



NONPOINT SOURCE SUCCESS STORY

South Carolina Watershed Project Leads to Cleaner Water in Smith Swamp

Waterbody Improved

Nonpoint source (NPS) pollution from agriculture runoff and failing septic systems has contributed to elevated bacteria levels in the Smith Swamp watershed. Specifically, Smith Swamp failed to attain its primary recreation designated use, prompting South Carolina to add this waterbody to the 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for bacteria impairment. A total maximum daily load (TMDL) for fecal coliform (FC) was developed for Smith Swamp in 2005 based on exceedances of bacteria water quality standards (WQS) at a key monitoring station in this watershed. In response, stakeholders conducted outreach to the public, implemented agricultural best management practices (BMPs), and repaired failing septic tanks. Water quality in the watershed has since significantly improved, and this key monitoring station is now designated as fully supporting.

Problem

The Smith Swamp watershed covers an area of roughly 23,350 acres in Marion County (Figure 1). The watershed captured by water quality monitoring station PD-187 contains 1,645 acres and drains the southeast portion of the town of Marion. The area is mostly agricultural, but roughly 26 percent is developed. There are large numbers of cattle farms, confined hog operations, horse “hobby” farms, and crop farms that apply hog manure and poultry litter to the land. Most rural homes and businesses in the area rely on septic tanks for wastewater treatment.

State criteria for FC impairment require that no more than 10 percent of the total samples during any 30-day period exceed 400 colony-forming units (CFU) per 100 milliliters (mL). Through extensive monitoring by the South Carolina Department of Health and Environmental Control (SCDHEC) at station PD-187 in the Smith Swamp watershed (see Figure 1), recreational uses were found to be only partially supported due to the bacteria exceedances, leading SCDHEC to place PD-187 on the CWA section 303(d) list of impaired waters in 1998.

SCDHEC also developed a TMDL for FC bacteria at station PD-187 in 2005. The TMDL said it was necessary to meet a target of $9.20E+10$ CFU/day, or to have a 66 percent reduction to achieve the water quality target.

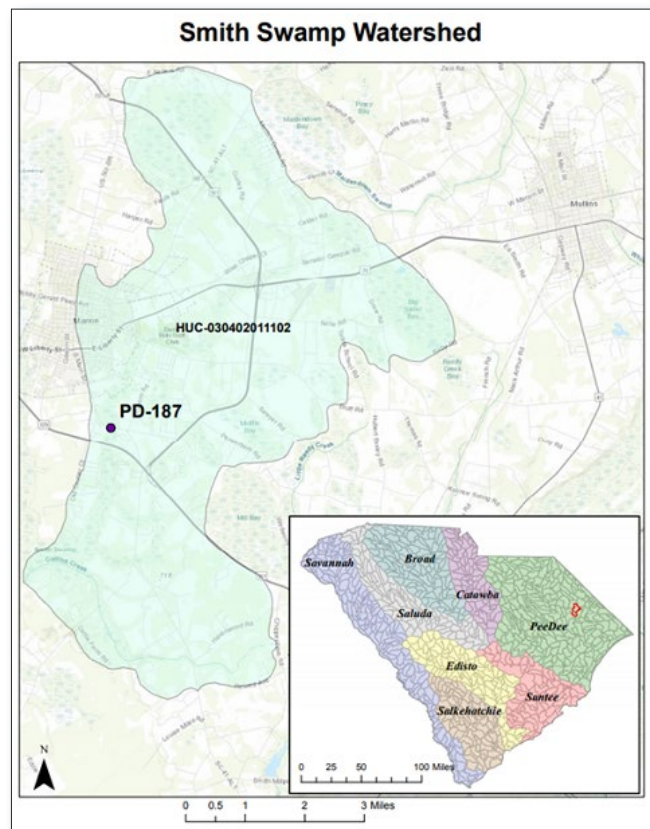


Figure 1. The Smith Swamp watershed in eastern South Carolina has shown water quality improvement at SCDHEC monitoring station PD-187.

Story Highlights

In 2008, the Pee Dee Resource Conservation & Development Council (RC&D) began an effort to repair septic tanks and implement agricultural best management practices (BMPs)—specifically targeting swine, cattle, and horse farms—as part of the Little Pee Dee River Watershed Water Quality Improvement Project covering the entire Little Pee Dee River and Catfish Creek watersheds.

Clemson University's Confined Animal Manure Managers Program team partnered on the project, conducting two seminars during this project for 35 local swine producers. As a result, six swine farms developed conservation plans and implemented BMPs to better manage the application of wastewater on their farms. To reach cattle farmers, the project team contacted the Cattlemen's Association and local agricultural stores and used doorknob handouts, flyers in stores, and word of mouth between neighbors. Consequently, 18 cattle farms received individualized conservation plans and, as a total, implemented the following BMPs on their properties: 484 acres of runoff management; 25 acres of critical area stabilization; and 77,265 feet of stream bank stabilization, sensitive area protection, and cross-fencing. Partners also worked with landowners to start prescribed grazing with their livestock, affecting 484 acres, and to exclude herds from waterways and provide alternative water sources. In total, landowners installed 12 wells and 39 troughs along with 36,089 square feet of heavy use areas to reduce FC runoff. Hobby farms are typically excluded from the U.S. Department of Agriculture's (USDA's) Environmental Quality Incentives Program cost-share availability, providing a unique opportunity for CWA section 319 funding to address NPS pollution from these farms. Thus, this project supported two workshops for hobby farmers, educating over 48 horse farmers and allowing for implementation of conservation plans to assist historically underserved horse producers in protecting their water quality.

A local community leader was hired to lead septic tank outreach and implementation, as past experience showed that a well-known community member would build trust more quickly. As a mark of success, the project team located and repaired or replaced 108 failing septic tanks compared to the estimated 60 that were thought to have issues upstream of the drinking water intake. Horry Soil and Water Conservation

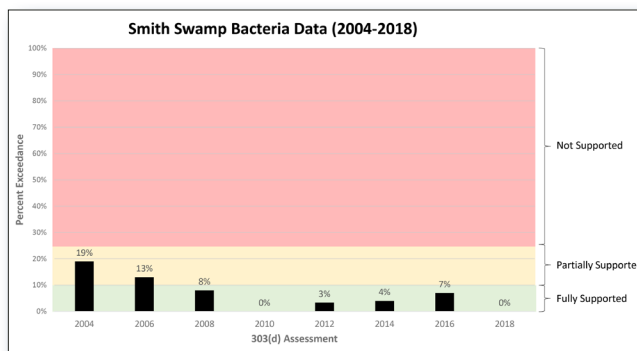


Figure 2. Percent exceedance of the bacteria single sample maximum standard at Station PD-187.

District (SWCD) continues to address water quality issues in the Pee Dee through outreach and education, agricultural BMPs, and septic repair and replacement.

Results

A comparison of data collected at station PD-187 before the project began in 2008 and after its completion in 2011 indicates that the site improved from not supporting, to partially supporting, and finally to fully supporting recreational use at this monitoring site (Figure 2). Bacteria levels have consistently met WQS at station PD-187 since 2008. As a result, Smith Swamp was removed from the list of impaired waters for FC in 2014. In total, implementation efforts reduced pollutant loadings of nitrogen by 24,285 pounds/year, phosphorus by 6,443 pounds/year, and FC bacteria by $1.497E+14$ CFU.

Partners and Funding

Pee Dee RC&D encouraged project participation using partnerships with Santee-Wateree RC&D; the Marion County and Dillon County SWCDs; the USDA Natural Resources Conservation Service in Marion, Dillon, and Horry counties; South Carolina Department of Natural Resources; Clemson University Cooperative Extension Service; and local landowners. These partners provided \$511,376 in cash and in-kind services. CWA section 319 funding from SCDHEC also provided \$693,490. Overall, with the assistance of partners and landowners, this project contributed \$696,490 directly in cost-share funds to 843 people and provided information on BMPs to over 2,000 people to help reduce NPS pollution.



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