



# NONPOINT SOURCE SUCCESS STORY

## New Mexico

### Adding Protection Measures Restores Sitting Bull Creek

#### Waterbody Improved

Heavy recreational use combined with inadequate restroom facilities resulted in poor water quality in New Mexico's Sitting Bull Creek. Severe algal blooms became a common occurrence, prompting the New Mexico Environment Department (NMED) to add the creek to the state's 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for sedimentation, total phosphorus, and bacteria. NMED collaborated with the U.S. Forest Service (USFS) using CWA section 319 funds to close unauthorized trails, reduce erosion from the road and parking lot with management measures, and improve the bathroom facilities. Water quality improved, allowing NMED to remove all listed impairments for Sitting Bull Creek in 2006. The creek now fully supports its designated uses.

#### Problem

Sitting Bull Creek is a scenic oasis and a popular recreation destination in the Chihuahuan desert of southeastern New Mexico, about 40 miles southwest of Carlsbad (Figure 1). It is part of the Pecos River watershed, but is only perennial in the upper reaches. Inadequate infrastructure and a lack of management at the Sitting Bull Falls Recreation Area led to pollution problems, including eroding soil from steep paths, runoff from roads with poor drainage control, and the deposition of human waste near the creek because of a lack of adequate bathroom facilities.

Nuisance algal blooms were common in pools below Sitting Bull Falls in the mid-1990s (Figure 2). Using best professional judgment, NMED determined that the creek did not support its designated uses of warmwater fishery and secondary recreation contact. As a result, in 1998 NMED added a 1.8-mile segment of Sitting Bull Creek (segment NM-9000.A-007: from Last Chance Canyon to Sitting Bull Springs) to the CWA section 303(d) list of impaired waters for sedimentation, bacteria and total phosphorus.

Staff from the NMED Surface Water Quality Bureau (SWQB) identified the probable sources of Sitting Bull Creek's water quality problems as dispersed recreation, improper sanitation, grazing and roads. The key pollution sources were addressed before a TMDL could be developed.



Figure 1. Sitting Bull Creek is in the Pecos River watershed in New Mexico.

#### Project Highlights

To restore water quality in Sitting Bull Creek, the NMED SWQB coordinated with USFS staff from the Lincoln National Forest to include water quality protection measures in their plans to renovate the Sitting Bull Falls Recreation Area. From fall 1996 to summer 1998, partners used CWA section 319 funds to address sediment pollution by installing a sediment retention basin and hard armoring the eroding drainage channels leading from the



Figure 2. Nuisance algal blooms were common in pools below Sitting Bull Falls in the mid-1990s.



Figure 3. Restoration project efforts included adding fencing and armoring drainage ditches.

road and parking lot (Figure 3). They installed pipe fencing around the picnic areas to discourage access to the unauthorized trails and to protect the riparian area from erosion. In addition, the partners installed a new water supply well and upgraded the restroom facilities; these improvements have resolved the sanitation issue and reduced bacterial loading. Volunteer site hosts are stationed in RVs onsite to monitor the day-use area to ensure success. This project was a good example of interagency cooperation on resource management, as both agencies came together on their planning efforts to upgrade the recreation area and improve water quality.

## Results

NMED SWQB performed an intensive survey of the creek after completion of the restoration project. In 2003, staff conducted six sampling events for fecal coliform, all of which showed that bacteria levels met the water quality standard (the monthly *E. coli* bacteria geometric mean must be 206 colony-forming units per 100 milliliters [cfu/100 mL] or less and any single sample must be 940 cfu/100 mL or less).

In July 2006, NMED SWQB performed a nutrient assessment that showed acceptable levels for the ecoregion-specific ratios required for nitrogen and phosphorus. Chlorophyll *a* and pH levels also fell within acceptable ranges. Because three or more indicators fell within acceptable ranges, the segment is considered not impaired by nutrients and qualifies as providing full support of its designated uses. As a result, the NMED SWQB removed

Sitting Bull Creek from the CWA section 303(d) list of impaired waters for total phosphorus, sediments, and bacteria, citing significant improvements in land management.

The creek's water quality is excellent, which prompted NMED to add the more restrictive primary contact designated use to Sitting Bull Creek's list of designated uses in the 2006–2008 State of New Mexico Integrated CWA Section 303(d)/305(b) Report (Figure 4).

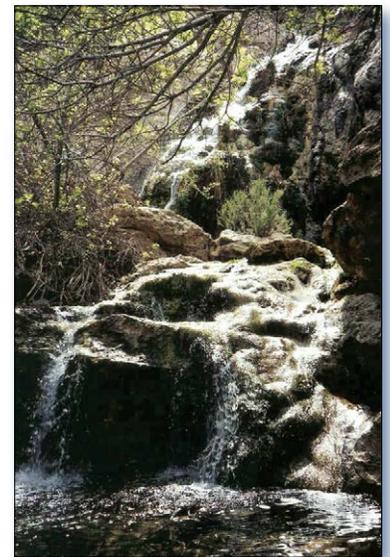


Figure 4. Thanks to water quality protection efforts, Sitting Bull Creek is now designated for primary contact recreation use.

## Partners and Funding

The partners on this project were the Guadalupe Ranger District of the Lincoln National Forest and NMED SWQB. A total of \$22,700 of CWA section 319 funds supported the Sitting Bull Falls Water Protection and Habitat Improvement Project, which included upgrading restrooms, purchasing seeding materials for disturbed areas, and installing fencing, erosion control structures and outreach kiosks. Matching funds and in-kind activities were provided by the U.S. Forest Service.



U.S. Environmental Protection Agency  
Office of Water  
Washington, DC

EPA 841-F-14-001KKK  
November 2014

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