Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Alabama

Installing Best Management Practices Reduces Ammonia Levels

Waterbody Improved

Runoff from pasture grazing contributed to elevated ammonia levels in Dry Creek in Alabama's Blount County, prompting the Alabama Department of Environmental Management (ADEM) to add the creek to the Clean Water Act (CWA) section 303(d) list of impaired waters in 1998. Implementing best management practices (BMPs) and conducting stakeholder education and outreach have led to improved water quality. Dry Creek now meets the ammonia water quality standard associated with its fish and wildlife designated use classification. As a result, the Alabama Department of Environmental Management (ADEM) removed a 12-mile segment of Dry Creek from the state's 2012 CWA section 303(d) list for its ammonia impairment.

Problem

The Dry Creek sub-watershed is in the Middle Locust Fork watershed of the Black Warrior River Basin in north central Alabama (Figure 1). The Middle Locust Fork watershed drains approximately 138 square miles in Blount and Etowah counties. The Dry Creek sub-watershed is entirely within Blount County and it covers approximately 12,650 acres. The town of Cleveland and a portion of the town of Rosa are within the sub-watershed. Key land uses in this sub-watershed include agriculture (40 percent), forest (40 percent), and developed land (8 percent). In 2008, an estimated 1,000 to 1,200 head of cattle were being raised on farms in the Dry Creek sub-watershed.

Data collected in the late 1980s and early 1990s indicated water quality problems in Dry Creek, leading ADEM to add the 12-mile waterbody to Alabama's 1998 CWA section 303(d) list for partial support of the fish and wildlife designated use. Nutrients, ammonia, organic enrichment and pathogens from pasture grazing runoff were noted as the sources of impairment. Chemical and biological data collected during ADEM's surface water quality screening assessment of the Cahaba and Black Warrior River basins in 2000 and 2002 indicated continued water quality impairment.

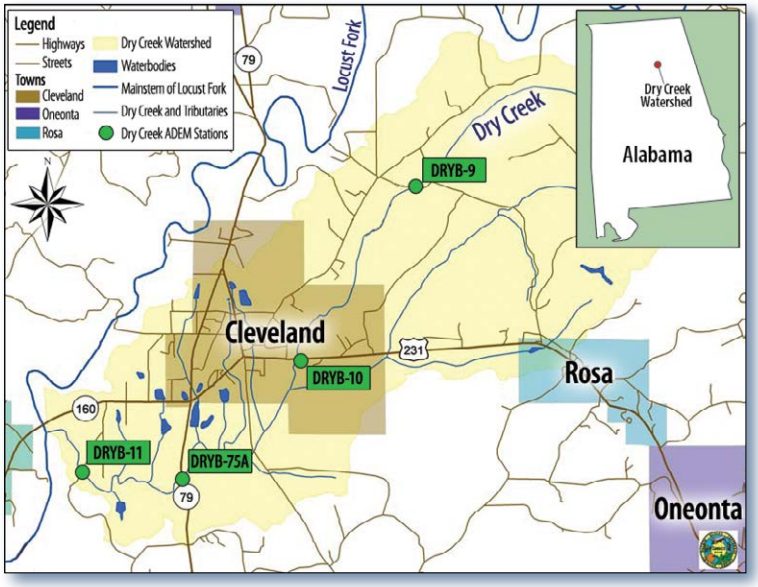

Figure 1. Dry Creek is in the Locust Fork Watershed in Blount County, Alabama.

Project Highlights

ADEM developed a watershed management plan (WMP) to help address the agricultural sources of ammonia, organic enrichment/dissolved oxygen, nutrients and pathogens identified on the CWA section 303(d) list. The WMP was implemented in part using a CWA section 319(h) nonpoint source grant provided by EPA through the ADEM Nonpoint Source Program. Federal, state and local agencies, as well as local landowners, partnered to implement watershed conservation and restoration initiatives. Various agricultural BMPs were installed, including livestock exclusion fencing (Figure 2), alternative watering sources (Figure 3), heavy-use area protection, alum treatment of poultry litter (Figure 4), and a septic tank pump-out program. In addition, project partners conducted numerous education and

Figure 2. A number of landowners installed fences in pastures to prevent livestock from accessing the creek.

Figure 3. Landowners provided alternative water sources after livestock exclusion fences were installed.

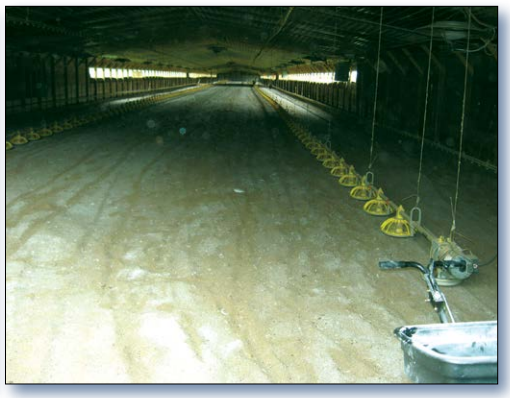

Figure 4. Alum was spread in poultry houses to help to bind phosphorus, reduce ammonia and reduce bacteria in the poultry litter.

outreach activities, which included presentations at local schools and public meetings for landowners. The project officially ended in 2010, but implementation of management measures continues through Phase II in an effort to address Dry Creek's remaining impairments.

Results

ADEM collected monthly water quality data on Dry Creek from March through November in 2007 and 2008. Data were collected at four stations on the impaired segment—DRYB-75A, DRYB-9, DRYB-10 and DRYB-11. (See Figure 1 for station locations.)

For each of the four Dry Creek stations, ADEM used the maximum pH value and the corresponding temperature value to calculate a criteria continuous concentration (CCC) value. The CCC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. Monitoring data showed that ammonia levels remained below applicable CCC levels (Table 1), indicating full support of the fish and wildlife designated use. As a result, ADEM removed ammonia as a source of impairment from the 12-mile segment of Dry Creek (from Locust Fork to the source) on the state's 2012 list of impaired waters. The creek remains listed as impaired for nutrients, organic enrichment and pathogens (note: a TMDL for pathogens was approved in 2009).

Partners and Funding

ADEM provided $208,220 in CWA section 319(h) funding to support a watershed coordinator and to implement agricultural BMPs. Other stakeholders involved with the project included the Blount County Soil and Water Conservation District; the U.S. Department of Agriculture, Natural Resources Conservation Service; the Cawaco Resource Conservation and Development Council; and the Alabama Department of Public Health. Nonfederal match contributions included $147,026. The total project cost was $355,206.

Table 1. Dry Creek Ammonia Monitoring Data (2007–2008)

Dry Creek Station	Maximum pH	NH3-N CCC (mg/L)	Number of Samples Collected (2007–2008)	Number of CCC Exceedances
DRYB-9	9.01	0.207	10	0
DRYB-10	8.90	0.481	11	0
DRYB-75A	8.20	1.630	16	0
DRYB-11	8.46	0.475	15	0

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