# Section 319
# NONPOINT SOURCE PROGRAM SUCCESS STORY
# New Mexico

## Restoration Efforts Revive Riparian Vegetation and Improve Water Quality

### Waterbody Improved

Livestock grazing and a wastewater treatment plant discharge contributed to water quality impairments in New Mexico's lower Santa Fe River. As a result, New Mexico added a 12.7-mile-long segment of the river to the state's 1998 Clean Water Act (CWA) section 303(d) list for pH, sedimentation and dissolved oxygen (DO). Implementing best management practices (BMPs), including restoring riparian vegetation, removing levees, and constructing wetlands, significantly improved water quality. Therefore, New Mexico removed the pH (2008) and sedimentation (2010) impairments from a segment of the lower Santa Fe River. Based on recent data, New Mexico is also proposing to remove the segment's DO impairment in 2012.

## Problem

The Santa Fe River originates in the Sangre de Cristo Mountains and flows into two municipal reservoirs that supply drinking water for the City of Santa Fe. Below the reservoirs the river flows intermittently through urban Santa Fe and eventually to Cochiti Reservoir on the Rio Grande River. The Santa Fe River Preserve is in the lower portion of the Santa Fe River, downstream of the city of Santa Fe. That section of the river flows perennially through the preserve as a result of its proximity to the Santa Fe wastewater treatment plant (WWTP) outfall, which provides the primary source of flow (Figure 1).

In 1998 New Mexico added a 12.7-mile-long segment of the Santa Fe River (from the Cochiti Pueblo to the Santa Fe WWTP) to the state's CWA section 303(d) list of impaired waters for not supporting the designated uses of marginal coldwater fishery, warmwater fishery and livestock watering. The water quality parameters of concern noted at the time were pH, stream bottom deposits (sedimentation), DO, chlorine and total ammonia. The probable sources of pollution were listed as municipal point sources and agriculture (cattle with access to streams).

Upgrades to the Santa Fe WWTP in 1996 and 1997 led to the removal of ammonia and chlorine as pollutants of concern in 2000 and 2002, respectively. However, cattle grazing and eroding riparian areas continued to contribute nonpoint source pollution to this reach of the Sante Fe River. Poor riparian condition exacerbated effects of nutrients present in the WWTP discharge.

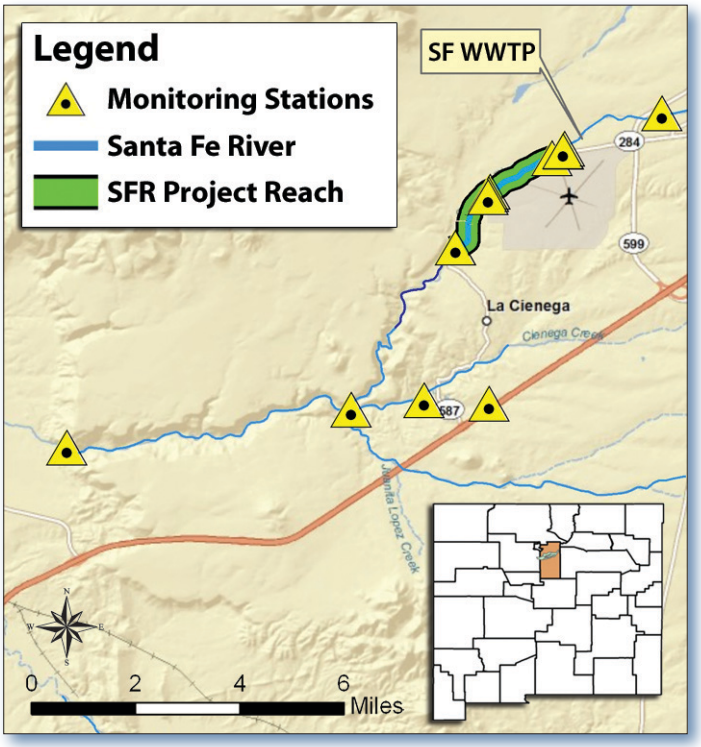


Figure 1. The impaired reach of the Santa Fe River extends below the Santa Fe wastewater treatment plant (SF WWTP).

In 2000 New Mexico completed total maximum daily load (TMDL) studies for the lower Sante Fe River. The studies set goals for four pollutants: pH (6.6 to 9.0), DO (5 milligrams per liter [mg/L] as a 24-hour average), residual chlorine (0.78 pound per day), and sedimentation (20 percent fines).

## Project Highlights

Restoration efforts transformed the impaired reach of the Santa Fe River from an erosion-prone, barren area (Figure 2) into a lush preserve with abundant riparian vegetation and wildlife (Figure 3). In 1997 the WildEarth Guardians collaborated with the Santa Fe Municipal Airport to install fencing to keep grazing livestock away from riparian areas and prevent them from roaming onto airport runways. Initial project funding came from a U.S. Fish and Wildlife Service Partners Grant. In 2000 WildEarth Guardians received a CWA section 319 grant to expand the project onto lands owned by the city of Santa Fe. The partners implemented a number of BMPs, including removing exotic vegetation and planting native vegetation—more than 5,000 cottonwood trees and 15,000 willow trees. The BMPs also included additional fencing, levee removal to allow high flows to reach the floodplain, wetland creation, and outreach and education activities.

Figure 2. The Santa Fe River, below the wastewater treatment plant, in 1997 (before restoration).

Figure 3. The Santa Fe River in 2004 (same location shown in Figure 2, after restoration).

In 2002 the Santa Fe Watershed Association developed the Santa Fe River Watershed Restoration Action Strategy (WRAS), providing a planning basis on which restoration activities were developed and funded. The restoration work addressed several WRAS goals, including planting the riparian corridor with native vegetation to increase shading, stabilizing banks and improving water quality. The Santa Fe City Council also passed a resolution that recognized the ecological significance of the river segment and encouraged its protection and restoration.

In 2004 another CWA section 319 grant provided funding to extend the project farther downstream on Santa Fe County open space and private lands. This second phase of the project installed additional cattle fencing, removed berms and exotic vegetation, and planted native cottonwoods and willows to reestablish the riparian corridor.

## Results

Water quality has improved. Following restoration, pH samples remained within the acceptable water quality target range of 6.6 to 9.0 standard units. Samples showed no pH standard exceedances, compared to 82 exceedances before restoration. A 2009 sediment survey indicated that the percent of sediment fines had dropped to 5 percent, well below the 20 percent target. On the basis of these data, New Mexico removed pH (2008) and sedimentation (2010) from the segment's list of impairments.

Additional samples collected after restoration show that DO levels consistently remain between 5 mg/L and 9 mg/L and comply with the target of greater than 5 mg/L as a 24-hour average. Therefore, New Mexico is proposing to remove the segment's DO impairment in 2012.

## Partners and Funding

Primary partners include WildEarth Guardians (formerly Forest Guardians), the City of Santa Fe, the County of Santa Fe, private landowners, the Santa Fe Soil and Water Conservation District (SWCD), and the Surface Water Quality Bureau of the New Mexico Environment Department. Approximately 70 volunteers planted native vegetation and learned about riparian systems during a Santa Fe River Stream Team event. Other planting programs were carried out by about a dozen Santa Fe area schools, another dozen volunteer groups and the state's inmate work program.

Initial funding came from a U.S. Fish and Wildlife Service grant. The Santa Fe River Restoration Project (2000 to 2004) was funded by $143,650 in CWA section 319 funds and $155,750 in matching funds. The La Cieneguilla Open Spaces/Santa Fe River Restoration Project (2005 to 2009) was funded by $114,275 in CWA section 319 funds and $124,231 in matching funds. Finally, the Santa Fe-Pojoaque SWCD provided a $48,000 grant to remove nonnative vegetation, in cooperation with the Santa Fe County Open Space Division and local community members.

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