NONPOINT SOURCE SUCCESS STORY

South Carolina

Making Progress Through Implementation and Partnership in Brunson Swamp

Waterbody Improved

Nonpoint source pollution from agriculture and failing septic systems contribute to elevated bacteria levels in Brunson Swamp. The waterbody failed to attain its primary recreation designated use, prompting South Carolina to add Brunson Swamp to the 2014 Clean Water Act (CWA) section 303(d) list for *Escherichia coli* bacteria impairment. In response, stakeholders implemented agricultural best management practices (BMPs), repaired failing septic tanks, and conducted outreach throughout the watershed. Water quality in Brunson Swamp has significantly improved; however, it will remain listed as impaired until bacteria levels consistently meet water quality standards.

Problem

Brunson Swamp is a blackwater system in the Lower Coastal Plain that drains to the Little Pee Dee River in the greater Pee Dee basin. The mostly rural Brunson Swamp watershed is in Horry County, south of the town of Aynor (Figure 1). The watershed is 16,000 acres, with most of the land being forested (48 percent) or devoted to agriculture (44 percent).

Brunson Swamp was included in a larger CWA section 319 implementation effort with Chinners Swamp and Palmetto Swamp, which all discharge to the Little Pee Dee River. Before this implementation project, water quality monitoring had not been conducted in the Brunson Swamp watershed. Beginning in 2011, as part of the implementation project, South Carolina Department of Health and Environmental Control (SCDHEC) began monitoring at station PD-370 to assess whether bacteria levels supported recreational use.

Until 2013, state criteria for fecal coliform bacteria in freshwaters required that at least four samples collected over a 30-day period could not exceed a geometric mean of 200 colony forming units (CFU) per 100 milliliters (mL), with a single sample maximum (SSM) of 400 CFU/100mL. After 2013, state criteria for *E. coli* require that at least four samples collected over a 30-day period cannot exceed a geometric mean of 126 most probable number (MPN) per 100 mL, with a SSM of 349 MPN/100 mL In most cases, insufficient data are collected to evaluate against the geometric mean criterion of the water quality standard; therefore, evaluation against SSM criterion is necessary. The

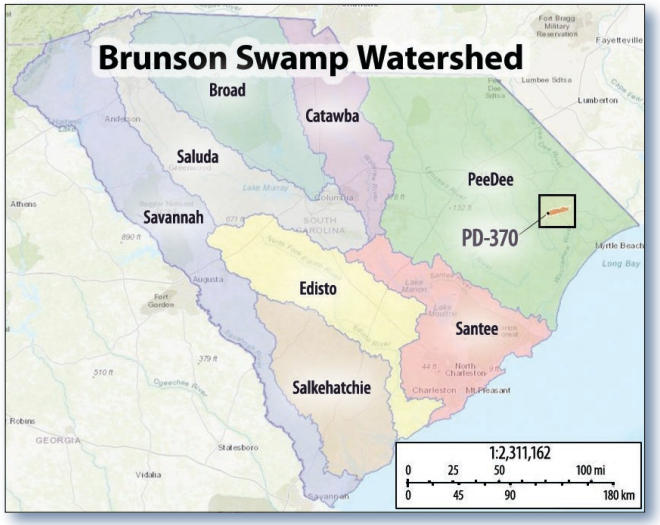

Figure 1. The Brunson Swamp watershed (in orange) has shown water quality progress at SCDHEC monitoring station PD-370.

CWA section 303(d) impaired waters list assessment methodology allows for no greater than 10 percent exceedances of the SSM criteria during a five-year assessment window. Upon review of data collected in 2011 and 2012, SCDHEC placed Brunson Swamp on the CWA section 303(d) list of impaired waters in 2014 due to exceedances of the recreational use SSM criterion.

Project Highlights

In 2011 the Horry Soil and Water Conservation District (Horry SWCD) began an effort to repair septic tanks and implement agricultural BMPs as part of the Horry, Aynor, and Dogbluff (HAD) Water Quality Project. As

Figure 2. Farmers installed alternative watering tanks in the Brunson Swamp watershed.

part of the project, Horry SWCD planned to repair 80 failing septic tanks. By the end of the project in 2015, Horry SWCD worked with landowners to exceed this goal, successfully repairing 120 failing systems.

A key component of this steady success was the face-to-face work between conservation staff and landowners. The main objectives of the agricultural component included minimizing concentrated manure deposition from livestock operations and educating landowners about manure and pasture management. A comprehensive nutrient management plan was developed for a participating swine producer, which included calibrating a spreader and installing a pumping plant to agitate manure. In 2013 the swine farmer hosted an Animal Waste Field Day where Clemson Extension staff spoke to 25 livestock producers.

Horry SWCD continued advertising using flyers posted in local businesses, such as feed and tack stores, and hand-delivered to local churches. The SWCD hosted two workshops focused on soil conservation, forage enhancement, and herd health throughout the project area. The SWCD also worked with participating landowners to start rotational grazing with their livestock (affecting 593 pasture acres) and worked with livestock producers to exclude herds from waterways and provide alternative water sources. In total, nine wells, 28 water storage tanks, and 9,450 feet of pipeline were installed for livestock alternative water sources (Figure 2), and 1,600 feet of fencing was also installed to physically exclude 359 livestock from waterways.

Horry SWCD also had an extensive outreach program that focused on the public and their impact on water quality. Representatives had a water quality

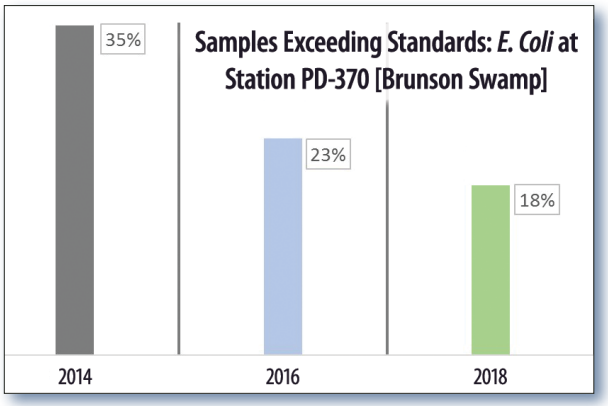

Figure 3. Percent exceedance of the *E. coli* single sample maximum standard at Station PD-370.

information booth at Swampfest and Baby Animal Day held at the Playcard Environmental Education Center. These events were open to all Horry County residents and were attended by approximately 2,000 people.

Results

Monitoring in the watershed began in 2011 with the start of the project and continued during and after implementation. In total, implementation efforts reduced pollutant loadings of nitrogen by 8,704 pounds, phosphorous by 2,170 pounds, and sediment by 114 tons. Monitoring from 2011 to 2018 shows that monitoring site PD-370 steadily improved, as the percent of samples with *E. coli* bacteria exceedances decreased from 35 percent to 18 percent (Figure 3). Although water quality standards have not yet been met, continued implementation efforts and monitoring in the watershed may continue to show incremental improvements.

Partners and Funding

The HAD Water Quality Project was made possible by the efforts of several organizations led by the Horry SWCD. Horry SWCD encouraged participation using partnerships with U.S. Department of Agriculture's Natural Resources Conservation Service, Horry County, Grand Strand Water and Sewer Authority, the town of Aynor, and local landowners. These partners and landowners supported the project by providing $517,780 in cash and in-kind services for BMP cost-share. In addition, funding sources included $525,115 in CWA section 319 funding from SCDHEC.

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