



NONPOINT SOURCE SUCCESS STORY

Alabama

Improving Scarham Creek Through Partnerships and Patience

Waterbody Improved

Scarham Creek in northeast Alabama suffered numerous impairments as documented in water quality (WQ) and biological data from 1988 to present. The Alabama Department of Environmental Management (ADEM) placed all of Scarham Creek on the 1992 Clean Water Act (CWA) section 303(d) list of impaired waters for not supporting fish and wildlife (F&W) use classification due to multiple pollutants. Numerous agencies prioritized the waterbody for voluntary implementation of agricultural best management practices (BMPs) and nonpoint source (NPS) pollution education. Through a combined decades-long effort and multiple funding sources, Scarham Creek now meets the WQ standards for organic enrichment/low dissolved oxygen (OE/DO), and ammonia as nitrogen (NH₃-N) in 2022.

Problem

Scarham Creek flows 23.42 miles in DeKalb and Marshall counties from its source to Short Creek, which ultimately empties into Guntersville Lake (Figure 1). The 58,600-acre (ac) Scarham Creek watershed includes the cities of Geraldine and Crossville. Suspected sources of WQ impairment included agricultural practices of crop production, animal feeding operations, and pasture grazing. Agricultural activities comprise most of the watershed's land use as of 2019 (58%) and are a major influencer of WQ in the watershed. Developed land now accounts for 11% of the land use (up from less than 1% in 2001) and plays a growing role in influencing WQ.

ADEM placed Scarham Creek (assessment unit ALO6030001-0805-200) on the 1992 CWA section 303(d) list for not supporting the F&W use classification for pesticides, siltation, pathogens, OE/DO, and NH₃-N. Total maximum daily loads (TMDLs) were approved in 2002 for all listed impairments except siltation, which was approved in 2003. According to ADEM's WQ standards, the minimum DO concentration allowed in F&W classification is 5.0 milligrams/liter (mg/L). For NH₃-N, ADEM employs U.S. Environmental Protection Agency's (EPA's) recommended criteria of 2.48 mg/L at a pH of 7 standard units, and it compares median sampling values to ecoregion reference values. The 2002 TMDL addressing OE/DO and NH₃-N specified that a 76.1% reduction in organic loads and a 75% reduction in NH₃-N were needed to achieve WQ standards.

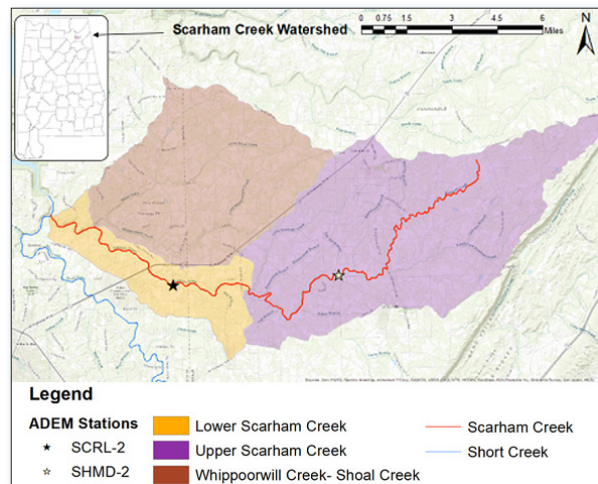


Figure 1. Scarham Creek is in northern Alabama.

Story Highlights

Restoration projects (2012–2022) included funding agricultural BMPs. With Scarham's high percentage of agricultural land use, implementing agricultural BMPs made sound scientific and fiscal sense. As a result, Scarham Creek was included as part of ADEM's 2002–2007 CWA section 319(h) project with DeKalb County Soil and Water Conservation District (DC-SWCD), which implemented voluntary agricultural BMPs and a septic tank pumpout effort. ADEM expended CWA section 604(b) funds in 2014 in partnership with the Top of

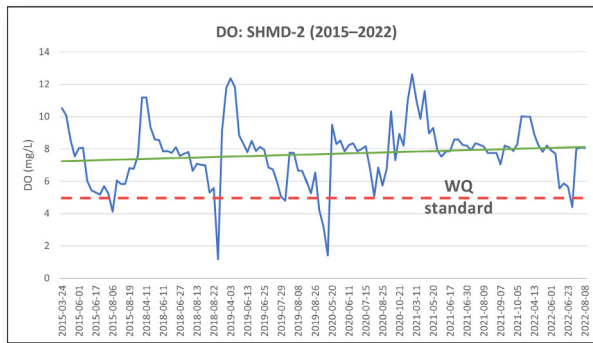


Figure 2. Dissolved oxygen levels are trending upwards and meet the WQ standard.

Alabama Regional Council of Governments (TARCOG) to develop an Upper Scarham Creek watershed management plan. The plan served as a road map for a second ADEM CWA section 319(h) watershed restoration project (2015–2018) with DC-SWCD to implement voluntary BMPs and education in the 9.12-mile section in the headwaters of Scarham Creek. The upper Scarham Creek watershed was listed as a National Water Quality Initiative (NWQI) priority watershed in 2012. In 2014, the NWQI area expanded to include lower Scarham Creek. Through NWQI, the Natural Resource Conservation Service (NRCS) and partners worked with agricultural producers and landowners to implement voluntary BMPs that improved WQ in high-priority watersheds while maintaining agricultural productivity.

Using various resources, stakeholders implemented BMPs throughout the watersheds of upper Scarham Creek (HUC 060300010803) and lower Scarham Creek (HUC 060300010805). The upper creek (UC) BMPs were implemented during 2012–2022 (with funds from NWQI and 319(h)). The lower creek (LC) BMPs were implemented during 2014–2022. The BMPs included access control (UC: 43 ac); alternative water sources (UC: 7); animal mortality facility (UC: 13); composting facility (UC: 5); comprehensive nutrient management plans (UC: 26, LC: 1); conservation crop rotations (UC: 544 ac); cool-season forage stockpiled for plant productivity/health (LC: 4 ac); cover crops (UC: 326 ac); fencing (UC: 47,573 ft, LC: 7,610 ft); forage harvest management (UC: 188 ac); grassland conservation initiative (UC: 18 ac); heavy use area protection (UC: 128,774 ft², LC: 2,225 ft²); herbaceous weed treatment (UC: 1,448 ac); managed grazing for soil compaction

(LC: 18 ac), livestock pipelines (UC: 19,111 ft, LC: 2,867 ft); nutrient management (UC: 3,285 ac, LC: 20 ac); pasture and hay planting (UC: 427 ac); Prescribed grazing (UC: 2,520 ac), pumping plants (UC: 1, LC: 1), residue and tillage management/no-till (UC: 682 ac); waste storage facilities (UC: 29, LC: 2); water wells (UC: 2, LC: 2); and watering facilities (UC: 31, LC: 4). The total number of BMPs applied in the two watersheds are 755 (UC) and 30 (LC); however, the applied count might cover the same land footprint because BMPs may be counted as being applied in multiple years, and multiple practices may cover the same area.

Results

WQ monitoring plays a critical role in assessing the field-scale impact of BMPs, calibrating WQ models, and targeting future activities/subwatersheds. From 2015 to present, ADEM conducted at least 96 and 80 sampling trips to Scarham Creek stations SHMD-2 and SCRL-2, respectively. Data showed minimum DO violations—all during low-flow conditions, which can naturally cause low DO; however, Scarham Creek is considered to be meeting DO standards due to the low number of violations per total number of samples (Figure 2). Ammonia data showed no exceedances of the TMDL, ADEM, or current EPA-recommended ammonia criteria, and no median values exceeded the Ecoregion 68d reference value of 0.1091 mg/L. ADEM has determined that OE/DO and NH₃-N impairments on Scarham Creek no longer exist. However, Scarham Creek currently remains on the impaired waters list for pathogens, siltation, and pesticides/herbicides. Voluntary projects and WQ monitoring will continue to help Scarham Creek meet WQ standards for F&W use classification.

Partners and Funding

Leveraged watershed funding through multiple agencies and partners led to these documented WQ improvements. Specifically, CWA section 319(h) grant projects, which included the Scarham Creek watershed, totaled \$585,151 (with \$436,687 provided in local match as documented by DC-SWCD). ADEM, DC-SWCD, NRCS, TARCOG, local landowners, and other state agencies, partners, and advisory groups contributed to watershed WQ improvements through their actions.



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