NONPOINT SOURCE SUCCESS STORY

Wyoming

Educating Homeowners and Fixing Failed Septic Systems Restores Recreation Use in North Piney Creek

Waterbody Improved

Failing septic systems contributed to elevated levels of *Escherichia coli (E. coli)* that exceeded the water quality criterion protective of primary contact recreation in Wyoming's North Piney Creek. As a result, the Wyoming Department of Environmental Quality (WDEQ) added North Piney Creek to Wyoming's 2006 Clean Water Act (CWA) section 303(d) list of impaired waters. The local county government undertook proactive septic system planning and education efforts and replaced or rehabilitated multiple septic systems in the area. Monitoring between 2008 and 2010 indicated that *E. coli* concentrations in North Piney Creek had declined and that the water quality criterion protective of primary contact recreation was now being met, prompting WDEQ to propose removal of North Piney Creek from the state's 2014 list of impaired waters.

Problem

Originating in the Big Horn Mountains, North Piney Creek is a perennial stream protected by WDEQ for drinking water, cold-water game and nongame fisheries, fish consumption, aquatic life (other than fish), recreation, wildlife, industry, agriculture and scenic value uses (Figures 1 and 2). Its flows are derived primarily from snowmelt within the upper reaches of the watershed. Recreation and livestock grazing are the primary land uses in most of the watershed, but the lowermost 4 miles flow through the unincorporated community of Story. Land use within Story consists of residential and rural residential properties of one-quarter acre to several acres, as well as some larger agricultural properties. Story does not have a central water supply or wastewater collection system; therefore, each property typically contains a private water supply well and septic system.

In 2005, allegations of surfacing sewage within a Story subdivision prompted WDEQ to conduct a study to evaluate *E. coli* contamination on several surface waters in the area, including North Piney Creek. Samples were collected from two sites on North Piney Creek—one above Story and one below. Samples collected in 2005 indicated that above Story, the *E. coli* criterion protective of primary contact recreation (geometric mean of 126 colony-forming units (cfu) per 100 milliliters (mL) was being achieved in North Piney Creek. However, samples from the site below Story indicated the *E. coli* criterion was being exceeded, as samples resulted in a geometric mean of 329 cfu/100 mL. This led to a 6.4-mile segment of North Piney Creek (segment WYPR100902060303 _ 01) being added to Wyoming's 2006 CWA section 303(d) list of impaired waters for nonsupport of primary contact recreation.

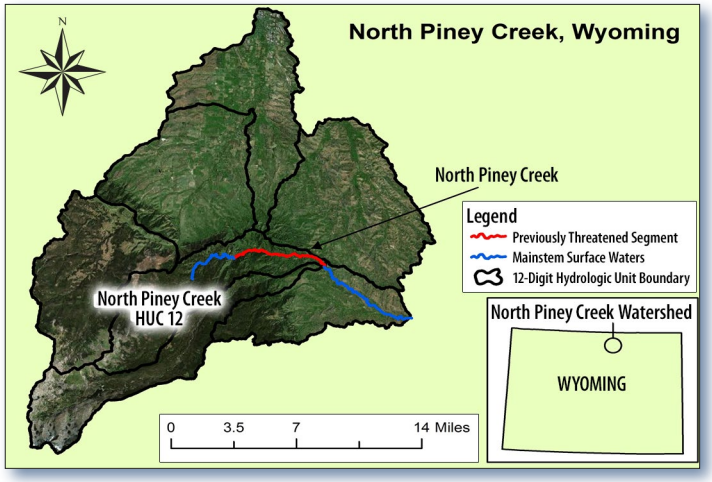

Figure 1. Map of the North Piney Creek watershed.

Figure 2. North Piney Creek is in northern Wyoming's Sheridan County.

Project Highlights

The CWA section 303(d) listing of North Piney Creek, along with concerns of septic system effluent contaminating the shallow alluvial aquifers used for Story's domestic water supply, prompted Sheridan County to undertake proactive efforts to address the bacteria impairment. Work included the county's sponsorship of a CWA section 205(j) project, one of the goals of which was to educate the public on water quality issues and the need for proper design and installation of septic systems. The county asked residents on a voluntary basis to allow county personnel access to private properties to inspect existing septic systems for a conditions assessment. Mapping of groundwater depths and depth fluctuations were accomplished, helping to better understand the hydrogeology of the area and to identify the areas most prone to problems. The project also provided information on recommended well construction standards. The county completed a review of septic system permitting records within Story, finding that roughly half of the 700 housing units did not have septic system permits and some of the permitted systems were out of date or inadequate. This effort culminated in Sheridan County working with Story residents to replace or rehabilitate multiple septic systems and the development of the Story Area Septic System Supplemental Regulations. The supplemental regulations to Sheridan County Small Wastewater Regulations required additional design and construction requirements for septic systems placed in the alluvial material in the Story area.

Results

At the request of Sheridan County, WDEQ completed follow up sampling on North Piney Creek from 2008 to 2010 to determine if the bacterial impairments had been mitigated. WDEQ collected samples from North Piney Creek during the primary contact recreation season (May through September) in months corresponding to when samples were collected in 2005. Five samples were collected in a 30-day period (each sample separated by at least 24 hours) to calculate a geometric mean in accordance with Wyoming's water quality criterion for

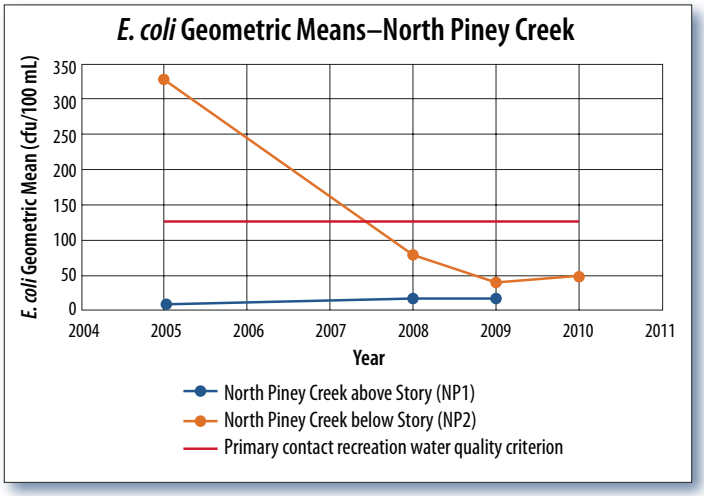

Figure 3. Data show that North Piney Creek *E. coli* geometric means dropped between 2005 and 2010.

E. coli. The geometric mean *E. coli* concentrations obtained in 2008–2010 indicated that *E. coli* concentrations at both North Piney Creek sites (above and below Story) attained the criterion protective of primary contact recreation. Specifically, the geometric mean concentration at the site below Story, which had been 329 cfu/100 mL in 2005, dropped to 80 cfu/100 mL in 2008, which met the water quality criterion. Data showed that concentrations dropped even lower in 2009 (42 cfu/100 mL) and 2010 (50 cfu/100 mL) (Figure 3). Geometric mean concentrations at the North Piney Creek site above Story attained the water quality criterion in all years it was sampled. Therefore, the WDEQ has proposed removal of North Piney Creek from the 2014 CWA section 303(d) list of impaired waters.

Partners and Funding

CWA section 205(j) funds awarded to Sheridan County through the state of Wyoming supported water quality management planning efforts in the watershed, leading to the voluntary rehabilitation or replacement of multiple failed septic systems in partnership with local residents. A total of $39,236 of CWA section 205(j) funds and $19,986 of nonfederal match contributed to this restoration effort.

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

EPA 841-F-15-001VV
October 2015

For additional information contact:

Ken Muller
Sheridan County
307-674-2920 • kmuller@sheridancounty.com
Jennifer Zygmunt
Wyoming Department of Environmental Quality
307-777-6080 • jennifer.zygmunt@wyo.gov