Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Virginia

Implementing Best Management Practices Improves Stream Health in Hall/Byers and Hutton Creeks

Waterbodies Improved

Sediment loadings from cropland, pasture and hayland degraded aquatic habitat in Hall/Byers and Hutton creeks. As a result, the Virginia Department of Environmental Quality (DEQ) added Hall/Byers and Hutton creeks to the Clean Water Act (CWA) section 303(d) list of impaired waters for benthic impairments due to sedimentation in 1998 and 2002. Installing agricultural best management practices (BMPs) helped reduce sedimentation in the creeks, allowing Virginia to remove two segments of Hall/Byers and Hutton creeks from its list of impaired waters in 2014.

Problem

The Hall/Byers Creek and Hutton Creek watersheds are in Washington County, part of southwestern Virginia's Middle Folk Holston River Basin (USGS Hydrologic Unit Code 06010102). These watersheds are contiguous to one another, approximately 10 miles northeast of Abingdon, Virginia. Byers Creek merges with Hall Creek approximately one mile upstream of the Middle Fork Holston River (Figure 1).

The 9,991-acre Hall/Byers Creek watershed is comprised of pasture/hay (57 percent), forest (20 percent), urban (12 percent) and crop (10 percent) land uses. The 7,149-acre Hutton Creek watershed area is comprised of pasture/hay (57 percent), forest (23 percent), urban (10 percent) and crop (10 percent) land uses.

To assess aquatic life conditions of Hall/Byers and Hutton creeks, DEQ used the Virginia Stream Condition Index (VSCI) based on biometrics analysis. A stream that achieves a rating score above 60 for an entire year is considered to be supporting biological integrity and, therefore, is considered supportive of the aquatic life designated use. Because Hall/Byers and Hutton creeks failed to meet this threshold, 0.48 miles of Byers Creek and 5.15 miles of Hutton Creek were added to the CWA section 303(d) list of impaired waters for *general standard – aquatic life* in 1998 and 2002. Water quality data analyses and field observations indicated that the primary cause of the benthic impairment in these streams was excessive sedimentation. DEQ developed sediment total maximum daily loads (TMDLs) for these watersheds in 2003.

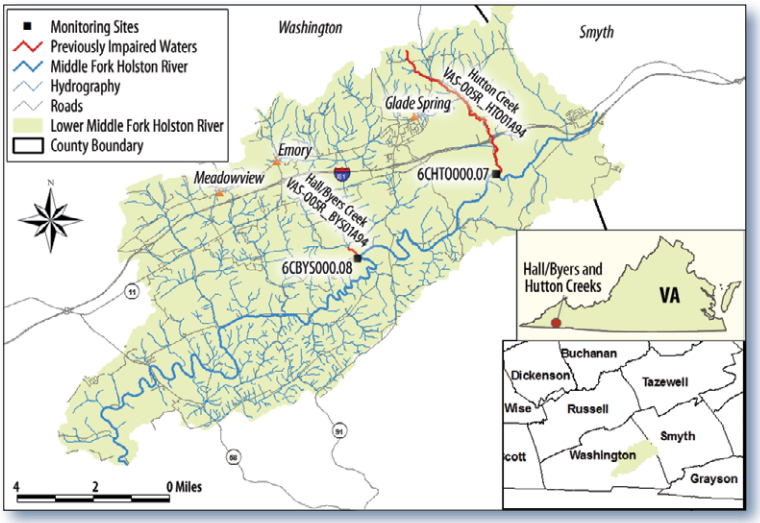

Figure 1. Locations of biological monitoring stations on Hall/Byers and Hutton creeks, and the extent of segments that failed to support their aquatic life designated uses because of agriculture-related sedimentation.

Project Highlights

Landowners installed a number of agricultural BMPs primarily through a TMDL implementation project from 2001–2008. These BMPs included 96,750 linear feet (18.3 miles) of livestock exclusion fencing, 702 acres of small grain cover crop for nutrient management, 311 acres of harvestable cover crop, 224 acres of riparian forest buffer and 38 acres of permanent vegetative cover on cropland. Landowners also installed 13 grazing land protection systems (Figure 2) to prevent livestock access to streams and 10 animal waste storage facilities in the impaired watersheds.

In addition, stakeholders worked with landowners to promote agricultural and residential BMP implementation. The outreach efforts included watershed tours, group meetings, personal contacts and presentation of BMP informational materials to farmers, residents and community leaders.

Results

The BMPs installed in Hall/Byers and Hutton creeks have resulted in total load reductions of 19,739 tons of sediment, 107,628 pounds of nitrogen and 22,108 pounds of phosphorous. Also, the animal waste storage facilities installed treated approximately 4,471 tons of animal waste in these watersheds. Due to this reduced pollutant loading, biological monitoring conducted by DEQ personnel in spring and fall of 2012 at Hall/Byers Creek (monitoring station 6CBYS000.08) and in 2007 and 2012 at Hutton Creek (monitoring station 6CHTO000.07) demonstrated that biological conditions in both waterbodies had improved. Data showed that VSCI scores for Hall/Byers Creek and Hutton Creek were above the water quality standard minimum threshold of 60 (Table 1).

The increased VSCI score reflects improved biological conditions that support the aquatic life designated uses in both waterbodies. As a result, DEQ removed 0.48 miles of Byers Creek (segment VAS-O05R _ BYS01A94) and 5.15 miles of Hutton Creek (segment VAS-O05R _ HTO01A94) from the state's impaired waters list in 2014.

Table 1. Virginia Stream Condition Index scores indicating biological assessment of Byers Creek and Hutton Creek

Station	Stream Name	Sampling Date	Score[1]
6CBYS000.08	Byers Creek	7/2/2002	57
6CBYS000.08	Byers Creek	11/15/2002	66
6CBYS000.08	Byers Creek	6/30/2005	52
6CBYS000.08	Byers Creek	**5/29/2012**	**64**
6CBYS000.08	Byers Creek	**11/26/2012**	**70**
6CHTO000.07	Hutton Creek	7/2/2002	55
6CHTO000.07	Hutton Creek	11/15/2002	63
6CHTO000.07	Hutton Creek	6/30/2005	57
6CHTO000.07	Hutton Creek	**4/9/2007**	**69**
6CHTO000.07	Hutton Creek	**10/10/2007**	**63**
6CHTO000.07	Hutton Creek	**5/29/2012**	**72**
6CHTO000.07	Hutton Creek	**11/26/2012**	**70**

[1] A score above 60 shows support of biological integrity

Figure 2. Photos taken before (left) and after (right) a landowner installed a livestock exclusion system in the Hutton Creek watershed.

Partners and Funding

The water quality improvement has largely resulted from partnerships between the Holston River Soil and Water Conservation District (HRSWCD) and several federal and state agencies, including the Virginia Department of Conservation and Recreation (DCR), DEQ, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), Tennessee Valley Authority, and the U.S. Fish and Wildlife Service. The TMDL implementation project was locally administered by HRSWCD and included cost-share funding, outreach activities and technical assistance to implement agricultural and residential BMPs. Using a mix of state and CWA section 319 funds, DCR provided a total of $1,141,606 for BMP cost share and $200,000 for technical services and outreach/education. NRCS provided $225,512 for BMP installation. The state of Virginia also provided support for BMP implementation in the form of tax credits.

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