Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Tennessee

Diverse Best Management Practices Control Urban and Agricultural Runoff

Waterbody Improved

High nutrient concentrations from agricultural runoff, loss of biological integrity as a result of siltation, and habitat loss from streamside alteration caused Tennessee to put a 15-mile segment of West Sandy Creek on its 303(d) list of impaired waters in 2002 and 2004. Sources included agriculture use, bank and shoreline modification, and runoff from urbanized areas. To help address the problems, the Henry County Soil Conservation District (District) implemented 10 best management practices (BMPs), including grade-stabilization structures, water/sediment control basins, terrace construction, and hay and pasture plantings. The BMPs improved the water quality in the 15-mile segment, which was removed from the 2006 303(d) list of impaired waters.

Problem

West Sandy Creek is in the Kentucky Lake watershed in Henry County (Ecoregion 65E). The 15-mile impaired segment of West Sandy Creek extends from the West Sandy embayment in Kentucky Lake to the creek's headwaters. Tennessee added the creek to its 2002 and 2004 303(d) lists of impaired waters because of siltation, high nutrient concentrations, loss of habitat, and poor biological integrity. The state identified the sources of siltation as runoff from agricultural land and urban areas. Modification of the creek's shoreline led to its listing for habitat loss. This segment of West Sandy Creek was not meeting water quality criteria to fully support its designated use classification for fish and aquatic life. The state standards require that there be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits, or sludge banks of such size or character that could be detrimental to fish and aquatic life.

Project Highlights

The District implemented 10 BMPs in the Kentucky Lake watershed between 1999 and 2005. Pasture and hay planting, terrace construction, and installing water/sediment control basins helped to prevent excess silt from entering the creek. The terraces stabilized steep slopes along the creek and reduced runoff and soil erosion. Water/sediment control basins reduced stream bank scouring and gully erosion, trapped sediment, and reduced runoff, thereby improving water quality.

The District also created grade-stabilization structures throughout the watershed. These structures controlled the grade of the creek and helped prevent water from cutting into the side of natural or artificial channels. The practice was used in areas where the concentration and flow of water could potentially have caused gully erosion.

Three grade-stabilization structures and one terrace were installed in the drainage area of West Sandy Creek (Figure 1). The District also installed two water/sediment control basins and one grade-stabilization structure in the Spring Creek drainage area. Clifty Creek benefited from the installation of one water/sediment control basin. One grade-stabilization

structure was installed on Chapel Branch, in the Kentucky Lake watershed.

Results

The BMPs implemented in the West Sandy Creek watershed reduced the level of nutrients and silt in the water and helped to prevent streamside erosion. Using the U.S. Environmental Protections Agency's (EPA's) rapid bioassessment protocol III (RBPIII), state biologists calculated a biological reconnaissance score (biorecon) for the West Sandy Creek, which is used to measure compliance with the state water quality standard for siltation. Biorecon is one tool used to recognize stream impairment as judged by species richness measures, emphasizing the presence or absence of indicator organisms without regard to relative abundance. The biorecon index is scored on a scale from 1 to 15. A score of less than 5 is regarded as *very poor*. A score of more than 10 is considered *good*. The principal metrics used are the total macroinvertebrate families, the number of families of mayflies, stoneflies, and caddisflies (collectively referred to as EPT, which is short for the order names Ephemeroptera, Plecoptera, and Trichoptera), and the number of pollution intolerant families found in a stream.

In 2004 biological sampling on West Sandy Creek, state biologists found 19 total families, 5 EPT families, and 1 pollutant-intolerant family. The biorecon score for the station was 13, which is in the *good* range. The data indicate that the stream is meeting water quality standards. Therefore, Tennessee removed this 15-mile segment of West Sandy Creek from its 2006 303(d) list of impaired waters.

Partners and Funding

The Henry County Soil Conservation District implemented the BMPs with $24,817 provided by the Tennessee state Agricultural Resources Conservation Fund through cost-share from Clean Water Act section 319 grant pool projects. In addition, local matching funds contributed $13,170.

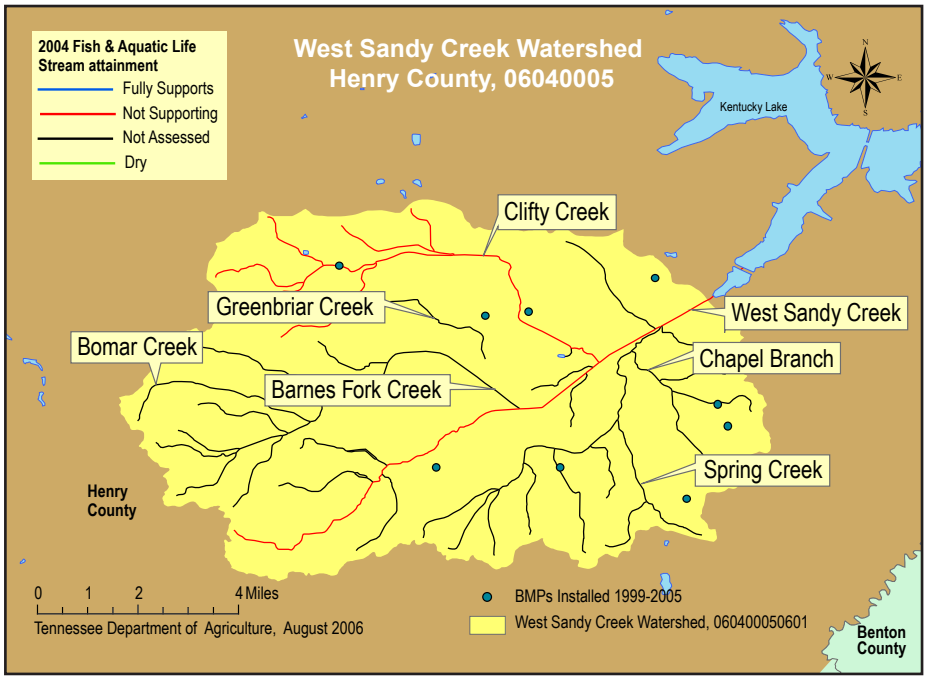

Figure 1. Location of BMPs installed along West Sandy Creek, TN.

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