



# NONPOINT SOURCE SUCCESS STORY

## Alabama

### Nutrient and Sediment Loadings are Reduced Through Cooperative Efforts to Improve Hester Creek

#### Waterbody Improved

Agricultural land use contributed to nutrient enrichment and habitat degradation on Hester Creek. Fish Index of Biotic Integrity (IBI) data collected by the Tennessee Valley Authority (TVA) in 1994–1995 were used to place the entire 7.27-mile reach of Hester Creek on the Clean Water Act (CWA) section 303(d) list of impaired waters in 1998 for nutrients. Implementing best management practices (BMPs) resulted in decreased siltation and nutrient runoff, increased dissolved oxygen (DO), and improved biological and in-stream aquatic habitat conditions. Based on the instream total phosphorus and total nitrogen values, chlorophyll-*a* values, DO concentrations, and biological assessments, the Alabama Department of Environmental Management (ADEM) removed Hester Creek from the 2012 CWA section 303(d) list for nutrient overenrichment and turbidity.

#### Problem

Hester Creek (AL06030002-0303-500) drains an approximately 39-square mile area within the Mountain Fork subwatershed in Madison County, Alabama, northeast of the city of Huntsville within the larger Flint River watershed in the Tennessee River Basin (Figure 1). The Mountain Fork subwatershed contains approximately 41,639 acres of pasture, row crop, and forestland, with some residential areas. Cattle farms are located throughout the watershed on highly erodible soils and with 2 to 6 percent slopes. The southwest part of the watershed is under pressure from development related to urban sprawl. The stream segment begins in Elora, Tennessee, and flows southwest into Alabama.

In 1999 the U.S. Geological Survey (USGS) began a three-year study as part of the Lower Tennessee Basin Survey. Fish sampling was rated as “poor/fair” and habitat was characterized by a narrow riparian corridor and streambank instability. Moderate deposition of sediment in the stream and some channelization were noted. Nutrient enrichment and habitat degradation were also noted as negatively impacting the creek. In 2004 the Tennessee Valley Authority (TVA) sampled Hester Creek, which received a “poor” fish rating and a “fair” benthic rating. TVA noted that siltation was problematic. The 2006 CWA section 303(d) list added turbidity from land development/agriculture to the

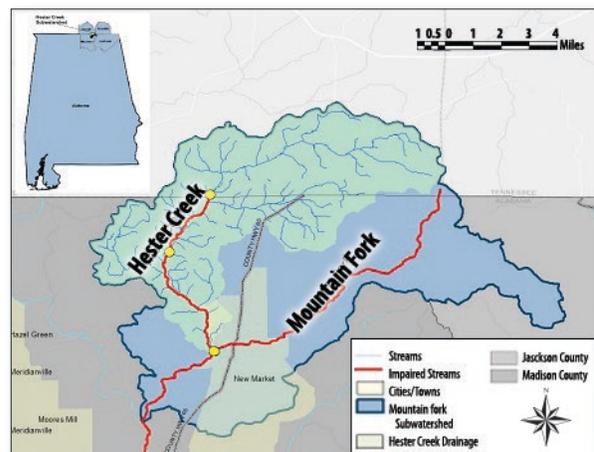


Figure 1. Hester Creek is within the Mountain Fork watershed in the Tennessee River Basin.

Hester Creek listing based on the 1999 USGS water monitoring results.

#### Story Highlights

The entire Flint River watershed was first addressed with CWA section 319(h) funding from 2000 to 2005 in cooperation with the Madison County Soil and Water Conservation District (SWCD). Community stakeholder meetings, Alabama Water Watch volunteer monitoring training, and other workshops helped to communicate the project goals. Agricultural practices installed included cover crops, conservation tillage, terracing

and waterway systems, sediment basins, cropland conversion, and livestock stream crossings, fencing, alternative watering sources, and rotational grazing. A CWA section 319(h)-funded streamside zone management project was also implemented in the Hester Creek drainage area during this period in cooperation with Alabama A&M University. Approximately 12,500 feet of stream channel stabilization and 14 acres of riparian buffer were installed.

In 2005 Madison County adopted subdivision ordinances and stormwater oversight to help with the increased urban runoff to Hester Creek and other Flint River subwatersheds due to the growth of Huntsville. Subsequently, Hester Creek was added to the CWA section 303(d) list for turbidity from agriculture and land development in 2006. The Hester Creek/Mountain Fork Watershed Management Plan was completed in 2007 by the Flint River Watershed Coordinator with assistance from ADEM, the Madison SWCD, and the TVA resource stewardship staff.

Two phases of the Hester Creek/Mountain Fork Watershed Project (2009–2013) were funded through a CWA section 319(h) grant in cooperation with the Madison County SWCD and ADEM. Agricultural practices implemented to address cropland sources of nutrients and sediment included cover crops, conservation tillage, conservation cover, terracing, and cropland conversion to permanent vegetation (Figure 2). Education and outreach activities included U.S. Department of Agriculture Farm Service Agency and Flint River Conservation Association newsletter articles, local watershed advisory meetings, Flint River weekend canoe cleanups, annual earth day events, and various homeowner association presentations.



Figure 2. Erosion control blankets were used to stabilize eroded cropland, preventing sediment and nutrients from washing into the creek.

## Results

In 2009 ADEM collected chemical, physical and biological data on Hester Creek at stations HESM-1, HESM-2 and HESM-3 in an effort to more fully evaluate existing conditions. Based on the 2009 sampling, nutrient concentrations and chlorophyll-*a* concentrations were relatively the same as, or well below, the ecoreference level concentrations. In August 2010 diurnal DO data were also collected. DO concentrations at these stations remained within normal levels during the sampling events, ranging between 5.3 and 9.0 milligrams per liter (mg/L). Also, pH levels were normal, ranging between 7 and 8, further providing evidence that Hester Creek is not impaired for nutrients.

Bioassessment results indicated the macroinvertebrate and the fish community to be in “fair” condition. Based on the instream total phosphorus and total nitrogen values, chlorophyll-*a* values, DO concentrations, and biological assessments, ADEM removed Hester Creek from the CWA section 303(d) list for nutrient overenrichment and turbidity in 2012.

## Partners and Funding

The Flint River Coordinator was partially funded through a partnership with the Flint River Conservation Association, the city of Huntsville, Huntsville Utilities, TVA, Alabama A&M University, ADEM and the Madison County SWCD. Additional partners on the watershed advisory committee were the Tennessee River Basin Clean Water Partnership, the Natural Resources Conservation Service, USGS, the Madison County Commission, the U.S. Fish and Wildlife Service, the Land Trust of Huntsville and North Alabama, and the Top of Alabama Regional Council of Governments. The Hester Creek implementation measures were primarily funded through four CWA section 319(h) grants from fiscal years 2000, 2001, 2006 and 2010, which provided \$496,259 in federal funding. The Madison County SWCD, farmers, landowners, volunteers, and other partners provided approximately \$488,627 in nonfederal match.



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## For additional information contact:

**Sam Sandlin**  
Madison County Soil and Water Conservation District  
256-532-1692 • [Sam.Sandlin@al.nacdnet.net](mailto:Sam.Sandlin@al.nacdnet.net)  
**Alabama Nonpoint Source Management Program**  
Alabama Department of Environmental Management  
334-260-4501 • [NPSmail@adem.alabama.gov](mailto:NPSmail@adem.alabama.gov)