



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Nevada

Best Management Practices Drastically Reduce Sediment and Restore Water Quality in Las Vegas Wash

Waterbody Improved

The Las Vegas Wash drains the 1,600-square-mile Las Vegas Valley, delivering stormwater, urban runoff, and highly treated effluent to Lake Mead, the nation's largest manmade reservoir and the primary water supply for millions of people in Nevada, Arizona, and southern California. These sources caused water quality impairments to the lower wash due to excess sediment and iron transported with that sediment. In 2002, Nevada placed the lower reach of Las Vegas Wash on its 303(d) list of impaired waters, with impairments to aquatic life propagation (excluding fish) due to total suspended solids (TSS). Following the construction of erosion control structures, restoration of wetland areas, and removal of invasive vegetation, average TSS concentrations declined significantly. This allowed the state to remove the lower reach from its 303(d) list in 2004.

Problem

During the past 30 years, the Las Vegas area of southern Nevada experienced dramatic population increases. Indeed, the 1,600-square-mile metropolitan Las Vegas Valley is one of the fastest growing areas in the United States. The valley drains into Las Vegas Wash, which carries stormwater runoff and wastewater 12 miles to Las Vegas Bay, an arm of Lake Mead.

Rising population and development rates have increased the volume of water discharged into the wash. An increase in impervious surfaces allows more stormwater runoff to flow directly into the wash rather than be absorbed by the soil. In addition, the growing population produces a high volume of wastewater that is discharged into the wash. The increased water flow, when added to an area already prone to flash flooding, accelerated erosion in the wash, destabilized the stream channel, significantly degraded wetland areas, and contributed excessive sediment to Las Vegas Bay.

For state water quality management purposes, Nevada divides the wash downstream of the city of Las Vegas into two reaches. The lower reach, which extends 5.12 miles upstream from



Weirs are low dams designed to reduce streambed erosion by flattening the slope of the channel and slowing flows. Many weirs are constructed of confined rock riprap, providing a somewhat natural look (top). Other structures are built with concrete, resulting in a more engineered look (bottom). Weirs, wetland restoration, and invasive vegetation removal helped reduce TSS concentrations in lower Las Vegas Wash and led to its removal from the Nevada 303(d) list in 2004.

Las Vegas Bay, has a state TSS water quality standard of 135 mg/L to protect aquatic life propagation (excluding fish). For a waterbody to be deemed in compliance with the standard, it must not exceed the standard more than 10 percent of the time over 5 consecutive years. Between 1997 and 2001, the lower reach failed to meet the 5-year exceedence criterion, so the Nevada Division of Environmental Protection (NV DEP) placed the lower reach on the 2002 state 303(d) list for impairments to aquatic life propagation (excluding fish) due to TSS.

Project Highlights

When NV DEP first listed the lower reach in 2002, efforts were already underway to restore the lower reach and protect the waterbody. In 1998 the Las Vegas Wash Coordination Committee (LVWCC) met to develop a practical, comprehensive plan to rehabilitate and manage the wash downstream of the city of Las Vegas. The Las Vegas Wash Comprehensive Adaptive Management Plan (CAMP) was approved and adopted in January 2000.

The CAMP identified various activities needed to improve water quality, such as installing weirs and other erosion control structures, creating and restoring wetlands, and controlling noxious and invasive plant species. The CAMP also called for an extensive revegetation effort to stabilize soils and replace previously lost riparian and wetland habitat.

LVWCC sponsored numerous planting events that helped increase citizen awareness and foster community support for the restoration effort. Citizen volunteers removed trash from the wash and planted wetland, riparian, and upland plant species. They also removed invasive vegetation such as tall whitetop, which has narrow and easily broken roots that destabilize the soil and allow increased bank erosion.

LVWCC initiated an extensive long-term monitoring program to provide baseline water quality data and measure the success of erosion control and revegetation efforts.

Results

As of June 2006, the project has involved constructing nine weirs, stabilizing more than 21,000 linear feet of streambank, restoring 33 acres of wetlands, and removing 500,000 pounds of trash and 680 acres of tall whitetop.

While project water quality benefits had begun to be realized before 2002, the lower reach of the wash did not meet the 5-year threshold criteria for TSS and was therefore placed on the 2002 Nevada 303(d) list. Water quality improvements continued, however, with average TSS concentrations declining 50 percent since 2001. Analysis of 1999–2003 water quality data showed that TSS concentrations exceeded the 135 mg/L standard 11 times out of 130 samples collected. This represented an 8.5 percent noncompliance rate, below the maximum 10 percent allowable rate.

With TSS data showing compliance with water quality standards, Nevada removed the lower reach's aquatic life propagation (excluding fish) impairment from its 303(d) list in 2004. The NV DEP will continue to review monitoring data to confirm continued compliance with water quality standards.

Partners and Funding

The cooperation of 28 members of the LVWCC, representing local, state, and federal agencies, local environmental groups, businesses, and interested citizens, was essential in the creation of a comprehensive management plan for the Las Vegas Wash. Volunteers also played an important role in the project, providing the needed labor for wetland and riparian plantings and invasive vegetation removal. The overall cost to implement the CAMP is projected to be approximately \$127 million through 2013.

As of 2006, \$33 million has been spent on CAMP implementation. Approximately \$600,000 of section 319 funds was used to support construction of erosion control structures, bank revegetation, and public outreach efforts. Participating agencies contributed \$1.8 million during the 2005–2006 fiscal year.



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For additional information contact:

Keiba Crear
Southern Nevada Water Authority
Las Vegas Wash Coordination Team
702-822-3388
keiba.crear@snwa.com