Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
South Carolina

Adding Agricultural Best Management Practices and Repairing Onsite Wastewater Treatment Systems Improves Water Quality

Waterbodies Improved

Urban and agricultural runoff contributed fecal coliform bacteria and nutrients to the Fishing Creek watershed, causing violations of the water quality standard. As a result, South Carolina's Department of Health and Environmental Control (SCDHEC) placed 11 sites in the Fishing Creek watershed on the 1998 and 2002 Clean Water Act (CWA) section 303(d) lists of impaired waters for fecal coliform. Stakeholders installed agricultural best management practices (BMPs) and repaired onsite wastewater treatment systems to reduce fecal coliform and nutrient levels. Based upon an assessment in the year following implementation of the project, two of the eleven sites now meet South Carolina's water quality standards for fecal coliform.

Problem

The Fishing Creek watershed (Figure 1) drains approximately 288 square miles in the Piedmont region of South Carolina's York and Chester counties. The creek empties into the Catawba River downstream of Fishing Creek Hydroelectric Station and the Fishing Creek Reservoir near Great Falls, South Carolina. Land use in the watershed is predominantly forest (65 percent); other uses include cropland (13 percent), pastureland (14 percent) and urban land (5.3 percent).

Urban and agricultural runoff contributed fecal coliform bacteria to the Fishing Creek watershed, causing more than 10 percent of samples collected to exceed the instantaneous 400 colony-forming units (cfu) per 100 milliliters (mL) component of South Carolina's fecal coliform water quality standard. As a result, SCDHEC placed 11 sites in the Fishing Creek watershed on the 1998 and 2002 CWA section 303(d) lists of impaired waters for fecal coliform.

SCDHEC developed a total maximum daily load (TMDL) for these sites, which the U.S. Environmental Protection Agency (EPA) approved in June 2002. In the TMDL, SCDHEC determined that that nonpoint source pollution was primarily responsible for Fishing Creek's water quality impairments. SCDHEC identified the top three fecal coliform sources as runoff from cattle-grazing pastures, direct deposition of manure into streams and ponds by livestock, and failing onsite wastewater

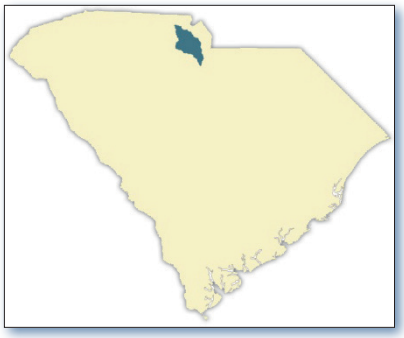

Figure 1. The Fishing Creek watershed is in north-central South Carolina.

treatment systems. All the houses in the watershed use onsite wastewater treatment, and the systems were calculated to have a failure rate of five percent, or approximately seven systems in the drainage area. Project partners developed a watershed-based implementation plan for all 11 sites, with each site serving as the basis for a separate subwatershed management unit.

Project Highlights

To meet the designated water quality standard and the load allocation outlined in the TMDL, project partners sought to identify and significantly lower fecal coliform pollutants in the Fishing Creek watershed. To address these pollutants, project partners provided local landowners with information on sources of fecal coliform loading and helped them to implement BMPs within the target areas. Project partners evaluated and prioritized proposed BMPs based on which would offer the most cost-effective benefit to water quality.

As part of this project, landowners implemented several BMPs, including 182 acres of vegetative riparian buffers, more than 17,000 square feet of heavy-use area protection, 10 onsite wastewater treatment systems, 12 alternative water source units (Figure 2), five structures for water control, and 104,000 feet of fencing that excluded 675 cattle and 42 horses from streams in the watershed. In addition, one constructed wetland was built to alleviate issues associated with a failing septic system. To encourage additional members of the community to install and use BMPs, project partners hosted field days and farm tours on properties where BMPs had been installed. At each farm site the landowner explained the BMPs and their added benefits for the farming operation, including improved herd health and better grazing management. Overall, 11 agricultural landowners (covering 13 farms) and 10 landowners with septic repair issues participated in the project.

Figure 2. Agricultural BMPs such as reinforced creek crossings and alternative water sources (wells and troughs) limit livestock access to streams and provide clean drinking water.

Results

Water quality has improved as a result of the restoration efforts in the watershed. Based upon an assessment in the year following implementation of the project, two (CW-005 and CW-006) of the eleven sites now meet South Carolina's water quality standards for fecal coliform (Table 1). At site CW-005, all water samples collected after December 2008 (when the active implementation effort ended) meet the water quality standard. Similarly, the most recent water samples collected for site CW-006 also meet the standard.

Data also show that fecal coliform levels at seven of the remaining Fishing Creek monitoring sites have declined (but do not yet meet standards), indicating that progress is being made.

Partners and Funding

The project was supported by $383,498 in EPA CWA section 319 funding and a non-federal match of $256,000 provided by landowners and other project partners. Participating partners included SCDHEC; Research Planning, Inc.; the conservation district, Natural Resource Conservation Service and Cattleman's Associations of Chester and York counties; Clemson University Extension; York County Engineering; and local residents.

Table 1. Fecal coliform data for CW-005 and CW-006* from 2002, 2007 and 2009 (bold values show fecal coliform levels that exceeded the water quality standard)

	Date	Fecal Coliform Bacteria (cfu/100 mL)	
		Site CW-005	Site CW-006
2002 (Before Project)	January 2002	**8000**	**1900**
	February 2002	**860**	**780**
	March 2002	90	**450**
	April 2002		300
	May 2002	**840**	**900**
	June 2002	60	**740**
	July 2002	250	120
	August 2002		180
	September 2002		**460**
	October 2002	130	**520**
	November 2002	**3200**	**3700**
	December 2002	320	340
2007 (During Project)	January 2007	220	170
	February 2007	390	160
	March 2007	97	90
	April 2007	120	150
	May 2007	82	41
	June 2007	**3100**	52
	July 2007	**500**	200
	August 2007	110	40
2009 (After Project)	January 2009	310	*N/A
	February 2009	270	
	March 2009	360	
	April 2009	110	
	May 2009	160	
	June 2009	180	
	July 2009	260	
	August 2009	270	
	September 2009	400	
	October 2009	370	
	November 2009	140	
	December 2009	150	

**Data beyond 2007 are not available for CW-006.*

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For additional information contact:

Meredith Murphy
Nonpoint Source Coordinator
SCDHEC Bureau of Water
murphymb@dhec.sc.gov • 803-898-4222