

SECTION 4 HISTORICAL SEDIMENT DEPOSITION AND REMOVAL

As a result of their location and function, sediment from the mountains is deposited in reservoirs and debris basins as well as in other facilities maintained by the Flood Control District. The amount of sediment that reaches a facility any given year depends on the size of the watershed, the watershed's vulnerability to erosion, watershed conditions (such as vegetated watershed versus burned watershed), and weather conditions (such as the amount and intensity of rain). Although small quantities of sediment may regularly be deposited into the facilities, it is often several years between significant sediment depositions since sediment is deposited mainly during discrete storm events. Removal of sediment deposited into the facilities is required in order to maintain their functionality. This section summarizes historical sediment deposition and removal for the reservoirs and debris basins.

4.1 RESERVOIRS

The region's reservoirs were constructed to intercept floodwaters and capture sediment and debris in order to provide for flood and debris flow risk management and water conservation. Sediment-laden floodwaters result in accumulation of sediment in the reservoirs. In order to determine changes in the capacity of the reservoirs maintained by the Flood Control District, the reservoirs are surveyed routinely. Since the 1920s, a total of approximately 131 million cubic yards (MCY) of sediment has been intercepted by the reservoirs maintained by the Flood Control District, as shown in Figure 4-1 and Table 4-1. Approximately 83 MCY of sediment has been removed as of May 2011. Based on the latest surveys, there are approximately 45 MCY of sediment in the reservoirs.

Sediment accumulated in the reservoirs reduces the capacity for incoming water and debris flows. Furthermore, sediment accumulation at the face of a dam can cover the dam's valves, making them inoperable. These effects can lead to a dam's inability to manage the risk of floods and debris flows.

In the past, the Flood Control District has employed sluicing and excavation to remove sediment from reservoirs. Given the rate of sediment accumulation, its effect on a dam's flood and debris flow risk management function, and the effect the sediment removal process has on stored water, it is often several years between sediment management projects at each reservoir.

It should also be noted that in addition to positively impacting a dam's ability to provide flood and debris flow risk management, sediment removal at the reservoirs also helps regain the water storage capacity of reservoirs, improving the water conservation capabilities of the facilities.

Figure 4-1 Reservoir Sediment History

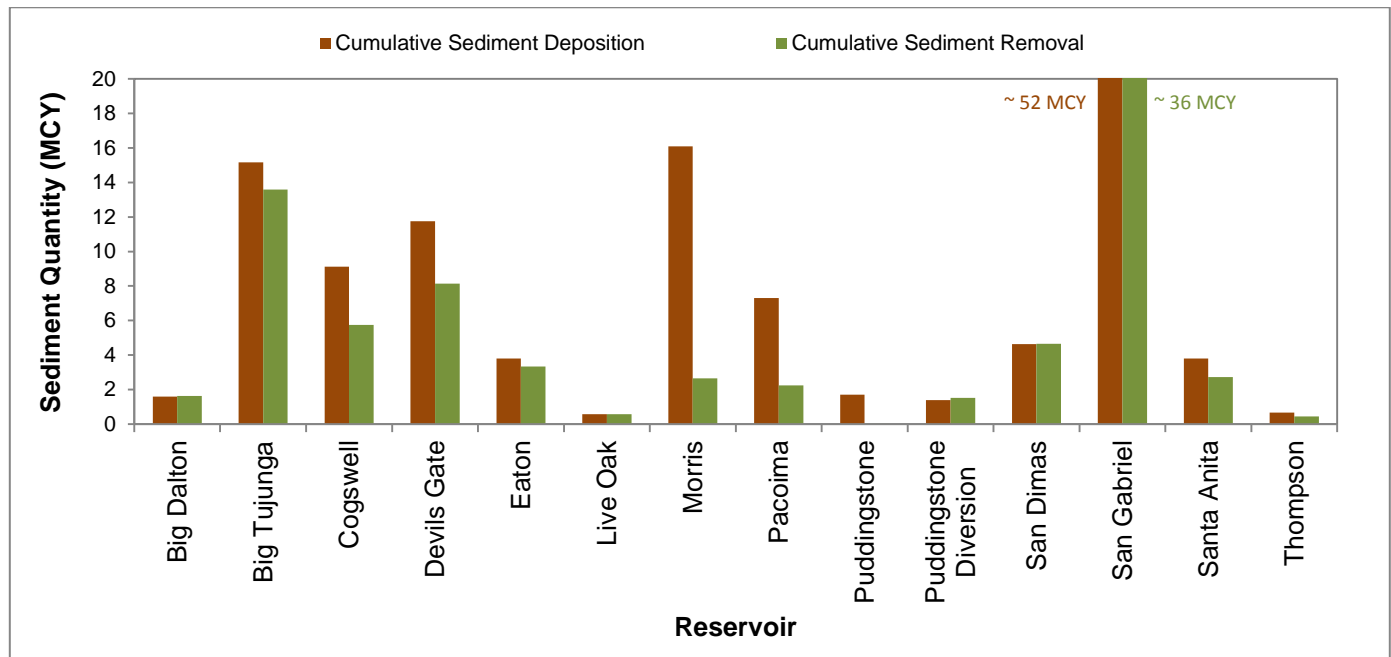


Table 4-1 Reservoir Sediment History in Million Cubic Yards

Reservoir	Construction Date	Total Historical Sediment Accumulation (MCY)	Total Historical Sediment Removal (MCY)	Condition as of Last Survey	
				Date of Last Survey	Sediment Quantity in the Reservoir (MCY)
Big Dalton	1929	1.6	1.6	Jul 2008	0.0
Big Tujunga	1931	15.6	13.5	Aug 2011	2.0
Cogswell	1934	9.6	5.7	Aug 2011	3.9
Devil's Gate	1920	12	8.1	Mar 2011	3.9
Eaton	1937	3.8	3.3	May 2010	0.5
Live Oak	1922	0.6	0.6	Nov 2008	0.008
Morris	1934	16.1	2.6	Dec 2010	13.1
Pacoima	1929	7.3	2.2	Sep 2010	5.1
Puddingstone	1928	1.7	0	Sep 1989	1.7
Puddingstone Diversion	1928	1.4	1.5	Oct 2007	0.0
San Dimas	1922	4.6	4.6	Aug 2009	0.0
San Gabriel	1939	52.1	36.1	Dec 2006	14.4
Santa Anita	1927	3.8	2.7	Dec 2010	0.3
Thompson	1926	0.7	0.4	Jun 2004	0.2
Total		130.9	82.9	N/A	45.1

Note:

- The quantities of sediment accumulated and removed from the reservoirs are estimated based on bathymetric surveys and truck counts. Both these methods have a certain level of inaccuracy. As a result, cumulative sediment deposition minus historical removal may not be equal to the sediment quantity in the reservoir as of the last survey.

4.2 DEBRIS BASINS

Debris basins are constructed to capture sediment and debris that erode from the mountains before that material enters the downstream system. This capture of sediment and debris provides flood risk management for downstream communities and protects downstream infrastructure (channels and drains) from wear that can result from the erosive properties of sediment-laden flows. Sediment inflow and removal records for the debris basins maintained by the Flood Control District have been kept since Water Year 1935-36. An analysis of the Flood Control District’s records shows approximately 18 MCY of sediment have accumulated and been removed from debris basins since then. During that time, approximately 40 percent, or 6.7 MCY, was removed in one 4-year period, as shown in Figure 4-2.

In unburned watersheds, debris basins are cleaned out when they are 25 percent full. The Flood Control District’s environmental regulatory permits (dating from the 1990s) require this criterion be met before a cleanout occurs. As with the reservoirs, sediment mainly accumulates in the debris basins during discrete storm events. Furthermore, the areas in which the debris basins are located vary in rainfall potential and debris production potential. Therefore, the time it takes for a debris basin to reach the 25 percent full level varies. For debris basins in an unburned watershed, it could be several years between cleanouts.

A watershed that has had more than 20 percent of its tributary area burned within the previous 5 years is considered a burned watershed. Debris basins in burned watersheds are cleaned out when they are 5 percent full. For some debris basins in burned watersheds, this may lead to multiple cleanouts within a year, as was seen during the 2009-10 Storm Season in the aftermath of the 2009 Station Fire.

Figure 4-2 shows the historical quantity of sediment removed per water year since Water Year 1935-36 from the debris basins maintained by the Flood Control District. The figure illustrates the variability in the quantity of sediment removed from the debris basins each year. The historical records include the effects of heavy rains and fires.

Figure 4-2 Debris Basin Sediment Removal History

