



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

South Carolina

Removing Sources of Fecal Coliform Improves Water Quality

Waterbodies Improved

Livestock grazing practices and failing septic systems contributed fecal coliform bacteria to South Carolina's Thompson Creek watershed, prompting the South Carolina Department of Health and Environmental Control (DHEC) to add two sites to the state's 2000/2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Watershed stakeholders implemented agricultural best management practices (BMPs) and repaired septic systems, thereby reducing the amount of fecal coliform in the creek. The two impaired Thompson Creek sites are showing progress toward attaining water quality criteria.

Problem

The Thompson Creek Watershed drains parts of South Carolina's Chesterfield County (100 square miles) and North Carolina's Anson County (49.8 square miles), before emptying into South Carolina's Pee Dee River (Figure 1). Major land uses in the watershed are forest (65.5 percent) and agriculture (22.3 percent).

High fecal coliform levels impaired Thompson Creek above South Carolina's Highway 9 in Chesterfield County. Ambient water quality monitoring collected before 2002 show fecal coliform counts significantly higher than the South Carolina water quality standard of 400 colony forming units (cfu) per 100 milliliters (mL). Fecal coliform counts routinely reached more than 2,000 cfu/100 mL in water quality samples, with some samples reaching as high as 11,000 cfu/100 mL.

On the basis of the data, DHEC placed two segments (PD-246 and PD-247) of Thompson Creek on South Carolina's 2002 CWA section 303(d) list of impaired waters for not meeting the state's fecal coliform bacteria water quality standard. DHEC attributed the impairment primarily to nonpoint source pollution (Figure 2).

DHEC established a total maximum daily load (TMDL) for Thompson Creek in 2003. Project partners worked to implement a watershed-based plan for two fecal coliform TMDLs along Thompson Creek. The partners' project received special recognition for successfully combining funding from federal, state and local sources to achieve water quality improvements.



Figure 1. Thompson Creek flows through portions of North and South Carolina before emptying into South Carolina's Pee Dee River.



Figure 2. Prior to project implementation, Thompson Creek was impaired by bacteria, largely from nonpoint sources such as manure from cattle that loitered in and around the creek.

Project Highlights

The local soil and water conservation district recruited participants to implement BMPs. Landowners installed almost 53,000 feet of fence to exclude cattle from stream areas—this effort had an immediate beneficial effect on water quality. Other BMPs installed included 5 wells, 37 watering facilities, 24,648 feet of pipeline,

974 acres of conservation tillage, 2 waste storage facilities, 3 acres of critical area planting, 24,899 square feet of heavy use area protection (Figures 3 and 4), 34 acres of forest site preparation, 26 acres of pasture and hayland planting, and 106 acres of tree and shrub planting. Homeowners also repaired/replaced 34 septic systems. Collectively, the BMPs have significantly improved water quality in the watershed.



Figure 3. Prior to project implementation, runoff from this muddy cattle feeding area flowed downhill into Thompson Creek.

Figure 4. To address the runoff from the heavy use feeding area, the landowner built a structure that keeps the cows dry during feeding and allows for easy clean up of manure.



Results

DHEC staff assessed the impaired Thompson Creek sites (PD-246 and PD-247) monthly beginning a year before (2003) and ending a year after the project's completion (2008). Data collected in 2008 indicated that, while the sites were not yet fully meeting water quality standards, overall water quality had improved.

Monitoring data collected at sites PD-246 and PD-247 in 2008 after the project's completion found that no samples exceeded 1,000 cfu/100 mL, compared to one-third of the samples collected

in 2003. Only 5 of 22 samples exceeded South Carolina's water quality standard of 400 cfu/100 mL. Both stations show that the average number of exceedances decreased—from 3,064 cfu/100 mL to 570 cfu/100 mL (81.4 percent reduction) for PD-246 and 1375 cfu/100 mL to 580 cfu/100 mL (57.8 percent reduction) for PD-247. Project partners feel that the majority of sources in the South Carolina portion of the watershed have been addressed and expect that, with time, the water quality standard will be met.

Overall, agricultural BMPs installed in the Thompson Creek watershed dramatically improved water quality. Project participants received added benefits—homeowners cited improvements to their health and general quality of life, and increased production and reduced costs on their farms.

Many project participants have been eager to share accomplishments and knowledge with other local residents. Thus, through the Thompson Creek Watershed Project, other citizens have learned about the requirements for maintaining clean water and the role they can play in protecting this vital resource.

Partners and Funding

The project was supported by \$393,150 in U.S. Environmental Protection Agency (EPA) CWA section 319 funding, \$61,291 in U.S. Department of Agriculture (USDA) Environmental Quality Incentive Program (EQIP) funds and a nonfederal match of \$274,351 provided by Pee Dee Resource Conservation and Development Council, and from landowners' cost-share. Chesterfield USDA Natural Resources Conservation Service (NRCS) staff worked diligently to combine CWA section 319 and EQIP funds as much as possible for the project. Leveraging of complementary resources allowed section 319 funds to be stretched further in the watershed and helped to make the project successful.

Participating partners for the project included the EPA CWA Section 319 Program, the South Carolina DHEC, USDA NRCS, Pee Dee Resource Conservation and Development Council, the Chesterfield County Soil and Water Conservation District, South Carolina Department of Natural Resources and local landowners.



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

EPA 841-F-10-001Q
September 2010

For additional information contact:

Meredith Murphy
South Carolina Department of Health and
Environmental Control
803-898-4222 • murphymb@dhec.sc.gov