish Visitor Use Facilities at Mugu Lagoon

FUNDING STATUS: Unfunded

SERVICEWIDE CODES:

N00 Resource and Visitor Use Management
N11 Rights-of-Way and Easement Management
S04 Visitor Use
S12 Visitor Recreation
S13 Visitor Services

CULTURAL RESOURCE CODE: COMB

RMAP PROGRAM CODES: Q01 Water Resources Management
I00 Interpretation of Natural Resource Issues

PACKAGE NUMBER: 10-238

ACTIVITY CODE: Interpretation

PROBLEM STATEMENT:

Mugu Lagoon is the largest remaining salt marsh area within the SMMNRA boundary. It is an important stopover for migratory birds on the Pacific Flyway and a nursery ground for many birds, fish and mammals. The lagoon harbors a rich diversity of plankton, benthic macroinvertebrates, plants, fish, birds and mammals including endangered species such as the light footed clapper rail, California least tern and Belding's savanna sparrow.

The lagoon has been minimally effected because of the protection and limited access required by the U.S. Navy. Point Mugu Naval Air Weapons Station is the present owner of Mugu Lagoon; however, a portion of the lagoon's eastern arm resides within the NPS boundary and is managed by the Navy. The Navy has agreed to the incorporation of an interpretive visitor program for the National Park Service that will not compromise the necessary security required by the Navy. This opportunity to provide the public with the opportunity to see this unique wetlands could expand

the visitors' experiences into a new dimension which cannot be obtained in other parts of the park.

There are currently no regularly scheduled visitor activities at the lagoon. The Navy however has allowed the Audubon Society and other similar groups to conduct occasional bird watching activities. With the signing of a Memorandum of Understanding (MOU) between the U.S. Navy and the National Park Service, there could be greater visitor access the lagoon. A visitor center and a contiguous boardwalk into the lagoon are needed to enable a more intimate visit to the lagoon while protecting the resource. Interpretative activities could commence at the visitor center where the groups would be taken to the lagoon by docent-led tours. The visitor center could house exhibits that describe the importance of Mugu Lagoon and which provide information about the SMMNRA and local marine sanctuaries. Educational programs and park public information activities could be available in the visitor center.

It is anticipated that a docent group could be formed to work in the visitor center and to provide additional support to park staff. Facilities for research activities related to the lagoon could also be housed in this building.

Building a visitor center and associated facilities, such as a gathering place for tours, and constructing a boardwalk within and adjacent to Mugu Lagoon would provide a more rewarding experience for visitors to the SMMNRA and the Point Mugu Naval Weapons Station. Interpretive activities, such as, guided walks or bus tours could commence at the visitor center with exhibits which describe the importance of the lagoon and its relation to the entire park. The visitor center could also serve those visitors unable to visit the facilities in the lagoon and it would introduce them to the additional resources and visitor services of the SMMNRA. The conducted tours would fulfill the U.S. Navy's desire for controlled access, while enabling the general public the opportunity to see and understand the importance of Mugu Lagoon. For those with more time, scheduled van tours of additional portions of Mugu Lagoon could be conducted (see SAMO-N-315.010).

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The SMMNRA and the U. S. Navy at Point Mugu Naval Air Weapons Station will cooperate on the construction and staffing of a visitor center adjacent to Pacific Coast Highway, opposite the present entrance of the Point Mugu Naval Air Weapons Station. This location will make the lagoon and the SMMNRA readily accessible to the many persons using this major transportation route. Boardwalks into various parts of the lagoon adjacent to the visitor center will be constructed for public access for those unable to go on a conducted tour of the lagoon. Appropriately constructed boardwalks into the lagoon will also offer visitors with physical limitations an opportunity to experience this resource.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. There are currently no NPS activities at Mugu Lagoon, and the site has a very restricted access policy to maintain security for naval operation. Under this alternative, the Navy will continue to allow only visitors who have business with the Navy on the base and may continue to entertain requests by groups such as the National Audubon Society for birding opportunity access.

2) Implement Recommended Project. Construction of a visitor center and a boardwalk, and implementation of interpretive tours of the lagoon will provide a unique experience for visitors to the park. There is currently no visitor center in the SMMNRA. This visitor center on Pacific Coast Highway will provide an opportunity to acquaint the public with the resources within other areas of the park as well as within Mugu Lagoon. The excellent public visibility of a visitor center next to the beach and the lagoon would make it a desirable destination, requiring staffing by Interpretive Rangers and docents. The dynamic activities of the hydrology and geology of the SMMNRA, which come together at Mugu Lagoon, provide a living classroom for the public and a source for research activities. Mugu Lagoon may be viewed as one of the few remaining lagoons left in California which contains a wealth of flora, fauna, hydrology and geology to be shared with the public and studied.

COMPLIANCE:

This project will require an environmental assessment.

FUNDING REQUIREMENTS:

FUNDING NEEDS	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Construction of the visitor center and boardwalk		PNR2	5000.0					5000.0
Maintenance and upkeep		PNR1		100.0	105.0	111.0	117.0	433.0
Interpretive Ranger GS-9	1	PNR1		27.0	28.0	29.0	30.0	114.0
TOTAL	1		5000.0	127.0	133.0	140.0	147.0	5547.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-317.010

TITLE: Prepare Water Resources Brochure

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N13 Lack of Secure Water Rights
N16 Visual and Biological Impacts on Urbanization and Other Near-Park
 Development on Park Resources
N22 Overuse/Impacts to Recreation and/or Landscaped Areas
S11 Visitor Communication
S05 Visitor Perceptions

CULTURAL RESOURCES TYPE CODE:

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Interpretation

PROBLEM STATEMENT:

The complexity of the water resources in the Santa Monica Mountains is not readily apparent. Growth and development in the Santa Monica Mountains and the surrounding area are effected by these complex water resources. The dynamics of the complex water resources lend themselves to a national park interpretive brochure.

The Mediterranean ecosystem, in the Santa Monica Mountains, is similar to other ecosystems that are strongly associated with the presence or absence of water. There is a short, winter/spring rainy season and a long, hot, dry summer/fall, which control the types of flora and fauna present in this ecosystem. The long dry season, with its relatively low levels of rainfall, limits the size and extent of surface and subsurface water resources.

Perennial creeks with year-round water, are limited in the Santa Monica Mountains and have a disproportionate influence on natural and cultural resources. These perennial creeks attract the greatest visitor use, development and human impacts. Ephemeral or intermittent creeks contain water for only short periods during the winter/spring rains and may be on the surface from the late spring to the winter. The wildlife and vegetation associated with the perennial and ephemeral creeks may differ. Overall, however, the wildlife and vegetation in the Santa Monica Mountains are adapted to thrive on the limited rainfall of this Mediterranean climate.

The long dry season and the accompanying Santa Ana winds dry exposed vegetation making it extremely combustible. Water conservation by the vegetation in the Santa Monica Mountains provides greater survivability but makes the vegetation more prone to burn, particularly during the dry season.

In addition to annual rainfall, the presence of the ocean provides an additional amount of moisture in the form of morning fog. This fog, which descends with regularity, strongly influences the natural and cultural resources in the Santa Monica Mountains. This coastal/mountain interface and the Mediterranean climate combine to create the unique climatic conditions of the Santa Monica Mountains.

In the Santa Monica Mountains it is impossible to separate the natural environment from the impacts of the urban environment. California has manipulated its water resources to satisfy the interests of agriculture and urban growth. To accomplish the redistribution of water in California, monumental projects have been constructed. The agricultural and urban areas where imported water is used are closely tied to the park. For example, Franklin Canyon Reservoir was the site for the first major importation of water into Los Angeles. This importation of water manifests itself as increased water flows into the park either from non-point sources such as runoff from residences or agriculture, or from point sources, such as water treatment plants.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Although water is essential for life in semi-arid Southern California, the public has only limited awareness of this major resource. During the droughts in recent years the local and state water agencies conducted major water conservation programs. The public has some understanding of the effects of drought on the human population, but has a limited understanding of the role water plays in the natural world as exemplified by the Santa Monica Mountains.

A brochure will be prepared to interpret the significance of water resources in the Santa Monica Mountains using the Water Resources Management Plan (WRMP) as a primary source. The brochure will highlight the Mediterranean climate and its influences upon the park's ecosystem, especially the associated adaptations of wildlife and vegetation, and it will identify other NPS units which also have a Mediterranean climate. In addition, it will discuss the importance of water to southern California, a semi-arid area with periodic droughts. Specifically the brochure will

discuss how the importation of water has enabled the development of the metropolitan area and what this increase in local water has on the normally dry environment. The brochure will suggest appropriate water conservation measures that can be implemented by local homeowners and businesses, and will describe the conservation efforts of the NPS. Knowledge of how native plants and animals adapt to this semi-arid environment may help the readers of this brochure better able to understand the park and to act responsibly during drought conditions.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Without written interpretive information on the water resources in the Santa Monica Mountains, residents and visitors will probably not understand the importance of water and its effects on creating the unusual landscape of this park. The park experience may only be superficial at best in the absence of organized information.

2) Implement Recommended Project. Information about any subject can make an experience more rewarding. The diversity and complexity in an area such as the Santa Monica Mountains, needs to be explained to the visitor. Providing the park visitor with written information about this national park will create a greater understanding and appreciation for its resources. This is particularly true because in the Santa Monica Mountains, as a result of its location and multifaceted uses, there are many complex water resources issues. The brochure may be the basis of a training document for park staff to increase understanding of the water resources in interpretive programs.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.5).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Total
Biological Technician GS-5	0.5	RNRM	15.0	15.0
Publication		POF1	10.0	10.0
Or Contract Project			25.0	25.0
TOTAL	0.5		25.0	25.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources management project statements contained within the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments will be reported for each applicable project implemented.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-318.010

PROJECT TITLE: Inventory and Assess Handicapped Accessibility to Water Resources

FUNDING STATUS: Unfunded

SERVICEWIDE CODES:

S01 Visitor Problems
S04 Visitor Use
S09 Visitor Needs
S12 Visitor Recreation

CULTURAL RESOURCES CODE: COMB

RMAP PROGRAM CODE: Q01 Water Resources Management
 QI00 Resource and Visitor Use Management

PACKAGE NUMBER: 10-238

ACTIVITY CODES: Interpretation

PROBLEM STATEMENT:

The natural environment in the Santa Monica Mountains is frequently not accessible to individuals with physical limitations. Water-related activities are particularly difficult for these individuals to experience because the soil or sand at the edge of the water is frequently soft and muddy or sandy. In either case, for those persons using wheelchairs or persons with walking problems, the softness underfoot presents a major barrier. Wheelchairs sink or get stuck, and poorly balanced walkers lose their stability. Parking lots providing access to water resources or recreation for the able-bodied often contain berms which limit access to the beach or recreation area by restricting a wheelchair's ability to leave the parking lot.

Swimming, wading and fishing are the major recreational activities a visitor can participate in while visiting a water-related resource. To be a participant in these activities, the visitor must have access to the water in a safe manner. The complete experience must include a safe, barrier free means of getting to the area of visitor activity. Each individual natural setting requires

specific access programs. Accessibility also varies with the individual needs of those with disabilities. Some disabilities require major alterations to acquire access while others may need none. Accessibility can mean simply the removal of barriers in some locations such as parking lots, or constructing boardwalks and providing temporary support measures such as beach mats for wheel chairs. For those who are hearing impaired, physical barriers do not inhibit activities and only appropriate signage is needed. The means for providing access must remove barriers while not compromising the resources.

The non-contiguous nature and separation of land parcels in the park and the diversified terrain of the SMMNRA park lands presents additional accessibility challenges. The physically disadvantaged community has been reluctant to visit the parks in the past because of the frustration encountered in trying to use or experience the resources available only for the able-bodied. There is little information available to the general public and the disadvantaged in particular about what is readily accessible in the park. Frequently, creating access for the disabled also creates access for families with small children in strollers. As more of the park becomes readily accessible, it will be necessary to ensure the entire community is made aware of the resources available within the park. A public awareness program presented to the many diversified handicapped groups and the general public, should include accessibility with public transportation, accessibility of all facilities at the entry point as well as accessibility to the resources within the park.

In addition, multilingual signage is necessary.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The National Park Service will conduct an assessment of the facilities within the SMMNRA boundary to determine the accessibility of the venues and different resources for individuals with special needs. The initial study will focus particularly on water-related activities or experiences because these attract the greatest number of visitors. Riparian areas are frequently the most scenic and trails in these areas can get washed out and have a tread which is difficult to traverse. Currently there are a number of trails made to accommodate those with disabilities on NPS land and on adjoining other park land; however, there has been no uniform set of standards used. A survey of visitor attitudes and desires as well as existing available facilities will include the complete experience for visitors from their arrival to their departure. The parameters of accessibility will try to be inclusive, from those with physical/medical limitations, to those with sensory impairment, and the very young or old. Plans for management and/or remediation to remove barriers will follow the baseline study and the guidelines of the American With Disabilities Act (1990).

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Without the basic information obtained in this survey, the National Park Service may not understand the extent of the problem of access by a large part of our potential visitor

population at the SMMNRA. Without knowledge of the problem, remediation is not possible. The Americans With Disabilities Act requires nothing less than making visitor resources accessible to all.

2) Implement Recommended Project. Making the SMMNRA accessible to all visitors conforms to the laws of the nation. Generating baseline information is essential in order to implement the regulations of the Americans with Disabilities Act.

COMPLIANCE:

This study is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEEDS	FTE	FUNDING SOURCE	Year 1	Year 2	Total
GS-12 Architect	0.5	POF1	35		35
Retrofitting to accommodate those with special needs		RMRR	25	50	75
Travel/Training		POF1	3	3	6
or Contract Project			63	53	116
Total	0.5		63	53	116

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all the other natural resource projects contained in the park's Resource Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER SAMO-N-320.010

TITLE: Evaluate Water Quality in Lakes and Ponds with Illegal Swimming

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities
N20 Lack of Basic Data: Insufficient Understanding of Park Ecosystems & Threats to Them
N22 Overuse/Impacts to Recreation and/or Landscaped Zones
S10 Visitor Health/Safety
S03 Visitor Impacts

CULTURAL RESOURCE CODE:

RMAP PROGRAM CODE: Q01 Water Resource Management

PACKAGE NUMBER:10-238

ACTIVITY TYPE: Monitoring

PROBLEM STATEMENT:

The ponds at Rocky Oaks and Satwiwa and China Flat, Franklin Canyon Lake and Hidden Pond are impounded water bodies on National Park Service property. The ponds are seasonal and may be dry during the summer and early fall. Franklin Canyon Lake is fed via the City of Los Angeles' domestic water supply. These bodies of water are located in areas with great opportunity for human contact. Despite park regulations, exposed ponds are attractive to park visitors and act as magnets for human contact and contamination. Contamination of these standing bodies of water may also affect various forms of wildlife. Limited numbers of bodies of water along the Pacific Flyway make even the smallest pond attractive to migrating birds. Migrating birds have been observed on Satwiwa and Rocky Oaks ponds, Franklin Canyon Lake and Hidden Pond. Contamination of water with metals or toxic chemicals could adversely affect the birds and other wildlife.

The lack of fencing of these water bodies enables easy access for humans to make body contact. People regularly go wading and/or swimming in these ponds and lakes despite posted signs which state "No Swimming."

Static bodies of warm water with high nutrient levels become incubators for many microorganisms and may present a significant health risk to those who come in contact with them. Without fencing and proper signage the public cannot be prevented from coming in contact with the water. The quality of these waters, particularly in the ponds, varies considerably because they are primarily dependent on rainwater. The quantity of water within these ponds changes markedly, depending on the season. Franklin Canyon lake has a more controlled water supply and better fencing, but there is greater opportunity for human exposure, because of its location within the City of Los Angeles and heavy commercial use by film makers. Although none of these are used as potable drinking water, there is always the possibility the ready access to these bodies of water will encourage drinking.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

The potential for adverse health impacts and environmental effects to humans and other species makes it imperative that the National Park Service evaluate the quality of the water in the ponds and lakes on its lands. Regularly scheduled water sampling and analysis will be performed for normal water constituents. The data will be assembled and interpreted so that protective measures may be taken to avoid exposing the public or wildlife to health-threatening activities. It should be assumed that until there is a sufficient data base to make a conclusion, these waters pose a health threat. Signage, warning visitors to avoid body contact and not to contaminate the water will be installed at all locations in both English and Spanish. Records of water quality measurements will be archived and made available to visitors and other interested parties. Where a contaminant is identified that presents a threat to human health and/or the environment, mitigation measures will be adopted to reduce or eliminate the threat.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. If no action is taken to monitor and/or mitigate any of the possible contaminants to the bodies of water on National Park Service property, the Park Service will be derelict and violate its public trust, and may be vulnerable to justified litigation due to its indifference to an "attractive nuisance." The moral, ethical and legal mandates of the National Park Service in general and the mandates of the enabling legislation of the SMMNRA in particular, will be ignored.

2) Implement Recommended Project. A systematic and good faith effort to identify and control contaminants in the ponds at Satwiwa, Rocky Oaks, China Flat, Franklin Canyon lake and Hidden Pond by a rigorous monitoring system will help avoid health and environmental problems associated with these bodies of water. Visitor safety and protection of the wildlife and water resources will be achieved. An ongoing monitoring program will generate a data base to provide fundamental information for future interpretive or developmental activities at these sites.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.6).

FUNDING REQUIREMENTS:

FUNDING NEEDS	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Biological Technician GS-5	0.5	SNWR	15	15	15	15	15	75
Testing		SNWR	20	20	20	20	20	100
Supplies and Materials		SNWR	10	10	10	10	10	50
Travel/ Training		SNWR	1.5	1.5	1.5	1.5	1.5	7.5
or Contract Project			46.5	46.5	46.5	46.5	46.5	232.5
TOTAL	0.5		46.5	46.5	46.5	46.5	46.5	232.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to all other natural resources project statements contained in the park's Resources Management Plan and Water Resources Management Plan.

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

In the annual RMP Update and Superintendent's Annual Report, accomplishments for each applicable project for which implementation has occurred will be reported.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-400.040

TITLE: Inventory Extent of Wetlands

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N11 Degradation of Park Water Quality Due to External Activities
N20 Insufficient Understanding of Park Ecosystems and Threats

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring

PROBLEM STATEMENT:

Due to the desert-like climate, wetlands play a significant role in maintaining the natural processes of the Santa Monica Mountains. To date, the U.S. Fish and Wildlife Service has provided a rough estimate (National Wetlands Inventory) of the extent of wetlands in the Mountains. Based on 1974, 1:80,000 aerial photography the USFWS delineated wetlands on the fourteen U.S.G.S. 7.5-minute maps that encompass the park. These maps have not been field checked. Furthermore, the information depicted on these maps is of such a gross scale it can only be used for large-scale analysis of land use practices. With the rapid lot-by-lot, development of the mountains, more definitive information is needed. The park is developing a GIS that will allow agencies to quickly determine if significant resources exist on individual parcels of private land. A detailed wetland inventory is needed to support this effort in order to address specific threats to park resources.

As a young, and growing, unit of the National Park System, the park has an active planning program. In response to Executive Order 11990 (Protection of Wetlands), the NPS developed Floodplain Management And Protection Of Wetlands Guidelines. Section 6.B (Procedures) of these guidelines states, *"Inventory - Floodplain, flood hazard and wetland areas subject to or potentially subject to public use or development, where the magnitude of hazard and impact of human activities is likely to be the greatest, will be inventoried prior to or during the preparation of the General Management Plan or other planning documents."* In Section 6.C.1.b (Determine

if the Action is in a Wetland) states, "*NPS will consult...to determine if a National Wetland Inventory Map is available for the vicinity of the proposed action.*" It then states, "*If the information is still inadequate, the NPS will carry out an on-site analysis performed by Service professionals qualified to determine wetland based on the definition in the Wetlands Order.*" The existing National Wetlands Inventory Maps are inadequate to meet this mandate. A detailed wetlands inventory is needed.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

Map and digitize wetlands within the Santa Monica Mountains Zone. A field botanist and GIS Specialist will map, groundtruth, and digitize wetlands within the Santa Monica Mountains Zone as prioritized by park management.

Current 1:12,000 and 1:24,000 aerial photography and 1:24,000 topographic maps will be used to revise and update the USFWS maps. The higher resolution maps will allow us to identify wetlands as small as 0.1-0.2 acre in this mountainous region. This smaller scale mapping will allow more of the narrow riparian wetlands to be mapped as polygons. These smaller scale maps are particularly valuable for the wetland banking project, which may require more specific delineation of the properties to be considered. Mapping will follow the USFWS National Wetlands Inventory protocol and will include the following information:

Boundaries of all wetlands and their classification to subclass based on Cowardin, et al. (Classification of Wetlands and Deepwater Habitats of the U.S.) classification system.

Use the "Routine On site Determination Method" to inventory and groundtruth wetlands. The "Plant Community Assessment Procedure" will be used to make wetlands determinations.

A general vegetation description (dominant plant species) of each wetland.

The minimum mapping unit for this project will be 0.1 acre.

Priorities for wetlands to be inventoried will be based on current and potential threats, and park planning and management needs. As mapping and groundtruthing are completed, the GIS Specialist will be responsible for revising the current digital wetlands data.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. By relying on existing information many wetlands not previously identified will be lost to private and public development. Attempts at identifying wetlands on a case-by-case basis will, in the long run, not be adequate. Lack of available staff expertise and time will prevent adequate surveys from being conducted.

2) Implement Recommended Action. This will provide the NPS with the needed information to take a pro-active role in protecting wetlands.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.5 and 1.11).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Total
Botanist GS-408-07	1.0	SNWR	36.68	36.68	73.36
Cartographic Technician GS-07	0.5	SNWR	18.34	18.34	36.68
Vehicle		SNWR	4.0	4.0	8.0
Supplies and Materials		SNWR	1.0	1.0	1.0
Travel/ Training		SNWR	2.0		2.0
or Contract Project		SNWR	62.02	60.02	122.04
TOTAL	1.5		62.02	60.02	122.04

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following projects contained within the Resource Management Plan:

SAMO-N-120.010	Conduct Cooperative Resources Management Program
SAMO-N-130.010	Ensure Compliance with Appropriate Environmental Legislation
SAMO-N-140.010	Increase GIS/Information Management Programs
SAMO-N-301.200	Conduct Inventory and Assessment -- Water Resources
SAMO-N-310.010	Cooperate with Other Agencies on Water Resources Management
SAMO-N-400.020	Identify and Describe Significant Plant Communities
SAMO-N-402.015	Develop and Implement Riparian Monitoring Handbook

SAMO-N-413.010 Model Potential Habitat for Threatened and Endangered Species
SAMO-N-414.010 Identify Communities Which May Become Threatened
SAMO-I-100.010 Identify Significant Lands Not in Public Ownership
SAMO-I-102.010 Conduct Development Monitoring Program

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

The information gathered under this project will be summarized in the annual RMP Update and in the Superintendent's Annual Report. This information will also be incorporated into the park's GIS.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-402.015

TITLE: Monitor Health and Status (Change over Time) of Native Plant Communities

SUBPROJECT: Develop a Riparian Community Monitoring Handbook

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N03 Impacts on Threatened, Endangered and Sensitive Plants
N20 Insufficient Understanding of Park Ecosystems and Threats

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring

PROBLEM STATEMENT:

Next to native grasslands, riparian communities in California are the most endangered. It is estimated that less than 10 percent of the original 200,000 acres of riparian communities remain in California (see Rose *et al.*, 1982). According the 1982 SMMNRA Resource Management Plan, the greatest species diversity is exhibited in the park riparian communities. In contrast to the single-level, dominant chaparral community where plants exhibit drought and fire adaptations, the riparian community has both an over- and an under-story and consists of soft-leaved, water-loving plants.

According to the California Natural Diversity Database (CNDDB), the following types of riparian areas occur in the Santa Monica Mountains: Southern Coast Live Oak Riparian Forest (sensitive - -selected sites with Big Leaf Maple), Southern Cottonwood-Willow Riparian Forest (sensitive), White Alder Riparian Forest (Sensitive -- narrow riparian corridors), Southern Sycamore-Alder Riparian Woodland (sensitive -- open streamside woodland), Mule Fat Scrub (disturbed site community maintained by frequent flooding) and Southern Willow Scrub (sensitive -- maintained by repeated flooding).

Riparian areas within the Santa Monica Mountains are abundant. According to the park Water Resources Management Plan (1982), there are 38 separate watersheds, containing 73 intermittent streams, 4 U.S. Geological Survey identified blue-line streams, and 9 partially perennial streams, as well as more than 800 drainages.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

- 1) Research riparian zone management and ecological relationships (literature review)
 - a. Sycamore/Live Oak/Bay Laurel/Big Leaf Maple
 - b. Willow
 - c. Baccharis
 - d. California Black Walnut
- 2) Identify management objectives:
 - a. To maintain riparian areas
 - b. To enhance riparian areas
- 3) Identify model riparian habitat within the park:
 - a. Identify Special Ecological Area(s)
 - b. Set up monitoring plots in representative locations
- 4) Write Riparian Monitoring Handbook.
- 5) Identify additional research needed.
- 6) Assemble a representative plant collection to be used in monitoring activities.
- 7) Develop an interpretive brochure which discusses current knowledge and management of this threatened community.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. The National Park Service at the SMMNRA will abdicate its responsibility (Management Policies, 1988) to monitor natural resources in the riparian community.
- 2) Implement Recommended Project. The SMMNRA will be able to assemble baseline data to be used in short- and long-term monitoring of the riparian community. The monitoring results will be critical in making management decisions regarding the conservation and protection of this community.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.5).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Plant Ecologist GS-408-11	.2	RNSR	10.8	10.8	10.8	32.4
Restoration Specialist (Research Scientist) GS-408-12	.2	RNSR	12.8	12.8	12.8	38.4
Site Surveys (Biotechs-2) GS-401-05	.6	RNSR	17.8	17.8	17.8	53.4
Publication of Guidelines		RNSR	2.5	2.5	2.5	7.5
Interpretive Brochure		POF1		1.0	5.0	6.0
Supplies and Materials		RNSR	2.5	2.5	2.5	7.5
Travel/ Training		RNSR	4.0	4.0	4.0	12.0
or Contract Proposal		RNSR	50.4	51.4	55.4	157.2
TOTAL	1.0		50.4	51.4	55.4	157.2

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following project statements contained within the Resource Management Plan:

SAMO-N-110.040 Create and Maintain a Research and Monitoring Prospectus
SAMO-N-110.070 Support Independently Funded Natural and Social Science
 Research Projects
SAMO-N-120.010 Conduct Cooperative Resources Management Program
SAMO-N-120.020 Establish Park Special Ecological Areas
SAMO-N-400.010 Produce a Vegetation/Land Cover Map of the Santa Monica
 Mountains Zone

SAMO-N-403.010	Conduct Native Plant Community Restoration
SAMO-N-410.010	Inventory and Map Distribution of Special Plant Taxa
SAMO-N-510.010	Inventory and Map Distribution of Special Wildlife Taxa
SAMO-N-442.010	Establish the Role of Fire in Maintaining Functioning Biological Communities
SAMO-I-100.010	Identify Significant Lands Not in Public Ownership

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects will be reported in the annual RMP Update and Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-403.015

TITLE: Potrero Creek Restoration Project

FUNDING STATUS: Partially Funded

SERVICEWIDE ISSUE CODES:

N06 Degradation of Park Resources Due to Past Land Use Practices

N17 Loss of Biological Diversity

RMAP CODES: V00-Vegetation Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Protection/Mitigation

PROBLEM STATEMENT:

The National Park Service at the Santa Monica Mountains received a grant from Kraft Lite 'N' Lively through the National Park Foundation to conduct a restoration project within the area burned by the fall 1993 Greenmeadow Fire. With this funding the park has chosen to restore riparian vegetation along Potrero Creek (Arroyo Conejo Creek, South Fork, East) at Rancho Sierra Vista. The Greenmeadow fire provided an opportunity to consider the restoration of previously damaged plant communities in the park. Years of ranching, grazing and other negative human disturbances have resulted in greatly reduced reproduction of riparian species along the creek, and the gradual disappearance of a major part of the creek's original riparian vegetation. This site was selected because it is representative of the park's intent to restore native systems where possible, and because existing planning documents called for it-- such as the Ranch Management Plan (1993) and the Rancho Sierra Vista/Satwiwa Development Concept Plan (1984) .

Few restoration projects have been accomplished within the boundary of the SMMNRA by park agencies; thus, a review of the appropriate literature regarding riparian restoration is included as a part of this plan.

Because this project primarily consists of enhancing riparian vegetation along a denuded section of Potrero Creek, its major emphasis is on planting and implementing a system that will enable maximum plant survival.

As in all successful projects accomplished within the SMMNRA, cooperating with the National Park Service in this project are a variety of organizations, individuals and volunteers.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

See Potrero Creek Restoration Plan (1994)

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

- 1) No Action. Potrero Creek will remain an alien annual grassland along at least part of its length. Alien plants such as milk thistle and canary or harding grass will continue to invade the site. A buffer zone to separate the areas of the ranch for cultural use from the areas where natural resources are preserved will not exist. Native plants may, over a long period, return to the site, but they may also disappear.
- 2) Implement Recommended Project. Potrero Creek will recover to retain a native riparian visual appearance. A distinction between the dryland farming areas at Rancho Sierra Vista and the creek will be evident.

COMPLIANCE:

This project is categorically excluded from NEPA. Informal consultation with the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Army Corps of Engineers has occurred. No disturbance to the creek itself is anticipated.

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Total
Irrigation System		NPRF	4.885	0.2	0.2	0.2	5.485
Water Meter Installation		NPRF	1.22	0	0	0	1.22
Restoration Plan Preparation	0.3	PNRI	14.1	0	0	0	14.10

Auger		PNRI	0.396	0	0	0	0.396
Tractor Auger Bits		NPRF	0.051	0	0	0	0.051
Garden Hoses		NPRF	0.042	0	0	0	0.042
Wire Mesh		NPRF NVOL	0.367 0.147	0	0	0	0.514
Plants		NPRF PNRI	2.623 0.250	0	0	0	2.873
Gas and Oil		NPRF	0.072	0	0	0	0.072
Soil Test		NPRF	0.108	0	0	0	0.108
Backflow Device Tests		NPRF	0.5	0.5	0.5	0.5	2.00
Water/Water Service		NPRF	0.5	0.5	0.5	0.5	2.00
Additional Supplies and Materials (Pipe Glue, Porta-Potties., bookmarks, etc)		NPRF PNRI	0.268 0	0 1.8	0 2.0	0 2.0	6.068
Labor	0.1 0.1 0.1 0.3 4.0 0.1	NVOL-V NVOL-Pr NVOL-Pk PNRI POF1-A POF1-F	0.86 2.46 4.6 13.4 8.36 1.0	3.75 0 0 4.7 0 7.4	3.75 0 4.0 4.7 0 4.7	3.75 0 4.0 4.7 0 4.7	84.83
TOTAL	5.0		56.21	22.85	20.35	20.35	119.759

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following project statements:

SAMO-N-100.012 Hire Biological Technicians to Implement the Vegetation Management Program
SAMO-N-402.014 Develop and Implement Riparian Monitoring Handbook

SAMO-N-403.010 Conduct Native Plant Community Restoration
SAMO-N-420.012 Manage Integrated Pest Management Program -- Plants
SAMO-N-450.010 Develop Management Plan for Rancho Sierra Vista

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

FY 1994

1050 holes were augered and filled with the following riparian associates: *Platanus racemosa*, *Rosa californica*, *Sambucus mexicana*, *Juglans californica*, *Quercus agrifolia*, *Quercus lobata*, *Elymus triticoides*, *Baccharis glutinosa*, and *Baccharis pilularis*. In addition, the following coastal sage scrub associates were planted: *Salvia leucophylla* and *Artemisia californica*.

An above-ground irrigation system was installed using ultraviolet PVC pipe (1.5 inches for main line, 0.75 inches for lateral lines) and black line (0.5 inches for feeding lines, 0.25 inches for drip lines).

Wood chip mulch (donated by tree trimming companies) was moved to surround each plant on the west side of the creek. The east side was mulched much less extensively.

A test to determine the need for fertilization at outplanting was begun. In three of six areas trees were fertilized at the time of planting with a gro-power tablet (24-10-10).

Over 200 volunteers turned out for the planting date (November 19). Additional volunteers from the park staff put in 44 hours of unpaid time and 680 hours of paid time.

FY 1995

Monitoring of project success and maintenance and repairs to the drip irrigation system, were accomplished using SCA interns and volunteers. Plant growth and survival is extremely variable, with elderberries sustaining a 71 percent mortality rate; but, individuals of this species attain the greatest growth (ranging 13.7 to 76.9 inches), with stem diameters of greater than 1.4 inches. Sycamores, on the other hand, had an initial survival rate of 90 percent, but attained virtually no additional height (range 2.3 to 40.6 inches) due to a widespread fungus infestation that caused the trees to die back after an early spring growth and then to resprout from the base with varying vigor. Wild rose has had an 85 percent survival rate and has attained heights ranging from 5.9 to 51.5 inches, with a large number, like the surviving elderberries, producing both flowers and seeds. Live oaks and valley oaks had survival rates of 78 percent and 62 percent respectively, with height ranges of 3.3 to 40.6 inches and 5.1 to 55.4 inches respectively.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-504.014

TITLE: Develop Inventory and Monitoring Guidelines for Terrestrial and Aquatic Vertebrates

SUBPROJECT: Monitor Reptile and Amphibian Population Status and Trends

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N20 Insufficient Understanding of Park Ecosystems and Threats

N17 Loss of Biological Diversity

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Monitoring

PROBLEM STATEMENT:

According to a report published by the Southwestern Herpetologists Society, The Distribution and Present Status of the Herpetofauna of the Santa Monica Mountains of Los Angeles and Ventura Counties, California (1986), many areas with the richest herpetofauna have been omitted from conservation plans. In addition, as the habitat disappears there has been an apparent decline in the abundance of many species of reptiles and amphibians. The SMMNRA formerly exhibited extremely high species diversity and density for an area its size. DeLisle's unpublished data cited in the above report are 34 species, some with densities exceeding 247/acre. This report summarizes data gathered during a 5-year study (1981-1986) in the Santa Monica Mountains Zone, and draws comparisons with data gathered from 1950-1970.

Additional information needs to be collected about the species which have been designated in Category 2 on the Federal Endangered Species List, such as the Southwestern Pond Turtle (*Clemmys marmorata pallida*) and the California Red-legged Frog (*Rana aurora draytoni*) and the species identified as declining by the report cited above, including: Silvery Legless Lizard (*Anniella pulchra pulchra*), Coastal Whiptail (*Cnemidophorus tigris multiscutatus*), Southwestern Blind Snake (*Leptotyphlops humilis humilis*), Western Yellowbelly Racer (*Coluber*

constrictor mormon), Red Coachwhip (*Masticophis flagellum piceus*), Coast Patch-nosed Snake (*Salvadora hexalepis virgultea*), Western Blackhead Snake (*Tantilla planiceps*), and California Lyre Snake (*Trimorphodon biscutatus vandenburghi*).

Of the areas recommended for inclusion in the SMMNRA, the following have been purchased: Lower Corral Canyon, Lower Zuma Canyon, and Trancas Canyon. The other recommendations included the north side of Ladyface Mountain (outside the designated boundaries), Cold Creek Drainage (lower portion), Lower Escondido Canyon (small piece owned by Santa Monica Mountains Conservancy), and the area between Carrizo Peak and Malibu Lake (T1S, S8/9, R18W) (small portion owned by NPS).

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

In cooperation with the California Department of Fish and Game, the California Department of Parks and Recreation and other park land management agencies in the Santa Monica Mountains, together will conduct an assessment (similar to the above study) of sensitive reptile and amphibian species within the Santa Monica Mountains.

Set up monitoring guidelines to determine changes to these reptile and amphibian species since the 1981-1986 Southwestern Herpetologists study was conducted.

Set up reptile and amphibian monitoring plots and transects, especially in park lands not assessed by the above study.

Implement yearly herpetofauna monitoring program.

Conduct a literature search to assess the habitat requirements of sensitive reptile and amphibian species.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. Little information will be gathered regarding the present distribution and status of amphibians and reptiles. Certain species may continue to decline without a definitive analysis of their habitat requirements and populations.

2) Implement Recommended Project. The SMMNRA will act to preserve an intact amphibian and reptile fauna. Gathering information about the distribution and status of these populations will help guide park managers in making decisions likely to affect these species.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.7).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Total
Wildlife Biologist GS-408-11	.3	RNSR	16.3	16.3	16.3	48.9
Biotechnician GS-401-05 (four)	2.0	RNSR	59.2	59.2	59.2	177.6
Supplies and Materials		RNSR	5.0	5.0	5.0	15.0
Travel/ Training		RNSR	6.0	6.0	10.0	22.0
or Contract Project			86.5	86.5	86.5	259.5
TOTAL	2.3		86.5	86.5	86.5	259.5

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following projects contained in the Resource Management Plan:

SAMO-N-110.050	Establish Liaisons with Local Universities for Research and Monitoring Activities
SAMO-N-120.010	Conduct Cooperative Resource Management Program
SAMO-N-142.010	Develop a History of Scientific Studies
SAMO-N-313.010	Monitor Threats to Aquatic Resources
SAMO-N-400.040	Inventory Extent of Wetlands
SAMO-N-510.010	Inventory and Map Distribution of Special Wildlife Taxa
SAMO-I-100.010	Identify Significant Lands Not in Public Ownership

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects will be reported in the annual RMP Update and Superintendent's Annual Report.

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
PROJECT STATEMENT**

PROJECT NUMBER: SAMO-N-504.080

TITLE: Conduct Inventory and Assessment -- Terrestrial and Aquatic Insects

FUNDING STATUS: Unfunded

SERVICEWIDE ISSUE CODES:

N20 Insufficient Understanding of Park Ecosystems and Threats

N17 Loss of Biological Diversity

RMAP PROGRAM CODE: Q01 Water Resources Management

PACKAGE NUMBER: 10-238

ACTIVITY TYPE: Inventory

PROBLEM STATEMENT:

Terrestrial and aquatic insects are an extremely large and diverse group of animals in any environment. The vast number of species, and the difficulties of identifying specimens make them relatively difficult to study. Nonetheless, insects are responsible for a wide variety of ecosystem functions.

A greater understanding of the insects which occur in the Santa Monica Mountains can only lead to better protection for this ecosystem. A survey conducted by a volunteer docent at Charmlee Natural Area in the western end of the Santa Monica Mountains has yielded over 300 species of moths alone. Additionally, insects were studied by the Topanga-Las Virgenes Resource Conservation District (TLVRCD) and at Arroyo Sequit (under the direction of Santa Monica College Professor Walt Sakai). As a result of the TLVRCD study, there is a partial list of the insects in the Santa Monica Mountains.

The following publications, which describe insects in the Santa Monica Mountains are available:

The Butterflies of Southern California: Thomas C. Emmel and John F. Emmel. November 30, 1973. Natural History Museum of Los Angeles County. Science Series 26.

The Insects of the Los Angeles Basin: Charles L. Hogue. June 30, 1974. Natural History Museum of Los Angeles County. Science Series 27.

DESCRIPTION OF RECOMMENDED PROJECT OR ACTIVITY:

In cooperation with other agencies which manage Santa Monica Mountains park lands, inventory insects by habitat using local expertise and university liaisons. A variety of collecting techniques would be employed depending on the species being targeted.

Conduct a literature search for information regarding insects specific to the south coast Mediterranean ecosystem of the Santa Monica Mountains.

Inventory summaries should provide recommendations for future research and recommendations for management.

ALTERNATIVE ACTIONS AND THEIR PROBABLE IMPACTS:

1) No Action. No research on terrestrial and aquatic insects will be undertaken. This group of animals will remain poorly understood in the Santa Monica Mountains.

2) Implement Recommended Project. Resource managers in the SMMNRA will begin to understand the critical relationships between plants and insects within the park. Knowledge of aquatic insect populations would help park managers to analyze the water quality within the many streams of the Santa Monica Mountains.

COMPLIANCE:

This project is categorically excluded from NEPA (516 DM, Chapter 2, Appendix 2, 1.7).

FUNDING REQUIREMENTS:

FUNDING NEED	FTE	FUNDING SOURCE	Year 1	Year 2	Year 3	Year 4	Total
Contracts		RNSR	3.5	3.5	3.5	3.5	14.0
Supplies and Materials		RNSR PNR1	0.5	0.5	0.5	0.5	2.0
Travel/ Training		RNSR PNR1	1.0	1.0	1.0	1.0	4.0
TOTAL			5.0	5.0	5.0	5.0	20.0

RELATIONSHIP TO OTHER PROJECT STATEMENTS:

This project is related to the following projects contained in the Resource Management Plan:

SAMO-N-110.050	Establish Liaisons with Universities for Research and Monitoring Activities
SAMO-N-120.010	Conduct Cooperative Resource Management Program
SAMO-N-142.010	Develop a History of Scientific Studies for the Santa Monica Mountains Zone
SAMO-N-301.040	Cooperate with Other Agencies Engaged in Monitoring Water Quality
SAMO-N-313.010	Monitor Threats to Aquatic Resources
SAMO-N-510.010	Inventory and Map Distribution of Special Wildlife Taxa
SAMO-N-504.010	Determine Status, Location and Extent of Alien Animals
SAMO-N-504.014	Monitor Reptile and Amphibian Population Status and Trends

ANNUAL PROJECT STATUS AND ACCOMPLISHMENTS:

Accomplishments for implemented projects will be reported in the annual RMP Update and Superintendent's Annual Report.

IV. Appendices

APPENDIX A

LIST OF PREPARERS AND ACKNOWLEDGEMENTS

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APPENDIX B

CONSULTATION AND COORDINATION

Participants in August 1993 Water Resources Scoping Session

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APPENDIX C

BASIN MORPHOMETRY (from 1984 WRMP)

SANTA MONICA MOUNTAINS WATERSHEDS, STREAM SEGMENTS AND ORDER.

WATERSHED	DRAINAGE	TRIBUTARIES	STREAM ORDER				
			1	2	3	4	5
MALIBU CANYON (1)	MEDCA CREEK		176	37	8	3	1
			44	9	3		
		Upper Medca Creek	14	4	1	0	0
		Palo Comado	6	1	0	0	0
		Cheeseboro	5	1	1	0	0
	COLD CREEK	Lindero Canyon	12	2	1	0	0
			20	5	1	0	0
		Upper Cold Creek	114	4	1	0	0
		Dark Canyon	5	1	0	0	0
			2	1	0	0	0
	SLEEPER CANYON LAS VIRGENES		22	4	1	0	0
		East Las Virgenes	5	1	0	0	0
		Stokes Canyon	8	1	0	0	0
		Gates Canyon	1	0	0	0	0
		Liberty Canyon	3	1	0	0	0
	TRIUNFO		25	4	1	1	0
		Lobo Canyon	9	2	1	0	0
		Trough Canyon	1	0	0	0	0
		La Sierra Canyon	7	1	0	0	0
	POTRERO VALLEY CREEK		29	7	1	0	0
ISOLATED (2)			131	20	1	0	0
LA JOLLA CANYON			8	2	1	0	0
CALLEGUAS CREEK (3 - not complete)			12	6	3	1	0
CALLEGUAS			12	6	3	1	0
		Calleguas Creek	4	4	2	1	0
		Long Grade	8	2	1	0	0
BIG SYCAMORE CANYON			53	10	2	0	0
BIG SYCAMORE			53	10	2	0	0
		Big Sycamore	35	7	1	0	0
		Wood Canyon	7	1	0	0	0
		Serrano Canyon	11	2	1	0	0
LITTLE SYCAMORE CANYON			14	3	1	0	0
DEER CANYON			5	1	0	0	0
ARROYO SEQUIT			30	7	2	1	0
ARROYO SEQUIT			30	7	2	1	0
		Arroyo Sequit	9	2	0	1	0
		East Fork	12	3	1	0	0
		West Fork	9	2	1	0	0

WATERSHED	DRAINAGE	TRIBUTARIES	STREAM ORDER				
			1	2	3	4	5
WILLOW CREEK			1	0	0	0	0
SAN NICHOLAS CANYON			3	1	0	0	0
LOS ALISOS CANYON			2	1	0	0	0
LACHUSA CANYON			2	1	0	0	0
ENCINAL CANYON			4	1	0	0	0
STEEP HILL CANYON			1	0	0	0	0
TRANCAS CANYON			21	5	1	0	0
ZUMA CANYON	ZUMA		20	3	1	0	0
			20	3	1	0	0
		Zuma Creek	16	2	1	0	0
		Newton Canyon	4	1	0	0	0
WALNUT CANYON			2	1	0	0	0
SOLSTICE CANYON	SOLSTICE		9	2	1	0	0
			9	2	1	0	0
		Solstice	8	2	1	0	0
		Dry Canyon	1	0	0	0	0
CORRAL CANYON			6	2	1	0	
PUERCO CANYON			3	1	0	0	0
MARIE CANYON			3	1	0	0	0
WINTER CANYON			1	0	0	0	0
CARBON CANYON			6	1	0	0	0
LAS FLORES	LAS FLORES		9	2	1	0	0
			9	2	1	0	0
		Las Flores	8	2	1	0	0
		Little Las Flores	1	0	0	0	0
PIEDRA GORDA CANYON			1	0	0	0	0
PENA CANYON			1	0	0	0	0
TUNA CANYON			2	1	0	0	0
RAMIREZ CANYON			9	1	0	0	0

WATERSHED	DRAINAGE	TRIBUTARIES	STREAM ORDER				
			1	2	3	4	5
ESCAMBUO CANYON			5	1	0	0	0
LATIGO CANYON			2	1	0	0	0
ARROYO CONEJO			9	2	0	0	0
SKELETON CANYON			7	1	0	0	0
SCHOOLHOUSE CANYON			5	2	0	0	0
WINDMILL CANYON			2	1	0	0	0
TOPANCA CANYON			46	9	2	0	0
	OLD TOPANCA		13	4	1	0	0
		Old Topanga	9	2	1	0	0
		Red Rock	2	1	0	0	0
		Hondo	2	1	0	0	0
	GREENLEAF		18	4	1	0	0
	UPPER TOPANCA		18	4	1	0	0
		Upper Topanga	17	4	1	0	0
		Santa Maria Canyon	1	0	0	0	0
	LOWER TOPANCA		14	1	0	0	0
		Lower Topanga	12	1	0	0	0
		Dix Canyon	1	0	0	0	0
		Brookside Canyon	1	0	0	0	0
SANTA YNEZ CANYON			17	4	1	0	0
	SANTA YNEZ		13	2	1	0	0
	QUARRY CANYON		2	1	0	0	0
	TRAILER CANYON		2	1	0	0	0
PULCA CANYON			2	1	0	0	0
TEHESCAL CANYON			3	1	0	0	0
SANTA MONICA CANYON			23	4	2	0	0
	SANTA MONICA CANYON		8	2	1	0	0
		Santa Monica Canyon	0	0	1	0	0
		Sullivan Canyon	3	1	0	0	0
		Holmdenville Canyon	4	1	0	0	0
		Kenter Canyon	1	0	0	0	0
	RUSTIC CANYON		15	2	1	0	0

(1) Watersheds were broken down into three categories: watersheds, drainages, and tributaries. The sum of the tributaries equals the stream segments for each drainage. Likewise, the sum of the drainages equals the stream segments in a watershed. For example, the MALIBU CREEK WATERSHED has 176 first order streams. The Meden Creek drainage of Malibu Creek contributes 44 of the 176 stream segments in the watershed. Of the 44 segments in Meden Creek, 14 are contributed by Upper Meden Creek, 6 from Palo Comado, 5 from Cheeseboro, and 12 from Lindero Canyon.

(2) Isolated watersheds are those which are self contained drainages that have not been identified by names on the USGS Quads.

(3) Calleguas Creek Watershed was not completed because much of its drainage is outside of the HRA and beyond the scope of the Water Resource Management Plan. Only tributaries relevant to SAMO have been included.

APPENDIX D

CARBON CANYON STATION RAINFALL (1983-1994) (Elevation 50 feet)

Year ^a	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
93-94	0.3	5.2	1.5	0.4	0.1	0.0	0.0	0.0	0.0	0.4	0.7	0.9
92-93	11.0	6.2	2.4	0.0	0.0	0.1	0.0	0.0	0.0	0.8	0.0	6.8
91-92	0.6	6.1	5.4	1.2	0.0	0.0	0.3	0.1	0.0	0.3	0.0	3.5
90-91	1.4	2.3	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
89-90	0.9	2.6	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.2	0.5	0.0
88-89	0.3	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.1
87-88	1.9	1.7	0.0	2.5	0.0	0.0	0.0	0.4	0.0	3.3	1.2	2.2
86-87	0.0	1.5	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	1.8	0.3
85-86	4.0	7.0	4.4	0.4	0.0	0.0	0.0	0.0	0.4	0.7	4.6	0.5
94-85	0.8	2.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3	2.5
83-84	0.1	0.3	0.3	0.4	0.0	0.0	0.2	0.0	0.0	1.7	3.4	3.4

Mean Monthly	3.6	2.6	2.3	0.4	0.0	0.0	0.1	0.0	0.0	0.8	1.5	2.2
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Mean Annual												13.1
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^a Rain year begins October

^b inches

Source: L.A. County Department of Public Works

APPENDIX E

MALIBU BEACH-DUNNE STATION RAINFALL (1983-1994) (Elevation 160 feet)

Year ^a	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
93-94	0.3 ^b	3.7	1.6	0.8	0.1	0.0	0.0	0.0	0.0	0.4	0.6	1.0
92-93	9.0	4.1	3.1	0.0	0.0	0.8	0.0	0.0	0.0	0.7	0.0	5.6
91-92	1.6	6.3	4.5	0.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0	3.8
90-91	1.5	1.6	6.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6	0.1
89-90	1.6	2.4	0.2	0.76	1.3	0.0	0.0	0.0	0.0	0.3	0.7	0.0
88-89	0.5	2.0	1.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.2	3.0
87-88	1.4	2.1	0.2	2.5	0.0	0.0	0.0	0.0	0.1	3.3	1.8	1.1
86-87	2.0	1.9	1.6	0.1	0.1	0.1	0.3	0.0	0.0	0.1	1.6	0.4
85-86	2.8	5.9	4.2	1.0	0.0	0.0	0.2	0.0	3.0	0.8	3.2	0.6
84-85	1.1	2.2	1.2	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.7	5.1
83-84	0.1	0.0	0.3	0.6	0.0	0.0	0.0	0.0	0.4	1.7	3.6	1.7
Mean Monthly	2.2	3.2	2.2	0.6	0.1	0.1	0.1	0.0	0.0	0.8	1.5	2.2
Mean Annual	13.7											

^a Rain Year begin October

^b inches

Source: L.A. County Department of Public Works

APPENDIX F

SANTA YNEZ RESERVOIR STATION RAINFALL (1983-1994) (Elevation 735 feet)

Year ^a	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
93-94	0.4 ^b	6.9	1.1	0.8	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.3
92-93	16.9	7.5	4.6	0.0	0.0	1.0	0.0	0.0	0.0	0.6	0.5	6.1
91-92	3.4	9.9	8.6	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.0	5.0
90-91	1.4	2.2	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
89-90	-	-	-	-	-	-	-	-	-	-	-	-
88-89	0.9	3.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.1
87-88	2.5	1.3	1.4	4.2	0.0	0.0	0.0	0.0	0.2	5.3	1.1	2.4
86-87	0.8	1.2	1.5	0.1	0.0	0.1	0.3	0.0	0.0	0.1	1.8	0.4
85-86	3.4	10.9	6.0	0.4	0.0	0.0	0.0	0.0	0.6	0.7	5.1	0.8
84-85	0.8	3.8	1.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	3.0	5.0
83-84	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.1	0.2	1.6	3.7	5.0

Mean Monthly	3.4	5.2	3.6	0.7	0.0	0.0	0.0	0.0	0.1	1.0	2.2	3.2
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Mean annual												19.6
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a Rain Year begins October

b inches

Source; L.A. County Department of Public Works

APPENDIX G

TOPANGA RANGER STATION RAINFALL(1983-1994) (Elevation 745 feet)

Year ^a	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
93-94	0.5 ^b	7.5	2.7	0.9	0.6	0.1	0.0	0.0	0.0	0.5	1.2	1.9
92-93	19.5	11.2	4.6	0.0	0.0	1.1	0.0	0.0	0.0	2.5	0.0	9.7
91-92	2.9	11.6	10.1	0.2	0.0	0.0	0.1	0.0	0.0	0.6	0.0	7.5
90-91	1.9	5.8	9.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0
89-90	2.9	6.4	0.1	0.5	1.3	0.0	0.0	0.0	0.0	0.6	0.6	0.0
88-89	0.5	4.0	1.3	0.1	0.0	0.0	0.0	0.0	0.3	0.0	1.6	5.0
87-88	3.2	2.4	0.1	0.1	0.0	0.0	0.0	0.0	0.2	5.6	1.3	3.6
86-87	1.6	1.1	1.9	0.1	0.0	0.0	0.2	0.0	0.0	0.2	2.2	0.5
85-86	4.2	11.9	5.5	0.8	0.0	0.0	0.0	0.0	0.8	0.6	7.0	0.9
84-85	0.9	2.4	1.8	0.0	0.1	0.0	0.0	0.0	0.1	0.0	3.4	4.5
83-84	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	2.3	4.2	6.8
Mean	3.8	6.4	3.8	0.3	0.2	0.1	0.0	0.0	0.1	1.3	2.0	4.0
Monthly												
Mean Annual												22.8

^a Rain Year begins October

^b inches

Source: L.A. County Department of Public Works

APPENDIX H

GROUNDWATER LEVELS IN ZUMA AND TRANCA CANYONS

<u>DATE</u>	<u>ZUMA CANYON, Well</u> Well# 2187B, @ 55.5 ft.	<u>TRANCAS CANYON,</u> Well# 2156 @ 26.3 ft.
4/20/59	14.5 ft above sea level	2.7 ft. above sea level
12/7/59	3.7	0.4
5/4/60	1.6	2.4
12/5/60	0.4	-1.0
5/2/61	-15.9	1.7
12/4/61	1.6	1.9
5/1/62	30.3	14.4
12/4/62	22.1	1.9
4/9/63	15.5	3.7
12/4/63	10.2	2.4
4/15/64	8.0	2.1
11/24/64	6.5	2.5
4/28/65	10.5	8.1
11/8/65	10.6	2.6
4/12/66	28.3	11.7
11/16/66	21.5	3.7
5/1/67	37.1	15.6
11/15/67	26.1	3.2
4/17/68	23.0	11.7
11/19/68	15.2	3.2
4/29/69	38.6	15.8
11/19/69	25.7	3.9
5/5/70	16.4	6.2
11/25/70	10.1	3.3
4/13/71	22.7	8.6
11/16/71	19.3	3.3

5/1/72	16.3	4.3
12/27/72	10.6	—
4/16/73	30.8	14.7
11/13/73	26.6	3.7
11/19/74	21.2	3.1
4/14/75	22.4	11.4
10/29/75	21.9	3.3
4/20/76	10.4	5.0
11/8/76	10.4	3.7
4/25/77	9.5	5.0
11/21/77	3.6	3.2
4/24/78	38.3	14.1

Source: L.A. County Department of Public Works

APPENDIX I
BENEFICIAL USES OF INLAND SURFACE WATERS

Los Angeles Regional Water Quality Control Board

Beneficial Uses of Inland Surface Waters

WATERSHED		Hydra. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MGR	SPWN	SHELL	W	
CALLEGUAS-CONEJO CREEK WATERSHED																											
Mugu Lagoon c	403.11								E		Pd	E	Ee	P					E	E	E	Eg	Eh	Eh	Ee	P	E
Calleguas Creek Estuary c	403.11								P		Pd	E	E						E	E	E	Eg	Eh	Eh			E
Calleguas Creek	403.11	P				E	E	E			E	E	E		E	E					E						E
Calleguas Creek	403.12	P	E	E	E	E	E				E	E	E		E	E					E						E
Revolon Slough	403.11	P	P			E	E				E	E	E		E	E					E						E
ncBeardsley Wash	403.61	P						E			E	E	E		E	E					E						E
Conejo Creek	403.12	P	E	E	E	E	E				E	E	E		E	E					E			E			E
Conejo Creek	403.63	P									E	E	E		E	E					E						E
Arroyo Conejo	403.64	P									E	E	E		E	E					E						E
ncArroyo Conejo	403.68	P									E	E	E		E	E					E						E
Arroyo Santa Rosa	403.63	P									E	E	E		E	E					E						E
Arroyo Santa Rosa	403.65	P									E	E	E		E	E					E						E
pr North Fork Arroyo Conejo	403.64	P	P	P	P	E	E				E	E	E		E	E	P				E						E
pr Arroyo Las Posas	403.12	P	P	P	P	E	E	E			E	E	E		E	E	P				E						E
ncArroyo Las Posas	403.62	P	P	P	P	E	E				E	E	E		E	E					E						E
Arroyo Simi	403.62	P	P	P	P	E	E				E	E	E		E	E					E						E
Arroyo Simi	403.67	P	P	P	P	E	E				E	E	E		E	E					E						E
pr Tapo Canyon Creek	403.66	P	P	P	P	E	E				E	E	E		E	E					E						E
pr Tapo Canyon Creek	403.67	P	P	P	P	E	E				E	E	E		E	E					E						E
Gilliland Canyon Creek	403.66	P									E	E	E		E	E					E						E
pr Gilliland Canyon Creek	403.67	P									E	E	E		E	E					E						E
Lake Bard (Wood Ranch Reservoir)	403.67	E	E	E	E	E	E				P	E	E		E	E					E						E
LOS ANGELES COUNTY COASTAL STREAMS																											
Arroyo Sequit	404.44	P									E	E	E		E	E					E		E	E			E
San Nicholas Canyon Creek	404.43	P									E	E	E		E	E					E		E	E			E
Los Alisos Canyon Creek	404.42	P									E	E	E		E	E					E		E	E			E
Lachusa Canyon Creek	404.42	P									E	E	E		E	E					E		E	E			E
Encinal Canyon Creek	404.41	P									E	E	E		E	E					E		E	E			E
Trancas Canyon Creek	404.37	P									E	E	E	E		E			E		E		Pe	Pe			E
pr Dume Lagoon c	404.36								E		E	E	E	E		E	E				E		Pe	Pe			E
nc Dume Creek (Zuma Canyon)	404.36	P									E	E	E		E	E					E		P	P			E
nc Ramirez Canyon Creek	404.35	P									E	E	E		E	E					E						E
Escondido Canyon Creek	404.34	P									E	E	E		E	E					E						E
Latigo Canyon Creek	404.33	P									E	E	E		E	E					E						E
Solstice Canyon Creek	404.32	P									E	E	E		E	E					E						E
Puerco Canyon Creek	404.31	P									E	E	E		E	E					E						E
Corral Canyon Creek	404.31	P									E	E	E		E	E					E						E
Carbon Canyon Creek	404.16	P									E	E	E		E	E					E						E
Las Flores Canyon Creek	404.15	P									E	E	E		E	E					E						E
Piedra Gorda Canyon Creek	404.14	P									E	E	E		E	E					E						E
Pena Canyon Creek	404.13	P									E	E	E		E	E					E						E
Tuna Canyon Creek	404.12	P									E	E	E	E		E			E		E		Ed	Ee	Ee		E
pr Topanga Lagoon c	404.11	P							E		E	E	E	E		E	E		E		E		P	P			E
Topanga Lagoon c	404.11	P									E	E	E	E		E	E		E		E						E

WATERSHED ^a	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRESH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MGR	SPWH	SHELL
MALIBU CREEK WATERSHED																								
Malibu Lagoon c	404.21							E		E	E			E	E		E	E	E		Ed	Ee	Ee	
Malibu Creek	404.21	E*								E	E			E	P				E		E	E	E	
pr Cold Creek	404.21	E*								E	E			E	P				E		E	P	P	
Las Virgenes Creek	404.22	E*								E	E			E	P				E		E	P	P	
pr Century Reservoir	404.21	E*								E	E			E					E		E			
Malibu Lake	404.24	E*						E		E	E			E	P				E		E			
pr Medoa Creek	404.23	E*					I			E	E			E					E		E			
pr Medoa Creek	404.24	E*					I			E	E			E					E		E			
Lindero Creek	404.23	E*								E	E			E					E		E			
Triunfo Creek	404.24	E*								E	E			E					E		E			
pr Triunfo Creek	404.25	E*					I			E	E			E					E		E			
Westlake Lake	404.25	E*						E		E	E			E					E		E			
pr Potrero Valley Creek	404.25	E*					I			E	E			E					E		E			
pr Lake Eleanor Creek	404.25	E*					I			E	E			E					E		E			
pr Lake Eleanor	404.25	E*					E			E	E			E					E		E			
Las Virgenes (Westlake) Reservoir	404.25	E	E	E	E					E	E			E					E		E			
Hidden Valley Creek	404.26	E*					I			E	E			E					E		E			
Lake Sherwood	404.26	E*					E			E	E			E					E		E			

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are based on State Board Resolution No. 88-63. See page 2-3 for more details.

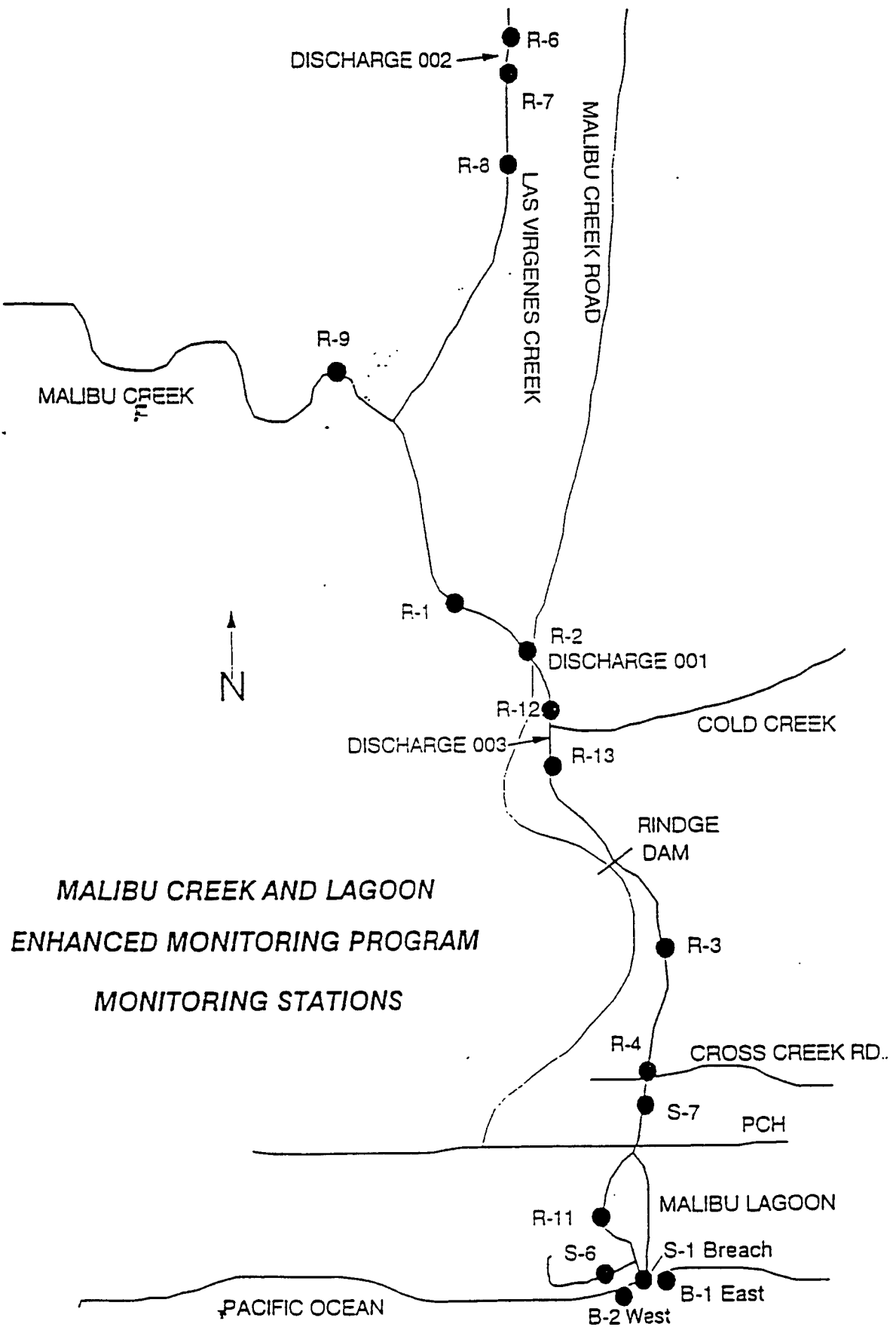
- a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
- b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
- c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).
- d One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.
- e Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

- f Public water supply reservoir. Owner prohibits public entry.
- g These areas are engineered channels. All references to Tidal Prisms in Regional Board documents are functionally equivalent to estuaries.
- h Access prohibited by Los Angeles County DPW

For Draft: pr indicates proposed waterbody; underlined uses are beneficial uses listed in the existing Basin Plan; strike-outs indicate proposed changes to beneficial uses; nc indicates name change.

APPENDIX J

1993 ANNUAL WATER QUALITY MONITORING REPORT FOR MALIBU WATERSHED BY TAPIA TREATMENT PLANT (Source: Las Virgenes Municipal Water District)



LAS VIRGENES MUNICIPAL WATER DISTRICT
TAPIA WATER RECLAMATION FACILITY
MALIBU CREEK MONITORING PROGRAM
California Regional Water Quality Control Board Order No. 89-076
NPDES Permit No. CA 0056014

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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
R6 FLOW, Avg, cfs	254.5	190.8	32.4	7.0	5.5	4.0	2.5	2.0	1.3	4.0	1.6	2.0	42.3
R6 TEMPERATURE, Avg, °C	9.4	10.9	13.2	14.3	17.2	17.5	19.6	19.3	18.1	17.3	15.1	12.0	15.3
R6 pH, Max	9.3	7.9	7.9	7.9	7.5	7.6	7.6	7.5	7.4	7.5	7.6	7.6	NA
R6 pH, Min	7.4	7.6	7.7	7.6	7.2	7.3	7.2	7.1	7.1	7.1	7.2	7.3	NA
R6 SALINITY, Avg, PPT			1.7	1.8	2.1	2.1	1.9	2.0	1.9	1.8	1.9	1.9	1.9
R6 DISSOLVED OXYGEN, Avg, mg/l	9.5	10.2	9.9	9.2	7.3	7.2	6.7	6.5	6.4	6.5	6.6	7.2	7.8
R6 TOTAL COLIFORM, Avg, MPN/100ml	3600	4000	3540	4500	3475	4740	4300	8400	4000	34500	6360	<7050	<7372
R6 ENTEROCOCCI, Avg, cfu/100ml													NA
R6 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R6 NITRATE-N, mg/l	1.9	3.3	7.6	4.0	2.9	2.8	2.4	2.9	2.8	3.0	2.6	3.4	3.3
R6 NITRITE-N, mg/l	0.27	0.11	0.12	0.14	0.19	0.10	0.09	0.10	0.06	0.06	0.12	0.10	0.12
R6 AMMONIA-N, mg/l	0.05	0.05	0.08	0.04	0.07	0.05	0.04	0.06	0.04	0.04	0.05	0.05	0.05
R6 ORGANIC-N, mg/l	0.58	1.17	0.98	0.89	0.87	0.70	0.75	0.86	0.54	0.56	0.57	0.26	0.73
R6 PHOSPHATE-P, mg/l	0.18	0.18	0.20	0.12	0.10	0.13	0.18	0.15	0.17	0.18	0.15	0.16	0.16
R6 COLOR, Color Units	20	30	40	25	30	20	15	15	15	10	20	20	NA
R6 TURBIDITY, NTU	1.8	1.2	4.1	0.7	0.6	0.6	0.6	0.5	0.4	0.5	0.6	1.3	1.1
R6 SUSPENDED SOLIDS, mg/l	1.4	3.6	22.3	2.9	2.0	1.4	5.8	2.4	1.2	2.8	1.1	1.9	4.1
R6 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R6 B.O.D., mg/l	0.5	0.7	1.3	1.1	<0.1	<0.1	0.8	<0.1	0.5	1.0	0.3	0.7	<0.6
R6 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1.2
R6 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
R6 BORON, mg/l							0.6						0.6
R6 FLUORIDE, mg/l							0.47						0.47

LAS VIRGENES MUNICIPAL WATER DISTRICT
TAPIA WATER RECLAMATION FACILITY
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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AV
R9 FLOW, Avg, cfs	286.3	733.5	190.4	50.3	24.3	15.0	6.3	2.0	1.3	20.5	2.8	13.0	112
R9 TEMPERATURE, Avg, °C	10.0	12.1	16.1	18.4	20.3	22.2	23.3	23.8	22.8	20.0	16.0	10.3	17
R9 pH, Max	8.2	8.3	8.2	8.2	7.9	8.0	7.9	7.8	7.5	7.8	7.8	8.3	N
R9 pH, Min	7.8	8.1	8.0	8.0	7.7	7.6	7.8	7.3	7.3	7.3	7.3	7.5	N
R9 SALINITY, Avg, PPT			0.6	0.6	1.0	1.2	1.1	1.2	1.2	1.4	1.3	1.1	1
R9 DISSOLVED OXYGEN, AVG, mg/l	11.0	10.6	10.8	10.8	6.8	6.1	5.9	4.0	3.7	5.3	5.5	8.1	7
R9 TOTAL COLIFORM, Avg, MPN/100ml	1850	6150	1520	1550	1700	1420	920	720	1025	9375	3540	6575	302
R9 ENTEROCOCCI, Avg, cfu/100ml													N
R9 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0
R9 NITRATE-N, mg/l	0.5	1.3	1.4	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0
R9 NITRITE-N, mg/l	0.16	0.04	0.03	0.03	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.0
R9 AMMONIA-N, mg/l	0.06	0.04	0.06	0.04	0.04	0.02	0.03	0.05	0.03	0.04	0.03	0.05	0.0
R9 ORGANIC-N, mg/l	0.53	0.63	0.53	0.43	0.36	0.51	0.51	0.36	0.29	0.31	0.27	0.45	0.4
R9 PHOSPHATE-P, mg/l	0.09	0.11	0.08	0.08	0.04	0.05	0.10	0.06	0.07	0.06	0.04	0.15	0.0
R9 COLOR, Color Units	25	40	25	25	15	25	20	15	10	10	15	50	N
R9 TURBIDITY, NTU	2.0	2.8	1.8	1.0	0.4	1.4	2.0	0.6	0.5	0.7	0.4	7.8	1.
R9 SUSPENDED SOLIDS, mg/l	3.8	3.4	4.2	2.0	<1.0	4.4	3.4	2.6	0.9	1.6	0.9	14.5	<3
R9 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0
R9 B.O.D., mg/l	1.4	2.2	1.7	1.7	0.2	1.7	1.5	0.4	<0.1	1.3	0.4	4.5	<1.
R9 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1.
R9 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.0
R9 BORON, mg/l													0.
R9 FLUORIDE, mg/l							0.40						0.40

LAS VIRGENES MUNICIPAL WATER DISTRICT
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	PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVC
S-1	R1 FLOW, Avg, cfs	288.8	1381.3	276.0	94.0	32.5	22.4	17.0	16.8	15.0	29.3	12.4	20.8	183.1
	R1 TEMPERATURE, Avg, °C	10.1	12.0	15.2	17.3	18.9	20.0	20.4	20.0	18.4	17.9	14.8	10.9	16.5
	R1 pH, Max	8.2	8.3	8.2	8.4	8.0	8.1	8.1	8.0	8.0	8.0	8.0	8.3	N/A
	R1 pH, Min	8.1	8.0	7.9	7.9	7.7	7.7	7.9	7.6	7.7	7.7	7.7	7.8	N/A
	R1 SALINITY, Avg, PPT			0.7	0.9	1.2	1.3	1.3	1.2	1.4	1.4	1.5	1.3	1.2
	R1 DISSOLVED OXYGEN, Avg, mg/l	10.5	9.9	10.6	9.8	9.3	9.6	8.8	7.9	8.2	8.1	9.4	10.4	9.4
	R1 TOTAL COLIFORM, Avg, MPN/100ml	2650	3650	2780	2000	1275	1200	2975	3680	3000	27225	1820	8400	5050
	R1 ENTEROCOCCI, Avg, cfu/100ml					47	43	58	38	39	333	56	361	120
	R1 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	R1 NITRATE-N, mg/l	0.8	1.8	2.3	0.6	1.0	0.8	1.1	1.2	1.2	1.4	1.3	0.9	1.2
	R1 NITRITE-N, mg/l	0.13	0.04	0.04	0.04	0.02	0.04	0.05	0.05	0.04	0.05	0.04	0.04	0.05
	R1 AMMONIA-N, mg/l	0.08	0.04	0.06	0.03	0.06	0.04	0.04	0.08	0.03	0.05	0.04	0.05	0.05
	R1 ORGANIC-N, mg/l	0.58	0.71	0.66	0.57	0.46	0.43	0.49	0.50	0.43	0.79	0.53	0.75	0.50
	R1 PHOSPHATE-P, mg/l	0.14	0.13	0.12	0.10	0.06	0.08	0.21	0.10	0.11	0.19	0.12	0.16	0.12
	R1 COLOR, Color Units	20	30	30	25	20	20	20	15	10	5	15	50	N/A
	R1 TURBIDITY, NTU	1.8	2.5	4.2	1.2	0.5	0.7	1.8	0.8	0.4	0.7	0.6	5.5	1.7
	R1 SUSPENDED SOLIDS, mg/l	2.6	4.0	13.5	4.7	1.0	1.8	15.6	4.0	3.6	3.4	3.4	10.0	5.0
	R1 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	R1 B.O.D., mg/l	1.5	1.4	1.6	1.3	0.1	0.7	2.3	0.6	0.1	0.9	0.6	3.3	1.2
	R1 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<2	<2	<1.2
	R1 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	R1 BORON, mg/l							0.4						0.4
	R1 FLUORIDE, mg/l							0.43						0.43
	R1 TOXICITY, In-Situ, % Survival				100				100		100			100

LAS VIRGENES MUNICIPAL WATER DISTRICT
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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
R2 FLOW, Avg, cfs	363.0	1377.5	327.0	123.8	42.8	33.0	18.3	16.8	16.5	37.3	19.0	31.0	200.5
R2 TEMPERATURE, Avg, °C	12.1	12.8	15.9	18.0	19.8	20.5	21.0	21.0	19.6	20.1	19.5	14.4	17.9
R2 pH, Max	8.0	8.0	7.9	7.9	7.9	8.0	8.0	8.0	7.8	7.7	7.5	8.0	NA
R2 pH, Min	7.5	7.6	7.6	7.5	7.3	7.7	7.8	7.6	7.7	7.1	6.7	7.1	NA
R2 SALINITY, Avg, PPT			0.9	0.9	1.2	1.2	1.2	1.2	1.3	1.2	0.9	1.0	1.1
R2 DISSOLVED OXYGEN, Avg, mg/l	10.0	9.9	10.0	9.5	9.6	9.5	8.6	8.7	8.9	7.9	7.9	9.1	9.1
R2 TOTAL COLIFORM, Avg, MPN/100ml	1450	2650	1740	1875	1850	2620	1875	2780	2375	<42925	820	6925	<5824
R2 ENTEROCOCCI, Avg, cfu/100ml					53	62	64	47	91	222	45	274	107
R2 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R2 NITRATE-N, mg/l	4.0	2.8	3.3	1.4	3.0	0.8	0.8	0.9	0.9	1.3	6.8	2.4	2.4
R2 NITRITE-N, mg/l	0.09	0.04	0.04	0.03	<0.02	0.03	0.04	0.04	0.05	0.06	<0.02	0.04	<0.04
R2 AMMONIA-N, mg/l	0.08	0.05	0.07	0.04	0.05	0.07	0.04	0.06	0.03	0.05	0.13	0.07	0.06
R2 ORGANIC-N, mg/l	0.93	0.70	0.71	0.61	0.63	0.58	0.43	0.49	0.47	0.44	1.00	0.04	0.59
R2 PHOSPHATE-P, mg/l	2.10	0.64	0.72	0.52	0.55	0.10	0.13	0.16	0.20	0.27	2.10	0.80	0.69
R2 COLOR, Color Units	15	30	25	20	15	20	10	10	10	5	15	40	NA
R2 TURBIDITY, NTU	1.6	2.1	3.4	1.3	0.6	0.6	0.8	0.7	0.4	0.6	0.6	4.8	1.5
R2 SUSPENDED SOLIDS, mg/l	2.6	3.0	8.3	3.9	<1.0	1.4	2.6	4.2	2.7	2.9	4.7	12.6	<4.2
R2 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R2 B.O.D., mg/l	0.9	1.7	1.1	1.2	<0.1	0.6	1.3	0.2	<0.1	0.8	1.1	3.0	1.0
R2 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<2	<2	<1.2
R2 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
R2 BORON, mg/l							0.4						0.4
R2 FLUORIDE, mg/l							0.46						0.46
R2 TOXICITY, In-Situ, % Survival			92	100				95		100			97

**LAS VIRGENES MUNICIPAL WATER DISTRICT
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MALIBU CREEK MONITORING PROGRAM**
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LAS VIRGENES MUNICIPAL WATER DISTRICT
TAPIA WATER RECLAMATION FACILITY
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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
R13 FLOW, Avg, cfs	367.5	1335.0	337.0	140.0	92.5	58.0	24.5	19.8	21.5	49.5	23.5	31.5	208.4
R13 TEMPERATURE, Avg, °C	12.2	12.8	15.6	17.9	20.1	21.3	21.3	21.2	21.0	21.2	20.3	16.5	18.5
R13 pH, Max	7.7	8.0	8.0	8.0	7.9	8.4	8.1	8.0	7.7	7.4	7.4	7.8	NA
R13 pH, Min	7.2	7.5	7.8	7.7	7.0	6.7	7.8	7.6	7.5	7.3	6.6	7.3	NA
R13 SALINITY, Avg, PPT			0.8	0.8	1.1	1.0	1.0	1.1	1.1	0.9	0.9	1.0	1.0
R13 DISSOLVED OXYGEN, Avg, mg/l	10.0	10.0	10.3	10.0	9.8	8.8	8.6	8.7	8.7	7.6	8.3	8.7	9.1
R13 TOTAL COLIFORM, Avg, MPN/100ml	2350	14500	2180	1778	1450	3180	3875	2340	5650	<46675	2925	5425	<7694
R13 ENTEROCOCCI, Avg, cfu/100ml													NA
R13 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R13 NITRATE-N, mg/l	4.3	2.8	3.0	1.4	2.7	4.2	0.9	1.3	2.6	3.5	6.5	2.9	3.0
R13 NITRITE-N, mg/l	0.09	0.04	0.04	0.04	0.02	0.02	0.04	0.05	0.06	0.06	0.03	0.04	0.04
R13 AMMONIA-N, mg/l	0.09	0.05	0.07	0.04	0.05	0.06	0.05	0.05	0.04	0.06	0.12	0.09	0.06
R13 ORGANIC-N, mg/l	0.74	0.72	0.66	0.64	0.61	0.81	0.49	0.34	0.48	0.50	0.91	0.82	0.64
R13 PHOSPHATE-P, mg/l	2.20	0.58	0.50	0.44	0.95	1.88	0.25	0.35	0.89	1.60	2.10	1.00	1.06
R13 COLOR, Color Units	15	30	30	20	15	10	15	15	10	10	15	30	NA
R13 TURBIDITY, NTU	1.7	2.1	3.3	1.2	0.7	0.5	1.0	0.6	0.4	0.6	0.8	4.2	1.4
R13 SUSPENDED SOLIDS, mg/l	3.6	3.4	9.2	5.4	<1.0	1.2	5.2	1.9	4.2	4.2	6.9	13.6	4.8
R13 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
R13 B.O.D., mg/l	0.8	1.4	1.6	1.2	0.1	0.7	1.0	0.4	<0.1	1.0	1.3	3.3	<1.1
R13 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1.2
R13 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
R13 BORON, mg/l							0.5						0.5
R13 FLUORIDE, mg/l							0.41						0.41

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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
R3 FLOW, Avg, cfs	308.3	1025.0	542.0	206.7	85.8	66.0	24.0	20.0	20.0	65.0	19.6	30.0	201
R3 TEMPERATURE, Avg, °C	11.1	12.8	16.4	18.3	20.6	22.3	23.2	23.1	21.2	19.6	16.7	14.5	18
R3 pH, Max	8.5	8.4	8.5	8.5	8.5	8.6	8.5	8.5	8.4	8.2	8.5	8.5	N
R3 pH, Min	8.2	8.3	8.1	8.3	8.3	8.2	8.2	8.1	7.8	7.9	7.9	8.0	N
R3 SALINITY, Avg, PPT			0.7	0.7	1.0	1.1	1.0	1.0	1.1	1.0	1.0	1.0	0.
R3 DISSOLVED OXYGEN, Avg, mg/l	10.8	10.7	10.5	10.8	11.4	10.1	8.5	9.1	9.7	8.9	9.9	9.9	10.
R3 TOTAL COLIFORM, Avg, MPN/100ml	2200	11000	3200	810	383	614	1500	1400	1900	41525	1280	5475	594
R3 ENTEROCOCCI, Avg, cfu/100ml					4	<3	18	<4	30	158	32	278	<6
R3 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.
R3 NITRATE-N, mg/l	4.4	2.8	2.8	0.3	1.9	2.1	0.5	0.9	4.7	5.3	4.7	3.4	2.
R3 NITRITE-N, mg/l	0.11	0.04	0.04	0.03	0.03	0.07	0.04	0.05	0.09	0.07	0.07	0.06	0.0
R3 AMMONIA-N, mg/l	0.07	0.04	0.07	0.03	0.05	0.04	0.07	0.06	0.04	0.08	0.05	0.07	0.0
R3 ORGANIC-N, mg/l	0.87	0.65	0.66	0.58	0.48	0.59	0.51	0.43	0.65	0.62	0.50	0.88	0.6
R3 PHOSPHATE-P, mg/l	2.30	0.56	0.44	0.45	0.41	0.78	0.54	0.70	1.00	2.60	1.30	1.10	1.0
R3 COLOR, Color Units	20	25	25	20	15	10	15	10	15	15	15	40	N/
R3 TURBIDITY, NTU	2.3	2.2	3.1	1.1	0.3	0.6	1.3	0.7	0.8	1.2	0.6	6.8	1.
R3 SUSPENDED SOLIDS, mg/l	5.0	3.6	9.3	4.7	<1.0	<1.0	4.2	2.6	4.4	3.8	1.4	17.4	<4.
R3 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.
R3 B.O.D., mg/l	1.5	1.5	1.8	1.8	0.2	<0.1	0.9	0.2	0.2	0.5	0.4	2.4	<1.
R3 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1.
R3 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
R3 BORON, mg/l							0.5						0.5
R3 FLUORIDE, mg/l							0.42						0.42

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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
R4 FLOW, Avg, cfs	427.5	1435.0	500.0	195.0	85.0	66.0	23.5	17.2	17.0	44.3	16.8	41.5	239
R4 TEMPERATURE, Avg, °C	11.8	12.8	16.8	18.7	21.3	22.6	24.1	23.9	22.3	20.5	17.1	14.3	18
R4 pH, Max	8.4	8.4	8.6	8.4	8.5	8.6	8.6	8.5	8.4	8.3	8.5	8.4	N
R4 pH, Min	7.8	7.5	8.1	8.3	8.3	8.2	8.2	8.2	7.9	7.8	8.0	8.0	N
R4 SALINITY, Avg, PPT			0.8	0.8	1.1	1.0	0.9	1.0	1.0	1.0	1.0	0.9	0.
R4 DISSOLVED OXYGEN, Avg, mg/l	9.8	10.5	11.0	10.6	13.6	13.4	12.5	13.1	11.6	9.0	9.3	9.0	11.
R4 TOTAL COLIFORM, Avg, MPN/100ml	2150	5000	2020	2350	500	752	4875	3600	1875	5250	1980	11300	347
R4 ENTEROCOCCI, Avg, cfu/100ml													N
R4 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.
R4 NITRATE-N, mg/l	5.2	2.8	2.7	2.0	1.7	1.6	0.3	0.6	3.6	3.8	4.7	3.8	2.
R4 NITRITE-N, mg/l	0.13	0.04	0.04	0.03	0.04	0.08	0.05	0.08	0.10	0.08	0.10	0.06	0.0
R4 AMMONIA-N, mg/l	0.08	0.04	0.05	0.04	0.05	0.03	0.05	0.06	0.04	0.08	0.07	0.07	0.0
R4 ORGANIC-N, mg/l	0.85	0.70	0.66	0.54	0.50	0.59	0.55	0.43	0.65	0.57	0.61	0.89	0.6
R4 PHOSPHATE-P, mg/l	2.00	0.56	0.52	0.42	0.56	0.59	0.59	0.76	0.94	2.40	1.30	1.20	0.9
R4 COLOR, Color Units	20	25	25	25	15	15	10	10	10	10	15	40	N
R4 TURBIDITY, NTU	4.5	2.5	3.2	1.1	0.4	0.7	2.0	0.6	0.7	0.8	0.8	7.5	2.
R4 SUSPENDED SOLIDS, mg/l	11.6	3.8	7.9	4.3	<1.0	<1.0	5.9	1.8	3.0	1.9	2.7	22.6	<5.
R4 SETTLEABLE SOLIDS, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.
R4 B.O.D., mg/l	2.1	1.4	2.1	2.0	1.2	0.7	1.1	0.5	0.4	0.4	0.7	2.6	1.
R4 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1.
R4 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
R4 BORON, mg/l							0.5						0.
R4 FLUORIDE, mg/l							0.42						0.42

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PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AV
R11 TEMPERATURE, Avg, °C	12.3	13.4	17.4	20.6	23.7	24.2	25.5	24.8	23.0	20.9	18.8	15.4	20
R11 pH, Max	8.3	8.3	8.7	8.3	8.4	8.3	8.3	8.1	8.1	8.0	8.1	8.2	N
R11 pH, Min	7.9	7.4	8.1	8.3	8.2	7.7	8.1	7.8	7.5	7.6	7.5	7.9	N
R11 SALINITY, Avg, PPT			0.9	1.4	16.6	19.3	25.4	26.7	26.8	27.1	25.6	16.1	18
R11 DISSOLVED OXYGEN, Avg, mg/l	10.1	10.1	11.3	12.0	13.8	12.3	8.6	9.3	10.3	7.8	6.9	7.8	10
R11 TOTAL COLIFORM, Avg, MPN/100ml	6500	5500	1460	4500	1200	680	1025	2460	1450	24925	2200	9025	507
R11 ENTEROCOCCI, Avg, cfu/100ml					31	22	19	45	44	123	81	330	8
R11 CHLORINE RESIDUAL, Total, mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0
R11 NITRATE-N, mg/l	4.8	2.8	2.8	2.2	1.2	1.7	0.5	0.8	1.7	2.2	1.0	3.6	2
R11 NITRITE-N, mg/l	0.15	0.05	0.04	0.04	0.06	0.09	0.07	0.10	0.10	0.10	0.07	0.06	0.0
R11 AMMONIA-N, mg/l	0.08	0.08	0.07	0.03	0.05	0.04	0.05	0.06	0.05	0.06	0.14	0.10	0.0
R11 ORGANIC-N, mg/l	0.62	0.67	0.63	0.50	0.46	0.62	0.43	0.11	0.45	0.37	0.08	0.10	0.4
R11 PHOSPHATE-P, mg/l	1.60	0.63	0.48	0.43	0.56	0.62	0.54	0.46	0.77	1.10	0.30	1.10	0.7
R11 COLOR, Color Units	20	20	25	20	20	15	15	10	10	10	20	30	N
R11 TURBIDITY, NTU	6.8	24.0	3.0	1.2	1.0	0.7	2.2	0.9	0.8	3.1	2.7	7.6	4
R11 SUSPENDED SOLIDS, mg/l	19.6	24.5	7.6	5.4	5.0	2.8	6.2	4.9	7.7	15.9	25.0	15.8	11
R11 SETTLEABLE SOLIDS, mg/l	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<1
R11 B.O.D., mg/l	1.5	0.7	2.1	2.0	0.8	0.7	1.0	0.6	0.9	1.3	0.9	1.8	1
R11 OIL & GREASE, mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<1
R11 MBAS, mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.0
R11 BORON, mg/l							0.7						0
R11 FLUORIDE, mg/l							0.48						0.4

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- PARAMETER

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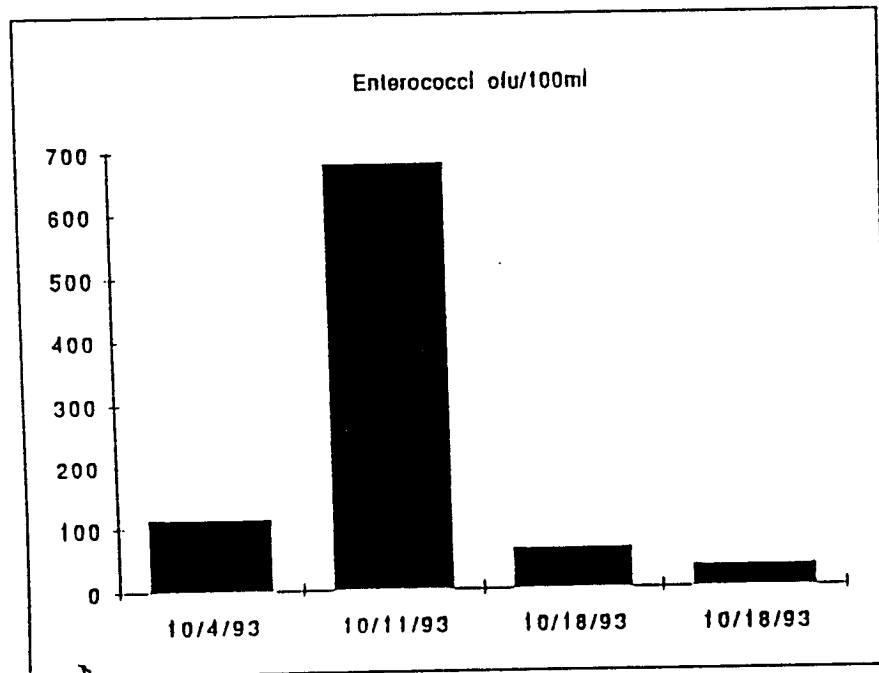
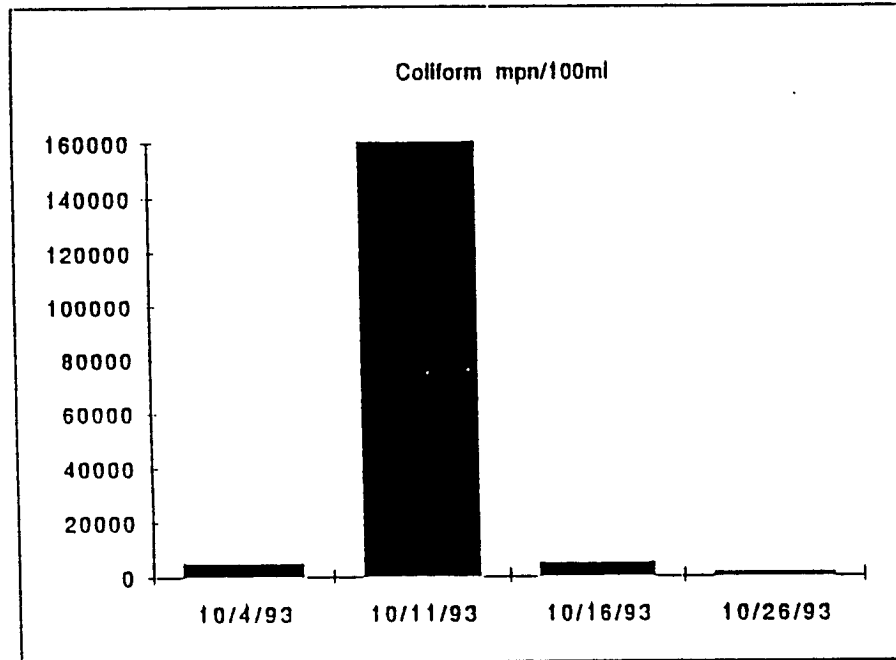
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APPENDIX K

EFFECTS OF FIRST RAIN ON MALIBU CREEK COLIFORM AND ENTEROCOCCI LEVELS



APPENDIX L

POPULATION IMPACTS ON STREAM SYSTEMS

Changes in Stream Hydrology

- Increase in Magnitude and Frequency of Floods
- Increased Frequency of Erosive Bankfull Floods
- Increase in Annual Volume of Surface Runoff
- Increased Stream Velocities

Changes in Stream Morphology

- Stream Channel Widening and Downcutting
- Increased Streambank Erosion
- Shifting Bars of Coarse Grain Sediment
- Elimination of Pool/Riffle Structure
- Imbedding of Stream Sediments
- Stream Relocation/Enclosure Channelization

Changes in Water Quality

- Pulses of Sediment During Construction
- Increased Pollutants
- Nutrient Enrichment
- Increased Bacteria
- Increased Organic Carbon Loads
- Increased Levels of Toxics, Trace Metals and Hydrocarbons
- Elevated Water Temperature
- Trash and Debris

Changes in Stream Habitat and Ecology

- Reduction in Diversity of Aquatic Insects
- Reduction in Diversity and Fish Abundance
- Loss of Wetlands, Riparian Buffers and Springs

APPENDIX M

THREATENED AND ENDANGERED SPECIES

Eight permanent or seasonal resident species of the Santa Monica Mountains NRA are federally-listed threatened or endangered. One of these, the California Condor, is currently extirpated, but could occur again, depending on the success of ongoing breeding and reintroduction programs administered by the U.S. Fish and Wildlife Service and the U.S. Forest Service. Nineteen additional state-listed species occur within the Santa Monica Mountains. Another forty-nine species are candidates for federal listing or have been proposed for listing (a listing package has been prepared) by the U.S. Fish and Wildlife Service. A comprehensive list of these species is provided in the table below.

Status Code Definitions

- C1 — Sufficient information exists to list taxa as threatened or endangered
- C2 — Information indicates taxa may warrant listing, but sufficient information to support listing is lacking
- C3b — Taxonomic understanding does not meet definition as a biological "species"
- C3c — Taxa more common than originally believed
- + — denotes state-listed

Federally listed threatened or endangered:

Endangered Wildlife

+ California Condor	<u>Gymnogyps californianus</u>
+ Bald Eagle	<u>Haliaeetus leucoccephalus</u>
+ Peregrine Falcon	<u>Falco peregrinus anatum</u>
+ Brown Pelican	<u>Pelecanus occidentalis californicus</u>
+ Light-footed Clapper Rail	<u>Rallus longirostris levipes</u>
+ California Least Tern	<u>Sterna antillarum browni</u>
+ Least Bell's Vireo	<u>Vireo belli pusillus</u>
California (Black-tailed) Gnatcatcher	<u>Poliophtila californica</u>

Endangered Plants

+ Salt Marsh Bird's Beak	<u>Cordylanthus maritimus</u> <u>maritimus</u>
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Threatened Wildlife

Western Snowy Plover	<u>Charadrius alexandrinus nivosus</u>
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Federally Proposed Threatened or Endangered (Listing Packages Published in the Feder Register)

Proposed Endangered

Braunton's Milk Vetch

Astragalus brauntonii

+ Lyon's Pentachaeta
Swamp Sand Wort

Pentachaeta lyonii
Arenaria paludicola

Proposed Threatened

Tidewater Goby

Eucyclogobius newberryi

+ Marcesant Dudleya
Santa Monica Mountains
Dudleya

Dudleya cymosa marcesans
Dudleya cymosa ovatifolia

Verity's Dudleya

Dudleya verityi

Category 1 species:

Southwestern Pond Turtle

Clemmys marmorata pallida

Southwestern Willow

Epidonax traillii extremus

Flycatcher

Ventura Marsh Milk Vetch

Astragalus pycnostachys
lanosissimus

+ Coastal Dunes Rattleweed

Astragalus tener titi

+ Nevin's Barberry

Berberis nevinii

San Fernando Valley

Chorizanthe parryi fernandina

Chorizanthe

Category 2 species:

Arroyo Southwestern Toad

Bufo microscapanus californicus

Coastal Western Whiptail

Cnemidophorus tigris multiscutatus

San Bernardino Ringneck
Snake

Diadophis punctatus modestus

San Diego Mountain King
Snake

Lampropeltus zonata pulchra

Coastal Rosy Boa

Lichanura trivirgata rosafusca

San Diego Horned Lizard

Phrynosoma coronatum blainvillei

Coast Patch-nosed Snake

Salvadora hexalepis virgulata

Two-striped Garter Snake

Thamnophis hammondi

Mountain Quail

Oreortyx pictus

Western Least Bittern

Ixobrychus exilis hesperis

California Horned Lark

Eremophila alpestris actia

Elegant Tern

Sterna elegans

Loggerhead Shrike

Lanius ludovicianus

Tri-colored Blackbird

Agelaius tricolor

Southern California Rufous-
crowned Sparrow

Aimophiala ruficeps canescens

+ Belding's Savannah Sparrow

Passerculus sandwichensis beldingi

Greater Western Mastiff Bat
 Spotted Bat
 California Leaf-nosed Bat
 Occult Little Brown Bat
 Pacific Western Big-eared Bat
 Salt Marsh Ornate Shrew
 Salt Marsh Skipper
 Clouded Tailed Copper
 Butterfly
 Wright's Checkerspot
 Butterfly
 Callippe Silverspot Butterfly
 Santa Monica Mountains
 Hairstreak
 Valley Oak Ant
 Santa Monica Shieldback
 Katydid
 Dorothy's El Segundo Dune
 Weevil
 Belkins Dune Tabanid Fly
 Hoover's Baccharis
 Dune Larkspur
 Beach Spectacle-pod
 + Conejo Buckwheat
 Many-stemmed Live-forever
 + Santa Susana Tarweed

Category 3b and 3c species:

Long-billed Curlew
 + Swainson's Hawk
 Southern Marsh Harvest
 Mouse
 Turkish Rugging

Additional California Listed Species (not shown above)

Endangered

Willow Flycatcher
 Coastal Dunes Rattleweed

Threatened

Bank Swallow

California Candidate Species

Marbled Murrelet

Eumops perotis californicus
Euderma maculatum
Macrotus californicus
Myotis lucifugus occultus
Plecotus townsendii townsendii
Sorex ornatus salicornicus
Panoquina errans
Lycaena arota nubila

Euphydryas editha quino

Speyeria callippe callippe
Satyrium auretteorum fumosum

Proceratium californicum
Neduba longipennis

Trigonoscute dorothea
dorothea

Brennania belkini
Baccharis plummerae glabrata
Delphinium parryi blockmanii
Dithyrea maritima
Eriogonum crocatum
Dudleya multicaulis
Hemizonia minthornii

Numenius americanus
Buteo swainsoni
Reithrodontomys megalotus limicola

Chorizanthe staticoides
chrysacantha

Empidonax traillii
Astragalus tener titi

Riparia riparia

Brachyramphus marmoratus

California Species of Special Concern

California Red-legged Frog

American White Pelican

Harlequin Duck

Cooper's Hawk

Northern Harrier

Golden Eagle

Osprey

Prairie Falcon

Merlin

Long-billed Curlew

Long-eared Owl

Burrowing Owl

Yellow Warbler

Rana aurora draytoni

Pelecanus erythrohynchos

Histrionicus histrionicus

Accipiter cooperii

Circus cyaneus

Aquila chrysaetos

Pandion haliaetus

Falco mexicanus

Falco columbarius

Numenius americanus

Asio otus

Athene cunicularia

Dendroica petechia

Extinct Species:

California Grizzly Bear

Ursus californicus

Locally Extinct Species

Pronghorn

Black Bear

Antilocapra americana

Ursus americanus

Potentially Extirpated Amphibians

California Red-legged Frog

Arroyo Toad

Rana aurora draytoni

Bufo microscapanus californicus

Potentially Extirpated Reptiles

California Red-sided Garter

Snake

California Lyre Snake

Thamnophis sirtalis

infernalis

Trimorphodon biscutatus

vandenburghi

Extirpated or Potentially Extirpated Birds

+ California Condor

California (Black-tailed)

Gnatcatcher

+ Least Bell's Vireo

Gymnogyps californianus

Polioptila californica

Vireo belli pusillus

APPENDIX N
AGENCIES WITH JURISDICTION IN THE SANTA MONICA MOUNTAINS

Federal

Federal Aviation Administration
Laguna Peak
U.S. Navy
Point Mugu Naval Air Weapons Station
U.S. Fish and Wildlife Service
Environmental Protection Agency (Santa Monica Bay Restoration Project)
Drug Enforcement Administration

State

California Department of Parks and Recreation

Point Mugu State Park
Malibu Creek State Park
Topanga State Park
Leo Carrillo State Beach
El Pescador " "
El Matador " "
La Piedra " "
Corral " "
Malibu Lagoon " "
Point Dume " "
Santa Monica " "
Will Rogers " "

Will Rogers State Historic Park

Santa Monica Mountains Conservancy

Mulholland Gateway Park
Temescal Gateway Park
Solstice Canyon
Red Rock Canyon Park
Calabasas Peak Park
Serrania Park
Escondido Falls

Mountains Restoration and Conservation Authority

Mountains Education Program -- WODOC

Liberty Canyon

Caballero Canyon

Mountains Conservancy Foundation

Mountains Restoration Trust

Cold Creek Canyon Preserve

Las Flores Canyon

Topanga-Las Virgenes Resource Conservation District

California Department of Forestry

California Department of Fish and Game

California Coastal Conservancy

California Conservation Corps

California Department of Transportation

California Highway Patrol

California Coastal Commission

County

Los Angeles County

Department of Public Works
Fire Department
Probation Department
District Attorney
Department of Environmental Affairs
Department of Regional Planning
Sanitation District
Rustic and Sullivan Canyons
Department of Water and Power
School District
Mosquito Abatement District
Weed Abatement Division
Sheriff's Department
Department of Beaches and Harbors
Zuma Beach
County Line Beach
Las Flores Beach
Palisades Park
Nicholas County Beach
Charmlee County Park
Tapia Park (State)
Griffith Park

Franklin Canyon

Ventura County

Department of Public Works
Fire Department
Regional Planning
Sheriff's Department

Cities Within or Partially Within the Santa Monica Mountains

City of Agoura Hills
City of Calabasas
City of Hidden Hills
City of Los Angeles
City of Malibu
Environmental Review Board
City of Thousand Oaks
City of Westlake Village

Unincorporated Cities

Oak Park

14

Schools

SOKA
Pepperdine University

Camps

Salvation Army
 Camp Gilmore
 Mount Crags
JCA Shalom
Camp Bloomfield
Big Rock
L.A. County Probation
 Camp Miller
 Camp Kilpatrick
 Camp David Gonzales
Camp for the Junior Blind
Camp Wes Cramer
Camp Joan Mier
L.A. County Fire
 Camp 8
 Camp 13

Camp Siskiyou

Public Open Space Ownership

Conejo Open Space and Conservation Authority
Rancho Simi Recreation and Park District
University of California
 Stunt Ranch

Other Resources Regulatory Agencies

Air Quality Control Boards
 Los Angeles
 Ventura
Regional Water Quality Control Boards
 Los Angeles
 Ventura

Utilities

Calleguas Municipal Water District
Las Virgenes Municipal Water District
Southern California Edison
The Gas Company

Other

Southern California Association of Governments

APPENDIX O

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