



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Mississippi

Implementing Agricultural Best Management Practices Reduces Fecal Coliform Bacteria in Magees Creek

Waterbodies Improved

Fecal coliform (FC) bacteria in runoff from agricultural areas, wildlife and other nonpoint sources caused Mississippi's Magees Creek and other nonpoint sources caused Mississippi's Magees Creek to fail to meet pathogen water quality standards for its primary recreation designated use. As a result, the Mississippi Department of Environmental Quality (MDEQ) placed Magees Creek on the state's 1998 Clean Water Act (CWA) section 303(d) list of impaired waters for pathogens. With the support of CWA section 319 grant funds and matching funds from partner agencies, MDEQ and its project partners implemented agricultural best management practices (BMPs) on more than 3,355 acres in the watershed. Water quality has improved; therefore, MDEQ removed Magees Creek (two segments) from the state's list of impaired waters in 2012.

Problem

The Magees Creek watershed (Figure 1) covers approximately 143,000 acres in Walthall, Marion and Lawrence counties in southern Mississippi. Magees Creek flows in a southwesterly direction from its headwaters north of Darbun, Mississippi, to the mouth at the Bogue Chitto River. The current land uses in the watershed include pasture (57 percent), forest (32 percent), cropland (5 percent) and wetland (4 percent).

The FC bacteria water quality standard to protect the primary contact recreation designated use of Magees Creek requires that:

1. The maximum allowable level of FC bacteria not exceed a geometric mean of 200 colonies (col) per 100 milliliters (mL), based on a minimum of five samples taken over a 30-day period (with no less than 12 hours between individual samples).
2. The samples examined during a 30-day period not exceed a colony count of 400 col/100 mL more than 10 percent of the time.

Water quality monitoring in the 1990s indicated that Magees Creek violated water quality standards for FC bacteria. As a result, MDEQ added the creek to the state's CWA section 303(d) list for pathogens impairment in 1998.

In 2003 MDEQ developed an FC bacteria total maximum daily load (TMDL) for Magees Creek. The TMDL assessments identified a number of nonpoint sources of FC bacteria in the Magees Creek watershed—failing septic systems, wildlife, land application of hog and cattle manure, grazing animals, land application of poultry litter, human activities and

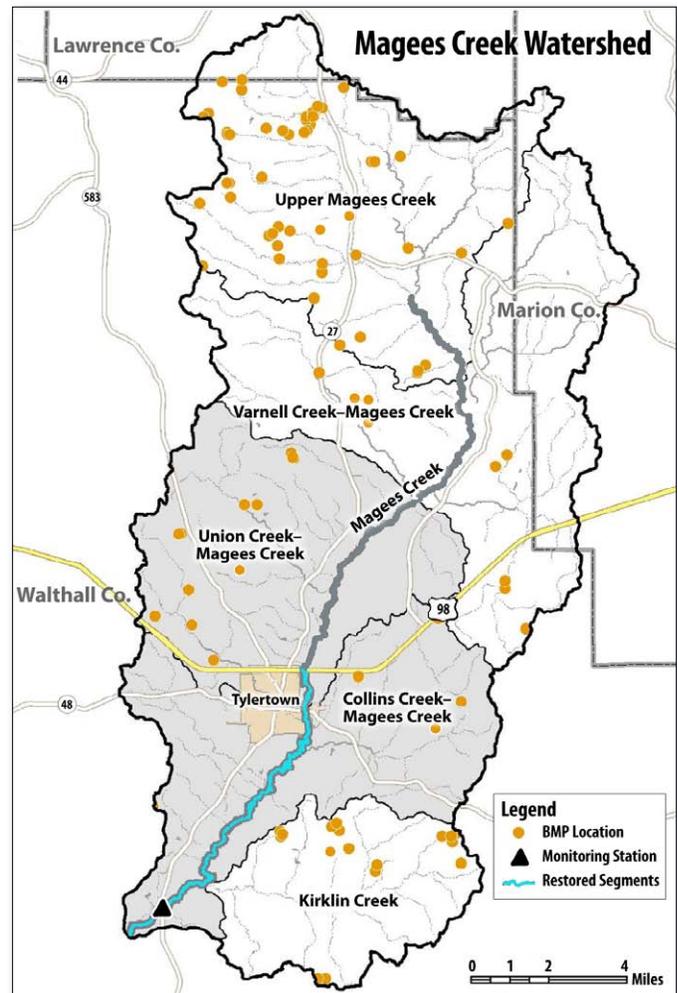


Figure 1. The Magees Creek watershed is in southern Mississippi.

urban development. According to the TMDL, to meet the FC bacteria water quality standard, the FC bacteria loading to Magees Creek must be reduced by 45 percent. In the 2006 assessment cycle, Magees Creek was divided into five separate segments, two of which were classified as impaired for primary contact recreation with a TMDL in place (two consecutive segments downstream of Highway 98).

Project Highlights

MDEQ's Pearl River/South Independent Streams Team selected Magees Creek as a priority watershed in 2004 because of the high level of stakeholder interest and the impaired status of the waterbody. Restoration efforts were aimed at meeting the FC bacteria water quality standards and reducing soil loss on pastureland within the watershed. In 2005 MDEQ awarded a CWA section 319 subgrant to the Mississippi Soil and Water Conservation Commission (MSWCC) to implement BMPs in the Magees Creek watershed. MSWCC worked with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the Walthall County Soil and Water Conservation District (SWCD) to identify appropriate BMPs for targeted areas in the watershed and to engage landowners to encourage them to implement BMPs.

Between 2005 and 2009, MSWCC worked with local landowners to implement approximately 114 BMPs on more than 3,355 acres in the Magees Creek watershed (see Figure 1). These agricultural BMPs included implementing nutrient management practices on approximately 2,800 acres of land, planting pasture and hayland on 350 acres, planting trees on approximately 177 acres, and installing approximately 52,000 feet of fencing to

exclude livestock from land adjacent to the creek. Landowners also installed sediment control basins, grade stabilization structures, animal waste control facilities (Figure 2) and livestock troughs. These efforts helped control FC bacteria sources in the watershed and reduced sediment loads in the creek by 7,841 tons per year.



Figure 2. Some landowners in the Magees Creek watershed installed animal waste control facilities.

Project partners conducted education and outreach to local stakeholders to increase understanding of restoration efforts to improve water quality in the Magees Creek watershed. MSWCC and its partners wrote articles for the local newspaper, conducted field tours to demonstrate BMPs, installed roadside signs to identify water quality improvement projects, and scheduled regular meetings with community members to educate them about restoration efforts in the watershed.

Results

Bacteria levels in Magees Creek have declined significantly (Table 1). The installation of agricultural BMPs throughout the watershed has led to reduced pathogen loads, as well as reductions in nutrient and sediment loads in Magees Creek. Since 2008, FC bacteria levels in Magees Creek have been in compliance with the state's water quality standards. (Over a 30-day period, the geometric mean must be less than 200 col/100 mL, and exceedances above 400 col/100 mL must occur less than 10 percent of the time.) Despite an increase in FC bacteria levels in 2010 due to natural variation in rainfall, MDEQ indicates that Magees Creek continues to meet the FC bacteria criteria to support the creek's primary recreation designated use. Based on these data, MDEQ removed both segments of Magees Creek (12.2 miles total) from the state's list of impaired waters in 2012.

Table 1. FC Bacteria Monitoring Data for Magees Creek

Sample dates	90 th percentile (col/100 mL)	Geometric mean (col/100 mL)
06/04/2008 – 06/25/2008	69.0	50.62
02/04/2009 – 02/25/2009	81.5	59.51
06/24/2009 – 07/20/2009	82.5	50.20
01/25/2010 – 02/10/2010	278.0	165.95
06/17/2010 – 07/13/2010	328.0	187.24

Partners and Funding

The project was supported by approximately \$359,860 in U.S. Environmental Protection Agency CWA section 319 funds and \$160,560 in matching funds from the partnering agencies. Partners included MDEQ, MSWCC, NRCS and the Walthall County SWCD.



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