US Army Corps of Engineers®

Hansen Dam Basin

Los Angeles County, California

Master Plan
And
Draft Environmental Assessment

MARCH 2011

Prepared by the
U.S. Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, CA 90053-2325

Funding by
The American Recovery
And Reinvestment Act
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EXECUTIVE SUMMARY

This 2011 *Master Plan and Draft Environmental Assessment for Hansen Dam Basin* is an update to the *1991 Final Hansen Dam Master Plan and Environmental Impact Statement*. The U.S. Army Corps of Engineers (Corps) Master Plan for an authorized civil works project is a conceptual document guiding Corps responsibilities pursuant to Federal laws and regulations to manage the project lands, water, and associated resources, and to preserve, conserve, develop, restore, and maintain those resources. The Master Plan provides direction and guidance for land development and utilization in the Hansen Dam Basin consistent with Corps regulations, laws, and policies. The Federally-authorized project, Hansen Dam Flood Control Project (Dam or Project), refers to the structures, amenities, and lands necessary for operation of the Dam. The Hansen Dam Basin (Basin) refers to the lands acquired for the construction, operation, and maintenance of the project.

A need exists to ensure that Federal lands are managed in a way that conforms to current Corps regulations, policy and guidance. A Master Plan is intended to capture the Corps' assessment of land management needs and expressed public desires, as well as provide guidance for evaluation of specific developments, uses and activities. This Master Plan provides guidance and foresight for Basin management that balances the needs and desires of the public with legal, policy and resource constraints.

Since the issuance of the 1991 Master Plan the land and resource uses within the Basin and surrounding community have changed significantly. Some recreation amenities proposed in the 1991 Master Plan such as a 15-acre swimming lake with associated amenities such as picnic areas and restaurant were never built. However, a 1.5-acre swim lake as part of the Aquatic Center was constructed in the Basin. An updated Master Plan is needed to reflect the described changes to the Basin and applicable Federal laws, regulations, policy, and guidance that have been amended or changed since the 1991 Master Plan.

This Master Plan and associated Draft Environmental Assessment (DEA) trace the history and development of the Basin and provide the baseline condition of existing resources and amenities. The Corps held three community workshops to: (1) provide information to the public about the Corps' master planning process; (2) gain feedback on existing and proposed changes to the existing land use classifications in the Basin; and (3) to identify the public's needs, desires, and concerns regarding current and future recreation in the Basin. Visitation data and secondary data about recreation needs and potential future demand for amenities were also analyzed. Separate meetings were held with the Basin lessee to gain insight on current operations and needs. With these analyses taken together, and in light of an integrated ecological approach to land management by the Corps, a set of resource objectives were identified for each land use classification to guide the development of the land and resource plan recommendations.

Based upon existing conditions and future projections, the plan recommends that the land at Hansen Dam Basin be classified into seven land use classifications: (1) Project Operations; (2) Recreation; (3) Environmentally Sensitive; (4) Multiple Resource Management – Recreation – Low Density; (5) Multiple Resource Management – Vegetative Management; (6) Multiple Resource Management - Inactive and/or Future Recreation; and (7) Easement Lands. Corps policies are summarized in the Master Plan and are attached in Appendix A. Specific recommendations are discussed for management of the Basin as a whole and for particular land use classifications. The Recommended Plan provides guidance for balancing flood risk management requirements, recreation opportunities, and preservation of natural resources while managing the Basin water and land resources for future generations.

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1 INTRODUCTION

1.1 Purpose of a Master Plan

A U.S. Army Corps of Engineers (Corps) Master Plan for an authorized civil works project is a conceptual document guiding Corps responsibilities pursuant to Federal laws and regulations to manage project lands, water, and associated resources and to preserve, conserve, develop, restore, and maintain those resources. The Master Plan provides direction and guidance for land development and utilization in the Basin consistent with Corps regulations, laws, and policies. The Federally-authorized project, Hansen Dam Flood Control Project (Dam or Project), refers to the structures, amenities, and lands necessary for operation of the Dam. The Hansen Dam Basin (Basin) refers to the lands acquired for the construction, operation, and maintenance of the Project.

The Hansen Dam Basin Master Plan is intended to guide the orderly and coordinated use, development, and management of resources within the Basin. Water, land and other natural and human resources have been assessed and document existing conditions for consideration of Project purposes. The Corps guidance for the preparation of Master Plans identifies applicable policies and procedures including:

- Master Plans are developed and are to be kept current for all Civil Works projects and other fee-owned and easement lands for which the Corps has administrative responsibility for management.
- The Master Plan is an essential element in fostering an efficient and cost-effective project and natural resources management program.
- The Master Plan provides guidance for project development and use and for the responsible stewardship of project resources for the benefit of present and future generations.
- The Master Plan promotes the protection, conservation and enhancement of natural, cultural and man-made resources.

The primary goals of Corps Master Plans are to prescribe overall land and water management plans, resource objectives, and associated design and management concepts, which include:

- Providing the best possible combination of responses to regional needs, resource capabilities, land use suitability, and expressed public interest and desires consistent with authorized project purposes.
- Contribute towards a high degree of recreation diversity within the region.
- Emphasize the particular qualities, characteristics, and opportunities of the project.
- Exhibit consistency and compatibility with national objectives and other state and regional goals and programs. (EP 1130-2-550, para. 3-2.d.)

A Draft Environmental Assessment (DEA) has also been prepared in conjunction with this Master Plan in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.), Council on Environmental Quality (CEQ) regulations published at 42 CFR part 1500, and Corps regulations published at 33 CFR part 230. The purpose of the DEA is to provide sufficient information on the existing environmental conditions within the Basin and the potential environmental effects of the No-Action Alternative (continuation of the 1991 Master Plan) and the Proposed Action (approval of the updated Master Plan) so that decision makers can determine the need to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The DEA is included as Appendix D.

1.2 Project Location

The Project is comprised of a Dam and lands that support the construction, operations and maintenance of the Dam. It is located in Los Angeles County at the confluence of the Big and Little Tujunga Washes along the northeastern edge of the San Fernando Valley (Map 1). The Basin area lies entirely in the City of Los Angeles (Map 2), and is approximately 17 miles northwest of downtown Los Angeles. Foothill Boulevard marks the northern extent, while Glenoaks Boulevard and Montague Street mark the southern boundary of the Basin. The Basin extends beyond Osborne Street to the west and follows Wentworth Street along the east extent. The purview of this Master Plan includes all Federally-owned lands managed by the Corps at the Basin (Map 3).

1.3 Authorized Project Purpose

Flood Risk Management A U.S. Army Corps of Engineers (Corps) Master Plan for an authorized civil works project is a conceptual document guiding Corps responsibilities pursuant to Federal laws and regulations to manage the project lands, water, and associated resources and to preserve, conserve, develop, restore, and maintain those resources. Although the authorized Project purpose in the legislation for the Project was originally referred to as flood control, it is now referred to as flood risk management. The Project purpose is to provide flood risk management to the communities downstream of the Basin, and all other activities that may occur within the Basin must not impede or diminish the purpose of flood risk management.

Hansen Dam and Sports Fields

Hansen Dam was authorized pursuant to two acts of Congress. The Flood Control Act of (FCA) of 1936 (Public Law (P.L.) 74-738), provides for the construction of the Dam and related flood risk management works for the protection of metropolitan Los Angeles County, California. The second (P.L. 75-761), amended the 1936 Act by providing for the acquisition by the United States of land, easements, and right-of-way for flood risk management projects, channel improvements, and channel rectification. The FCA of 1936 (P.L. 74-738), authorized civil works projects for flood risk management measures through the Corps and other Federal agencies. The Project is an important part of a comprehensive system for flood risk management in Los Angeles County known as the Los Angeles County Drainage Area (LACDA). Hansen Dam is managed by the Corps, Los Angeles District.

Recreation Section 4 of the FCA of 1944, (P.L. 78-534), as amended, authorizes the Corps to construct, maintain, and operate public park and recreation amenities at water resource development projects and to permit the construction, maintenance, and operation of such amenities." It authorizes the Corps to grant leases of lands, including structures or amenities that are suitable for public parks and recreation purposes to Federal, state, or local government agencies when such action is determined to be in the public interest. Since 1948, recreation amenities have been developed throughout the Basin by the City of Los Angeles Department of Recreation and Parks (City) in accordance with a lease agreement between the Corps and the City. Currently, no water is impounded behind the Dam for purposes of recreation and no releases are made downstream for recreation purposes.

Water Conservation Although water conservation is not a Congressionally authorized purpose of the Dam, the water control plan has provisions to operate the Dam to increase water conservation by coordinating Dam releases with the Los Angeles County Department of Public Works (LACDPW) operation of downstream groundwater recharge basins. When the Dam water surface is at or below elevation 1010.5 feet (NGVD), releases may be reduced to match LACDPW and City of Los Angeles Department of Water and Power spreading grounds capacity to recharge water to groundwater. Water conservation operations may not compromise flood risk management. Water held temporarily for water conservation is released at a rate to ensure that the entire storage capacity of the Basin is available if needed for flood risk management operations.

1.4 Need for Updated Master Plan

A need exists to ensure that Federal lands are managed in a way that conforms to current Corps regulations, policy and guidance. A Corps Master Plan is intended to capture the Corps' assessment of land management needs, expressed public desires, and provides guidance for evaluation of specific developments, uses, and activities. A Master Plan defines land use classifications, provides guidance and foresight that allows the Basin to be managed in a way that balances the needs and desires of the public with legal, policy and resource constraints.

Over the past several years, Corps policy and guidance has come to recognize a greater need for environmental stewardship that includes conservation and protection of the Nation's natural resources. The updated Master Plan must reflect this policy in order to guide future development within the Basin. Federal laws, regulations, and Executive Orders have changed in response to increasing needs for environmental protection and conservation. These changes in Corps environmental regulations and policy must be considered in the management of the Basin's land and water resources.

This Master Plan provides a review of existing land and resources uses within the Basin, describes the needs and desires of the surrounding community and other stakeholders, prescribes land use classifications for Basin land based on Corps guidance, offers resource and land use objectives for guidance in land management, and identifies recommendations for future development as well as preserving and conserving the Basin's natural resources.

1.5 History of the Basin

The need for flood risk management in the coastal drainages of Los Angeles County was recognized before 1900, but increased after the substantial flooding in January and February 1914. On 12 June 1915, Los Angeles County Flood Control District (LACFCD) was created. The LACFCD agency worked with the Corps' Los Angeles District on various minor flood risk management projects, but it was not until two decades later that major flood risk management projects were given serious consideration. The flood of 1 January 1934 emphasized the need for flood risk management projects in southern California, and the

New Deal Relief and Public Works Program provided the financial vehicle for comprehensive construction programs.

In 1935 and 1936, the Corps and LACFCD became partners in a large Works Progress Administration contract to design a comprehensive flood risk management system for Los Angeles County for the San Gabriel and Los Angeles Rivers and their tributaries (Corps 1938). The Definite Project Report for the control of Los Angeles River was submitted in December 1936. The severe storms and floods of February-March 1938 provided additional impetus for a comprehensive flood risk management program in southern California.

1939 Flooding

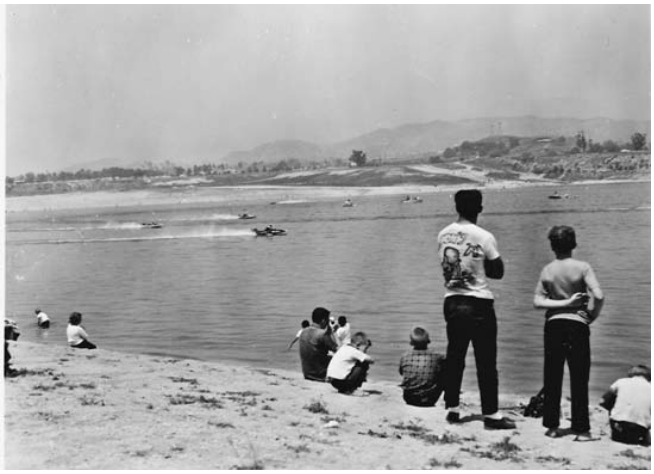
Hansen Dam forms part of the LACDA system of flood risk management structures located on the San Gabriel and the Los Angeles Rivers and their tributaries. The analysis of design, completed in 1939, established the location and design of the Dam and appurtenant flood risk management facilities. Construction of the Dam, spillway, and outlet works that exist today was completed in September of 1940 at a Federal first cost of over $11,000,000. Hansen Dam was named after horse ranchers Homer and Marie Hansen, who established a ranch in the vicinity of the Dam in the 1800s. The Hansen's ranch was later acquired in 1939 to support construction and operation of the Dam.

Hansen Dam Aerial 9 September 1940

Construction of the Dam

On 10 July 1946, a preliminary report outlining recreation possibilities at the Basin noted that the site was already popular for recreation attracting approximately 75,000 visitors annually. The California Department of Natural Resources, Division of Fish and Game voluntarily stocked fish in the water remaining in the borrow pits at the Basin establishing fishing and picnicking activities. In April 1948, the City of Los Angeles (City) leased 1,450 acres within the Basin for recreation purposes and began a

phased program for overall development of the Basin. The initial recreation development at the Basin by the City started in 1952 with the development of the west lake (Holiday Lake) development. Holiday Lake, a popular feature, was created from the borrow pits for construction of the Dam. The Holiday Lake was originally 130 acres, but by 1975 it was reduced to 80 acres of water surface due to sediment accumulation. By 1982 the lake was abandoned as a recreation facility and by 1983 the lake had reduced in size to approximately 30 acres. The 1991 Master Plan reported the lake was entirely filled in. The City of Los Angeles Department of Recreation and Parks currently manages, operates, and maintains recreation amenities in the Basin with Corps oversight.



Holiday Lake Boat Race

Fishing at Holiday Lake

1.6 Applicable Laws, Executive Orders, Regulations, and Policy Guidance

The following Federal laws, Executive Orders, and Corps regulations and guidance are pertinent to the Master Plan update.

1.6.1 Public Laws

The Flood Control Act of 1944, Section 4, as amended (16 USC Section 460d) authorizes the Corps to construct, maintain and operate public park and recreation amenities at water resource development projects; to construct of such amenities by local interest; to permit the maintenance and operation and maintenance of such amenities by local interest; and to grant leases for public park and recreation purposes on Federally-operated lands controlled by the Corps, including structure or amenities thereon. Preference for use shall be given to Federal, state, or local governmental agencies. The authority to issue licenses is included under this authorization and may be granted without monetary consideration.

The National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq.) provides a framework for Federal agencies to minimize environmental damage and requires Federal agencies to evaluate the potential of environmental impacts of their proposed actions. Under NEPA, a Federal agency prepares an Environmental Assessment (EA) describing the environmental effects of any proposed action and alternatives to that action to determine if there are significant impacts requiring development of an Environmental Impact Statement (EIS) or if a Finding of No Significant Impact (FONSI) is appropriate. The EA must identify measures necessary to avoid or minimize adverse impacts, and all impacts must be reduced to a level below significance in order to rely upon a FONSI.

The Migratory Bird Treaty Act, as amended (16 USC 703-712) prohibits the taking or harming of any migratory bird, the living bird, any part of the bird, its eggs, or eggs without an appropriate Federal

permit. This Act covers birds specifically listed therein or named in wildlife treaties between the United States and countries, including Great Britain, Mexican States, Japan and countries once part of the former Soviet Socialist Republics. Disturbance of the nest of a migratory bird requires a permit issued by the United States Fish and Wildlife Service (USFWS) pursuant to Title 50 of the Code of Federal Regulations.

The Fish and Wildlife Coordination Act of 1958 (16 USC 661-667e) requires that any agency impounding, diverting, channel deepening, controlling or otherwise modifying a stream or body of water for any purpose whatever, including navigation and drainage, consult with the United States, Fish and Wildlife Service. The Act is intended to give fish and wildlife conservation equal consideration with the purposes of water resource development projects.

The Federal Water Project Recreation Act of 1965, as amended (16 USC 460*l*-12 to 460*l*-21) requires that recreation and fish and wildlife enhancement be given full consideration in Federal water development projects. The Act authorizes the use of Federal water resource project funds for land acquisition in order to establish refuges for migratory waterfowl.

The Clean Water Act, as amended (33 USC 1251-1387), authorizes water quality programs; requires certification from the state water control agencies that a proposed water resource project is in compliance with established effluent limitations and water quality standards (Section 401); establishes conditions and permitting for discharges of pollutants under the national pollutant discharge elimination system (NPDES) (Section 402); and requires that any non-Corps entity acquire a permit from the Corps for any discharges of dredged materials into the waters of the United States, including wetlands (Section 4040). The Act also defines the conditions which must be met by Federal projects before they may make discharges into the waters of the United States. Under the Section 404(b)(1) guidelines, as published in 40 CFR 122.6, only the Least Environmentally Damaging Practicable Alternative should be recommended. The United States Environmental Protection Agency (EPA) has primary responsibility for implementing the programs designed to clean up waters of the United States.

The Clean Air Act, as amended (42 USC 7401-7671q), establishes Federal standards for seven toxic air pollutants. It also establishes attainment and maintenance of National Ambient Air Quality Standards (Title I), motor vehicles and reformulation (Title II), hazardous air pollutant (Title III), acid deposition (Title IV), operation permits (Title V), stratospheric ozone protection (Title VI), and enforcement (Title VII). Under Section 176(c) of the Clean Air Act Amendments of 1990, the Lead Agency is required to make a determination of whether the Proposed Actions "conform" to the State Implementation Plan (SIP). Conformity is defined in Section 176(c); compliance with the SIPs is for the purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. If the total direct and indirect emissions from a Proposed Action are below the General Conformity Rule "*de minimus*" emission thresholds, then a Proposed Action would be exempt from performing a comprehensive Air Quality Conformity Analysis, and would be in conformity with the SIP. In addition, the analysis must consider whether the emissions would be "regionally significant" before determining no comprehensive Air Quality Conformity Analysis is required.

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), protects threatened and endangered species, as listed by the USFWS, from unauthorized take, and directs Federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 of the Act defines Federal agency responsibilities for consultation with USFWS.

The Archaeological and Historic Preservation Act, as amended (16 USC 469), requires that Federal agencies consider the effect of their undertakings, including Federally-licensed activity or program, on historic American sites, buildings, objects, and antiquities of national significance when taking actions

that include, but are not limited to, flooding, the building of access roads, relocation of railroads or highways, and other alterations of the terrain caused by the construction of a dam.

The National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.), requires that Federal agencies consider the effect of their undertakings, including federally licensed activities or programs, on properties eligible for the National Register of Historic Places (NRHP).

The American with Disabilities Act of 1990, as amended, (42 USC 126 et seq.), prohibits public entities, defined as any state or local government, or division thereof, from excluding any individual with a disability from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity. A "qualified individual with a disability" is an individual with a disability who, with or without reasonable modifications to rules, policies, or practices, the removal of architectural, communication, or transportation barriers, or the provision of auxiliary aids and services, meets the essential eligibility requirements for the receipt of services or the participation in programs or activities provided by a public entity.

Leases: Non-Excess Property of Military Departments and Defense Agencies, as amended, (10 USC 2667(a)), authorizes the Corps to lease Federal land under its control to non-Federal entities when such use will promote the national defense or to be in the public interest. Lands considered for lease under this authority must not be necessary for public use and is not considered excess. This leasing authority typically applies to uses that are considered “non-recreation.”

Easements for Rights of Way, as amended (10 USC 2688), authorizes the Corps to issue easements for rights-of-way over, in, and upon Federal land controlled by the Corps when such use will not be against the public interest.

1.6.2 Executive Orders

Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality, amended by Executive Order 11991, Relating to Protection and Enhancement of Environmental Quality, mandates that the Federal government provide leadership in protecting and enhancing the quality of the nation’s environment to sustain and enrich human life. Federal agencies must initiate measures needed to direct their policies, plans and programs so as to meet national environmental goals. Section 1 of EO 11990 amends Section 3(h) of EO 11514, by directing the CEQ to issue guidelines to Federal agencies for implementing procedural provisions of the NEPA 1969. These regulations include procedures for early environmental impact statement (EIS) preparation and require impact statements to be concise, clear, and supported by evidence that agencies have made the necessary analyses.

Executive Order 11988, Floodplain Management, outlines the responsibilities of Federal agencies in the role of floodplain management. Federal agencies are required to evaluate the potential effects of actions on floodplains, and should avoid undertaking actions which directly or indirectly induce growth in the floodplain or adversely affect natural floodplain values. Agency regulations and operating procedures for licenses and permits are directed to include provisions for the evaluation and consideration of flood hazards. Construction of structures and amenities in floodplains must consider alternative approaches that avoid adverse effects and incorporate flood proofing and other accepted flood risk management measures. Agencies shall attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties. This EO requires Federal agencies to provide leadership and take action to: (1) avoid development in the base (100-year) floodplain unless it is the only practicable alternative; (2) reduce the hazards and risk associated with floods; (3) minimize the impact of floods on human safety, health and welfare; and (4) restore and preserve the natural and beneficial values of the base floodplain.

Executive Order 11990, Protection of Wetlands, states that the Federal agencies shall take action to minimize destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agencies responsibilities. Each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. In making this finding the head of the agency may take into account economic, environmental, and other pertinent factors. Federal agencies shall also provide opportunity for early public review of any plans or proposals for new construction in wetlands.

Executive Order 12088, Federal Compliance with Pollution Control Standards, requires all Federal agencies to ensure that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal amenities and activities under control of the agency.

Executive Order 12898, Environmental Justice in Minority Populations and Low-Income Populations, requires Federal agencies to identify and address disproportionately high and adverse impacts of Federal Actions, including Federal licensed actions, programs, policies, or activities, on minority or low income populations in the United States.

Executive Order 13112, Invasive Species, requires Federal agencies to expand and coordinate efforts to prevent the introduction of invasive species and to minimize the economic, ecological, and human health impacts that invasive species may cause.

Executive Order 13148, Greening the Government through Leadership in Environmental Management, mandates that environmental management considerations must be a fundamental and integral component of Federal Government policies, operations, planning, and management. The primary goal of this EO in the natural resources arena is for each agency to strive to promote the sustainable management of Federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment.

Executive Order 13195, Trails For America in the 21st Century, requires that Federal agencies will, to the extent permitted by law and where practicable, and in cooperation with Tribes, States, local governments, and interested citizen groups, protect, connect, promote, and assist trails of all type, throughout the United States.

1.6.3 Corps' Guidance

The following paragraphs list Engineer Regulations (ER), Engineer Pamphlets (EP), and Engineer Manuals (EM) published by the Corps that are pertinent for planning, development, and management of the Basin. These Corps documents are cited with their initial publication date and updates using a system of changes to specific pages to incorporate modifications to the guidance resulting from new legislation or policy changes. The documents including changes are available in digital format at the publications page on the Corps' Headquarters website: http://140.194.76.129/publications/.

- Regulations - Engineer regulations (ER) establishes topic-specific procedural practices that must be followed at Corps District levels.
- Pamphlets - Engineer pamphlets (EP) provide clarification guidance and/or detailed implementation guidance in support of Federal laws and regulations.

- Manuals - Engineer manuals (EM) are documents which provide comprehensive planning and design guidance for a wide range of technical and functional activities.

1.6.4 Engineering Regulations

ER 200-1-5, Policy for Implementation and Integrated Application of the U.S. Army Corps of Engineers Environmental Operating Procedures (EOP) and Doctrine, 30 Oct 2003, provides specific policy and guidance for implementation and the integrated application of the Corps' EOP and associated doctrine across the full spectrum of Corps' program management initiatives and business processes.

ER 200-2-2, Environmental Quality: Policy and Procedures of Implementing NEPA, 04 Mar 1988, (33 CFR part 230), provides policy and procedural guidance to supplement the Council of Environmental Quality's final regulations implementing the procedural provisions of the NEPA for the Civil Works Program of the Corps.

ER 200-2-3, Environmental Compliance Policies, 29 Oct 2010, provides the policy for the management of environmental compliance-related operations and maintenance activities for the U.S. Army Corps of Engineers Civil Works Projects.

ER 405-1-12, Real Estate Handbook, 20 Nov 1985, provides guidance on real estate requirements and procedures, including guidance on appraisals, acquisitions, relocation assistance, homeowners' assistance, real estate claims, audits, and recording and reporting.

ER 1105-2-100, Planning Guidance Notebook, 22 Apr 2000 (original); 30 Jun 2004 (Appendix D - Amendment 1); 31 Jan 2007 (Appendix F - Amendment 2); 30 Jun 2004 (Appendix G – Amendment 1); 20 Nov 2007 (Appendix H – Amendment 1), provides overall direction by which the Corps Civil Works projects are formulated, evaluated and selected for implementation. It contains a description of the Corps planning process, Corps missions and programs, specific policies applicable to each mission and program, and analytical requirements.

ER 1110-2-240, Water Control Management, 08 Oct 1982; 30 Apr 1987 (change 1); 01 Mar 1994 (change 2), prescribes policies and procedures to be followed by the Corps in carrying out water control management activities, including the establishment of water control plans for Corps and non-Corps projects, as required by Federal laws and directives.

ER 1110-2-400, Design of Recreation Sites, Area and Facilities, 31 May 1988, establishes policy, and guidance for the design of recreation sites, areas, and facilities.

ER 1130-2-530, Flood Control Operations and Maintenance Policies, 30 Oct 1996, establishes the policy for the operation and maintenance (O&M) of Corps flood risk management and related structures at civil works water resource projects and of Corps-built flood risk management projects operated and maintained by non-Federal sponsors.

ER 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance Procedures, 15 Nov 1996 (Original); 04 Nov 2002 (change 1); 31 Jul 2005 (change 2); 11 Aug 2008 (change 3), establishes land management policy for Corps-administered project lands and water, based on various authorizing legislation and the principles of good environmental stewardship. Environmental stewardship includes both passive and proactive management to sustain healthy ecosystems and biodiversity, and conserve natural resources, such that Corps lands and waters are left in a condition equal to or better than their condition when acquired, and such that those natural and cultural resources are available to serve the

needs of present and future generations. Management plans will be prepared for all Corps administered lands and waters.

ER 1130-2-550, Recreation Operations and Maintenance Policies, 15 Nov 1996 (Original); 01 Oct 1999 (change 1); 01 Mar 2002 (change 2); 15 Aug 2002 (change 3); 30 Aug 2008 (change 4); 30 Mar 2009 (change 5), establishes the policy for management of recreation programs and activities, and for the operation and maintenance of U.S. Army Corps of Engineers recreation amenities and related structures, at civil works water resource projects.

ER 1165-2-26, Implementation of Executive Order 11988 on Floodplain Management, 30 Mar 1984, sets forth general policy and guidance for Corps implementation of Executive Order 11988, Floodplain Management, as it pertains to planning, design, and construction of Civil Works projects, to activities under the operation and maintenance program, and to the real estate program of the Corps. The policy of the Corps with respect to floodplain management is to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base (100-year) floodplain and avoid inducing development in the base floodplain unless there is no practicable alternative. The decision on whether a practicable alternative exists will be based on weighing the advantages and disadvantages of floodplain sites and non-floodplain sites. Factors to be taken into consideration include, but are not limited to, conservation, economics, esthetics, natural and beneficial values served by floodplains, impact of floods on human safety, locational advantage, the functional need for locating the development in the floodplain, historic values, fish and wildlife habitat values, endangered and threatened species, Federal and State designations of wild and scenic rivers, refuges, etc. and, in general, the needs and welfare of the people. The test of practicability will apply to both the proposed Corps action and to any induced development likely to be caused by the action. Identification and evaluation of practicable alternatives shall include consideration of alternative sites (carrying out the proposed action outside the floodplain); alternative actions (other means which accomplish the same purpose as the proposed action); and no action. When a determination is made that no practicable alternative to undertaking an action in the floodplain exists, it will be appropriately documented and the features or qualities of the floodplain that make it advantageous over alternative non-floodplain sites shall be described and adequately supported.

ER 1165-2-119, Modifications to Completed Projects, 20 Sep 1982, provides guidance on the use of available authorities, as compared to the need of new project authorizations, for study and accomplishment of modification to completed projects.

ER 1165-2-400, Recreational Planning, Development, and Management Policies, CH1, 09 Aug 1985, defines the objectives, philosophies, and basic policies for the planning, development and management of outdoor recreation and enhancement of fish and wildlife resources at Corps water resource development projects.

ER 1165-2-501, Civil Works Ecosystem Restoration Policy, 30 Sep 1999, provides policy on Corps involvement in ecosystem restoration and protection through Civil Works programs and activities.

1.6.5 Engineering Pamphlets

EP 310-1-6, Corporate Information: Graphic Standards Manual, 01 Sep 1994 (original); 01 Jun 2006 (change 1), establishes a unified approach regarding the use of Corps logotype and preparation of visual communications. The manual covers the use of the logo in business cards, signs, publications, forms, vehicles, and miscellaneous items.

EP 310-1-6a, 232 Sign Standards Manual, VOL 1, 01 Jun 2006, provides direction and guidance for signage, including planning, use, placement, materials, and maintenance, at Corps Civil Works water resource projects.

EP 310-1-6b, Sign Standards Manual, VOL 2, Appendices, 01 Jun 2006, provides guidance on procurement procedures, materials and specifications, sign maintenance procedures, typography reference, reference material, and reproduction materials for signage at Corps water resource projects.

EP 1130-2-540, Environmental Stewardship and Maintenance Guidance and Procedures, 15 Nov 1996 (original); 04 Nov 2002 (change 1); 31 Jul 2005 (change 2); 11 Aug 2008 (change 3), establishes guidance for the management of environmental stewardship-related operations and maintenance activities at Corps civil works water resource projects and supplements ER 1130-2-540, Environmental Stewardship Operations and Maintenance Policies.

EP 1130-2-550, Project Operations-Recreation Operation and Maintenance Guidance and Procedures, 15 Nov 1996 (original); 01 Oct 1999 (change 1); 01 Mar 2002 (change 2); 15 Aug 2002 (change 3); 30 Aug 2008 (change 4), establishes guidance for the management of recreation programs and activities, and for the operation and maintenance of Corps recreation amenities and related structures, at civil works water resource projects and supplements ER 1130-2-510, Recreation Operation and Maintenance Policies. Master Plans and operational management plans are to be developed in accordance with the guidance on master planning and report content contained in Chapter 3 of both ER and EP 1130-2-550.

EP 1165-2-316, Rules and Regulations Governing Public Use of Water Resources Development Projects Administered by the Chief of Engineers, May 2000; codified as 36 CFR part 327, establishes rules and regulations pertaining to the recreation land use and safety measures at Corps administered water resource and development projects.

EP 1165-2-502, Ecosystem Restoration – Supporting Policy Information, 30 Sep 1999, provides policy information in support of ER 1165-2-501 to guide Corps of Engineers involvement in ecosystem restoration and protection through Civil Works programs and activities.

1.6.6 Engineering Manuals

EM 1110-1-400, Recreation Facility and Customer Services Standards, 01 Nov 2004, provides general guidance for the rehabilitation of existing, and the design and construction of new recreation areas and amenities, the provision of customer services, and recreation program evaluation activities at recreation areas managed by the Corps of Engineers. The overall purpose of this document is to establish a uniform level of quality nationwide by which Corps-managed parks will meet the needs of current and future park customers.

EM 1110-2-410, Design of Recreation Areas and Facilities – Access and Circulation, 31 Dec 1982, presents data compiled from experience and research that may be useful to Corps personnel concerned with the design of access and circulation to recreation sites, areas and amenities. The material presented in the manual is intended as design guidance for obtaining an end product which results in safe, useable, economical recreation developments and accessible to all.

1.6.7 South Pacific Division Regulations

SPDR 1110-2-1, Land Development Proposals at Corps Reservoir Projects, Nov 2001, establishes South Pacific Division (SPD) policy for evaluating land development proposals within Basins and flood basins of the Corps, and documenting the results of the evaluation. The policies of this division regulation detail

the procedures to be followed in evaluating land development proposals by any entity (companies, organizations, private parties, governments, or agencies) to construct buildings, roads, or other amenities, or in any way would modify the land forms, vegetation, surface characteristics, or use lands within a Basin operated by the Corps for flood risk management. The objective is to assure that project purposes are not compromised, that the public is not endangered, and that natural and cultural resources associated with project lands are not harmed.

1.7 Pertinent Publications

U.S. Army Corps of Engineers Publications

U.S. Army Corps of Engineers, Los Angeles District, *Analysis of Design Hansen Dam, Volumes 1 and 2,* 1938

U.S. Army Corps of Engineers, Los Angeles District, *Flood Control in the Los Angeles County Drainage Area,* 1939

U.S. Army Corps of Engineers, Los Angeles District, *Hydrology in the Los Angeles County Drainage Area,* 1939

U.S. Army Corps of Engineers, Los Angeles District, *Los Angeles County Drainage Area, California Preliminary Report Recreational Development Hansen Flood-Control Basin,* 1946

U.S. Army Corps of Engineers, Los Angeles District, *Administration and Development of Project Land and Water Areas,* 1956

U.S. Army Corps of Engineers, Los Angeles District, *Hansen Dam Master Plan Los Angeles County Drainage Area, California,* 1975

U.S. Army Corps of Engineers, Los Angeles District, *Operations and Maintenance Manual, Los Angeles County Drainage Area,* 1975

U.S. Army Corps of Engineers, Los Angeles District, *Tujunga Wash Recreation Master Plan*, 1975

U.S. Army Corps of Engineers, Los Angeles District, *Plan of Study, Review Report for Flood Control and Allied Purposes, Los Angeles County Drainage Area*, 1976

U.S. Army Corps of Engineers, Los Angeles District, *Interim Report on Hydrology and Hydraulic Review of Design Features of Existing Dams for LACDA Dams,* 1978

U.S. Army Corps of Engineers, Los Angeles District, *Los Angeles County Drainage Area, California, Reconnaissance Report on Sediment Storage Capacity at Hansen Dam Under Major Rehabilitation Program,* 1981

U.S. Army Corps of Engineers, Los Angeles District, *Final Feasibility Report for Hansen Dam Reservoir Recreation Lake and Water Conservation Pool Redevelopment,* 1983

U.S. Army Corps of Engineers, Los Angeles District, *Environmental Assessment for Debris Removal Hansen Dam Flood Control Basin,* 1984

U.S. Army Corps of Engineers, Los Angeles District, *Hansen Dam Preliminary Formulation Report,* 1984

U.S. Army Corps of Engineers, Los Angeles District, *Final Report, Review of Water Resources within the Los Angeles County Drainage Area,* 1985

U.S. Army Corps of Engineers, Los Angeles District, *Los Angeles County Drainage Area Recreation Review,* 1988

U.S. Army Corps of Engineers, Los Angeles District, *Draft Supplemental Environmental Assessment for Debris Removal Hansen Dam Flood Control Basin,* 1990

U.S. Army Corps of Engineers, Los Angeles District, *Water Control Manual Hansen Dam – Tujunga Wash, Los Angeles County, California,* 1990

U.S. Army Corps of Engineers, Los Angeles District, *Los Angeles County Drainage Area Review, Final Feasibility Report,* 1991

U.S. Army Corps of Engineers, Los Angeles District, *Final Hansen Dam Master Plan and Environmental Impact Statement, LACDA, CA,* 1991

U.S. Army Corps of Engineers, Los Angeles District, *Environmental Assessment Hansen Dam Recreation Area Swim Lake,* 1992

Other Agency Publications

City of Los Angeles, Department of Recreation and Parks, *2009 Citywide Community Needs Assessment,* 2009

2 PROJECT DESCRIPTION

2.1 Project Data

The Project is comprised of a compacted earthfill embankment, spillway structure, and outlet works. The earthfill Dam is a compacted, impervious structure 10,475 feet long and 1,087 feet in elevation according to National Geodetic Vertical Datum (NGVD). The maximum height above streambed is 97 feet. The Dam has a storage capacity of 33,348 acre-feet at spillway crest (elevation 1060 feet) based on the November 2004 topographic survey. The Dam embankment extends in a general east and west direction at right angles to Tujunga Wash. The Dam follows a gentle curve in order to connect the abutments of the Dam with a prominent rock outcrop located near the center of the Dam. At the east end, the Dam abuts against a range of small hills and on the west end, terminates in a gentle sloping hill. Rock is exposed on the hillside at the east abutment and is found at shallow depths on the west abutment. Between the ends of the Dam and the central rock outcrop, the axis of the Dam crosses the lower end of a typical debris cone. The upstream face of the Dam has a slope of 3 horizontal:1 vertical (3H:1V) and is covered with a 2.5 feet layer of riprap over a 6 inch spall blanket. The downstream face has a slope of 6H:1V from the rock toe to elevation 1,020 feet NGVD, a slope of 5H:1V from elevation 1,020 to 1,050 feet NGVD, and a slope of 3H:1V to the Dam crest. Three berms, each 20 feet wide, run parallel to the axis of the Dam, one on the upstream face at elevation 1,040 feet and two on the downstream face at elevations 1,020 and 1,050 feet.

Hansen Dam Aerial 27 January 1959

The spillway structure, with a crest elevation of 1,060 feet NGVD is located near the center of the Dam on a prominent rock outcrop just west of the Tujunga Wash Channel. The approach channel, leading to the crest, is a 320-foot wide rectangular section with invert sloping from the earth berm at elevation 1,040 feet to the point of intersection with the concrete crest section at elevation 1,060 feet. The crest is a Creager and Justin ogee section with an overall length of 302 feet and six 3-foot wide crest piers, making a net length of 284 feet. A concrete lined rectangular spillway channel, which includes the outlet channel at its center, is designed to carry the spillway discharge beyond the earth embankment. The spillway channel consists of a 302 foot constant width section to the toe of the ogee section, and an 897 foot transition to a width of 180 feet from the toe of the ogee section on a slope of 0.08584 and then 664 feet on the slope of 0.02681, being parallel to the outlet channel invert, terminating at elevation 964 feet and finally connecting with the improved channel.

The outlet structures and spillway are located west of the Tujunga Wash Channel in Hansen Knob, which is on the axis of the Dam and approximately bisects it. The outlet structures include an approach channel, an intake structure with operating house and vent house, eight gated and two ungated outlet conduits, and an outlet channel. The outlet conduits are installed through the overflow spillway section, located symmetrically with respect to the spillway center line and aligned to discharge into Tujunga Wash. The gated conduits are located in the center of the outlet section in two groups of four. All conduit entrances are elliptical in shape and have been provided with a semicircular trash rack structure. The throat entrances to the ungated conduits are 8 by 8 feet in order to allow larger discharges through. A 60 foot long section, dropping to the approximate elevation of the gated conduits, is used as the transition from the 8 by 8 foot entrance throat to the 8 foot wide by 6 foot high outlet section. The combined maximum capacity of the outlets is 22,000 cfs at water surface elevation 1,060 feet NGVD, which is at the spillway crest. Of this, 4,900 cfs passes through the ungated openings and 17,100 cfs passes through the gated openings. Table 2.1 (Corps 2010a) provides a summary of the physical characteristics of the Dam and Basin.

Table 2.1 Hansen Dam and Basin Pertinent Data

General Information	
Construction Completed	1940
Stream System	Tujunga Wash
Drainage Area	151.9 square miles
Basin	
Elevation[1]	
Debris Pool	1,010.50 ft, NGVD
Spillway crest	1,060 ft, NGVD
Spillway design surcharge level	1,081.20 ft, NGVD
Top of Dam	1,087 ft, NGVD
Area[1]	
Debris Pool	372 acres
Spillway crest	826 acres
Spillway design surcharge level	1,084 acres
Top of Dam	1,154 acres
Capacity, Gross[1]	
Debris Pool	3,756 ac-ft
Spillway crest	33,348 ac-ft
Spillway design surcharge level	52,964 ac-ft
Top of Dam	59,299 ac-ft
Allowance for sediment (50-year)	10,500 ac-ft
Allowance for sediment (100-year)	21,000 ac-ft
Dam: Type	Earthfill
Height above original streambed	97 ft
Top Length	10,475 ft
Top width	30 ft
Freeboard	5.8 ft

Table 2.1 Hansen Dam and Basin Pertinent Data	
Spillway: Type	Overflow conc, Ungated ogee
Crest length	284 ft
Design surcharge	21.2 ft
Design discharge	99,700 cfs
Outlets	
Uncontrolled	
Number and size	2 - 8' W x 6' H
Entrance invert elevation	1,011 ft, NGVD
Controlled	
Gates - type	Vertical Lift
Number and size	8 - 5' W x 8' H
Entrance invert elevation	990 ft, NGVD
Conduits	
Number (total)	10
Size and number	2 - 8' W x 6' H ft
Size and number	8 - 5' W x 8' H ft
Length	265 ft
Maximum capacity at spillway crest	22,000 cfs
Regulated capacity at spillway crest	20,800 cfs
Standard Project Flood	
Duration (inflow)	4 days
Total volume (including baseflow)	92,500 cfs
Inflow peak	53,000 cfs
Probable Maximum Flood	
Duration (Inflow)	5 days
Total volume	246,000 ac-ft
Inflow peak	105,000 cfs
Historic Maximums	
Maximum release (2 March 1983)	17,966 cfs
Maximum water surface elevation (2 March 1983)	1,039.70 ft, NGVD
[1]Based on November 2004 Survey. Source: Corps 2010a.	

2.2 Real Estate

A total of 1,507.2 acres was acquired for construction, operations, and maintenance of the Project. The United States owns 1,461.3 acres in fee and limited flowage rights over an additional 45.9 acres. The Corps, as the agency authorized to manage the Basin, reserves 162.7 acres exclusively for operation of the Dam. The remaining 1,298.6 fee acres may be available for compatible uses with a preference toward recreation purposes.

The Corps originally granted a lease to the City of Los Angeles (City or Lessee) in 1948 pursuant to 16 USC 460d for 1,450 acres. On 21 January 1969, the Corps granted a new lease of 1351.8 acres in the Hansen Dam Basin for park and recreation purposes to the City for a term of 50 years decreasing the total acreage available for compatible recreation purposes. On 16 August 1972, Supplement 1 to the lease was executed which increased the lease by 3.5 acres by adding a parcel that was no longer required by the 6th U. S. Army as a site for a U. S. Army Reserve Center. This increased the total leased acreage to approximately 1355.3 acres. On 4 June 1974, Supplement 2 was signed which added 0.09 acres to the lease for a parcel that the City of Los Angeles, Department of Water and Power no longer required. This increased the total leased acreage to approximately 1355.4 acres. Supplement 3 to the lease, dated 24 September 2002, extended the term of the lease from 50 years to 75 years, with a termination date of 20 January 2044. Map 4 shows the area leased for recreation purposes.

2.3 Recreation Amenities

A variety of recreation amenities are available at the Basin. Amenities include equestrian trails, an aquatic center, active sports fields, and open areas for hiking and picnicking. Map 9 shows the location of existing recreation amenities in the Basin. All of the existing recreation amenities currently located in the Basin are described in Section 4.4.

2.4 Watershed

The Project is located on the northeastern edge of San Fernando Valley on Tujunga Wash, a principal tributary of the Los Angeles River system. The San Gabriel Mountain Range forms the northern drainage divide of the watershed, while a high ridge forms the divide with the upper San Gabriel River watershed to the east, and delineates a 152 square mile watershed. Big Tujunga Dam, located 14 miles upstream of the Project, controls 82 square miles of this drainage area and is a water conservation and flood risk management facility owned and operated by Los Angeles County Department of Public Works (LACDPW). Downstream of Big Tujunga Dam, Tujunga Wash flows across a broad alluvial fan and passes through the Basin, through an urbanized valley, and empties into the Los Angeles River 9.3 miles downstream. Little Tujunga Wash, the other major tributary in the watershed, joins Big Tujunga Wash within Hansen Basin. The longest watercourse in the watershed is the Big Tujunga Wash. It is 31.5 miles in length and an average slope of 148 feet per mile (Corps 1990). See Maps 2 and 5 for the Basin boundaries and the watershed.

Tujunga Wash Watershed

Approximately 140 square miles of the 152 square mile drainage area above the Basin consists of steep, mountainous terrain, dissected by deep, narrow ravines containing the numerous watercourses, tributaries to this watershed. The remainder of the watershed consists of a relatively flat alluvial fan surface and

valley fill area. Elevations in the mountains vary from 7,124 feet at Pacifica Mountain to 990 feet at the Dam. Much of the watershed is part of the Angeles National Forest (Corps 1990).

Tujunga Wash flows out of the Dam into the channelized wash to the south, a rectangular reinforced concrete channel with a hydraulic capacity that varies from 20,800 cfs to 28,200 cfs, and on to the Los Angeles River. Immediately downstream of the Dam are the Hansen Spreading Grounds are owned and operated by LACDPW.

2.5 Surrounding Community/Market Area

The surrounding community, or market area, refers to the population that lives within a reasonable proximity to the Basin and that is expected to travel from their home to take part in the Basin's recreation opportunities. Populations that utilize the recreation areas, natural areas, and open spaces of the Basin are considered the market demographic. The primary market demographic is expected to include the people of the immediately adjacent communities including San Fernando, Pacoima, Tujunga and Sun Valley, as well as the City and County of Los Angeles. This demographic is considered when identifying recreational and resource needs for the Basin.

Categories of statistics considered in the master planning process include the 2000 population, estimated 2008 population, age distribution, ethnic heritage, household size, density of people per square mile, median household income, the percentage of individuals living below the poverty level and other statistics (Table 2.2).

Table 2.2 Demographic Data for Communities Surrounding Basin

Community		Los Angeles County	City of Los Angeles	San Fernando	Burbank
2000 Population		9,519,338	3,694,820	23,564	100,316
2008 Population Estimation		9,832,137	3,833,995	23,833	102,968
Age Distribution	≤ 9 yrs.	16.1%	15.8%	19.9%	12.3%
	10-19	14.8%	13.7%	17.8%	12.0%
	20-54	52.0%	53.7%	50.1%	54.3%
	≥ 55	17.0%.	16.7%	12.1%	21.4%
Ethnicity	Asian	11.9%	10.0%	1.1%	9.2%
	Black	9.8%	11.2%	1.0%	2.1%
	Latino	44.6%	46.5%	89.3%	24.9%
	Native American	0.8%	0.8%	1.7%	0.5%
	Pacific Islander	0.3%	0.2%	0.1%	0.1%
	White	48.7%	46.9%	42.8%	72.2%
	Other	23.5%	25.7%	49.4%	9.9%
Household Size		3.0	2.8	4.1	2.4
Density (People per Square Mile)		2,344	7,877	9,881	5,782
Median Household Income		$42,189	$36,687	$39,909	$47,467
Individuals Living Below Poverty Level		17.4%	22.1%	19.1%	10.5%
High School Graduates		69.9%	66.6%	41.9%	83.1%
Bachelor's Degree or Higher		24.9%	25.5%	5.4%	29.0%
Living With a Disability		20.4%	21.7%	20.6%	18.2%

[1]Data taken from 2000 Census Data, American FactFinder.
[2]Mixed-race ethnicities reported resulting in a total greater than 100%.

Overall population, household size, and density describe the number of people that may utilize the Basin for recreation purposes. The statistics obtained for the median household income and number of people living below the poverty level help to determine the need for free or low cost recreation activities. Ethnic and educational background assists in defining the need for signage, interpretative programs, educational enhancement, recreation types, and other activities to meet a broad spectrum of socioeconomic needs. Population density describes the distribution of people in the market area and is an important demographic to consider in meeting the needs of the community. Los Angeles County is the third most densely populated county in California with 2,344 living in each square mile. The high density of people per square mile indicates that pressure on the natural environment and demand for open space, recreational opportunities, and environmental protections is greater than other less densely populated areas in the state of California.

With an estimated 10 million people living within the Basin market area, there is significant need for recreation opportunities, open space, and environmental stewardship. To reflect the demographics in the market area, the development of these opportunities must widely appeal to a broad spectrum of the population.

2.6 Regional Context

Los Angeles County (County) provides approximately 87,000 acres of parkland (just under 9 acres per 1,000 people); 37,000 acres of recreation area (3.6 acres per 1,000 people); a roughly equivalent amount of wilderness area; 2,900 acres of beaches; 13,000 acres of golf courses; and 645,000 acres of forest. The range of recreation options within and adjacent to the County is very diverse and responds to a broad spectrum of recreation and leisure preferences.

The National Parks and Recreation Association recommends 10 acres of open space per 1,000 residents, so the County as a whole has nearly adequate park space. Yet disparities exist at the local level in the more urbanized areas, especially when the access and proximity to open space are considered. The recreation amenities in the Basin play an important role in filling this local need.

The range of recreation options within and adjacent to the County is very diverse and responds to a broad spectrum of recreation and leisure preferences. Map 6 shows the locations of open space and park lands throughout the region.

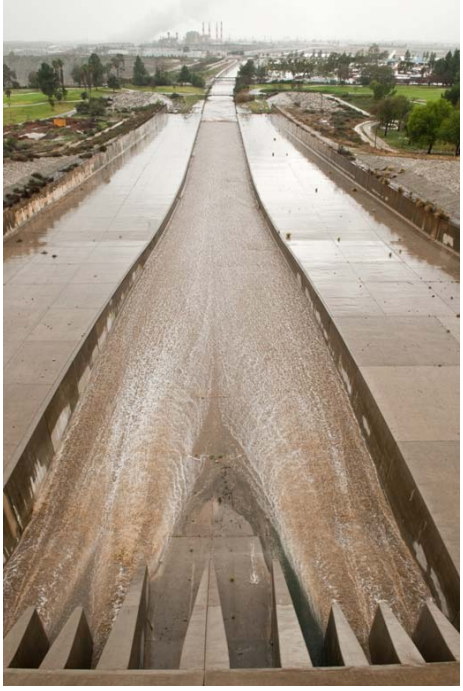
2.7 Hydrology and Basin Operations

2.7.1 Climate and Hydrology

The climate of the drainage area above Basin is generally temperate and semi-arid, with warm, dry summers and cool, moist winters. Most precipitation in southern California coastal drainages occurs during the winter season, primarily from November through early April, as mid-latitude cyclones from the northern Pacific Ocean move inland over the area. Most of these storms are the general winter type, characterized by hours of light-to-moderate precipitation, but with many heavy showers and thunderstorms within the storm system. Within the drainage area, mean annual precipitation ranges from slightly more than 15 inches near the Dam to more than 36 inches in the San Gabriel Mountains upstream of Big Tujunga Dam. There is great year-to-year variability in monthly, as well as annual precipitation (Corps 1990).

All of the major inflow and impoundment events in the history of the Project have been the result of general winter storms. Runoff from the watershed is characterized by high flood peaks of short duration that result from high-intensity rainfall on the watershed. Flood events are usually less than 48 hours

duration. Inflow rates drop rapidly between storms, and inflow during the dry summer season is usually less than 10 cfs. Based on the US Geological Survey stream-gage record for Big Tujunga Creek below the Dam (#11097000), the long-term average outflow from the Dam for the period 1948 through 2009 is 17,927 acre-feet per year (or 24.8 cubic feet per second). The mean annual outflow varied from a high of 224 cfs in water year 1993 to the lowest runoff of 0 cfs in water years 1950, 1951, 1963-1965, and 1972. Channel flow below the Dam is characterized by releases of relatively long duration with occasional sharp peaks from the tributary urban areas downstream (Corps 1990).



Dam Operation During Storm

The watershed has a high sediment and debris production potential. The original estimate of sedimentation in the Dam was 5,000 acre-feet (AF) over a 50-year period (1940 to 1990). However by 1977, sedimentation at the Basin (approximately 10,000 AF) had greatly exceeded the original estimate. Based on the historical average annual sedimentation rate for the Basin, approximately 84 percent (272 acre-feet/year) of all sediment entering into the Basin area remains behind the Dam. Approximately 16 percent (52 acre-feet/year) of all sediment is conveyed downstream into the Tujunga Wash Channel. Due to the amount of sediment that has been deposited behind the Dam, a long-term sediment removal operation was initiated at the Basin in 1984. This operation has restored much of the original Basin storage capacity (Corps 1999).

2.7.2 Dam Operation

The primary Project purpose is flood risk management for the communities in the San Fernando Valley along Tujunga Wash and the Los Angeles River. Water is temporarily stored behind the Dam during periods of high inflows and is released more slowly through the downstream Tujunga Wash Channel. The water control operation described in the Water Control Manual (Corps 1990) uses the Basin storage capacity (33,348 acre-feet) in conjunction with the outlet release capability (maximum of 20,800 cfs) to control flood inflow events to the conveyance capacity of the downstream Tujunga Wash and Los Angeles River channels. The operation schedule for the Dam includes controlled releases up to 500 cubic feet per second until the Basin reaches an elevation of 1,010.5 feet NGVD. Above this elevation Dam releases are permitted up to 20,800 cfs, not to exceed the downstream channel capacity in Tujunga Wash or the Los Angeles River (Corps 1990). The available conveyance capacity of the downstream channels vary throughout flood events depending on the physical condition of the channel as well as rainfall and flood runoff downstream of the Dam that use up a portion of the channel conveyance capacity. Project pertinent data is provided in Table 2.1 (Corps 2010a).

At low water surface elevations (up to 1,010.5 feet), Hansen Dam can be operated for water conservation during periods of favorable weather and runoff forecasts subject to the requirements of the Project. Dam releases for water conservation are made in coordination with LACDPW and the City, who operate groundwater recharge spreading basins along Tujunga Wash. The operation plan does not provide for the temporary or permanent storage of floodwaters for recreation purposes. During flood risk management operations, areas developed for recreation may be inundated with storm water and are repaired or restored by the Lessee (Corps 1999).

2.7.3 Basin Filling Frequency

The frequency and extent of flood inundation is considered in the management of Basin lands. The operation of the Dam to control flood inflows for flood risk management, results in periodic storage of flood waters within the Basin. A statistical analysis of water surface elevations over a historical period of time in which the Dam has been operated determines the filling frequency. Filling frequency refers to the relationship between the maximum water elevation in the Basin and how frequently these elevations are reached. Filling frequency values are presented in Table 2.3.

Table 2.3 Hansen Dam Filling Frequency Relationship

Percent Chance Exceedance	Return Period	Basin Stage (feet)
0.2	500	1066.3
0.5	200	1054.2
1.0	100	1043.4
2.0	50	1034.0
5.0	20	1024.8
10.0	10	1022.8
20.0	5	1014.5
50.0	2	1010.6
80.0	1.25	1007.0
90.0	1.11	1006.4
95.0	1.05	1005.9
99.0	1.01	1005.5

The Basin's water surface elevation gage produces a continuous record of the Basin stage. The filling frequency of the Basin is used to develop a statistical relationship between water surface elevation and frequency. This statistically derived relationship was augmented by using the results of prior Corps hydrology studies that used inflow volume frequency and hydrograph routing procedures to estimate the frequency of occurrence of the less frequent (rarer) floods such as the 100-year, 200-year, and 500-year events. In Table 2.3, percent chance exceedance means, for example, that every year there is a 1-percent (1 out of 100) chance for the indicated Basin water surface elevation (1043.4 feet NGVD) to be equaled or exceeded due to flood inflows. The elevation-frequency contours in Map 7 show the Basin area inundated for the 10-, 50-, and 100-year return period flood events as well as area inundated when the Basin pool elevation is at spillway crest (1060 feet). With regard to duration of Basin inundation, the project operation for flood risk management produces short periods of Basin inundation. Floodwaters are released quickly (a matter of days) in order to regain storage space to capture future flood inflows.

Figure 2.1 presents the historical record of the Project's water surface elevation from October 1941 to September 2007 (65 years) (Corps 2009).

2.7.4 Operational Issues

Basin sedimentation is an operational issue as it steadily reduces storage capacity leading to more frequent Basin inundation at higher pool levels. The Corps periodically excavates sediment within the Basin to maintain storage capacity. The trash rack in front of the outlet works occasionally becomes clogged from vegetative debris accumulation that must be manually cleared (Corps 1990).

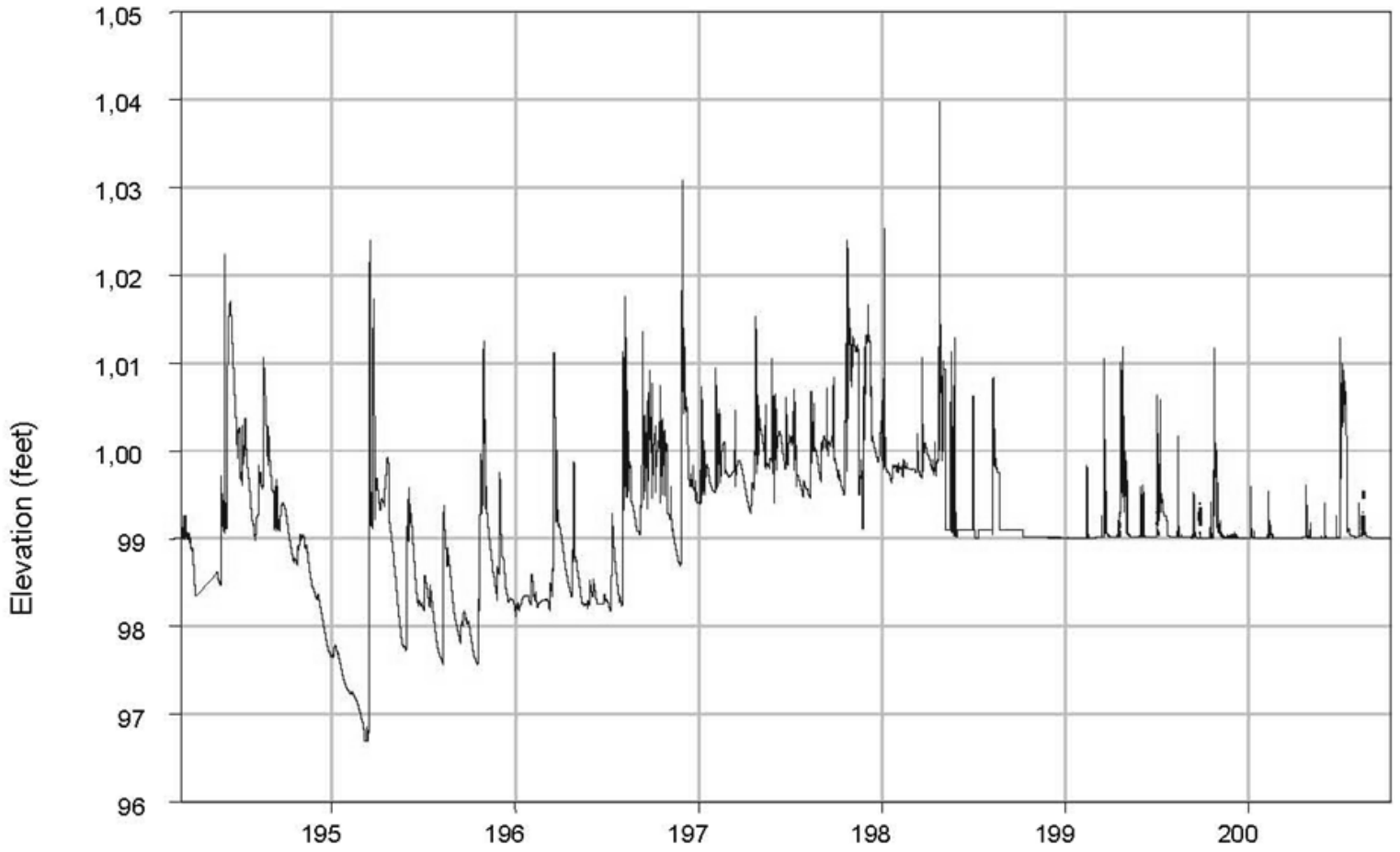


Figure 2.1 Historic Water Surface Elevation

3 PLANNING PROCESS

The planning process for the approval of a Master Plan requires (1) establishment of the Corps' vision and mission; (2) establishment of what and how the Plan will be used; (3) input of needs and desires from stakeholders and the surrounding community; and (4) defining the guiding principles that reflect the Corps guidance and policy.

3.1 Vision and Mission

According to Corps guidance, the ongoing vision of water resources management is one of sustainability and environmental stewardship in natural resources management. The Corps mission states:

"The Army Corps of Engineers is the steward of the lands and waters at Corps water resources projects. Its Natural Resources Management Mission is to manage and conserve those natural resources, consistent with eco-system management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations. In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance, and restoration practices. The Corps manages for long-term public access to, and use of, the natural resources [of the Basin] in cooperation with other Federal, State, and local agencies as well as the private sector. The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life." (ER 1130-2-550, Chapter 2, Paragraph 2-2.a (1) (15 November 1996).

3.2 Use of Master Plan

The Master Plan is an essential tool in fostering an efficient and cost-effective use of natural resources, recreation development, and management programs. The Master Plan provides guidance for land use and development. It is a vital tool for the responsible stewardship of Basin resources for the benefit of future generations and promotes the protection, conservation, and enhancement of natural cultural, and human made resources. The primary goals of the Master Plan are to identify a water and land management plan, resource objectives, and associated management concepts including:

- Provide the best possible combination of responses to regional needs, resource capabilities and suitability's, and expressed public interests and desires consistent with authorized project purposes.
- Contribute towards a high degree of recreation diversity within the region.
- Emphasize the qualities, characteristics, and potentials of the Basin.
- Exhibit consistency and compatibility with national objectives and other state and regional goals and programs

The Master Plan addresses resources including but not limited to fish and wildlife, vegetation, cultural, esthetic, interpretive, recreation, mineral, water, and outgranted lands and easements. This Master Plan describes and identifies: (1) an inventory of Basin lands, resources, and uses; (2) a summary of the public participation input; (3) a summary of resource and ecosystem use objectives; and (4) the recommended land use plan based on public input, existing resources, and resource objectives.

3.3 Public Participation

Public participation is an essential element in the development of this Master Plan. Community involvement offers an opportunity for the public to voice their concerns and desires for activities permitted in the Basin and also enriches the process with local knowledge of the Basin. The objectives of public involvement are to:

- Provide information about proposed Corps activities.
- Inform decision-makers of the public's desires, needs, and concerns.
- Consult with the public before decisions are reached.

The public has expressed a strong desire for public spaces to meet the diverse and evolving needs of the surrounding communities. The process recognizes the limitations of capital improvement and maintenance budgets within the context of the regulations of the Corps and the Project purpose. While public input is solicited and encouraged under the master planning process, the Corps cannot relinquish decision making authority, nor deviate from legal or policy constraints.

3.3.1 Outreach

Community workshops were held to encourage dialogue between the Corps, the City, and stakeholders. Three community workshops were held at the Lake View Terrace Recreation Center. The first community workshop was held on Saturday, 21 November 2009. At the first workshop, participants reported back to the entire group to provide a summary of their ideas, concerns and recommendations. The second workshop was held on Thursday, 28 January 2010. At the second workshop no formal presentation back to the group was made, but the proposed land use classifications were presented and discussed. Approximately 60 people attended the first two workshops.

At the third workshop, a summary of the resource and ecosystem objectives, and the land use classification map were presented and discussed in an open forum. Approximately 20 people attended the third workshop which was held on Thursday, 29 April 2010. Detailed information on Workshop and Public Participation may be found in Appendix C.

3.3.2 Feedback

The views of workshop attendees may not necessarily reflect the views of the broader public, but are provided here for informational purposes. A number of "comment sheets" were filled out during the meetings. Additional comments were also received via mail and email and these have also been incorporated as part of the public participation process. A graph showing the top 5 comments from all the workshops is shown in Figure 3.1.

Issues and Comments raised by attendees at the first workshop included the following:

- Allow the model airplane flyers to keep the area that they have been using.
- Keep all areas natural and restore where possible, including all of Tujunga Wash.
    - The alluvial scrub is rarer than riparian habitat.
- Re-open the traditional equestrian trails that once encircled the entire area that are now closed.
    - At a minimum, move the fence at the aquatic area to open the equestrian trail when the center is not open.
- Increase patrols and keep homeless encampments in check.
- Limit new development to the periphery where the active recreation and children's areas are located.

- Enforce existing laws.
- Expand biking/hiking trail system.
- Create an off-leash area for dogs.
- Prohibit paint-ball areas.

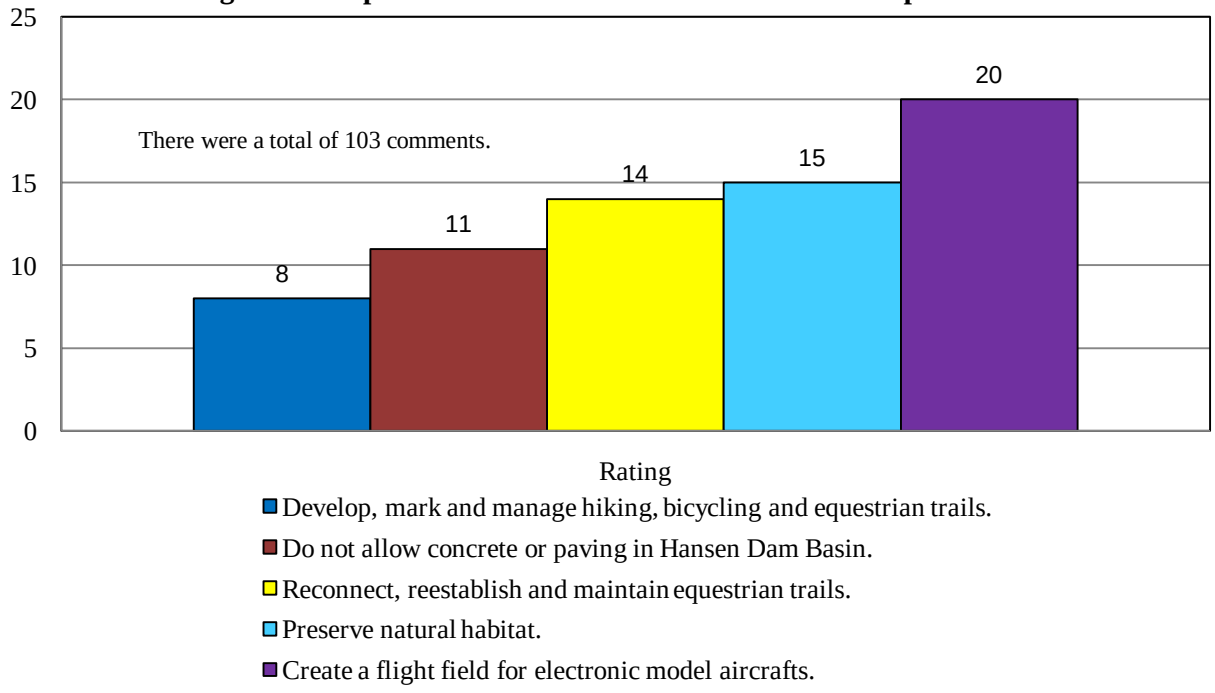
Issues and Comments raised by attendees at the second workshop included the following:

- Concern about the effects of Station Fire on the Basin with the potential for winter storms bringing down heavy sediment loads.
- Quicksand that develops after the wet weather and the lack of proper signage or restrictions to the area.
- Sedimentation restricting the use of the wildlife lake and Holiday Lake.
- Desire for better trail mapping and accessibility.

Issues and Comments raised by attendees at the third workshop included the following:

- The desire for access and fishing on the wildlife lake, much like what was proposed in the 1991 Master Plan and existed previously at Holiday Lake.
- More access to the wildlife lake could reduce homeless encampments.
- Conversion of the low density designation to environmentally sensitive in areas around Tujunga Wash and next to the ballfields.
- Designation of vegetative management or low density recreation instead of inactive and/or future recreation in the areas near ranches.
- Better patrols and maintenance.
- Would like to see the campground (in development phase) opened for local families, not just non-profit organizations, when the campground is finally developed.
- Desire to have Holiday Lake restored by removing sediment.
- Desire for better trail mapping and accessibility.

Figure 3.1 Top 5 Comments from Hansen Dam Workshops



3.3.3 Inclusion

Formation of the Land Use and Resource Plan Recommendations took into account feedback from the community, research on recreation needs and desires, input from the City, and Corps staff. The concerns and issues raised by the public have been communicated to the City since many of these concerns fall into the realm of ongoing maintenance which is the responsibility of the City in accordance with the terms of the lease, rather than Master Plan recommendations.

3.4 Guiding Principles

Following the completion of public workshops, community input was utilized in concert with existing Corps guidance to compile a list of guiding principles for the management of the Basin Five guiding principles have been identified including:

- Ensure that all uses within the Basin are consistent with the primary Project purpose;
- Ensure that a variety of recreational opportunities exist;
- Stakeholders recognize the importance of fostering environmental responsibility and preservation of cultural and historical resources;
- Provide guidance in protecting and restoring ecosystem function crucial to human, plant, and animal life in the region; and
- Management of the Basin and activities should integrate sustainable practices.

4 LAND ALLOCATION, EXISTING LAND USE CLASSIFICATION, AND RESOURCE INVENTORY AND ANALYSIS

The Corps land use classification system is defined in EP 1130-2-550. The Corps acquires land for a specific purpose. This purpose is its "allocation." Allocated lands may be utilized under the opportunities and constraints of "land use classifications." This section describes land allocations and land use classifications, and provides a complete description of all lands within the Basin and their existing classifications, uses, conditions, and needs.

4.1 Land Allocation

Land allocation refers to the identification and documentation of lands at Civil Works projects is in accordance with the authorized purposes for which they were or are to be acquired. There are four primary land allocation categories applicable to Corps projects for Project Operations (e.g., flood risk management, water supply, hydropower, etc.), Recreation, Fish and Wildlife, and Mitigation. For Hansen Dam, the Basin land was originally acquired for the purpose of flood risk management, which falls under the allocation of Project Operations. This allocation establishes that the primary and uncompromising purpose of the Basin is operations for the purpose of flood risk management. All land use classifications are secondary to this purpose and must be compatible with flood risk management.

Land Allocation
Operations

Land Use Classifications
Project Operations
Recreation
Environmentally Sensitive
Multiple Resource Management*
Easement Lands
***Multiple Resource Management**
Recreation – Low Density
Vegetative Management
Inactive and/or Future Recreation

4.2 Land Use Classifications

Allocated Project lands are further classified to provide for development and resource management consistent with authorized project purposes, the provisions of NEPA, and other Federal laws. The classification process refines the land allocations to fully utilize project lands and must consider public desires, legislative authority, as well as regional and project specific resource requirements and suitability. The Project Operations allocation takes precedent over any other classification categories. Agricultural or grazing use of project land is not a land use classification, but is an interim or corollary use to meet management objectives. Land is classified into one of the following uses:

Project Operations This classification category includes those lands required for the structure, operations center, office, maintenance compound and other areas that are used solely for Project Operations. In many cases the majority of lands (rim lands, etc.) on Corps projects will be allocated to Project Operations.

Recreation Land developed for intensive outdoor recreation activities by the public, including developed recreation areas, and areas for concession, resort, and quasi-public development. At new projects, recreation areas planned for initial development will be included in this classification. Future areas will be classified as Multiple Resource Management until initiation of the development.

Mitigation This includes land acquired or designated specifically for mitigation. Land classified in this category should be evaluated for consideration for lease or license to the Department of the Interior or the state.

Environmentally Sensitive Where scientific, ecological, cultural, or esthetic features have been identified for conservation and preservation. These areas must be considered by management to ensure the sensitive areas are not adversely impacted. Limited or no development of public use is contemplated on land in this classification. No agricultural or grazing uses are permitted on this land.

Multiple Resource Management Lands managed for one or more of, but not limited to, these activities to the extent that they are compatible with the primary allocation(s). The activities should be fully explained in the narrative portion of the Master Plan.

> Recreation - Low Density Low density recreation activities such as hiking, primitive camping, wildlife observation, hunting, or similar low density recreation activities.
>
> Wildlife Management Lands in this sub-category shall be evaluated for consideration for lease or license to the Department of the Interior or the state, or shall be designated for direct management by the Corps.
>
> Vegetative Management Includes management activities for the protection and development of forest and vegetative cover.
>
> Inactive and/or Future Recreation Areas Recreation areas planned for the future or that have been temporarily closed. These lands will be classified as Multiple Resource Management in the interim.

Easement lands All lands for which the Corps holds an easement interest but not fee title. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the project.

4.2.1 Land Use Classification Restrictions

Certain uses of and activities at the Basin are not compatible in all classifications, or are limited within classifications. Uses and activities designated as incompatible within a classification are not permitted. Additional guidelines and restrictions applicable to all land use classifications can be found in Appendix A, Outgrant Policies.

4.2.1.1 Project Operations

- Recreation is generally incompatible with the Project Operations classification. No recreation activities are permitted within Project Operations areas except on specifically designated trails and by permission of the District Commander.
- Potentially compatible activities that require review and approval by the District Commander include: filming, training activities for public organizations (e.g., police and fire departments), biological surveys, and volunteer activities. Filming, training and biological surveys must comply with the procedures and requirements outlined in the applicable appendices to this Master Plan. Volunteer activities require case-by-case analyses.
- Use by government personnel during emergencies (fire department staging, etc.) is potentially compatible but shall require case-by-case analysis under the applicable procedures and requirements, including Federal environmental laws and regulations.

4.2.1.2 Recreation

- Structures/development are allowed to support high density recreation uses and users (e.g., restrooms, drinking/water fountains, garbage and recycling cans, informational signage/kiosks, benches, picnic tables, group picnic areas, etc.). Sports fields and amenities requiring improvements to the land, including grading, excavation, or installation of structures require specific analysis and compliance with applicable environmental laws.
- Dogs and other animals/pets are allowed only on-leash, 6 feet in length or less, except where dog parks for off-leash use are specifically designated.
- Bicycles are allowed on designated trails, paths, and roads. Trails may be closed in the event of excessive erosion.
- Horses are allowed on trails, paths, and roads, but no grazing is permitted.
- Organized volunteer activities that are non-invasive or minimally invasive, such as trash pickup, held outside of breeding season (15 March – 15 September) or over 100 feet from habitat areas are considered compatible.
- Limited special events may be compatible. Special events are preferred at the areas designated in the Special Events Policy. Special events may be permitted outside these designated areas in certain circumstances subject to event-specific review. See Appendix A, Outgrant Policies, Special Events Policy for additional guidance.
- Filming and training activities may be compatible and should be coordinated with the lessee.

4.2.1.3 Environmentally Sensitive

- Structures/development is considered compatible only to support trail users (e.g., restrooms, drinking/water fountains, garbage and recycling cans, informational signage/kiosks, and benches). Picnic tables shall be limited and generally located in close proximity to trailheads or other developed areas.
- Pets are compatible only on leashes 6 feet or less in length, on designated trails. No dogs are allowed off designated trails, whether on- or off-leash.
- Bicycles are allowed only on designated trails. Use of bicycles on dirt trails can contribute to erosion. Trails may be closed to bicycles in the event of safety or environmental concerns.
- Horses are compatible on existing trails, but no grazing is permitted.
- Organized volunteer activities that are non-invasive or minimally invasive, such as trash pickup, held outside of breeding season (15 March – 15 September), may be considered compatible but may require specific environmental analysis.
- Special events are not compatible with this classification. No special events may be held within or traverse Environmentally Sensitive areas. This restriction includes, but is not limited to, organized walk/run events and bicycle races.
- Boating, swimming, and fishing are not compatible with this classification.
- Restoration proposals may be compatible. However, all requests will require request-specific analysis.
- Biological surveys may be compatible subject to certain restrictions and should be coordinated with the lessee, or the Corps, if the area has not been leased to others.
- Still photography is compatible with this classification. Professional still photography may be compatible subject to certain restrictions and should be coordinated with the lessee or the Corps, if the area has not been leased to others.

4.2.1.4 Multiple Resource Management (MRM)

MRM – Recreation – Low Density

- Structures/development is allowed only to support low density uses and users (e.g., restrooms, drinking/water fountains, garbage and recycling cans, informational signage/kiosks, benches, picnic tables, group picnic areas, etc.). No designated, organized sports fields are compatible with this classification.
- Dogs are compatible only on leashes 6 feet or less in length, except where dog parks for off-leash use are specifically designated.
- Bicycles are allowed on designated trails, paths, and roads. Trails may be closed in the event of excessive erosion or unsafe conditions.
- Horses are allowed on trails, paths, and roads, but no grazing is permitted.
- Organized volunteer activities that are non-invasive or minimally invasive, such as trash pickup, held outside of breeding season or over 100 feet from habitat areas, are considered compatible.
- Limited special events may be compatible. Special events are preferred in the land use classification Recreation; however, special events may be permitted in this land use classification area in certain circumstances subject to event-specific review. See the Appendix A, Outgrant Policies, Special Events Policy for additional guidance.
- Still photography is compatible with this classification. Professional still photography may be compatible subject to certain restrictions and should be coordinated with the lessee or the Corps, if the area has not been leased to others.
- Restoration proposals may be compatible with the MRM classification. However, all requests will require specific analysis.

MRM – Vegetative Management

- Structures/development are generally considered compatible only to support trail users (e.g., restrooms, drinking/water fountains, garbage and recycling cans, informational signage/kiosks, and benches). Picnic tables shall be limited and generally located in close proximity to trailheads or other developed areas.
- Dogs and other animals/pets are compatible only on leashes 6 feet or less in length, on designated trails. No dogs are allowed off designated trails, whether on- or off-leash.
- Bicycles are allowed only on designated trails. Use of bicycles on dirt trails can contribute to erosion. Trails may be closed to bicycles in the event of safety or environmental concerns.
- Horses are compatible on existing trails, but no grazing is permitted.
- Organized volunteer activities that are non-invasive or minimally invasive, such as trash pickup, held outside of breeding season (15 March - 15 September), may be considered compatible but may require specific environmental analysis.
- Special events are not compatible with this classification. No special events may be held within or traverse MRM-Wildlife Management or MRM-Vegetation Management areas. This restriction includes, but is not limited to, organized walk/run events and bicycle races.
- Still photography is compatible with this classification. Professional still photography may be compatible subject to certain restrictions and should be coordinated with the lessee or the Corps, if the area has not been leased to others.
- Restoration proposals may be compatible with the MRM-Wildlife Management and MRM – Vegetative Management classifications. However, all requests will require specific analysis. These areas are generally favored for restoration projects such as Corps Civil Works ecosystem restoration projects.

- Biological surveys may be compatible subject to certain restrictions and should be coordinated with the lessee or the Corps, if the area has not been leased to others.

MRM – Inactive and/or Future Recreation

- Areas may include areas leased for recreation or non-recreation purposes, as identified on Basin map.
- Dogs and other animals/pets are allowed only on areas leased for recreation purposes, on leashes 6 feet in length or less.
- Limited special events may be compatible. Special events are preferred at the areas designated in the Special Events Policy. Special events may be permitted outside these designated areas in certain circumstances subject to event-specific review. See Appendix A, Outgrant Policies, Special Events Policy for additional guidance.
- Filming, training, and volunteer activities may be compatible and should be coordinated with the lessee or the Corps if the area is not leased.

4.3 1991 Land Use Classifications

Within the Basin, the land use classifications as reported in the 1991 Master Plan are Project Operations, Recreation, Environmentally Sensitive Areas, and Multiple Resource Management – Potential Recreation, and Inactive and/or Future Recreation, and Easement Lands. The 1991 Master Plan Land Use Classification Map is shown in Map 8.

4.3.1 Project Operations

In the 1991 Master Plan, only the Basin outlet channel, spillway, and outlet works control house were classified as Project Operations. The Dam embankment was classified as Recreation. The 1991 Master Plan permitted public use of an operation and maintenance road on the top of the Dam as a designated trail.

4.3.2 Recreation

The Dam was given a land use classification of Recreation, but also included in this classification was the golf course, Little League fields, Hansen Dam Park, Aquatic Center (not yet developed at the time of the 1991 plan), the Sport Center, Lake View Terrace Recreation Center, Equestrian Area, and Orcas Park. The Aquatic Center was built close to the original footprint as demarcated on the maps in the 1991 Master Plan. No distinctions were made between Recreation and MRM – Recreation – Low Density.

4.3.3 Mitigation

No lands were designated as Mitigation, but it was noted that in the future, some of the Environmentally Sensitive lands may be set aside as Mitigation for debris removal or in association with construction of Phase II of the equestrian center.

4.3.4 Environmentally Sensitive

In the 1991 Master Plan, two areas of approximately 480 acres were assigned to this classification. Both are in the Big Tujunga and Little Tujunga Washes and subject to flooding and sedimentation. These areas support sensitive habitat and are part of wildlife corridors. These areas are recommended to be retained,

and potentially expanded, as Environmentally Sensitive to protect their habitat value. Riparian habitat in these areas contain a mixed sage scrub plant community that requires continued protection.

4.3.5 Multi Resource Management (MRM)–Inactive and/or Future Recreation

The 1991 Master Plan identified 14 potential recreation development areas. Land use developments ranged from low to high density recreation development. It recommended development of low density recreation amenities adjacent to residences and higher density activities in areas along Foothill Boulevard. Lake development was identified to provide a full range of recreation amenities. The lake would feature boating, fishing, interpretation, trails and picnic areas. Amenities of this nature have not been developed.

4.3.6 Easements

Flowage easements refer to lands over which the federal government acquired a limited right to inundate the land. An easement is not equivalent to fee title. The Corps holds flowage easement over 45.9 acres of Basin lands. Lands classified as Easement do not include easements that have been outgranted by the Corps to non-federal entities.

4.3.7 Existing Facility Inventory

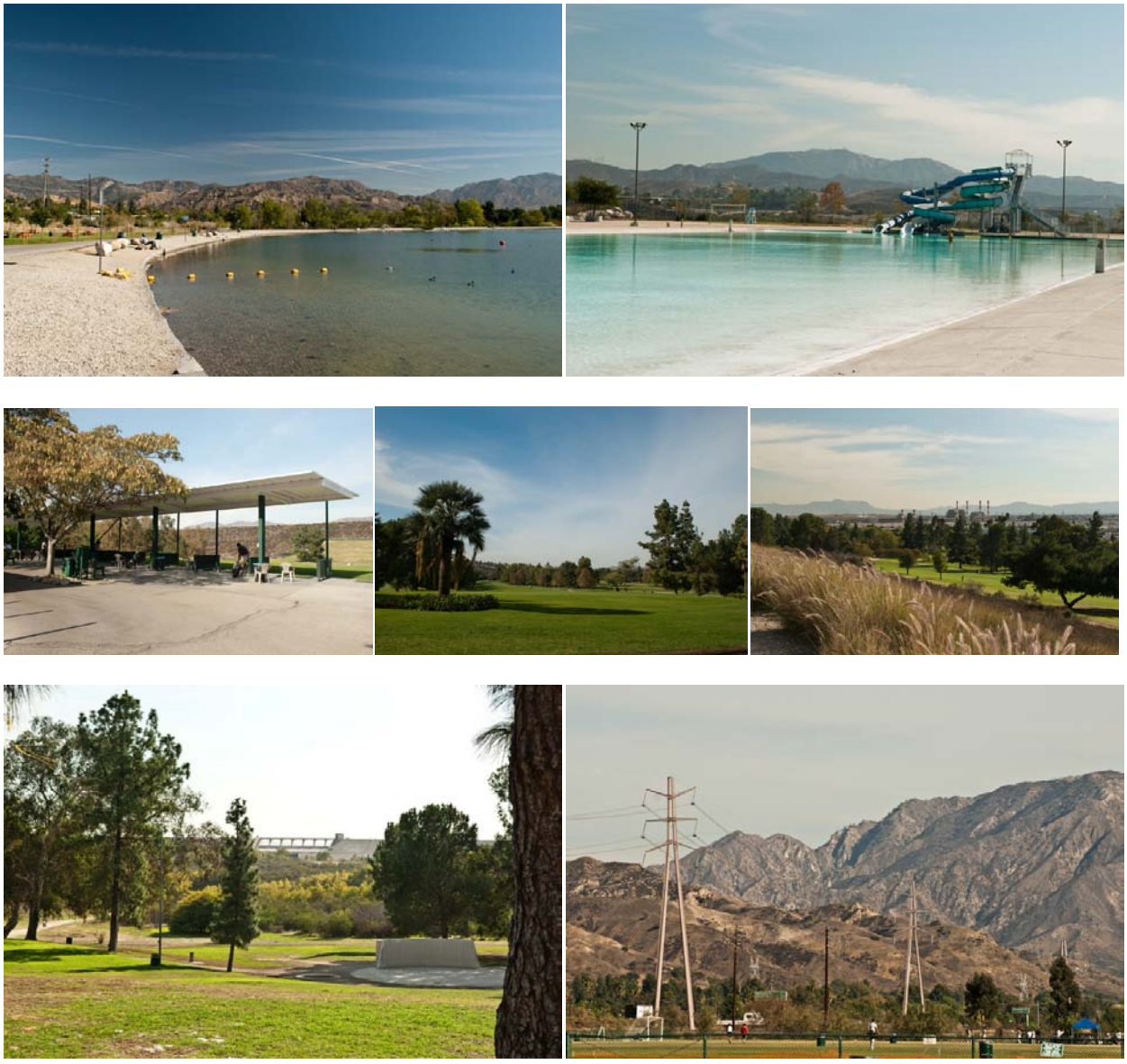
Hansen Dam Park is approximately 37 acres and is located north of the intersection of Osborne Street and Dronfield Avenue. The park includes barbecue pits, an unlighted baseball diamond, a Universal Access Playground (UAP), picnic tables, and an unlighted soccer field. The park has a developed system of trails for hiking and cycling. One of the trails crosses the top of the Dam and an equestrian trail is located at the base of the Dam.

Hansen Dam Aquatic Center is a 40-acre water recreation facility located on the northwest side of Hansen Dam Recreation Area. The facility consists of a 9-acre recreation lake and a 1.5-acre swimming lake. The recreation lake is available for fishing, paddle boat rentals, and public boating. The facility has 50 restrooms, 20 dressing rooms, 25 showers and picnic areas. The facility has parking for 415 vehicles.

Hansen Dam Park

Hansen Dam Golf Course is an 18-hole 211-acres golf course located downstream of the Dam and on the face of the Dam. The golf course includes a pro shop, driving range, and a clubhouse with a restaurant/snack bar.

Hansen Dam Sports Complex is approximately 26-acres, located north of the intersection of Osborne Street and Dronfield Avenue. The complex includes four baseball diamonds, two soccer fields, and an amphitheater.



Top Row: Aquatic Center, Middle: Golf Courses, Bottom: Hansen Dam Sports Complex

Hansen Dam Equestrian Center is approximately 35-acres and is located south of the intersection of Foothill Boulevard and Orcas Avenue, situated between Little Tujunga Wash and Orcas Park. Amenities include stables that can accommodate 100 horses; covered pens; 12 arenas with sand footing for both dressage and jumping; 8 turnouts; and lunging arena areas. Equestrian trails are easily acceptable and ample parking for both vehicles and horse trailers is provided.

Hansen Dam Equestrian Center

Lake View Terrace Recreation Center is an approximately 22-acre complex located to the north of Foothill Boulevard and west of Orcas Avenue. Amenities include barbecue pits, picnic tables, lighted outdoor basketball courts, a children's play area, a 90 person capacity community room, an indoor gymnasium, lighted tennis courts, and parking.

Lake View Terrace Recreation Center

Orcas-Gabrielino Equestrian Center is approximately 22 acres with a large arena and is located east of the Hansen Dam Equestrian Center.

Orcas-Gabrielino Equestrian Center

4.3.8 Qualitative Facility Assessment

A qualitative assessment of the condition of existing recreation amenities was completed to identify potential short-term capital repair needs and potential life-safety issues. The facility assessment does not involve detailed evaluation of structures, non-recreation amenities, and amenities that are not open and available to the public. Potential needs are summarized in Table 4.1.

Table 4.1 Description and Qualitative Assessment of Existing Basin Recreation Features

Facility	Description	Qualitative Assessment
Hansen Dam Park	West side of Basin picnic area, with universal access playground and tot lot. A small storage facility/ administration office is present. Parking areas are plentiful, both paved and unpaved. Overflow parking lots are also located at the east end of the Recreation area (where Osborne and 210 intersect). Overflow parking areas are denuded and result in fugitive dust.	Good
Hansen Dam Sports Complex	Four baseball fields with cyclone backstop and seating risers. Large multi-purpose sports field with soccer goals and 3-4’ cyclone fencing around. Fencing is rusted or bent in places. Small concrete amphitheater with back wall surrounded by grass slope for seating. Grass in need of rejuvenation throughout area. A cyclone fence enclosure is also present. Restrooms in fair condition, but may be in need of more regular maintenance or amenities replacement.	Fair-Good
Hansen Dam Aquatics Center	This area includes a fishing lake that is regularly stocked, picnic areas, a swim lake with lifeguards and water slide, and several restrooms. The fishing lake has a boat wooden/concrete pier boat launch and a small fee hut. Fishing lake shorelines are hardened and few trees are present. Shade may also aid in reducing water temperature for stocked fish. The swim lake (pool) has 4 lifeguard towers, and is surrounding by cyclone fencing.	Good
Lake View Terrace Recreation Center	Gymnasium, restrooms, community room. Two tennis courts outside and 1 full basketball court and 3 hoops. Visitor Center tot lot with sand surface. Awnings recommended for shade over tot lot.	Good
Pacoima Little League	"Sunny Slope" baseball fields. Three fields of varying sizes surrounding by approx. 6' cyclone fence. Lots of trash, vandalism, bent and broken benches or amenities. There are only portable toilets and "dugouts" are extremely small and in poor condition. This facility needs grass rejuvenation, new fencing, new dugouts, new signage, and permanent restrooms, preferably with locker rooms.	Poor
Maintenance Office	Small wooden hut surrounded by cyclone fencing with barbed wire. The area is poorly maintained, fencing is bent and rusted, grass is dead and bare ground is prevalent.	Poor
The Bluffs at Hansen Dam	Maintained grass and ornamental tree area with view of the Aquatics Center and Basin.	Good

Table 4.1 Description and Qualitative Assessment of Existing Basin Recreation Features		
Facility	**Description**	**Qualitative Assessment**
Hansen Dam Equestrian Center	This area includes wooden stables, several horse jump arenas, a small office area, and horse training fields. Ground is level and stables are secure. There are some leaking faucets and lots of dirt and dust in the paved lots.	Good
Orcas – Gabrielino Equestrian Center	Picnic areas, tot lot, lawn, ornamental tree area. There is a horse training field to southeast of Orcas Park.	Good
Hansen Dam Golf Course	18-hole golf course with driving range, clubhouse, restrooms and parking, all well-maintained.	Good

4.4 Existing Environmental Conditions

A draft environmental assessment was prepared in conjunction with this Master Plan to comply with the National Environmental Policy Act (NEPA), other Federal laws, Executive Orders and regulations. It provides a description of the existing environmental conditions within the Basin and additional information.

4.5 Recreation Needs Analysis and Assessment of Potential Future Demand for Amenities

4.5.1 Projected Future Population Growth and Demographic Shifts

The population of Los Angeles County as enumerated in the 2000 Census, was approximately 9.6 million people, with approximately 20% living within the San Fernando Valley, within a 30-mile service radius of Hansen Dam Basin (source: U.S. Census, 2000). A 2007 forecast prepared by the California State Department of Finance suggested that by 2010 the county's population would approach 10.5 million people, and by 2020, approximately 11.2 million people (State of California 2007). The current economic climate may temper this growth rate, which represents 17% from 2000-2020, and 7% between 2010-2020, but over the long term it is anticipated that the County's population will increase, placing demands on existing recreation amenities.

Equally important to consider are projected shifts in demographics and their implications for recreation amenities. State data also suggests that the age cohorts with the largest projected growth rates from 2010 to 2020 are those aged 70-74 which is a 51% increase, ages 65-69, a 50% increase, and 60-64 which is a 32% increase. By contrast, the share of the population that is aged 10-19 is anticipated to decline by over 15% during the period.

These figures reflect the aging of the "Baby Boom" generation, whose members have sought to maintain an active lifestyle, including pursuing a range of low-impact recreation activities such as fitness walking and biking, as well as higher intensity sports like tennis and skiing. This demographic shift may suggest a need to provide and maintain venues for these activities, while also providing for athletic fields that can support team and league activities oriented toward younger participants.

Los Angeles County is also ethnically diverse. Hispanic residents are projected to comprise the largest share of the population in 2020, at approximately 52%. This mirrors the statewide trend: by 2020 California's population of European descent will have grown only 4%, while the Hispanic population will

have grown 58%, and the Asian/Pacific Islander population will have grown 55%. The African American population will have grown 20%, and American Indian population will have grown 29%. Because recreation preferences are related to ethnicity, providing flexible amenities that can accommodate desired pursuits, from large family picnics to cultural festivals, is also important.

4.5.2 Visitation Trends at Hansen Dam Basin and Related Amenities

Figure 4.1 illustrates trends in visitation at Hansen Dam Basin from Fiscal Year 2004 through 2009. Trends are based upon estimates generated from actual enrollment numbers in recreation teams and leagues, attendance at permitted special events, and golf course rounds.

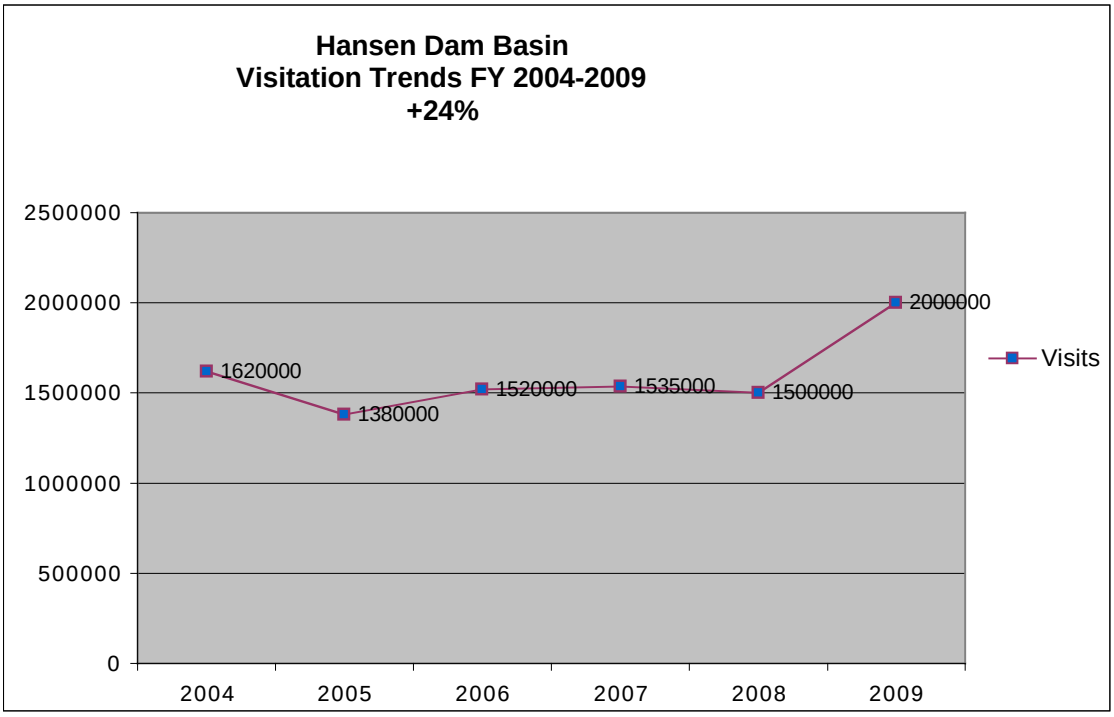


Figure 4.1 Hansen Dam Basin Visitation Trend

Visitation estimates suggest a 24% increase in number of visits and visitor hours during this timeframe, with most of the increase occurring between 2008 and 2009. Recreation managers attribute the 2009 increase to two factors:

- The economic downturn resulting in greater active participation in lower-cost or free recreation amenities. One example is the observed increased use of city-operated golf courses, which are substantially less expensive than private amenities.
- New amenities, including the universally-accessible playground, and planned amenities scheduled to be added at or next to the Basin, including opening a Children's Museum, ranger station, and youth campground which generate additional interest in the Basin even though the amenities are not yet available.

Looking into the future, it is reasonable to assume that visitation would remain roughly stable at 2009 levels, at the most conservative projection, or grow at the projected rate of population increase of

approximately 7% by 2020. Should the economic outlook remain poor, a more significant increase might be observed.

There are a number of regional-scale recreation amenities within a 30-mile service radius of Hansen Dam Basin that are attractive destinations for Los Angeles County residents. The 30-mile service radius is consistent with applicable Federal regulations as well as Los Angeles County level of service standards for regional parks that suggest a 25-mile service radius. Map 12 illustrates regional amenities close to Hansen Dam Basin.

A representative range of these amenities, that illustrates the diversity of options available, includes the following:

- Las Virgenes /Malibu Creek State Park features hiking, fishing, bird watching, camping, picnicking and horseback riding opportunities. There are 15 miles of streamside trail through oak and sycamore woodlands and chaparral-covered slopes.
- Rocky Peak Park encompasses 4,800 acres in the Santa Susana Mountains between Chatsworth and Simi Valley. This Rim of the Valley Trail Corridor property includes the 4,400-acre Runkle Ranch formerly owned by entertainer Bob Hope. Rocky Peak Park stretches from the 118 freeway five miles northward to Las Llajas Canyon, and forms the most critical wildlife habitat linkage between the Simi Hills and the Santa Susana Mountains. Spectacular sandstone boulders, outcroppings, oak savannahs, and perennial water sources provide diverse habitat for birds, mammals, and reptiles. The park features easy to moderate hiking trails of varying lengths.
- Sepulveda Dam Basin, located about 8 miles to the southwest of Hansen Dam is another Corps flood risk management Basin containing an extensive array of recreation amenities that include 3 golf courses, Sepulveda Basin Wildlife Lake, Universally Accessible Playground (UAP), Balboa Sports Complex, Woodley Park, Japanese Garden, archery range, cricket fields, model airplane field, Hjelte Sports Center, Libbit Park, Encino Baseball Complex, miniature golf course, velodrome, dog park, bike trails, and skate park.
- Topanga State Park, which is located in the cliffs and canyons of the Santa Monica Mountains, features 36 miles of trails through open grassland, live oaks and spectacular views of the Pacific Ocean. Picnic sites and a nature center are among the park amenities.
- La Tuna Canyon Park, located on the north slope of the Verdugo Mountains, provides trail access into the steep upper reaches of the mountains. Parking and picnic tables are provided at the trailhead. A trail from the parking lot leads to another picnic area at "The Grotto," one half mile further up La Tuna Canyon Road. The Grotto is a deeply incised canyon with steep walls and large overhanging trees that culminate in a waterfall with a small pool.
- Wildwood Canyon Park, located in Burbank, offers a variety of outdoor activities, including a 2 mile trail system for hiking only which traverses the Burbank side of the Verudgo Mountains. The well maintained park area off of Wildwood Canyon Road provides picnic and open grass areas. Many of the Burbank Nature Programs hikes and activities are conducted in Wildwood Canyon.
- Kenneth Hahn State Recreation Area, managed by the Los Angeles County Department of Parks and Recreation, includes large areas of native coastal sage scrub habitat, lawns and landscaped areas, picnic sites, tot lots, fishing lake, lotus pond, community center and five miles of trails. Active recreation and amenities include the following: playgrounds, one half basketball court, a fishing lake, two lighted baseball diamonds, one lighted multi-purpose field, and one sand volleyball court. Passive recreation includes eight picnic rental shelters and 100 picnic tables throughout the park. There are also eight large barbecue pits and 60 small ones dispersed throughout the park.

- Griffith Park, managed by the City of Los Angeles Department of Recreation and Parks, is the largest municipal park with urban wilderness area in the United States, with over 4,210 acres of both natural chaparral-covered terrain and landscaped parkland and picnic areas, and amenities for camping, golf, soccer, swimming, tennis, and horseback riding. The park also includes specialized amenities such as the Zoo, Griffith Park Observatory, and LA Equestrian Center.
- Elysian Park, the oldest City park, includes over 600 acres of low impact recreation and active athletic opportunities, most with dramatic views of the City. Amenities include baseball fields, Chavez Ridge Disc Golf, Chavez Ravine Arboretum, volleyball courts, tennis courts, picnic areas and hiking trails.

Map 12 also shows that the northern portion of the service area also encompasses the Angeles National Forest, as well as the San Gabriel Wilderness Area.

Considering Los Angeles County as a whole, there are very significant public lands resources available to potential visitors. Table 4.2 illustrates the total park acreage within Los Angeles County. Data was gathered in support of the 2009 *Citywide Community Needs Assessment*, described further below. Los Angeles County provides approximately:

- 87,000 acres of parkland; just under 9 acres per 1,000 people
- 37,000 acres of recreation area; 3.6 acres per 1,000 people
- 13,000 acres of golf courses
- 37,000 acres of wilderness area
- 2,900 acres of beaches
- 645,000 acres of forest.

The range of recreation options within and adjacent to the County is very diverse and responds to a broad spectrum of recreation and leisure preferences. County-wide studies assessing future needs for recreation amenities are not presently available. However, the City of Los Angeles Department of Recreation and Parks completed a citywide community needs assessment in 2009. The objective of the City's needs assessment was to develop strategies to help prioritize and address the challenges the City faces in developing or planning for the provision of recreation amenities, such as:

- Acquiring additional recreation and park land and finding opportunities for the reuse of land already in the public domain.
- Updating existing recreation amenities requiring improvements.
- Preventing future maintenance problems through effective asset management of public amenities.
- Offering positive recreation alternatives to an increasingly dense and urbanized population.

The needs assessment included a comprehensive community outreach and input process that engaged community leaders, stakeholders and the public across the City through a series of one-on-one interviews, focus groups and community forums followed by a statistically valid, mail-phone citywide household survey of almost 3,000 residents. Key findings from this survey as summarized below help to inform our understanding of recreation needs and trends that may have an impact on amenities at Hansen Dam Basin (Figure 4.2).

Key findings from the City's needs assessment are summarized below.

Table 4.2 Acres of Recreation Lands in Los Angeles County

Acres of Recreational Lands in Los Angeles County

Acres (Using 2008 Thomas Brothers Map)	Park	Open Space	Beach	Ecological Preserve / Estuary	Fairground	Historical Park	Historical Point of Interest	Recreation Area	Wilderness Area	Wildlife Refuge	Zoo	Forest	Golf Course	TOTAL ACRES
City of Los Angeles	11,906		166	518			46	1,123		177	103		1,523	**15,562**
Other Cities in Los Angeles County	15,991	2,822		214		18	1	2,274	1,177	137			5,123	**27,757**
Los Angeles County	6,233	58	2,000	134		1,361		1,106		2,019			1,093	**14,441**
State of California	33,833		707	37	470			24,150						**58,727**
Private	57		0					3,271					5,486	**8,984**
Santa Monica Mountains Conservancy	17,519	4,993		870	170									**23,382**
Federal Government	1,516		0					4,366	35,410			645,496		**686,788**
Unknown	225												116	**341**
TOTAL ACRES	**87,280**	**7,873**	**2,873**	**1,773**	**640**	**1,346**	**47**	**36,290**	**36,587**	**2,333**	**103**	**645,496**	**13,341**	
ACRES PER 1000 PEOPLE IN THE CITY (Using 2006 Census Est. 9,948,081)	**Park**	**Open Space**	**Beach**	**Ecological Preserve / Estuary**	**Fairground**	**Historical Park**	**Historical Point of Interest**	**Recreation Area**	**Wilderness Area**	**Wildlife Refuge**	**Zoo**	**Forest**	**Golf Course**	**TOTAL ACRES**
City of Los Angeles	1.197	0.000	0.017	0.052	0.000	0.000	0.005	0.113	0.000	0.018	0.010	0.000	0.153	**1.564**
Other Cities in Los Angeles County	1.607	0.284	0.000	0.022	0.000	0.002	0.000	0.229	0.118	0.014	0.000	0.000	0.515	**2.790**
Los Angeles County	0.627	0.006	0.201	0.013	0.047	0.133	0.000	0.111	0.000	0.203	0.000	0.000	0.110	**1.452**
State of California	3.401	0.000	0.071	0.004	0.000	0.000	0.000	2.428	0.000	0.000	0.000	0.000	0.000	**5.903**
Private	0.008	0.000	0.000	0.000	0.017	0.000	0.000	0.329	0.000	0.000	0.000	0.000	0.551	**0.903**
Santa Monica Mountains Conservancy	1.761	0.502	0.000	0.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**2.350**
Federal Government	0.152	0.000	0.000	0.000	0.000	0.000	0.000	0.439	3.559	0.000	0.000	64.886	0.000	**69.037**
Unknown	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	**0.034**
TOTAL ACRES	**8.774**	**0.791**	**0.289**	**0.178**	**0.064**	**0.135**	**0.005**	**3.648**	**3.678**	**0.235**	**0.010**	**64.886**	**1.341**	**84.034**

Notes:

Population

2006 US Census estimate: 9,948,081(2000 census: 9,519,338)

Data Source

Thomas Brothers 2008 GIS map Layer TBM_LACO_OWNA

Processing

Data layer contained many types of areas. Areas NOT used: Airport, Museum Park, Cemetery, Civic Center, College/University, Hospital, Military, Miscalleneous, Movie Studio, Oil Refinery, Prison, Racetrack, Shopping Mall, Stadium/Arena. Data layer lacked juristriction. Data was compared to TBM's City Boundaries layer, LAEAP's own Parks layer, property names were inspecte; web sites were consulted. Best effort was made ot classify ownership of properties as shown in tables above.
Processed by Daniel Elroi, NorthSouth GIS, 9/10/08.

LARAP's Data

LARAP's own parks layers was NOT used, to help keep this analysis consistent, i.e. To use a single data source. However, the total acres derive from Thomas Brothers match LARAP's own total acres.
Acres per LARAP Parks layer: 15,565

- Unmet citizen needs exist for a wide range of parks, trails, outdoor and indoor amenities and programs. From a list of 30 various parks and recreation amenities, respondents were asked to indicate for which ones they and members of their household have a need. The parks and recreation amenities with the highest percentage of need from respondent households are: walking and biking trails (63%), small neighborhood parks (60%), large community and regional parks (53%), shelters and picnic areas (50%) and nature trails (46%). Interestingly, these are amenities that benefit a broad constituency, not just one or two user groups. The figure below summarizes the percentage of survey respondents indicating a need for each type of facility queried *(all figures taken directly from the Needs Assessment report)*.

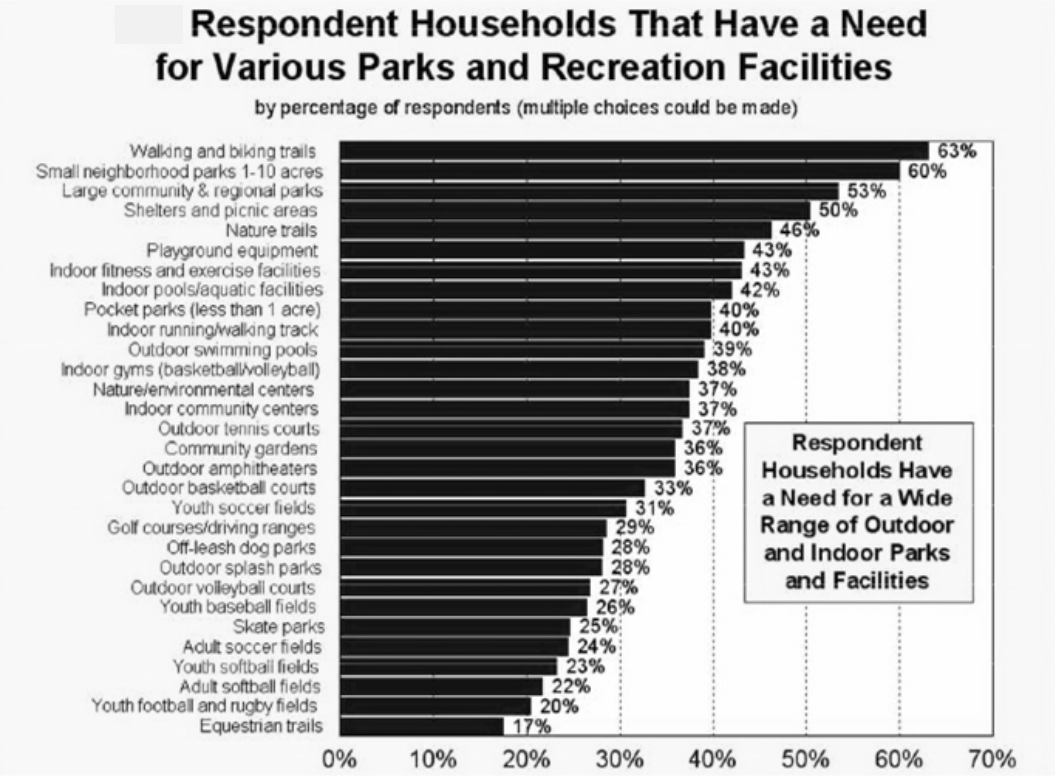


Figure 4.2 Respondent Households that Have a Need for Various Parks and Recreation Amenities

- From a list of 23 recreation programs, respondents were asked to select the four that they currently participate in the most often at the City of Los Angeles Recreation and Parks Department amenities. The programs that respondent households currently participate in most often at City amenities are: special events/festivals (8%) and youth sports programs (7%). It should also be noted that special events/festivals had the highest percentage of respondents select it as their first choice as the program they currently participate in most often at City amenities.

4.5.3 Assessment of State Future Trends

The trends described above, which emphasize low impact, low density recreation, are echoed in the California State Parks' 2008 California Outdoor Recreation Plan (CORP, California State Parks, 2009).

Californians tend to participate in activities that are less expensive, require less equipment, and need fewer technical skills. Californians' top 15 activities (by participation) were:

1. Walking for fitness or pleasure
2. Driving for pleasure, sightseeing, driving through natural scenery
3. Beach activities
4. Swimming in a pool
5. Day hiking on trails
6. Wildlife viewing, bird watching, viewing natural scenery
7. Jogging and running for exercise
8. Bicycling on paved surfaces
9. Outdoor photography
10. Using open turf areas
11. Using play equipment, play structures, tot-lots
12. Organized team sports such as soccer, football, baseball, softball, basketball
13. Fishing – freshwater
14. Bicycling on unpaved surfaces and trails
15. Surfing or boogie boarding, windsurfing

The most commonly used facility types included community/facility buildings, open spaces to play, picnic tables/pavilions, unpaved multipurpose trails and paved trails. Less than 20% of respondents reported using amusement (e.g., park train ride) areas, tennis or basketball courts, dog park areas, botanical gardens, or skate parks. The most common activities adult respondents participated in were:

- Walking (49%)
- Playing (30% - e.g., Frisbee, playing catch with a ball, kite flying, playing with children)
- Sedentary activities (24%)
- Eating/picnicking (24%)

Respondents participated the least in:

- Fishing (5%)
- Active water sports (4%)
- Tennis (2%)
- Martial arts/tai chi/yoga (<1%)
- In-line skating (<1%).

When asked which recreation activities they would like to participate in more often, the majority of adult respondents chose:

- Walking for fitness or pleasure (46%)
- Camping in developed sites with amenities such as toilets and tables (45%)
- Bicycling on paved surfaces (45%)
- Day hiking on trails (44%).

California Outdoor Recreation Plan 2008 Research suggests that this demand is from a variety of age groups including the Baby Boom generation, which continues to hike, mountain bike, kayak, and engage in other physically active, resource-based recreation. By contrast, golf and tennis are decreasing in popularity.

This state wide survey suggest a continuing future need for outdoor recreation walking/jogging/cycling paths, flexible open turf areas that are not necessarily dedicated to a particular type of programming, and opportunities for the occasional but perhaps transient high risk adventure sport.

4.5.4 Projections of Potential Future Needs and Demands

Recreation managers for the City indicated that the most popular areas at Hansen Dam Basin are:

- The Sports Complex
- The Aquatics Center including fishing areas
- Hansen Dam Park, including the playground and trails. Walking on top of the Dam is very popular.
- Lake View Terrace
- Gabrielino Park
- The Golf Course

Recreation managers indicate that none of these areas are so heavily utilized as to suggest that future management actions may be required to address potential resource impacts associated with a large number of visitors. Demands for these amenities are highest on the weekends; during the week, demand is reasonable and readily managed.

Public demand is high for soccer, baseball, and for open turf fields that can support flexible programming and are not dedicated to one particular use. Recreation managers report that demands are high for these amenities throughout the City and not just within the immediate service area covered by the Basin.

Recreation managers were queried about visitor use patterns, movement between amenities, and needs for improved connectivity within the Basin, and from the Basin to adjacent neighborhoods. Use patterns tend to vary depending on the type of activity that a visitor engages in. For highly specialized activities/amenities, such as using the Sports Complex, visitors tend to go to the activity venue, participate in the onsite activities, and then leave. Visitors participating in more generalized activities, including full day users, may move between Basin facilities. For example, some visitors may use the aquatic amenities and then visit the playground.

Generally, recreation managers felt positively in regard to connectivity between amenities within the Basin and externally to adjacent neighborhoods. Recreation managers will look to improve connections before the Children's Museum opens, although it should be noted that the museum is not on Corps Basin land but accessible from it.

Recreation managers assessed the potential need for additional parking, restrooms, and related support amenities. No chronic parking issues were reported such as visitors parking on grass, or illegally on roadways that were viewed as requiring management actions. The overlook occasionally experiences issues in the early morning and later in the evening, and recreation managers are considering expanding the parking lot, more effectively delineating spaces, and providing curbs and bollards to keep visitors in designated areas.

Restrooms can face heavy pressure during highly attended events, such as the 4th of July celebration that drew an estimated 25,000 people in 2009. Additional amenities may be needed. Installation of portable restrooms in the short term may help alleviate this pressure.

4.5.5 Conclusions and Implications for Facility Carrying Capacity, Long Range Sustainability, and Future Recreation Needs

Hansen Dam Basin provides a diverse array of recreation experiences, from "traditional" bat-and-ball active athletics, an aquatics facility with a zero depth entry pool, fishing amenities, a Universal Access Playground, multi-use trails, and a golf course. Additional improvements proposed for development include a youth campground, ranger station, and skate park.

Projected visitation at Hansen Dam Basin through 2020 is estimated to remain stable at 2009 levels, in the most conservative projection, or grow at a rate equal to or exceeding the projected population increase of approximately 7%. This growth in visitation suggests additional demands on resources at Hansen Dam Basin, for active athletic playing fields, and lower impact amenities such as trails and picnic areas in response to desires for more "green breathing space" and opportunities to be "in nature."

Basin carrying capacity, which includes both an environmental dimension, "how much use can the resource support without being compromised?", and a social dimension "how much use can occur before the quality of visitor experience is diminished?", presently appears to be in balance. Since it is estimated that visitation will continue to increase, future land use development plans and studies will be required to account for population growth, balance recreational diversity, and accommodate new demands within a developed footprint in a manner that is environmentally and economically sustainable.

4.6 Land and Resource Sustainability and Analysis

This section concludes with an assessment of the physical and adjacent use conditions and factors that will influence any potential future development of recreation amenities.

4.6.1 Constraints, Suitability, and Compatibility

4.6.1.1 Flood Risk

The primary constraint for land uses within the Basin is the periodic inundation of Basin lands as a result of operation of the Dam for downstream flood risk management. Areas within the Basin have been identified according to topographic analysis that reflect the level of flood inundation, and what activities and structures may occur within each area. Table 4.3, based on CESPD R 1110-2-1, provides the acceptable uses of each inundation category, including appropriate structure constraints and appropriate recreational or other uses.

The frequency, extent, and duration of flood inundation must be considered in the management and appropriate use of the Basin. As part of this updated Master Plan, the filling frequency curves have been recalculated, and maps have been developed that illustrate flood stage elevations for the 10-, 50-, and 100-year floods. Map 13 superimposes these flood lines on a map that illustrates locations of existing recreation amenities. There are no areas of particular concern since the recreation amenities are outside the 100-year flood zone.

Table 4.3 Minimum Criteria for Basin Land Use		
Evaluation Frequency	**Development Constraints**	**Acceptable Land Uses**
Up to 10-yr flood	Subject to prolonged inundation, sedimentation, and wave erosion	Structures are not recommended. Natural trails and open play fields are acceptable.
10-yr flood to the 50-yr flood	Subject to frequent flooding, sedimentation, and wave erosion	Open or floodable structures and field amenities that can sustain inundation with acceptable maintenance cost. Concession stands with portable contents, bridle trails, shade and picnic armadas, backstops, goalposts, etc. are considered appropriate.
50-yr flood to the 100-yr flood	Subject to periodic flooding, sedimentation, and wave erosion	Floodable structures and multipurpose paved surfaces that can sustain inundation with acceptable maintenance cost. Floodable restrooms and picnic areas are considered appropriate.
100-yr flood to the Basin Design Flood	Subject to infrequent flooding, sedimentation, and wave erosion	Flood-proofed, closed structures are permitted. Structures conductive to human habitation are prohibited.

4.6.1.2 Topography

The topography within the Basin appears to be relatively flat, (Map 14) but actually ranges from an elevation of 1,000 feet NGVD at the outlet works to 1,100 NGVD feet at the east end of the Basin in the vicinity of Big and Little Tujunga Washes. The highly disturbed area adjacent to the inflow in and adjacent to the Big and Little Tujunga Washes is subject to frequent inundation, and consequently the topography undergoes frequent modification. Areas in the Basin that would be highly suitable for future recreation development would be in the northern portion of the Basin, which is relatively flat and above the 50-year flood elevation. The land in the southern portion of the Basin has very steep slopes, making it unsuitable for recreation development.

Wildlife Lake

Picnic Area

4.6.1.3 Connectivity and Accessibility

Connectivity and Access to the Basin Interstate freeway 210 transects the Basin. The Basin is accessible from the 210 freeway via the Osborne Street exit or Wheatland Ave. exit. Locally the Basin is accessible from the Osborne Street, Dronfield Street, and Foothill Boulevard. Equestrians can access the Basin from

Little Tujunga Wash where there is passage under Foothill Boulevard and the 210 Freeway. The Basin is also served by the following Los Angeles County Metropolitan Authority (Metro) bus lines: 90, 91, 290, 166, 292, and 364; and City of Los Angeles Department of Transportation (LADOT) bus lines 409 and 419.

Accessibility and Connectivity within the Basin There are numerous parking lots throughout the Basin that provide close access to the major amenities and amenities. Map 19 shows the location of recreation amenities and their associated parking lots and access points. Because of the location of the recreation amenities, these are primarily along the perimeter of the Basin and fortunately do not impact the more ecologically sensitive areas of the Basin.

Trails throughout the Basin are ephemeral in nature since the Basin is subject to sedimentation. These may change seasonally as they are reestablished by the equestrian community riding through the area.

Equestrian Trail in Tujunga Wash

Recreation managers report that amenities within the Basin are handicapped accessible. Restrooms, shelters, and other buildings within the Basin have been designed for universal access.

Trails that are not paved are typically comprised of compacted native soils. Unpaved trails may pose an obstacle to Basin visitors with limited mobility, due to the inherent unevenness and minimal stability of a natural hiking trail. Trails may also have a slope that may limit use by ADA standards.

Wildlife Corridors and Connectivity Habitat connectivity is an important factor for the health of fish and wildlife populations (Krebs 1994). The minimum range that a species needs varies. A larger suitable habitat range allows for more abundant and diverse plant and animal populations. Movement of species within or between areas of suitable habitat can be limited by the presence of barriers, which may limit the overall habitat range available. Hansen Dam Basin is located near the San Gabriel Mountains; an area of relatively high biological diversity and abundance. The connectivity of the Basin with these mountains determines the species diversity and abundance found within the Basin.

Movement of wildlife between two areas varies by species and each species may require differing corridor characteristics. Spencer (2005) defines two types of barriers; a barrier that is impassable under any circumstances for a particular species, and a filter barrier, which may be utilized by a species under some circumstances. For example, most small ground-dwelling species such as amphibians, reptiles, and small mammals will not pass or are reluctant to pass over a busy roadway, retaining walls, a large area with no vegetation, fences, or other physical barriers or through filters, and are therefore less mobile than other species (Spencer 2005). Fish barriers include low or no stream-flow, culverts, dams, concrete channels, felled trees and other natural and man-made obstacles. Large mammals and birds are less sensitive to barriers.

Tujunga Wash

The Basin is connected to the San Gabriel Mountains via the Big and Little Tujunga Washes, which pass beneath Interstate 210 and provide both an aquatic and terrestrial habitat corridor. This is a corridor that plants, fish and wildlife may use to for movement between habitats. Aquatic passage through this corridor is extremely limited due to normal low flows and the presence of the Dam. Terrestrial species are able to pass into the stream corridors from Angeles National Forest and then into the Basin beneath Interstate 210. The highway bridge allows physical passage for all species.

The Basin is not connected to any other significant natural habitats other than the San Gabriel Mountains. Movement in or out of the Basin is restricted by the Dam embankment, surrounding urbanization, and roadways. As a result, it is important to maintain open and unrestricted passage within the stream corridors for both aquatic and terrestrial species.

4.6.1.4 Maintenance of Recreation Amenities

A major constraint to new or changed development within the Basin can be the resources needed for adequate maintenance. During economic downturns when municipal revenues are reduced, recreation department budgets may be reduced. By contrast, when budgets are adequately funded, finding and employing trained staff may be a challenge. Compounding this problem for recreation managers is the availability of funding for capital improvements but a lack of sufficient funding for ongoing maintenance. Consequently, construction of additional recreation amenities without additional operations and maintenance funding will stretch existing park maintenance resources.

When new amenities are proposed additional maintenance resources should be identified at the outset. If additional resources are not available to meet the additional needs, fees or volunteer services may be an alternative to address resource gaps.

5 RESOURCE OBJECTIVES

5.1 Introduction

The resource objectives are based on input from stakeholders as well as Corps Guidance. For each of the land use classifications, resource objectives have been identified. Seven proposed land use classifications are identified for the Basin: Project Operations, Recreation, Environmentally Sensitive, and MRM for Recreation – Low Density, Vegetation Management, Inactive and/or Future Recreation, and Easement Lands. There are no Resource Objectives for Easement Lands.

Table 5.1 Resource Objectives by Land Use Classification

Resource Objective	Project Operations	Recreation	Environmentally Sensitive	MRM Recreation – Low Density	MRM Vegetative Management	MRM Inactive and/or Future Recreation
Environmental Quality and Character	X	X	X	X	X	X
Connectivity	X	X	X	X	X	X
Community Involvement	X	X	X	X	X	X
Global Climate Change	X	X	X	X	X	X
Energy	X	X	X	X	X	X
Economic Development	X	X	X	X	X	X
Flood Risk Management	X	X	X	X	X	X
Safety and Security	X	X	X	X	X	X
Recreation		X			X	
Education		X		X	X	
Wildlife Habitat and Native Plant Communities			X		X	
Wetlands			X		X	
Water			X		X	
Soil Conservation	X	X	X	X	X	X
Air Quality	X	X	X	X	X	X
Visual and Auditory Quality	X	X	X	X	X	X
Cultural Resources	X	X	X	X	x	X
Sustainable and Local Agricultural Uses						X

5.2 Objectives Applicable to All Land Use Classifications

Resource management is moving towards an integrated ecological approach, as demonstrated by the changing guidance of the Federal government and the Corps. In highly urbanized areas such as southern California, ecosystems and their various habitat communities have become severely restricted. With the surrounding environment so drastically altered, biodiversity (species richness) is reduced and landscape linkages are broken. Conservation and restoration require a redefined planning process. A master plan and accompanying DEA must reflect the most current advances in restoration ecology and wildlife management in the context of the Corps mission, regulations, and guidance.

Restoration to a prior undeveloped state may no longer be practicable or feasible. The hydrology, topography, microclimates, and even soil structure and composition may be significantly altered due to previous construction activities within the Basin. Water tables may have lowered over time from groundwater pumping. Surrounding urban development adds unseasonal water runoff that carries high loads of pollutants, increased water temperatures, exotic invasive plant species, and drives a plethora of animal species that do not and cannot thrive in human-dominated ecosystems into remaining open spaces to seek refuge.

Science now recognizes the need for habitat connectivity so that wildlife not only has the necessary space to roam, but also has genetic diversity to ensure that an "island effect" on species is not inadvertently created on remnant habitat lands. With species increasingly endangered or of special concern, objectives must consider habitat that is needed for species most at risk given current conditions at Hansen Dam Basin. Objectives must also anticipate changes that may alter this scenario in the future. Effective adaptive management techniques need to respond to current conditions as well as an unknown future.

In the spirit of moving toward an integrated ecosystem approach, the Corps has developed a set of guidelines that capture a variety of goals that together foster a functional ecosystem, which have been incorporated into the development of Resource Objectives. The following Resource Objectives are common to all land use classifications and incorporate the principles of Environmental Stewardship, Flood Risk Management, Safety and Security, Environmental Quality and Character, Connectivity, Community Involvement, Global Climate Change, Energy, and Economic Development.

5.2.1 Flood Risk Management

Goal Through structural and non-structural solutions, minimize flood risk to downstream communities, thereby minimizing danger of loss of life and minimize damages to real and personal property.

Rationale The primary goal of management of the Dam is flood risk management as authorized under the 1936 Flood Control Act. Flood risk management is the process of identifying, evaluating, selecting, implementing and monitoring actions to mitigate levels of risk. Scientifically sound, cost-effective, integrated actions are taken to reduce risks while taking into account the cultural setting in which the Basin resides. (U.S. Army Corps of Engineer's Institute for Water Resources,2008, *Value to the Nation: Flood Risk Management.)* Even with heavy visitor use of recreation amenities and the enjoyment of the wildlife areas, the public may not be cognizant of the importance of the role the Basin plays in protecting their communities from floods, nor realize the danger posed by potential flooding.

Resource Objectives

- Promote installation of signage and interpretation to educate the public about the role of the Basin in flood risk management.

- Ensure that future land use proposals and activities are compatible with estimated levels and frequency of inundation, to ensure that the Dam can be operated without constraints that compromise downstream flood risk reduction.

Resources EO 11988, ER 1165-2-26, ER 1110-2-240, ER 1130-2-530, EP 310-1-6a,; CESPD R 1110-2-1.

5.2.2 Safety and Security

Goal Ensure that visitors are safe from physical hazards as well as ensuring personal safety while visiting the Basin.

Rationale The Dam was built to help minimize flood risk to lives and property from flooding. Safety also extends to visitors using the facilities within the Basin. A visitor's ability to survey and comprehend the environment of an area, the ability to enter and exit quickly, and feel safe while enjoying the Basin is critical to optimizing the experience. All land uses within the Basin should be reinforced with safety and security measures, including Dam operation and maintenance, facilities, and construction, and recreational activities.

Resource Objectives

- Encourage educating the public and lessees on flood risk awareness and safety issues.
- Ensure that all infrastructure is properly maintained to avoid creating a public hazard.
- Promote a means for visitors and emergency personnel to communicate quickly their specific location in the Basin.
- Encourage safety features be implemented such as fencing, lighting, warning signs, and that call boxes are installed where needed and maintained.
- Encourage lessee to maintain adequate patrols for safety.
- Encourage design of amenities so that vandalism and other "illegal activities" are discouraged.
- Encourage safe neighborhood connections.
- Continue to conduct risk assessments to identify opportunities and constraints for improving Basin safety.
- Maintain a Basin safety plan that ensures that restricted areas, danger zones, and hazardous areas are clearly marked and if necessary, barricaded and closed.

Resources EP 1130-2-550, EM 385-1-1

5.2.3 Environmental Quality and Character

Goal Protect, conserve and improve the overall environmental quality and character of the Basin, including unique and important natural and cultural resources of the Basin.

Rationale Environmental quality and character refers to the integrity and value of resources which comprise an environment, including land and water related resources, esthetic and cultural resources. The Basin contains resources which are considered important and/or significant. These resources individually and cumulatively contribute to the overall environmental quality and character of the Basin.

The conservation, preservation, and restoration of environmental resources is recognized as important to human welfare and quality of life. Through environmental legislation, Congress has indicated that protection and enrichment of environmental quality is in the public interest.

EO13112 and the Corps Memorandum on Invasive Species Policy direct the Corps towards energy efficiency, sustainability, eradication of invasive species, and educating the public on the adverse impacts of invasive species. Carrying out these objectives would improve environmental quality and character within the Basin.

Resource Objectives

- Encourage uses, activities, management practices, and future development that conserve natural and cultural resources.
- Preserve areas containing unique, sensitive and/or significant resources to minimize disturbance so the integrity and values will not be adversely impacted by other uses, management practices or developments within the Basin.
- Design site, operation of facilities, and activities to avoid or minimize adverse environmental impacts per Corps guidelines and design criteria.
- Avoid significant impacts on resources through change in design, location and/or use of future amenity development.
- Conserve and protect those resources which cumulatively contribute to the Basin's overall environmental quality and character.

Resources North American Wetlands Protection Act, Aesthetic and Scenic Quality § 232 of WRDA 1996, Endangered Species Act, National Historic Preservation Act as amended, Clean Air Act, Noise Control Act, Clean Water Act, Environmental and Economic Benefits of Landscape Practices on Federal Landscaped Grounds 60 Fed 408 37, EO 13186 Federal Responsibilities to Protect Migratory Bird Act, and ER1130-2-540.

5.2.4 Connectivity

Goal Connect the Basin to the surrounding landscape to facilitate the efficient movement of people and wildlife in a manner that minimizes environmental degradation and maximizes ecosystem function, respectively.

Rationale Connectivity on multiple levels is important in order to maintain the dynamic processes and relationships within the Basin of natural and human resources. The Basin, a remnant of once larger ecosystems, should not function as an independent landscape patch. Attention should be directed towards wildlife corridors and how the Basin is integral to the movement of wildlife through the region. Similarly, there should be seamless systems of linkages and trails that are connections for human access and movement and should not be cut off from the surrounding neighborhoods. The movement of people in, out, and around the Basin must be considered in light of various modes of transportation and individual mobility and the need for safety and to quickly evacuate during a flood event. Movement within the Basin must be accessible, whether by a single person or in a group, able-bodied or physically challenged, and should include hiking, biking, and equestrian trails throughout the Basin.

Resource Objectives

- Encourage identification and connection with regional trail systems and eliminate impediments to trail connections within the Basin.
- Encourage development of a trail system that loops back upon itself.
- Encourage the connection of Basin trails with trail systems outside the Basin.
- Promote safe and efficient circulation and access to the Basin's recreation facilities to control traffic and provide a link between activities within the Basin.

- Encourage the restoration of creeks and streams to allow for safe corridors for wildlife movement.

Resources National Trail Systems Act, Trails for America in the 21st Century Act.

5.2.5 Community Involvement

Goal Encourage the local community to become partners with the City and the Corps as stewards of the Basin.

Rationale The public partners with the Corps and recreation managers in being stewards of the Basin. If the community has a strong sense of ownership of the land, problems can be addressed and often solved at the local level. Community/grassroots empowerment is often the best means of identifying and protecting resources of the site, and educating the public about those resources.

Resource Objectives

- Promote the spirit of personal stewardship of public lands through volunteer programs for education and interpretation, clean-up and restoration activities, and safe accessibility of the Basin.
- Encourage communication channels among Basin users, the City, and the Corps for continuous dialog on problems and opportunities for Basin amenities.
- Ensure full disclosure and community awareness and input when new amenities are proposed.

Resources National Environmental Policy Act (42 USC 4321 et seq.), EP 1130-2-550, 3-6.

5.2.6 Global Climate Change

Goal To develop, implement, and assess adjustments or changes in operations and decision environments to enhance resilience or reduce vulnerability of Basin projects, systems, and programs to observed or expected changes in climate.

Rationale Climate change impacts affect water availability, water demand, water quality, storm water and wastewater infrastructure, flood and storm infrastructure, wild land fires, ecosystem functioning, and energy production and demand. All of these factors affect the water resources projects operated by the Corps and its non-Federal sponsors. Many of these were designed and constructed before climate change was recognized as a potential influence.

The Basin's water resources infrastructure and programs, existing and proposed, may be affected by climate change and adaptation to climate change. This affects design and operational assumptions about resource supplies, system demands or performance requirements, and operational constraints.
The Corps' Institute for Water Resources (IWR) has taken the lead in defining the Corps' response to Global Climate Change. (For further information, which is available at http://www.iwr.usace.army.mil/ inside/ products/climatechange/index.cfm.)

Resource Objectives

- Promote land uses and activities that minimize impacts to global climate change.
- Evaluate global climate change impacts of new amenity development.

- Use adaptive management to respond to changing conditions on site that may result from global climate change.
- Encourage the restoration and implementation of an indigenous plant palette.
- Promote the expansion of a native tree canopy.
- Promote the use of zero-emission transportation such as walking or bicycling within the Basin.
- Minimize impacts on natural resources by locating similar amenities near vehicular access points to minimize overall impact.
- Encourage circulation and traffic plans for optimal use of public transportation to and within the Basin.
- Promote the use or generation of renewable energy within the Basin.
- Encourage new buildings achieve a Leadership in Energy & Environmental Design (LEED®) Silver or higher rating

Resources EO on Federal Leadership in Environmental, Energy and Economic Performance dated 5 Oct 2009, ER 1130-2-540 15.

5.2.7 Energy

Goal Increase regional energy self-sufficiency and energy efficiency within the Basin.

Rationale Wise use of energy is a key component of sustainability and in reducing the carbon footprint of activities within the Basin. Energy saving measures must be installed and new development constructed in accordance with green building principles.

Resource Objectives

- Encourage energy conservation and apply/promote renewable energy alternatives.
- Promote the minimization of non-renewable energy use through energy efficient land use planning and construction techniques.
- Encourage that new development be consistent with green building principles.
- Encourage sustainable design.

Resources EO on Federal Leadership in Environmental, Energy and Economic Performance (EO 13514).

5.2.8 Economic Development

Goal Contribute to national economic development consistent with protecting the Nation's environment.

Rationale The primary function of the Dam is to minimize flood risk. The economic value of the Dam is the cost of property damage that has been avoided since its operation. The recreation amenities at the Basin generate user fees that help pay for and defray recreation operating costs. Recreation activities also contribute to the larger local economy through purchases of food, gas, and lodging, and specialized recreational equipment by users.

Resource Objectives

- Encourage recreation activities that contribute to the local economy while minimizing impacts to environmental resources.
- Encourage the lessee to pursue activities that help defray recreation amenities operation and maintenance costs.

Resources ER 1130-2-550

5.3 Land Use Classification: Project Operations

Project Operations land is utilized by the Corps for operations and maintenance of the Dam which includes the Dam embankment, outlet works, spillway, instrumentation and access roads, and other needs associated with maintaining flood risk requirements. As flood risk management is the authorized purpose of the Dam and Basin, this purpose cannot be compromised and therefore the resource objectives for flood risk management and safety apply to all land use classifications.

5.4 Land Use Classification: Recreation

The Resource Objectives under the land use classification of Recreation include that of Recreation (and in this context primarily referring to high-density recreation) and education. Education is included here because often these two activities are combined and may be directed primarily at children using these areas.

5.4.1 Recreation

Goal Provide a quality outdoor recreation experience which includes an accessible, safe and healthful environment for a diverse population while sustaining our natural resources (ER 1130-2-550, Chapter 16).

Rationale There is a critical shortage of open space within the urbanized southern California region, which includes portions of San Bernardino, Riverside, Orange and Los Angeles Counties. The Basin is unique in terms of its open space character in an urban setting. The Basin provides habitat for wildlife and some wetland, riparian, and upland habitat. It is essential that the development of recreation opportunities be in harmony with the natural resources of the Basin.

Further development of recreation in the Basin has to be weighed against the protection of the environment including wildlife habitat. The Basin offers large areas of open space with the potential for additional recreation opportunities. Due to the suitability of level sites for intensive recreation activities, there is a great deal of pressure to provide increased high intensity recreation activities within the Basin.

ER 1130-2-550 states that the primary rationale for future recreation development at the Basin is a showing that proposed development will be dependent on the Project's natural or other resources. Examples that do not rely on the project's natural or other resources include theme parks or ride-type attractions, sports or concert stadiums, and stand alone facilities such as restaurants, bars, motels, hotels, non-transient trailers, and golf courses. Previously approved development plans for land currently outgranted for recreation are grandfathered under this regulation.

Resource Objectives

- Through the planning process, develop recreation opportunities to minimize impacts to the natural environment and minimize conflicts between activities in the Basin.
- Promote self-supporting amenities and activities to serve the needs of the public which offset operation and maintenance expenses.
- Promote local and regional planning efforts to coordinate the Basin's amenities and resources with other recreation areas and facilities to optimize a diversity of recreational opportunities in the region.

Resources 16USC 460d, ER 1165-2-550, EP 1165-2-550.

5.4.2 Education

Goal Increase awareness and understanding of the Basin's natural resources through educational and interpretive programs.

Rationale With its rich diversity of natural resources and functioning ecosystems, the Basin provides unique opportunities for children and adults to learn about natural systems. With education comes appreciation, and an understanding of the importance of these lands and the need to preserve and protect them for generations to come. The Corps' Memorandum on Invasive Species Policy, dated 2 June 2009 also specifically calls for education, communications and interpretation programs that convey how the public can prevent, identify, detect, and control invasive species.

Resource Objectives

- Encourage development of non-intrusive areas for observation, research, and study of the Basin's significant natural and cultural resources.
- Promote educational and interpretive facilities that encourage an interest in the environment and its preservation.
- Encourage improvement and development of amenities with educative and interpretive value.
- Promote development and implement a public awareness program on invasive species.

Resources Invasive Species Act of 1996, Aquatic Plant Program § 104 of the Rivers and Harbors Act, as amended, EO 13112 Invasive Species, ER 1130-2-550, EP 1130-2-500.

5.5 Land Classification: Mitigation and/or Environmentally Sensitive

Mitigation and Environmentally Sensitive land use classified areas are awarded the highest protection due to either the nature of the habitat or the cultural resources on the site. For this reason, the Land Use and Resource Objectives of Wildlife Habitat and Native Plant Communities, Wetlands, Water, Soil Conservation, Air Quality, Visual and Auditory Quality, and Cultural Resources, are all included here, although they apply equally to the Multiple Resources Management land use classifications of Wildlife and Vegetative management.

5.5.1 Wildlife Habitat and Native Plant Communities

Goal Protect, preserve, and restore wildlife habitat and native plant communities within the Basin.

Rationale With increased urbanization throughout areas such as southern California, wildlife habitats have decreased and are increasingly cut off from each other. The Basin provides large open areas for habitat and with their connections to waterways provide important corridors for wildlife movement and subsequent genetic diversity. Many large predator species require wide expanses of connected habitat in order to survive and thrive. At the same time, within the Basin important remnant habitats provide some of the best sites for endangered species and species of special concern. Where practicable, these habitats should be managed or restored to provide these species with the high quality habitat and connections that are needed for them to thrive.

Genetic diversity and abundance is equally important to vegetation as it is to wildlife. Having the genetic stock that is indigenous to an area is critical for successful restoration as these plants have adapted to the particular nuances of the microclimate in which they have evolved. Because the Basin was created before many of the areas were as developed as they are today, the Basin may contain some of the few remaining

examples of native vegetation in situ. For this reason the native vegetation of the Basin must be preserved, expanded, and restored wherever practicable.

Resource Objectives

- Protect, preserve, and restore wildlife habitat and native plant communities within the Basin to increase the diversity and abundance of existing taxa within the Basin.
- Protect wildlife habitat for rare, threatened and endangered wildlife and vegetation within the Basin.
- Manage resources within the Basin in a manner that would maintain or preserve the quality of wildlife habitat.
- Promote use of appropriate native plant palettes in new landscaping or when rehabilitating established landscaped areas to maximize biodiversity, reduce soil erosion, and improve air quality.
- Preserve areas of vegetation that have a cultural and/or social significance.

Resources EO 13112 Invasive Species

5.5.2 Wetlands

Goal Protect, conserve, maintain and restore wetlands whether seasonal (such as vernal pools) or permanent, to achieve the national goal of no net loss of wetlands.

Rationale Lying on the border between water and land, wetlands provide a rich mix of nutrients, insects, and plants that make them ideal nesting, resting, feeding and breeding grounds for many different types of creatures. Over a third of all Federally listed rare and endangered species live in or depend upon wetlands. Wetlands also help control flooding, improve water quality and serve as rest stops for migratory birds. According to EP 1130-3-540 2-4 f.(1) (e), "On hydric soils (indicating previous wetland conditions) consideration and management emphasis should be given to retaining, operating, and/or maintaining wetlands for wetland plant communities. Consideration should be given to buffering the wetland within an adequate amount of land to prevent abuse or loss from adjacent land uses."

Resource Objectives

- Restore, protect, and maintain existing wetlands within the Basin.
- Buffer wetlands with appropriate land uses to protect the integrity and function of the wetland.

Resources North American Wetlands Protection Act, Endangered Species Act, EO 11990 Protection of Wetlands, North American Waterfowl Management Plan, EP 1130-3-540 2-4 f.(1) (e).

5.5.3 Water

Goal Prevent further degradation of, and improve water quality within the Basin and identify the Basin's potential role for increasing the efficiency of regional water use.

Rationale Water is increasingly scarce throughout the west, and the Basin provides opportunities for water conservation and/or re-use. There may be opportunities to incorporate Best Management Practices (BMPs) for improved water quality, retention, and treatment of runoff. BMPs can also provide critical habitat such as wetlands.

Resource Objectives

- Discourage activities in the Basin which reduce surface or groundwater quality.
- Encourage use of reclaimed water for irrigation of recreation amenities.
- Promote implementation of water conservation improvement measures through appropriate landscaping techniques and technologies.

Resources U.S.Army Engineer Institute for Water Resources. 2008. *Value to the Nation: Lands and Waters.*

5.5.4 Soil Conservation

Goal Protect and conserve soil resources within the Basin.

Rationale Preventing erosion and the sedimentation that comes with it is important for maintaining the flood risk management capability of the Basin as well as maintaining high quality habitat.

Resource Objectives

- Minimize soil erosion within the Basin in both the construction and post construction project phases of new development.
- Promote land use activities to optimize vegetative cover to minimize soil loss in the Basin.
- Promote soil conservation management plans for areas of significant soil erosion and subsidence.
- Institute BMPs for managing soil deposition from the watershed to protect recreation amenities and habitat.

Resources ER 1130-2-540

5.5.5 Air Quality

Goal Manage the resources, activities and land uses within the Basin in a manner that would not further degrade and may improve the air quality both within the Basin and the surrounding region.

Rationale The Basin can provide the “lungs” of an area by minimizing vehicular traffic and maximizing the cleansing function of vegetation. Trees especially remove particulates as well as cool the air and mitigate the urban heat island effect.

The enjoyment of nature includes stimulation of all the senses, including smell. If one has ever walked through the chaparral after rain or coastal sage scrub in the heat of the day, it is clear that different native plant communities have a signature scent. By avoiding conflicts with human-induced uses, visitors can experience the differences in scents that nature has to offer and scent becomes part of the overall enjoyment of the visitor experience.

Resource Objectives

- Promote planting of native vegetation to improve air quality in the Basin.
- Discourage new land uses and activities in the Basin that deteriorate air quality unless impacts can be offset through implementation of measures to improve air quality.
- Promote traffic plans that would minimize generating pollution within the Basin.

Resources Clean Air Act, Pollution Prevention Act, EO 12088 Federal Compliance with Pollution Control Standards.

5.5.6 Visual and Auditory Quality

Goal Preserve the open space and natural esthetic quality and character of the Basin and surrounding viewsheds.

Rationale The visual and auditory qualities within the Basin provide a much-needed respite from city life as it is located in the middle of a highly urbanized area. The ability to see, hear, and interact with nature is increasingly recognized as an important contributor to human health. Where roads bisect the Basin, it is important to minimize and or mitigate the adverse impacts from these elements. There may also be important views to consider when looking at new development within the Basin. Views from the Basin of nearby mountains or important landscape features, either within or outside the Basin, lead to an overall high quality visitor experience and should be preserved.

Resource Objectives

- Discourage adverse visual and noise impacts of existing and new amenities within the Basin.
- Maintain esthetic surroundings at historic sites.
- Encourage location and design of new amenities to avoid or minimize adverse environmental effects in areas near vehicular access points to minimize overall impact.

Resources Aesthetic and Scenic Quality § 232 of WRDA 1996, Environmental and Economic Benefits of Landscape Practices on Federal Landscaped Grounds 60 Fed 408 37.

5.5.7 Cultural Resources

Goal Conserve cultural resources within the Basin through preserving appropriate sites, providing interpretive opportunities, and improving knowledge of these resources.

Rationale Cultural resources need to be protected yet balanced against the educational goals of interpretation of sites. Education and interpretation should be implemented to acknowledge and appreciate the resources while minimizing exposure to theft or vandalism. Nature centers and interpretative panels can provide this function by safely displaying important artifacts of the site and interpreting the history of the site. Actual sites are not to be publicly disclosed as this may lead to theft or vandalism.

Resource Objectives

- Promote preservation and protection of cultural sites within the Basin.
- Encourage education and interpretation aspects of cultural sites while maintaining the condition of the sites.

Resources National Historic Preservation Act, Archeological Resources Preservation Act as amended.

5.6 Land Use Classification: Multiple Resource Management (MRM)

The Resource Objectives under MRM are specific to the kinds of activities listed under the land use classifications of Recreation – Low Density, Vegetative Management, Inactive and/or Future Recreation .

5.6.1 MRM- Recreation – Low Density

Goal Provide a variety of quality outdoor low-density recreational experiences designed for dispersed or low-impact use available to a broad cross section of the visiting public.

Rationale Activities such as walking, hiking, bicycling, horse-back riding, picnicking, primitive camping, wildlife observation, and fishing, provide enjoyable activities that are of less impact to the natural resources of the Basin and may create a higher level of interaction with nature than more intensive types of sports and recreation. These activities lend themselves to small groups such as families with children or school groups interacting together where each member of the group has a chance to participate in activities. These activities can also be good buffers between environmentally sensitive areas and active recreation areas because they are often dispersed throughout the Basin by the use of trails. These activities can provide an increased level of awareness and informal patrol of areas within the Basin.

Resource Objectives

- Promote design of low density recreation amenities to minimize conflicts between activities in the Basin, to minimize impacts to natural resources, and to take advantage of unique views or landmarks that lead to a greater appreciation of the Basin's natural resources.

Resources Federal Water Project Recreation Act, ER 1165-2-550, EP 1165-2-550.

5.6.2 MRM- Vegetative Management

Goal Manage land in the Basin to optimize wildlife habitat and native vegetation.

Rationale These land use classifications are of a more general nature than mitigated or environmentally sensitive lands where a special species or cultural resource needs protection. Land can be managed to provide wildlife habitat or plant communities that would naturally occur in the Basin without targeting rare, endangered, or species of special concern. The resource objectives of water, soil conservation, air, olfactory, and visual and auditory quality that are listed under the environmentally sensitive classification apply here as well, but will not be repeated. Where non-native trees and shrubs exist, these should be replaced with appropriate native vegetation over time; however, consideration should be given to preserving landscapes of a significant cultural nature.

Resource Objectives

- Protect, preserve, and restore wildlife habitat and native plant communities appropriate to the Basin.
- Manage resources within the Basin that would preserve or improve the quality of wildlife habitat and create coherent plant communities.
- Use appropriate native plant palettes in new landscaping or when rehabilitating older established landscaped areas.
- Replace non-native vegetation with native species when existing non-native vegetation dies.
- Respect landscapes of significant and/or cultural value.

Resources EO 13112, ER 1130-2-540.

5.6.3 MRM - Inactive and/or Future Recreation

Goal Before approving proposed development on land that is classified as inactive and/or future recreation i.e., those areas of the Basin that are neither designated as wildlife habitat nor recreation, carefully analyze the suitability of such lands for the proposed use since once approved, opportunities for more optimal uses may be permanently lost.

Rationale Natural lands and open space are defined here as areas of the Basin that are neither designated as wildlife habitat nor recreation. To the public they may seem abandoned, yet they may be providing other functions such as providing buffers from conflicting uses, upland habitat, protection of cultural resources or maintaining view-sheds. Before approving any new development, the suitability of such development on these lands must be carefully analyzed and weighed against alternative uses of the land.

Resource Objectives

- Discourage land uses in natural lands or open spaces that deteriorate environmental quality and provide environmental compensation for land uses that adversely affect the natural resources in the area that cannot be phased out or prevented.
- Designate natural areas for the protection of rare and endangered species of flora or fauna, scientific, historical, archeological or visual values.
- Minimize conflicts between land uses, activities, and developments through buffering, screening, and other measures.
- Conserve resources that cumulatively contribute to the Basin's environmental health.
- Preserve areas of unique, sensitive, or significant resources from adverse impacts by other uses, activities or developments. Determine suitability of natural areas for either wildlife habitat or recreation before changing land use classifications.

Resources EO 13112, ER 1130-2-540.

5.6.3.1 Sustainable and Local Agricultural Uses

Goal Allow continuing interim use of sustainably practiced agriculture when it is consistent with preserving open space, rural and pastoral character, environmental quality of the Basin, and the needs of the local community.

Rationale Agricultural use is deemed to be an interim use of Corps lands. However, agriculture in the Basin represents an historic use of the land and could provide education in connection with local history. Agriculture maintains open space, provides a pastoral quality to the landscape, and can be instructive about our food supply. With the increased emphasis on eating healthy and locally-grown food, these agricultural lands can provide a local food supply that minimizes transportation and the associated carbon footprint.

Resource Objectives

- Promote sustainable agriculture as an interim use in the Basin.
- Encourage interim organic agricultural practices utilizing native taxa which provide habitat, feed, and/or forage for wildlife in the Basin.
- Promote agricultural crops that optimize water conservation and rejuvenation of soil nutrients.
- When agricultural lands are to be transitioned to other purposes, encourage land uses that would maintain the existing open space character, such as wildlife habitat or low-impact recreation.

- Encourage practices that minimize or do not impact air quality. Options to improve air quality include incorporating crop residue into the soil, using appropriate levels of tillage, and planting wind breaks, cover crops or strips of native perennial grasses to reduce dust.
- Protect and maintain natural habitat and wildlife around the agricultural land uses. The diversity would enhance natural ecosystems and could aid in agricultural pest management.
- Limit water use by developing drought-resistant farming systems, such as improving water conservation and storage measures, providing incentives for selection of drought-tolerant crop species, using reduced-volume irrigation systems, and managing crops to reduce water loss.
- Improve water quality by addressing issues such as salinization and contamination of ground and surface waters by pesticides, nitrates and selenium.

Resources UC Sustainable Agriculture Research and Education Program.

6 LAND USE CLASSIFICATION AND RESOURCE PLAN RECOMMENDATIONS

The authorized purpose of the Project is flood risk management while offering a variety of quality recreational opportunities for a broad socioeconomic base of visitors, in a context of high ecosystem function throughout the Basin to the extent compatible with flood risk management.

6.1 Recommended Land Use Classifications

The 1991 Master Plan for the Basin identified six land use classifications, including what is currently recognized as Project Operations, Recreation, Mitigation, Environmentally Sensitive, Easements, Multiple Resource Management – Inactive and/or Future Recreation, and Easement Lands. The recommended land use classifications and resource plan identifies changes in three ways:

- The land use classifications from the previous Master Plan have been updated to reflect the current actual land uses within the Basin according to Corps guidance and policy.
- The extent and area of lands included within each proposed land use classification are described, including total acreage, and lands proposed for new classifications are mapped in Map 20.
- A description of the Corps regulations, policy and guidance appropriate for each land use classification has been provided to guide appropriate designation and future development and management of the lands.

6.2 Resource Plan Recommendations

Guidance for the development of Basin lands has been established through nationwide, regional and local laws, rules and regulations. Nationwide regulations and policies are outlined in Chapter 16, ER 1130-2-550 and the "Non-Recreation Outgrant Policy." The South Pacific Division of the Corps issued SPD Regulation 1110-2-1, "Land Development Proposals at Corps Reservoir Projects," to clarify acceptable guidelines for development proposals. Additional guidance, developed by the Corps, Los Angeles District for development proposals in the jurisdictional area of the Los Angeles District is provided in Appendix A.

A variety of recreational and non-recreation amenities have been developed at the Basin over the last 50 years. The Corps has prepared additional guidance regarding appropriate uses within each land use classification as provided in Appendix A. This guidance is intended to clarify to Basin lessees and the public the activities/events which may be held within certain areas of the Basin and under what constraints. This guidance also identifies what activities and events are compatible with resource goals and objectives described in Section 5 and in accordance with Corps guidance and regulations on outgranted lands.

Maps 21 and 22 illustrate recreation and restoration opportunities and are discussed below in the Environmentally Sensitive and MRM – Vegetative Management and MRM - Inactive and/or Future Recreation classifications.

6.2.1 Recommended Actions Applicable to All Land Use Classifications

A number of recommended actions are applicable to all land use classifications and are followed by actions particular to individual land use classifications. These include:

- Improve condition of existing trails and create new trails where appropriate. Improvement of hiking trails and other designated use trails in conjunction with other restoration measures would increase public access and awareness of the biological and other natural resources in the Basin.
    - These improvements should incorporate ecosystem restoration efforts and appropriate design and management to enhance the visitor's experience while not compromising the greater ecosystem.
    - Extending the trail system throughout the Basin with connections to existing trails leading to the Wildlife Lake and former Holiday Lake Areas to expand the visitor's experience and knowledge of the Basin's resources.
- Implement policy of landscaping with indigenous native plants. Identify a plant palette of indigenous native plants to use in landscaping new recreation areas and replace non-native plant material with native plants over time except where provided in association with a specific cultural, historical, or recreation experience.
    - Eradicate invasive exotic species, including but not limited to giant reed (*Arundo donax*), consistent with nationwide policy (EO 13112). Educate the public on the significance of the need for eradication and how action would substantially enhance the natural environment throughout the Basin. Through an Adaptive Habitat Management Plan (AHMP) an invasive species eradication program should be implemented to restore native plant communities. Through the AHMP process with interested stakeholders, create a short-term and long-range plan for plant replacement that seamlessly integrates native plants over time in the existing landscape.
    - Recognize that the existing ornamental and turf landscape requires more water than the native plants that may replace them, and adjust irrigation practices as needed.
    - If and when it becomes necessary to replace whole sections of the landscape with native plants ensure the successful establishment of the native plants by having compatible needs.
    - Institute a system of way-finding using Corps signage guidelines (EP 310-1-6a, 01Jun 06) so that the public and emergency personnel are able to easily navigate the Basin.
    - Combine a system of GPS with trail markers to positively identify locations in the Basin.
    - Create signs to be placed throughout the Basin that identifies current locations of visitors as well as other amenities in the Basin.
    - Indicate on signs where park personnel can be reached in case of emergencies.
    - Install signs that indicate length and physical difficulty of trails and estimated walking/hiking times. Institute sustainable resource management practices consistent with those already instated by the City.
    - Continue green waste management policies for recycling of lawn clippings, shrub and tree trimmings and green debris, either on site or for composting off site.
    - Implement additional "smart irrigation" systems throughout the Basin with satellite-operated controllers that monitor weather conditions and adjust irrigation schedules accordingly. Create an education program to demonstrate how this can be adapted for residential landscapes.
    - When replacing irrigation systems, identify zones with similar watering regimes and retrofit to meet these needs; avoid planting schemes where water requirements may be incompatible.
    - Regularly evaluate the salinity of soils irrigated with recycled water and balance soil amendment practices to sustain habitat or landscape value.
    - Develop a program to manage and recycle construction waste and provide incentives and recognition for lessees and contractors who adopt it per EO 13514. Identify a "green list" of contractors who have implemented strong recycling programs and encourage their participation in future projects.
    - Retrofit pavement projects with the use of porous pavement alternatives where appropriate to allow for the infiltration of storm-water.

- Implement landscape-based storm-water management systems, such as bio-swales, rain gardens and infiltration areas in retrofits and new construction projects.
- Naturalize edges of stream channels and paved surfaces wherever feasible to provide a buffer and cover for wildlife, prevent erosion, and intercept sediment and nutrients from runoff.
- Develop an Integrated Pest Management program that uses alternatives to chemical fertilizers and pesticides.
- Use low-voltage solar lighting where feasible.
- Identify potential heat islands and provide landscape-based mitigation to furnish shade and evapo-transpiration.

6.2.2 Recommendations Applicable to Individual Land Use Classifications

6.2.2.1 Project Operations

Land classified as Project Operations covers 197.8 acres, including 35.1 acres of roadways within the Basin. The classification of land as Project Operations has been expanded to the Dam embankment as well as the Dam outlet works and spillway structures designated in the 1991 Master Plan.

Project Operations land is the most restrictive land use classification. This area is managed by the Corps for operations and maintenance of the Project. While vegetation or trails may be permitted within Project Operations areas, vegetation may need to be cleared out periodically to maintain flood storage capacity; trails may need to be closed off quickly in the event of eminent flooding; and trails may be closed following a storm event due to damage caused by inundation.

Project Operations

The resource objectives discuss opportunities for education about flood risk management and the operations of the Dam in particular and information about the Dam could be provided at the parking lot on Osborne Street adjacent to the top of the Dam.

6.2.2.2 Recreation

A total of 229.9 acres is recommended for classification into the Recreation category.

The land use classification of Recreation is the most flexible or developable classification. This classification allows for amenities such as sports fields and associated support amenities including parking lots, restrooms, concessionaires and other amenities. Recreation areas are generally located in the higher elevations of the Basin as Corps policy restricts certain kinds of structures within given flood-line elevations or they must be mitigated for by being floodable. Requests for development for non-recreational purposes must be evaluated on a site specific basis for compatibility.

Hansen Dam Park

At Hansen Dam Basin several areas fall under this classification and reflect the current recreation amenities and use of the site. These amenities are very popular and well-maintained by the City. The City does not have any immediate plans to change these uses. The areas included for recommendation into this classification include:

- Hansen Dam Park
- Hansen Dam Aquatic Center
- Sports Complex
- Lake View Terrace Recreation Center
- Orcas Gabrielino Equestrian Center
- Pacoima Little League Baseball Fields
- Hansen Dam Equestrian Center
- Ranger Station

At the Orcas Gabrielino and Hansen Dam Equestrian Centers it is recommended that an overall plan for BMPs for water quality be implemented for the entire facility to include the placement and structure of wash-down amenities, manure management, dust control, and integrated pest management.

The Pacoima Little League Fields are in need of rehabilitation. These fields are in poor condition. There is visible trash, vandalism, bent and broken benches, and rusted chain link fencing. There are only portable toilets and "dugouts" are extremely small and in poor condition. This plan recommends that this facility receive grass rejuvenation, new fencing, new dugouts, new signage, and permanent restrooms, preferably with locker rooms. Landscaping should utilize a native plant palette including areas that provide shade cover.

The City has developed plans to construct a Ranger Station in the northwestern portion of the Basin adjacent to Osborne Street. The Ranger Station would serve as an office for park staff and a visitors' center and have parking and landscaping. The Ranger Station is to be built with City funding.

The recommendations for all land use classifications in Section 6.3.1 apply to all the amenities within this category.

Pacoima Little League Fields

Future Ranger Station Site

6.2.2.3 Environmentally Sensitive

A total of 721.2 acres is recommended for this land use classification which was formerly designated as Environmentally Sensitive and Recreation in the 1991 Master Plan.

This is the most protected category of land use classification for vegetation, wildlife, and cultural resources. It is recommended that the areas under this classification include lands surrounding Big and Little Tujunga Wash and the wildlife lake. The endangered least Bell's vireo and coastal California gnatcatcher have been documented in this area (see Map 18) as well as the San Fernando Valley spineflower and the Santa Ana sucker. This classification would severely restrict activities and use of the area. It would provide a high level of protection of the area to preserve the habitat value for resident species and is compatible with Corps environmental stewardship policies and reflects community desires for protection of wildlife habitat. Activities such as hiking, bird watching, and photography are permitted under Corps guidance. Unpaved trails transect the area and are accessible from a number of areas within the Basin (see Map 19). Maps 21 and 22 show potential areas for restoration especially what is now classified as MRM – Inactive and/or Future Recreation.

Many parts of this area proposed for this classification are degraded and it is recommended that these be restored, specifically the area west of Little Tujunga Wash and upstream of the Dam. There is a large patch of *Arundo donax* indicated on Map 17 that should be removed especially as it has the potential to spread throughout the Basin.

Potential Restoration Sites

The area east of the Equestrian Center is currently ornamental trees and maintained lawn. It is recommended that this area be converted to the mixed sage scrub that surrounds it.

It will also be important to watch for infestations of non-native plants throughout the entire area and take steps to quickly remove them in order to preserve as high a quality habitat as possible.

6.2.2.4 Easement Lands

A total of 45.9 acres are private lands encumbered by Government flowage easements. There are no recommendations for this land use classification. The Corps retains limited jurisdiction over easement lands.

6.2.2.5 MRM – Recreation – Low Density

A total of 223.7 acres is recommended for this land use classification. The areas proposed for this classification include the proposed campground and Hansen Dam Golf Course.

The classification of MRM – Recreation – Low Density recognizes areas that have less intensive recreation uses such as picnic areas and open play areas. Special events may be permitted in these areas on a case by case basis and must be compatible with the surrounding area to limit impacts to adjacent areas. Special events must comply with guidelines established by the Corps included in Appendix A, Outgrant Policies.

The proposed campground is to be located in the western portion of the Basin adjacent to the Dam. The camping area will consist of six tent pads, a concrete slab for a dining tent, restroom amenities, a sewer pump station and sewer line, and water line. The campground is being developed on a cost sharing basis between the Corps and the City. Recommendations for future improvements of the campground include installing interpretive signs about the natural history of the area and watershed.

Corps regulations expressly prohibit golf courses when developing new recreation amenities on Federal land, however existing golf courses are permitted to remain. The City has incorporates many sustainable practices into the management of its golf courses. These practices include:

- Smart irrigation
- Mulching lawnmowers that keep grass clippings in place
- Green waste taken to Griffith Park and composted.

Site of Future Campground

View from Future Campground

The use of recycled water is proposed at the Basin through construction of water lines. The proposed water lines would obtain water from the Donald C. Tillman Water Treatment Plant in Sepulveda Dam Basin. In addition, it is recommended that the City undertake an environmental audit of golf maintenance practices at the Hansen Dam Golf Course to get a better understanding of the Basin's environmental impact. Specifically, the following factors to be considered in such an audit would include an investigation of quantities of herbicides, pesticides, fungicides, and fertilizers applied and trash disposal of ancillary operations such as the restaurant. With this information, steps can be taken to reduce the environmental impacts through implementation of Integrated Pest Management (IPM) practices and improved recycling.

6.2.2.6 MRM – Vegetative Management

A total of 10.2 acres is recommended for this land use classification.

Site of Future Bioswale

Given its current condition, its proximity to active recreation and the road, yet adjacent to the Environmentally Sensitive area, this land use classification is most appropriate designation at this time. A bioswale and wetland could be installed where the current parking lot exists, shown above.

6.2.2.7 MRM – Inactive and/or Future Recreation

A total of 78.5 acres is recommended for this land use classification.

MRM – Inactive and/or Future Recreation areas include those areas that may be just empty open space (including dirt lots for overflow parking) or utilized on an interim use such as for agriculture or special events. Careful consideration should be given to how lands classified as MRM – Inactive and/or Future Recreation are developed. Once a recreation use is established with the attendant capital investment and established user group, a change to a different use in the future will be extremely difficult. The areas recommended for this classification are shown on Map 20.

The recommendations for this land are shown on Maps 20 and 21. The first area with its adjacency to residences is recommended for restoration. Members of the community expressed the desire to not to have this developed into recreation amenities since their homes and ranches border this land.

The area next to Aquatic Center and sports fields and the area between the land designated as Recreation and MRM – Vegetative Management are recommended for intensive recreation such as additional ball fields. There have been expressed desires for both additional fields such as for soccer, but these could also be developed as multi-purpose fields that would allow for more flexibility.

The area upstream of the Dam embankment is recommended for upland habitat restoration since it connects with the Environmentally Sensitive area and would provide a more natural setting for those utilizing the proposed campground.

Potential Restoration Behind Dam

Finally, the area east of the Dam is recommended for restoration as well since it already contains mixed sage scrub and is enjoyed by the equestrian community and hikers for its natural trails.

6.3 Timeline of Resource Plan Recommendations

The tables below summarize the recommendations discussed above in Section 6.2 according to their timeline for implementation.

Status of recommended plans in the Corps approval process:

- Ranger Station and Visitor Center (approved)
- Skate Park (under review)
- Campground (awaiting final approval)
- Bio-swale and Wetlands (awaiting final approval)

Table 6.1 Recommended Future Measures	
Action	**Associated Measures**
(1) Immediate Recommended Measures	
Native Plant Landscaping and Exotic Plant Removal	• Institute exotic plant eradication program for species such as giant reed, tree tobacco, castor bean, salt cedar must be developed in conjunction with the AHMP. A system of replacing non-natives with native species should be implemented.
Install Wayfinding	• Create a system of signage throughout the Basin that enables visitors to identify their location as well as other amenities in the Basin. Indicate on signs location of park personnel in case of emergencies, as well as emergency phone numbers. • Where practicable, install signs that indicate length and physical difficulty of trails and estimated walking/hiking times. • Combine a system of GPS with trail markers to identify locations.
Trail Improvement	• Enhance hiking trails and other low-density recreational features in conjunction with restoration management measures would increase accessibility to the public and facilitate more awareness of the biological resources found in the Basin. • Connect trails to create loops and facilitate movement throughout Basin. • Decommission disturbed trails and unofficial trails created by Basin visitors. • Structure trails to discourage homeless encampments.
Implement Sustainable Resources Management	• Employ green waste management, smart irrigation, and BMPs • Develop an Integrated Pest Management (IPM) program for golf course. • Use low voltage solar lighting and other energy saving utilities and measures. • Proper management of special events to eliminate closures of park amenities or impacts to environmentally sensitive areas. • Manage fugitive dust at denuded lots. • Manage special events to ensure no inappropriate use of Environmentally Sensitive and MRM- Vegetative Management Areas.
(2) Potential Immediate or Future Actions Specific to Land Use Classification	
Project Operations	• Include education about flood risk management and the operations of the Dam in interpretive signage.
Recreation	• Develop BMPs for implementation at the Orcas-Gabrielino and Hansen Dam Equestrian Centers • Rehabilitate and improve the Pacoima Little League Fields
Environmentally Sensitive	• Include education about flood risk management and the operations of the Dam in interpretive signage. • Restore native upland, riparian, riverine, and wetland habitats. • Conduct periodic biological surveys, particularly to determine presence in Basin of Federally protected species. • Manage trails and vegetation to limit homeless camps.
MRM – Recreation – Low Density	• Install signage with educational information regarding the Dam and watershed.
MRM – Vegetative Management	• Restore wetland areas.
MRM – Inactive and/or Future Recreation	• Investigate potential for development of model airplane field for electric planes.

6.4 Economic Feasibility

Economic feasibility involves demonstrating the economic value from implementing projects that are sustainable over time in terms of public needs and desires, use and perception, and sponsor operation and maintenance. It is recognized that well maintained recreation amenities are well used, and those that are not have little interest from the public and are often considered unclean and/or unsafe and decline further. When this happens, it often costs more to refurbish and rehabilitate amenities or implement new ones than providing a carefully constructed operations and maintenance program..

While no specific plans are considered under this updated Master Plan, future plans proposed for recreation development by the lessees are guided by Corps policies and guidelines for demonstrating the need and economic feasibility of such proposals. This includes documenting financial capability on the part of the project sponsor, sufficient funding to complete the proposed project as well as long term operation, maintenance, and repair. The proponent must also show the economic need for the project by providing market survey information to indicate community desire and the need for the project to indicate its future community use and intrinsic value.

Corps regulation requires documentation of new development economic feasibility which includes:

- A project proponent's financial capability to maintain the whole, including existing projects before new projects may be developed;
- Demonstrating that existing amenities are well maintained, are in good working order and will continue after implementation of a new project;
- Has the resources to maintain new amenities and will be operate and maintain these in the same manner and condition as existing amenities.

If the Lessee is not able to provide funding through normal budgetary means to maintain quality and use to a safe and clean standard, funds for operation and maintenance may need to be found elsewhere. This may involve the charging of use fees for certain activities such as ball fields, group reservations and special events (fees are subject to District Commander approval). Other sources include state and local funding sources, trusts, and private organizations to help defray costs. Public volunteer programs to staff amenities such as nature areas and visitor center could be pursued.

7 CONCLUSION

The Federal government owns and the Corps manages eleven Basins in southern California with the primary purpose of flood risk management for people and property downstream. Since the Basins are "dry" most of the year, holding water only after storm events occur, usually December through March, Basin lands may also be used for other purposes, primarily recreation that may not impede flood risk management operations. Over sixty (60) years of Federal laws and regulations have empowered the Corps to work with local interests to develop, construct, operate, and maintain recreation amenities within the Basins serving community needs.

The Corps has a formal arrangement with the City of Los Angeles through its Department of Recreation and Parks to lease a majority of the Basin land to the City for recreation purposes. Over the last fifty (50) years the Corps and the City have developed a variety of recreation amenities with Federal and City funds through cost sharing agreements. Amenities include ball fields, picnic areas, trails, and aquatic center,

The Master Plan itself is a tool for Corps, lessees, and public interests to guide future development in the Basin. Corps regulations and policies guide the development of amenities through the Master Plan. This Master Plan is an update of the last Master Plan for Hansen Dam Basin completed in 1991. Although Corps regulations recommend the update of a Master Plan every five (5) years, Federal funding is not always available to initiate and complete this process. As a result, this Master Plan incorporates a longer time frame into it, identifying short and long term recommendations for recreation development, amenity maintenance, restoration of native habitats, and other actions. This has been accomplished through a process which has:

- Identified existing recreation amenities and other facilities within the Basin,
- Incorporated the local community's needs and desires for recreation development,
- Developed resource goals and objectives, and
- Developed additional policies to facilitate these goals and objectives.

As a result, this Master Plan identifies land use classifications for the Basin based on this process within the definitions of Corps regulations. This will guide interested parties for future development through years to come to preserve and protect the Nation's lands and resources.

8 APPROVAL

I have reviewed this Updated Master Plan and Environmental Assessment for Hansen Dam Basin prepared by my staff for the guidance of future development for recreation and environmental stewardship efforts within the Hansen Dam Basin located in the City of Los Angeles, Los Angeles County, California in keeping with the Corps mission, values and vision.

This Master Plan is technically sound, environmentally acceptable, and meets the appropriate requirements of Corps regulations guiding the development of Master Plans for Corps water and land resource projects.

Therefore, I approve this Master Plan for Hansen Dam Basin as presented, subject to updates as needed for the benefit of flood risk management, public use, and environmental stewardship.

_____
Date

_____
R. Mark Toy
Colonel, U. S. Army Corps of Engineers
District Commander

9 ACRONYMS AND GLOSSARY

ac-ft	acre-feet
ADA	Americans with Disabilities Act
AGR	Agricultural
AHMP	Adaptive Habitat Management Plan
AQMD	Air Quality Management District
ARRA	American Recovery and Reinvestment Act
AT&T	American Telephone & Telegraph
BMP	Best management practices
CAAQS	California Ambient Air Quality Standards
CADC	California Department of Conservation
CAP	Continuing Authorities Program
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CDWR	California Department of Water Resources
CECW-ZA	Headquarters, Corps of Engineers Civil Works
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESA	California Endangered Species Act
CESPD	Corps of Engineers South Pacific Division
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGAP	California Gap Analysis Project
CH_4	Methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalents
Corps	U.S. Army Corps of Engineers
CRWQCB	California Region Water Quality Control Board
CWA	Clean Water Act
dB	Decibels
DPS	Distinct Population Segment
DSAC	Dam Safety Action Classes
DTSC	Department of Toxic Substance Control
DWR	Department of Water Resources
EA	Environmental Assessment
EC	Engineering Circular
EDR	Environmental Data Resources, Inc.
EHP	Earthquake Hazard Program
EIS	Environmental Impact Statement
EM	Engineer Manuals
EMT	Emergency Medical Treatment
ENSO	El Niño- Southern Oscillation
EO	Executive Order

EOP	Environmental Operating Procedures
EP	Engineer Pamphlets
EPA	Environmental Protection Agency
ER	Engineer Regulations
FCA	Flood Control Acts
FONSI	Finding of No Significant Impact
GHG	Greenhouse gas
GIS	Geographic information system
GPS	Global Positioning System
GWR	Ground Water Recharge
HEP	Habitat Evaluation Procedure
HFCs	Hydrofluorocarbons
HIS	Habitat Suitability Indices
HTRW	Hazardous, Toxic, and Radioactive Waste
HTWM	Hazardous and Toxic Waste and Materials
IND	Industrial Service Supply
IPCC	Intergovernmental Panel on Climate Change
IWMB	Integrated Waste Management Board
IWR	Institute for Water Resources
LA	Los Angeles
LACDA	Los Angeles County Drainage Area
LAD	Los Angeles District
LADPR	County of Los Angeles Department of Parks and Recreation
LARAP	City of Los Angeles Department of Recreation and Parks
LARWQCB	Los Angeles Regional Water Quality Control Board
LAX	Los Angeles International Airport
LEED	Leadership in Energy and Environmental Design
LTG	Lieutenant general
LUST	Leaking Underground Storage Tanks
LWCF	Land and Water Conservation Fund
LWRM	Limited Warm Freshwater Habitat
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MOU	Memorandum of Understanding
MP	Master Plan
Mph	Miles per hour
MRM	Multiple resource management
MSC	Major Subordinate Command
MUN	Municipal Water
N_2O	Nitrous oxide
NAAQS	National ambient air quality standards
NCRS	Natural Resources Conservation Service
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen dioxide
NPDES	National pollutant discharge elimination system
NPL	National Priorities List
NRHP	National Register of Historic Places
NWI	National Wetland Inventory

O&M	Operation and maintenance
O_3	Ozone
OHW	Ordinary High Water
OSHA	Occupational Safety and Health Act
OWUS	Other waters of the United States
P.L.	Public Law
PCE	Tetrachloroethylene
Ppm	Parts per million
PROC	Industrial Process Supply
RARE	Rare, Threatened or Endangered Species
RCRIS	Resource Conservation and Recovery Information System
REC1	Recreation Contact 1
REC2	Recreation Contact 2
RHA	Rivers and Harbors Act of 1899
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SCEDC	Southern California Earthquake Data Center
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SF_6	Sulfur hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SPD	South Pacific Division
SSURGO	Soil Survey Geographic Database
SWF/LF	Solid waste amenities and landfills
SWIS	Solid Waste Information System
TCE	Trichloroethylene
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TWRP	Tillman Water Reclamation Plant
UAP	Universally Accessible Playground
ug/m3	Micrograms per Cubic Meter of Air
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USNWS	U.S. National Weather Service
VCP	Voluntary Cleanup Program
WARM	Warmwater Habitat
WET	Wetlands
WILD	Wildlife Habitat
WRCB	Water Resources Control Board
WRDA	Water Resources Development Act

Note: Cited definitions are direct quotes from Corps regulations.

Abutment A geological feature that each end of a Dam is tied into for support.

Archaeological resources Surface or buried material remains, buried structures, or other items used or modified by people.

Attainment area A geographic area that is in compliance with the National and/or California Ambient Air Quality Standards (NAAQS or CAAQS).

Baseflow The sustained or fair weather flow in a channel due to subsurface runoff. In most streams, baseflow is composed largely of groundwater effluent. Also known as base runoff.

Basin Land area comprised of all Federal lands managed by the Corps that were acquired for the construction, operation and maintenance of the Santa Fe Dam Basin.

Carbon Dioxide Equivalent Metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2Eq)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

Carbon Dioxide A naturally occurring gas, and a by-product of burning fossil fuels and biomass, and land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

Channel Portion of the project carrying flow may be described as: natural, constructed, riprapped, concrete, trapezoidal, leveed, overbank, low flow, bypass etc.

Climate Change Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g. changes in ocean circulation); human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.).

Criteria air pollutant Air pollutant for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. Examples include: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and PM-10 (see individual pollutant definitions).

Dam A barrier built to hold back flowing water.

Discharge Volume of water that passes through a given cross-section per unit time; commonly measured in cubic feet per second (cfs) or cubic meters per second (m3/s); also referred to as flow. In its simplest concept discharge means outflow; therefore, the use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe or from a drainage basin.

Diversion The taking of water from a stream or other body of water into a canal, pipe, or other conduit.

Drainage Area An area of a stream at a specified location is that area, measured in a horizontal plane, which is enclosed by a drainage divide.

Easement Lands Land over which the Federal government acquired an interest in real estate to support construction, operation and/or maintenance of the project. Not equivalent to fee title.

Ecosystem Management An ecosystem is a dynamic community of biological organisms, including humans, and the physical environment in which they interact. Ecosystem management by the Corps is a proactive, goal-driven approach to sustaining ecosystems and their values. The Corps will manage communities to promote regional environmental values occurring on project lands toward sustaining ecosystems in which the project lands and waters occur. Such ecosystems and communities will be identified in resources objectives and/or land use classifications contained in the Master Plan and the OMP. Preferential treatment will be given to the management of ecosystems, communities, and habitats identified as having special status species. (ER 1130-2-540 15 Nov 96 2-2 f. (1)(a))

Ecosystem A biological community together with the physical and chemical environment in which it interacts.

El Niño A warm water current that periodically flows along the coast of Ecuador and Peru and northward, disrupting the local fishery. This oceanic event is associated with a fluctuation of the intertropical surface pressure pattern and circulation in the Indian and Pacific Oceans, called the Southern Oscillation.

Embankment Bank of earth, concrete, or other material constructed to hold back water.

Emissions Release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Endangered Species Any species which is in danger of extinction throughout all or a significant portion of its range, and has been so listed by the FWS/NMFS at 50 CFR 17.11 and 17.12.

Enhancement Enhancement measures/activities are those measures/activities taken above a stewardship level (i.e., level of required to sustain fish and wildlife resources for the life of the project), and those measures/activities which produce an increase or concentration of animal numbers for the purpose of recreation benefits. Historically the term “enhancement” has been used an indication of a net habitat improvement over the without project condition. However, this term now implies making the habitat better for some species than it would have been naturally in the absence of human intervention. Since this goes beyond the goal of ecosystem restoration, the use of the term, enhancement is rarely appropriate in Corps documents.

Ethnohistoric archaeological resources Native American archaeological sites that also show evidence of early European contact such as the presence trade beads.

Ethnohistory Description of the native cultures that were encountered by the Europeans using contemporary documents and oral histories.

Evaporation The process by which water is changed from the liquid or the solid state into the vapor state. In hydrology, evaporation is vaporization and sublimation that takes place at a temperature below the boiling point. In a general sense, evaporation is often used interchangeably with evapotranspiration or ET.

Flood peak The highest value of the stage or discharge attained by a flood; thus, peak stage or peak discharge.

Flood Risk Management Flood risk management is the process of identifying, evaluating, selecting, implementing, and monitoring actions taken to mitigate levels of risk. Scientifically sound, cost-effective, integrated actions are taken to reduce risks. Social, cultural, ethical, environmental, political, and legal considerations are accounted for in the process.

Flood-frequency curve Graph showing the number of times per year on the average, plotted as abscissa, that floods of magnitude, indicated by the ordinate, are equaled or exceeded.

Floodplain The lowland that borders a river, usually dry but subject to flooding.

Gaging station A particular site on a stream, canal, lake, or Basin where systematic observations of gage height or discharge are obtained.

Global Climate Change The term climate change is often used interchangeably with the term global warming, but according to the National Academy of Sciences, "the phrase 'climate change' is growing in preferred use to 'global warming' because it helps convey that there are [other] changes in addition to rising temperatures."

Global Warming An average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities.

Greenhouse Gas (GHG) Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Groundwater Water in the ground that is in the zone of saturation, from which wells, springs, and groundwater runoff are supplied.

Historic archaeological resources Archaeological sites whose deposits that post-date European contact.

Hydraulics The branch of physics having to do with the mechanical properties of water and other liquids in motion and with the application of these properties in engineering.

Hydric Pertaining to a wet or moist environment.

Hydrograph A graph showing stage, flow, velocity, or other property of water with respect to time.

Hydrology The study of water; generally focuses on the distribution of water and interaction with the land surface and underlying soils and rocks.

Hydrophytic A plant that grows only in water or very moist soil.

Infiltration The movement of water from the land surface into the soil.

Interpretive Services Communication and education processes provided to internal and external audiences which support accomplishment of Corps missions, tell the Corps story, and reveal the meanings of, and relationships between natural, cultural, and created environments and their features.

Invasive Species An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. A species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Invert As used in hydraulic engineering, the bottom or lowest point or elevation of a structure such as a pipe, conduit or channel.

Lacustrine Wetlands and deep water habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents or lichens with greater than 30% areal coverage and (3) total area exceeds 20 acres.

Land Allocation The identification and documentation of lands at Civil Works projects in accordance with the authorized purposes for which they were or are to be acquired. There are four primary land allocation categories applicable to Corps projects: (1) operations (i.e., flood control, hydropower, etc.), (2) recreation, (3) fish and wildlife, and (4) mitigation.

Land use classifications All lands are acquired for authorized project purposes and allocated for these uses. The classification process is a further distribution of project lands by management categories, which based upon resources available and public needs, will provide for full utilization while protecting project resources. (EP 1130-2-550, 15 Nov 96 1-4.d.)

Ldn It is a descriptor of noise level based on energy equivalent noise level (L_{eq}) over the whole day with a penalty of 10 dB(A) for night time noise.

Limnetic All deep water habitats within the Lacustrine System (Cowardin et al. 1979).

Market Area The geographic range that people are expected to reasonably travel from to visit the Basin area.

Master Plan A conceptual document guiding the Corps responsibilities pursuant to Federal laws and regulations to preserve, conserve, restore, maintain, and manage the project lands, waters, and associated resources. The plan addresses all resources including but not limited to fish and wildlife, vegetation, cultural, esthetic, interpretive, recreation, mineral, commercial, and outgranted lands, easements and water. The Master Plan is the document that organizes authorized activities, i.e., established by project specific authorities as well as general authorities for stewardship responsibilities which guide the project's role within the region, watershed, and ecosystem.

Mitigation Mitigation measures authorized by Congress or approved by Headquarters compensate for ecological resources unavoidably and adversely affected by a Corps project. Mitigation includes stand-alone projects; work undertaken concurrently with project construction; and operation, maintenance and management measures. (ER 1130-2-540, 15 Nov 96 2-2 (6)(b)

Model A physical or mathematical representation of a process that can be used to predict some aspect of the process.

Multiple Resource Management Lands managed for one or more of, but not limited to, these activities to the extent that they are compatible with the primary allocation(s). The activities should be fully explained in the narrative portion of the Master Plan.

Native Species With respect to a particular ecosystem, a species that other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

Nitrogen oxides (oxides of nitrogen, NOx) General term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO2), and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. NO is a criteria air pollutant, and may result in numerous adverse health effects.

Non-attainment area Geographic area identified by the U.S. Environmental Protection Agency and/or California Air Resources Board as not meeting either National Ambient Air Quality Standards or California Ambient Air Quality Standards for a given pollutant.

Non-native Species With respect to an ecosystem, any species including its seeds, eggs, spores, or other biological material capable of propagating that species that is not native to that ecosystem.

Non-statutory Mitigation The definition of mitigation is broadened to include "all measures necessary to make the Corps project whole." No specific statute may address these actions, yet damages are incurred and appropriate mitigation should be provided. Non-statutory mitigation actions may take the form of actions to restore project value, such as replacing trees, soil stabilization, and providing new, relocated, or replacement amenities.

Operational Management Plan A separate document from the Project Master Plan that outlines in detail the specific operation and administration requirements for natural resources and park management consistent with the approved Project Master Plan. Management strategies consistent with authorized project purposes, approved resource use objectives, and land designations will be established in the document. The document will be used as a working tool for the overall management of the project on a day to day basis.

Outgrant Authorizes a non-Federal entity the right to use Army-controlled real property. It is a written legal document that established the timeframe, consideration, conditions, and restrictions on the use of Army property.

Outlet works The hydraulic structure that controls the flow of water through a dam, usually consisting gates upstream of a lined conduit or pipe.

Outreach Activities Communication efforts involving programs that reach diverse populations such as students, teachers, organized groups such as Boy Scouts, Girl Scouts, 4-H, and the general public, beyond the physical boundaries of Corps projects and amenities.

Palustrine wetlands that are either dominated by hydric vegetation, or if not dominated, then are less than 20 acres in size and 6 feet in depth.

Partial-duration flood series A list of all flood peaks that exceed a chosen base stage or discharge, regardless of the number of peaks occurring in a year.

Planning Area The planning area is a geographic space with an identified boundary that includes the area identified in the study authorizing document and the location of alternative plans which are often called

project areas. The locations of resources that would be directly, indirectly, or cumulatively affected by alternative plans are also called the affected area.

PM10 An air pollutant consisting of small particles with an aerodynamic diameter less than or equal to a nominal 10 micrometer (about 1/7 the diameter of a single human hair). Their small size allows them to make their way to the air passages deep within the lungs where they may be deposited and result in adverse health effects. PM10 also causes visibility reduction.

PM2.5 An air pollutant consisting of small particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Precipitation As used in hydrology, precipitation is the discharge of water, in liquid or solid state, out of the atmosphere, generally upon a land or water surface. It is the common process by which atmospheric water becomes surface or subsurface water. The term precipitation is also commonly used to designate the quantity of water that is precipitated. Precipitation includes rainfall, snow, hail, and sleet, and is therefore a more general term than rainfall.

Prehistoric archaeological resources Archaeological sites whose deposits date to the time before the European presence in the area.

Prehistory The time period and cultures that inhabited the area before the arrival of Europeans.

Recreation – Recreation – Low Density activities such as hiking, primitive camping, wildlife observation, hunting, or similar low density recreation activities.

Recreation Land developed for intensive recreation activities by the visiting public, including developed recreation areas and areas for concession, resort, and quasi-public development. At new project, recreation areas planned for initial development will be included in this classification. Future areas will be classified as multiple resource management until initiation of the development.

Recurrence interval (return period) The average interval of time within which the given flood will be equaled or exceeded once. When the recurrence interval is expressed in years, it is the reciprocal of the annual exceedance probability (AEP).

Reservoir. A pond, lake, or pool, either natural or artificial, for the storage, regulation, and control of water, also called a Basin.

Resource Objectives Clearly written statements that are specific to a project or group of projects. They specify the attainable options for resource development and/or management. They must be consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and expressed public desires.

Risk The chance or probability of damage, loss, or injury.

Runoff That part of the precipitation that appears in surface streams. It is the same as streamflow unaffected by artificial diversions, storage, or other works of man in or on the stream channels.

Southern Oscillation This coupled atmosphere-ocean phenomenon is collectively known as El Niño-Southern Oscillation. During an El Niño event, the prevailing trade winds weaken and the equatorial countercurrent strengthens, causing warm surface waters in the Indonesian area to flow eastward to overlie the cold waters of the Peru Current. This event has great impact on the wind, sea surface

temperature, and precipitation patterns in the tropical Pacific. It has climatic effects throughout the Pacific region and in many other parts of the world. The opposite of an El Niño event is called La Niña.

Special Event Special events at Corps lakes such as water carnivals, fishing tournaments, boat regattas, music festivals, dramatic presentations, and other special recreation program of interest to the general public.

Species A group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

Spillway Hydraulic structure whose purpose is to bypass flow that exceeds the storage and/or release capacity of a dam.

Stage The height of a water surface in relation to a datum.

Stewardship Natural resources management through a stewardship concept ensures the conservation, preservation, or protection of those resources for present and future generations. Stewardship focuses on sustaining ecosystems. Stewardship shall be applied in a biological community context, thereby providing protection for the existing species populations, communities, habitat types and ecosystems.

Storage Water artificially or naturally impounded in surface or underground reservoirs. The term regulation refers to the action of this storage in modifying downstream streamflow. Also, water naturally detained in a drainage basin, such as ground water, channel storage, and depression storage. The term drainage basin storage or simply basin storage is sometimes used to refer collectively to the amount of water in natural storage in a drainage basin.

Stream A general term for a body of flowing water. In hydrology the term is generally applied to the water flowing in a natural channel as distinct from a canal. More generally as in the term stream gaging, it is applied to the water flowing in any channel, natural or artificial.

Streamflow The discharge that occurs in a natural channel. Although the term discharge can be applied to the flow of a canal, the word streamflow uniquely describes the discharge in a surface stream course. The term streamflow is more general than runoff, as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Streamgaging The process and art of measuring the depths, areas, velocities, and rates of flow in natural or artificial channels. The amount of water in natural storage in a drainage basin.

Traditional cultural properties Places associated with the cultural practices or beliefs of a living community. The significance of these places sites is derived from the role the property plays in a community's cultural identity as defined by its beliefs, practices, history and social institutions.

Water year In US Geological Survey reports dealing with surface water supply, the 12-month period, 1 October through 30 September. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ended 30 September 1959, is called the 1959 water year.

Watershed An area characterized by all direct runoff being conveyed to the same outlet. Similar terms include basin, drainage basin, catchment, and catch basin. A part of the surface of the earth that is

occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

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