Santa Monica Debris Basin Prevented Major Damages from Occurring After Heavy Rains in Wild fire Burned Areas in California.

Wildfires in California in 2017 and early 2018 destroyed homes and businesses and claimed the lives of residents. The fires also destroyed the vegetative cover that protected the landscape from erosion during heavy rain storms.

The Thomas fire affecting Ventura and Santa Barbara burned over 280,000 acres in December 2017, destroying at least 1,063 structures and damaging 280 others. This and multiple other wild fires left thousands of acres bare and unprotected when winter and spring rains occurred.

High rain fall events occurring in December 2017 and January 2018 caused tremendous damages from sediment and debris washed off areas affected by the fires. Mud slides caused considerable damages to homes and other structures and roads were covered and stream channels were filled with sediment.

Damage would have been much worse in some areas if not for debris basins that have been constructed in past years for flood control and to trap debris before it reaches developed areas.

<u>Santa Monica Debris Basin</u>

One of these debris basins is located in Santa Barbara County and was constructed over 40 years ago by local project sponsors with the assistance from the USDA Soil Conservation Service (now the Natural Resources Conservation Service). The Santa Barbara County Flood Control and Water Conservation District maintains this and ten other debris basins.

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Boulder field in Santa Monica Creek at the debris basin inlet after January 2018 rains

The debris basin is located in the Santa Monica Creek watershed that originates in the foothills of the Santa Ynez Mountains and drains a 2,337-acre watershed capable of producing 4,500 cubic feet per second during a 100-year return period precipitation event.

This debris basin was tested “to the limits” in early January 2018 when it completely filled with debris, sediment and huge rocks that was washed from the burned over watershed by a heavy rain storm.

Carpinteria Valley was spared from the disaster that occurred in other near-by areas due to the debris basin that trapped and prevented debris and sediment from washing further downstream.

Santa Monica Creek Debris Basin is an engineered facility that was built in 1977 as an element of the Carpinteria Valley Watershed Project. The debris basin was designed to trap 208,000 cubic yards of flood debris and was completely filled with debris after the January 2018 storms. Local officials with assistance from the Federal Emergency Management Agency and the US Army Corps of Engineers responded rapidly in cleaning out the debris from the basin restoring its capacity to trap additional debris during the spring rains.

The Santa Monica Creek Debris Basin is a very large basin with a two tiered dam face. The dam is over 60 feet high on the upstream and approximately 150 feet high on the downstream side. The dam is covered with large rip-rap with concrete spillway located on the east side of the basin. The spillway is approximately 1,600 feet long and discharges into a plunge pool. The plunge pool is approximately 300 feet long, 150 feet wide and 30 feet deep when clean and acts as a sediment catch basin and is cleaned and restored to full capacity after each storm event to be ready as needed for future storms.

This was not the first year that the debris basin has functioned as designed and prevented damages downstream. It was however the most significant test of the Basin since its construction and the first time debris had filled the basin to the point of exceeding the crest of the emergency spillway. Fortunately the basin capacity was adequate such that very little debris went through the emergency spillway resulting in no significant damage downstream.

The value of the basin has proved its worth over the years with numerous flood events that would have caused significant damage downstream if the basin had not been in place. Some of these memorable storms include the floods of March 1995, “El Nino floods” of 1998 and floods in 2005. After each of these events major work was required and completed to clean and restore the basin as quickly as possible to be ready for future storms.

The value of this project and good sound watershed planning in general can perhaps best be summarized in this statement from Tom Fayram Deputy Public Works Director, County of Santa Barbara: "While other watersheds saw tragic damage and loss of life, the Santa Monica Facility carried the day. In past events the City of Carpinteria was ravaged by the Santa Monica Watershed. In January 2018 the City was mostly unaffected." – T Fayram

This article developed by the National Watershed Coalition with contributions from: Bill Ward, PE, Retired NRCS Engineer, Doug Toews, PE, Retired NRCS Engineer, and Tom Fayram, PE, Deputy Public Works Director, Santa Barbara County – June 2018