



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

South Carolina

Implementing Best Management Practices Reduces Fecal Coliform Bacteria Levels in Scape Ore Swamp

Waterbody Improved

Agricultural activities and malfunctioning septic systems led to elevated levels of fecal coliform bacteria in South Carolina's Scape Ore Swamp. The South Carolina Department of Health and Environmental Control (SCDHEC) added the waterbody to South Carolina's Clean Water Act (CWA) section 303(d) list of impaired waters in 2002 for bacteria. Stakeholders implemented agricultural best management practices (BMPs) throughout the watershed, leading to water quality improvements. As a result, Scape Ore Swamp met water quality standards in 2012, and the waterbody is no longer impaired for bacteria and now fully supports the contact recreation designated use in the state's 2012 Integrated Report.

Problem

The Scape Ore Swamp main stem flows 11.8 miles in a southeasterly direction and eventually discharges into Rocky Bluff Swamp, a tributary of the Black River. The topography of the 95-square-mile watershed is gently rolling with slopes ranging from 1 to 6 percent. Major tributaries to the Scape Ore Swamp (Waterbody ID PD-355) include Timber Creek, Black Creek, Cedar Creek, and Beaverdam Creek. Major land uses in the watershed are agriculture and forestry.

A variety of agricultural activities, such as fields left barren after plowing, grazing livestock accessing Scape Ore Swamp, and land application of poultry litter, as well as malfunctioning septic tanks in the watershed, contributed nonpoint source pollution to Scape Ore Swamp. Pre-project water quality monitoring indicated that the waterbody's primary contact recreation designated use was threatened by excessive concentrations of fecal coliform bacteria. SCDHEC sampling at impaired monitoring station PD-355 (located at the Route 108 bridge in Lee County) indicated that Scape Ore Swamp failed to meet South Carolina's state water quality standard, which requires that no more than 10 percent of total samples exceed 400 colony-forming units (cfu) per 100 milliliters (mL). In the 2002 CWA section 303(d) listing cycle, 33 percent of samples exceeded this amount. Accordingly, Scape Ore Swamp at station PD-355 (Figure 1) was added to South Carolina's CWA section 303(d) list of impaired waters. A total maximum daily load (TMDL) for fecal coliform bacteria was approved in 2005.

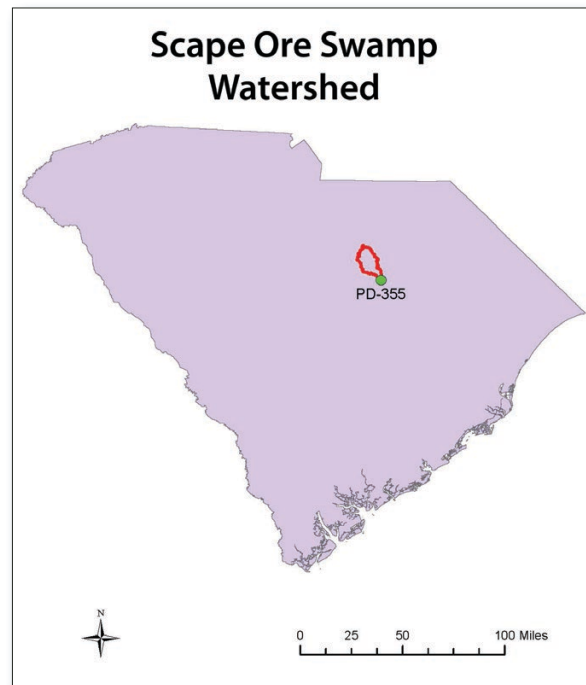


Figure 1. The Scape Ore Swamp watershed is in northeastern South Carolina.

Project Highlights

The Santee-Wateree Resource Conservation and Development Council, Lee and Kershaw Soil and Water Conservation District, U.S. Department of Agriculture's Natural Resources Conservation

Service (NRCS), and SCDHEC collaborated to implement the Scape Ore Swamp TMDL watershed plan. A variety of BMPs were installed in the watershed using CWA section 319 grant funds. The BMPs included one alternative water source, 4.5 acres of filter strip, 31,000 feet of heavy-use area protection, 943.4 acres of nutrient management, two on-site wastewater treatment systems, 188.4 acres of prescribed grazing, 1,100 feet of streambank and shoreline protection, nine waste storage structures, and the development of nutrient management plans for 2,200 acres (Figure 2).



Figure 2. One of the waste storage structures (stacking sheds) installed as part of the CWA section 319 grant. The landowner worked with NRCS to construct a shed using EQIP funds, but needed a larger facility than EQIP allowed. In the end, EQIP funded the initial half of this structure, and CWA section 319 funded the second half at a later date (with the landowner cost-sharing on both).

During the project period, NRCS Environmental Quality Incentives Program (EQIP) funds supported the installation of an additional suite of BMPs that included 30,000 square feet of heavy-use area protection, 1,460 acres of nutrient management, four wells, 462 acres of pasture planting, 13,084 feet of pipeline, 1,511 acres of cover crop planting, 22,679 feet of fencing, 186 acres of prescribed grazing, 10 waste storage facilities, 27 watering facilities, 11,361 feet of field border, 13.6 acres of tree planting, 7.4 acres of critical area treatment, 5 acres of grassed waterways, four alum treatments of poultry litter, 1 acre of riparian forest buffer, and 14 acres of contoured buffer strips.

Results

Post-project monitoring at impaired site PD-355 continued during and after implementation of the TMDL.

Water quality monitoring data assessed in 2012 indicated that only 4 percent of the samples exceeded 400 cfu/100 mL, meeting South Carolina's water quality standard for bacteria (which requires that no more than 10 percent of the samples exceed 400 cfu/100 mL). On the basis of these data, SCDHEC determined site PD-355 is no longer impaired for bacteria and identified Scape Ore Swamp as fully supporting its primary contact recreation designated use in the state's 2012 Integrated Report. Table 1 lists the results of water quality assessments for the 2002–2012 CWA section 303(d) listing cycles, further illustrating post-project water quality improvements. In total, implementation efforts reduced pollutant loadings of nitrogen (by 249,691.80 pounds), phosphorus (by 44,412 pounds), sediment (by 65.10 tons), and fecal coliform bacteria (by 1.1700E+14 cfu).

Table 1. South Carolina Department of Health and Environmental Control Water Quality Assessments for CWA Section 303(d) Listing Cycles 2002–2012: Fecal Coliform Bacteria at Station PD-355 (Scape Ore Swamp).

Year	Percent of samples exceeding 400 cfu/100 mL ¹
2002	33%
2004	32%
2006	22%
2008	16%
2010	12%
2012	4%

¹ Values that fall under 10% exceedance (in bold) meet the water quality standard.

Partners and Funding

Key funding sources included \$300,000 in CWA section 319 funding and grant oversight from the U.S. Environmental Protection Agency and SCDHEC. The Santee-Wateree Resource Conservation and Development Council provided overall project management. The Lee Soil and Water Conservation District and NRCS, the Kershaw Soil and Water Conservation District and NRCS, and South Carolina Department of Natural Resources supported TMDL development and implementation, project management and assistance, and dissemination of information related to fecal coliform bacteria loading into Scape Ore Swamp as part of \$52,878 provided through in-kind services. For the implementation of BMPs, private landowners provided \$196,844 worth of cost-share in cash and in-kind services. NRCS provided \$785,483 in 50 percent cost-share EQIP funding, technical design, and oversight beyond CWA section 319 project participation.



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