SECTION 1 INTRODUCTION

1.1 PURPOSE OF THE SEDIMENT MANAGEMENT STRATEGIC PLAN

The purpose of this Sediment Management Strategic Plan (Strategic Plan) is to identify strategies to address the Los Angeles County Flood Control District's sediment management needs in order to manage the risk of floods and debris flows and provide for water conservation from 2012 to 2032 in a sustainable manner – taking social, environmental, and economic impacts into account.

As a conceptual-level planning document, the Strategic Plan is intended to provide a broad overview of sediment management and identify potentially feasible alternatives. The alternatives are evaluated in terms of overall impacts, including very rough cost estimates.

For facilities with a number of feasible alternatives, this Strategic Plan represents the first step in a continued analysis and dialogue with our stakeholders to develop specific plans for management at those sites. Furthermore, this Strategic Plan is a living document that is open to other alternatives and may be revised in the future as conditions change. This Strategic Plan is intended to be an advisory document. The Strategic Plan will guide development of specific cleanout plans for the Flood Control District's numerous facilities.

1.2 BACKGROUND

The County of Los Angeles (County) is one of the largest and most populous counties in the United States. More than 10.4 million people reside within its 4,084-square-mile area - an area approximately 25 percent larger than the states of Delaware and Rhode Island combined. The County is comprised of 88 incorporated cities and approximately 140 unincorporated communities. Several erosive mountainous areas are located in the County, including the San Gabriel Mountains and Verdugo Hills. During heavy rainfall, runoff from these areas has the potential to transport large amounts of eroded sediment and vegetative debris. Other mountainous and hilly areas in the County have lower sediment and debris production potentials.

In 1915, the Los Angeles County Flood Control Act was adopted by the California State Legislature after a disastrous regional flood took a heavy toll on lives and property. The act established the Los Angeles County Flood Control District (Flood Control District) and empowered it to manage flood risk and conserve stormwater for groundwater recharge within its boundaries. The Flood Control District, shown in Figure 1-1, covers the 2,753-square-mile portion of the County south of the west to east projection of Avenue S, excluding Catalina Island. It is governed as a special district by the County of Los Angeles Board of Supervisors.

In 1984, the Flood Control District entered into an Operational Agreement with the County. Per the Agreement, the planning, operational, and maintenance activities of the Flood Control District were transferred to the County of Los Angeles Department of Public Works (Public Works).

Between 2007 and 2009, over 11 percent of the County was consumed by wildfires, burning approximately 545 square miles in all. The Station Fire of 2009 alone, which started on August 26 and was fully contained on October 16, burned approximately 250 square miles. The burned watersheds resulted in a significant increase in the amount of debris and eroded sediment travelling down the hillsides during storms and making their way into debris basins and reservoirs. Public Works, on behalf of the Flood Control District, has been tasked with the responsibility of managing the vast majority of this material. Figure 1-2 illustrates the increase in the amount of sediment removed from debris basins maintained by the Flood Control District the Water Year after the Station Fire (i.e., Water Year 2009-10, which extends from October 1, 2009, to September 30, 2010). Public Works' records indicate that during Water Year 2009-10, approximately 1.2 million cubic yards (MCY) of sediment were removed from the debris basins. The subsequent Water Year only approximately 40,000 CY of sediment were removed, which could be due to a number of factors including lower rainfall quantity and intensity.

Figure 1-1 Los Angeles County Flood Control District

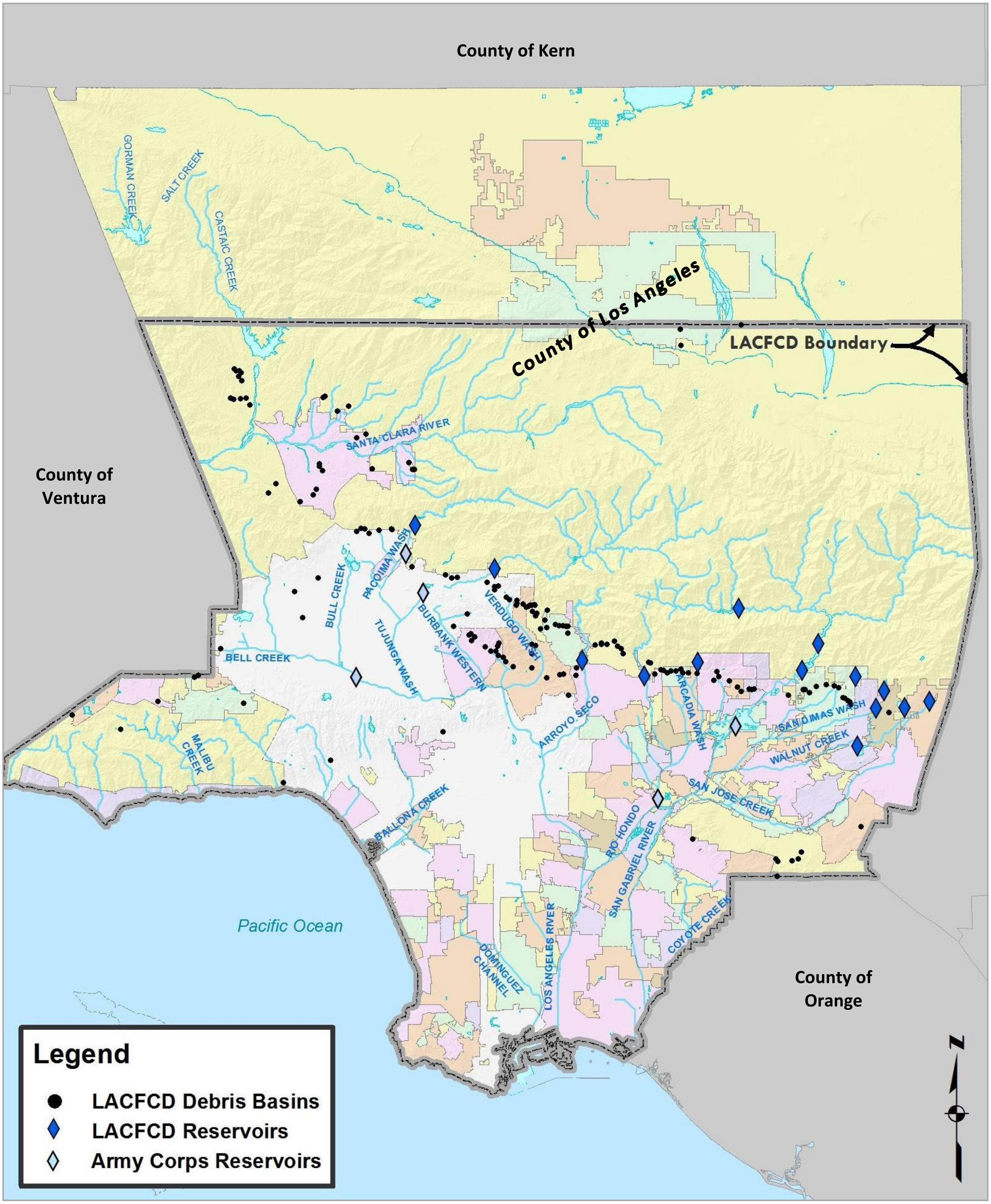
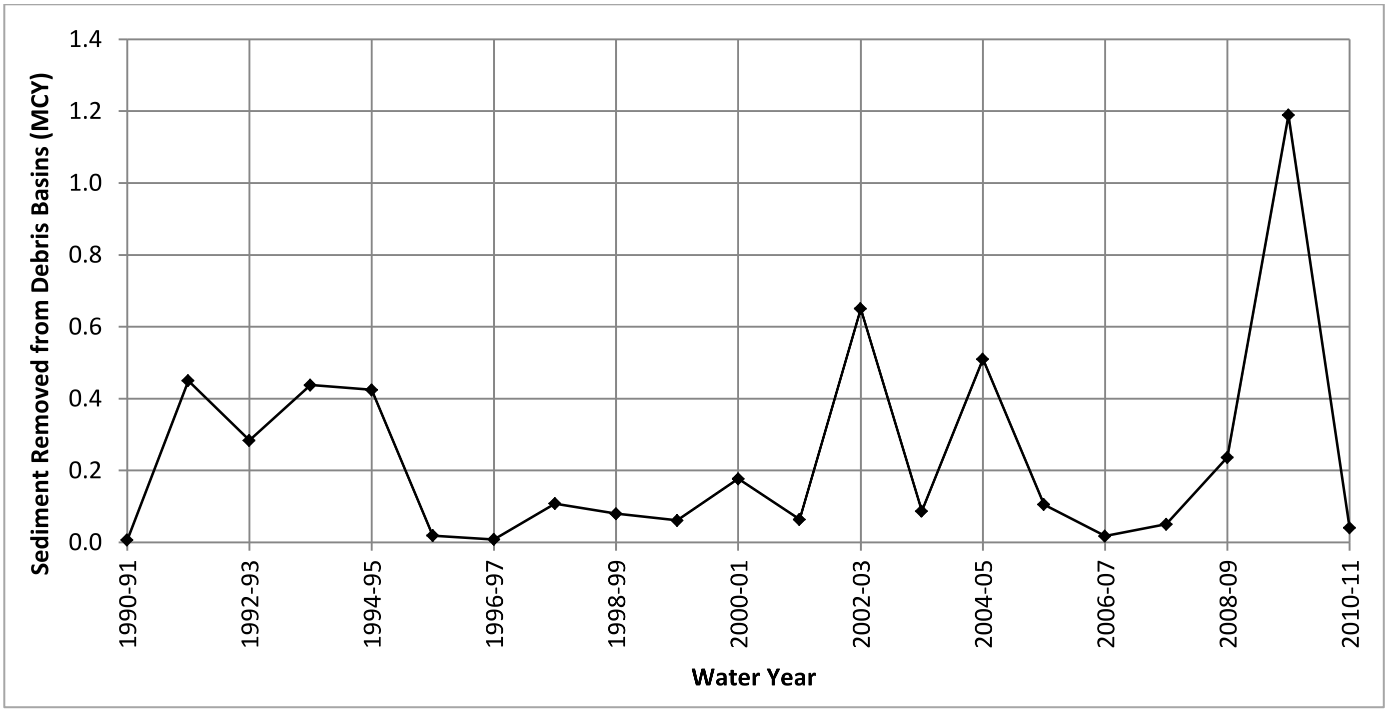


Figure 1-2 Sediment Removed from Debris Basins versus Water Year for Water Years 1990-91 to 2010-11



The Station Fire of 2009 significantly burned the watershed of four reservoirs maintained by the Flood Control District, namely Big Tujunga, Cogswell, Devil's Gate, and Pacoima Reservoirs. Based on surveys conducted before and after the Station Fire, approximately 3.4 MCY of sediment deposited in those four reservoirs during the 2 storm seasons following the Station Fire.

As a result of the fires, the Flood Control District's sediment management needs have far exceeded the projections in the Sediment Management Strategic Plan completed in 2006. This accelerated the need to develop a new plan.

1.3 FLOOD AND DEBRIS FLOW RISK MANAGEMENT, GROUNDWATER RECHARGE, AND SEDIMENT MANAGEMENT

Historically, sediment-laden water travelled from the mountains to the ocean along rivers and tributaries with changing courses, depositing sediment across alluvial fans and floodplains. Development of the Los Angeles Basin drastically changed this natural process. As the population grew, development encroached on the alluvial fans and floodplains. This resulted in exposure of development and people to flood waters and debris flows. Consequently, the existing engineered flood risk management system was developed to manage the risk of floods and debris flows for the Los Angeles Basin and its many residents.

The Flood Control District owns and maintains the vast majority of the flood risk management system within the Flood Control District's boundaries. The Flood Control District is responsible for 500 miles of open channel, 3,035 miles of underground storm drains, 14 dams, and 162 debris basins. The dams help attenuate peak-storm flows, so that downstream components of the system are not overwhelmed. The dams also capture debris flows. The concrete channels help move flood waters that cannot be stored in the reservoirs as efficiently as possible to the ocean using a minimal amount of land area. Debris basins capture sediment and debris that erode from the mountains before they enter downstream facilities. This reduces risk for adjacent communities from debris flows and ensures the system operates as designed by eliminating debris from the concrete channels and storm drains downstream. Sediment-laden flows can cause accelerated wear and reduced capacity for downstream facilities. The other major components of the flood risk management system within the Flood Control District's boundaries are owned and maintained by the U.S. Army Corps of Engineers.

In addition to managing the risk of floods and debris flows, the Flood Control District plays a vital role in recharging the region's groundwater aquifers. The reservoirs behind the dams store rainwater, runoff, and melted snow. When it is safe, controlled releases of water are conveyed through the channels. Water is either captured by water purveyors or allowed to flow downstream to spreading facilities used to recharge the region's groundwater aquifers. Local water sources provide for approximately a third of the region's water demand. In order to supply the remaining water demand, water is imported and reclaimed by various agencies. The Flood Control District system is used to convey and infiltrate some of the imported water as well as the reclaimed water into the groundwater aquifers. The Flood Control District recharges roughly 280,000 acre-feet of water annually, meeting the yearly needs of approximately 550,000 families of 4.

Dams, reservoirs, debris basins, channels, and spreading facilities are affected by the sediment that erodes from the mountains. Sediment impacts the operations at dams and reservoirs in several ways. Sediment accumulation behind a dam can render a dam's outlet valves inoperable if the valves become buried by sediment. It also decreases storage capacity, thus reducing the ability to manage peak-storm flows, capture debris flows, and store water for later use. By virtue of their function, debris basins capture sediment washed from the mountains during storms. Sediment that remains in the debris basin reduces the storage capacity for sediment inflows resulting from future storms. In channels, some sediment deposits as flows travel downstream. Fine sediment in the water infiltrated at spreading facitlities reduces groundwater recharge rates over time. In order to maintain the proper functionality of Flood Control District facilities, sediment has to be managed, with the majority of the sediment management needs being associated with the reservoirs and debris basins.

1.4 EFFECTS OF FIRES

Wildfires greatly increase the amount of runoff and erosion from mountainous watersheds. A recently burned watershed could produce greater than normal sediment volumes due to higher erosion caused by a lack of vegetation or lowered infiltration rates caused by hydrophobic soil. Flood flows from a denuded watershed can transport large quantities of sediment and debris including boulders and vegetation. As much as 120,000 cubic yards of sediment and debris have been produced per square mile of a burned watershed after a major storm. The duration and intensity of a storm, as well as the severity of the burn on a given watershed, determine the debris potential.

The first five years after a fire have proven to be the most critical. Typically by years four and five, vegetation in the burned areas significantly recovers and the debris potential is reduced by about half of what it was immediately after the fire. It takes approximately 10 years for the burned area to return to the prefire debris potential level.

1.5 DEVELOPMENT APPROACH

Various alternatives for sediment removal, transport, beneficial use, and placement were identified and analyzed based on five main factors - environmental impacts, social impacts, implementability, performance, and approximate 20-year cost. A number of specific concerns were considered within each factor, as shown in Table 1-1.

Table 1-1 Evaluation Factors Considered for Each Sediment Management Alternative

Evaluation Factor	Description	
Environmental Impacts	• Habitat • Water quality	• Groundwater recharge • Air quality
Social Impacts	• Traffic • Scenic and visual impacts	• Noise • Recreation
Implementability	• Construction issues	• Permits or agreements
Performance	• Previous experience • Cleanout capacity	• Number of operations required to address the planning quantity
Cost	• Estimated total cost over 20 years	

Using the five factors, the Flood Control District, with input from stakeholders, analyzed each alternative to identify the feasibility for reservoirs, and debris basins. Removal, transport, beneficial use, and placement alternatives identified as feasible for each facility type were put together for each reservoir and the debris basins to create combined sediment management alternatives.

1.6 OUTREACH STRATEGY

The Strategic Plan represents the results of a continuing dialogue about sediment management between the Flood Control District and the numerous stakeholders in the region. To ensure it accurately reflects the input of the numerous stakeholders in the Los Angeles Region, the Flood Control District engaged agency, industry, and public stakeholders to help shape the various sediment management alternatives under consideration. The tenets of the public outreach program included:

- Stakeholder Task Force: created to gather input from external stakeholders during the development and review of potential sediment management alternatives to be incorporated into the Strategic Plan. Regulatory agencies, cities, landfill owners and operators, water agencies, sand and gravel companies, environmental groups, and others were invited to participate in the Stakeholder Task Force. The first Stakeholder Task Force meeting was held in January 2011. The Stakeholder Task Force met approximately every two months throughout the development of the Strategic Plan. All Stakeholder Task Force meetings were open to the public.

- Advisory Working Group: created to gather additional input and a broad perspective from external stakeholders based on the members' diverse experiences and key roles in the stakeholder community. Participation included representatives from local jurisdictions, environmental groups, and the media. The Advisory Working Group met approximately every month.

- Public Open Houses: conducted to provide an open forum for public input during the Strategic Plan review period. Two open houses were held in the general vicinity of major facilities to allow neighboring community members to provide feedback on the alternatives identified in the Strategic Plan.

- Website: developed a website (www.LASedimentManagement.com) dedicated to sediment management to provide ongoing information to the public on the development of the Strategic Plan and the planning of upcoming reservoir sediment removal projects.

Based on valuable input from agencies, organizations, industry, and the public through the Stakeholder Task Force, Advisory Working Group, and Public Open Houses, the Flood Control District evaluated numerous sediment management alternatives. This input was used to develop the combined alternatives presented in this plan.