Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Tennessee

Agricultural Best Management Practices Reduce Erosion and Improve Water Quality

Waterbody Improved

Livestock activity eroded pasture areas along Tennessee's Austin Branch, causing siltation problems in the creek. The Tennessee Department of Environment and Conservation (TDEC) added the 3.9-mile long Austin Branch to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 2002. Local farmers implemented agricultural best management practices (BMPs) to exclude livestock from creek areas and control erosion. Water quality improved, prompting TDEC to remove the creek from the state's list of impaired waters in 2008.

Problem

Austin Branch flows through Sumner County, southwest of Portland, Tennessee, and empties into the Red River (Figure 1). Land use is primarily agricultural, with some large residential properties (on five-acre lots or larger) along the stream. Poorly managed livestock grazing operations led to erosion of pasture areas along Austin Branch. The eroded sediment washed into the stream and accumulated on the substrate. The standard states that there must 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. The high levels of siltation in Austin Branch prevented the waterbody from supporting its designated use of fish and aquatic life.

In addition, TDEC conducted a biological reconnaissance (biorecon) survey of Austin Branch in 2001 using the U.S. Environmental Protection Agency's rapid bioassessment protocol III. A biorecon survey is a tool used to evaluate stream impairment as determined by species richness measures, emphasizing the presence or absence of indicator organisms without regard to relative abundance. The biorecon survey score is used as a measure of compliance with water quality standards for the beneficial use of fish and aquatic life. The principal metrics used are the total macroinvertebrate families (or genera); the number of families (or genera) of mayflies, stoneflies, and caddisflies (collectively

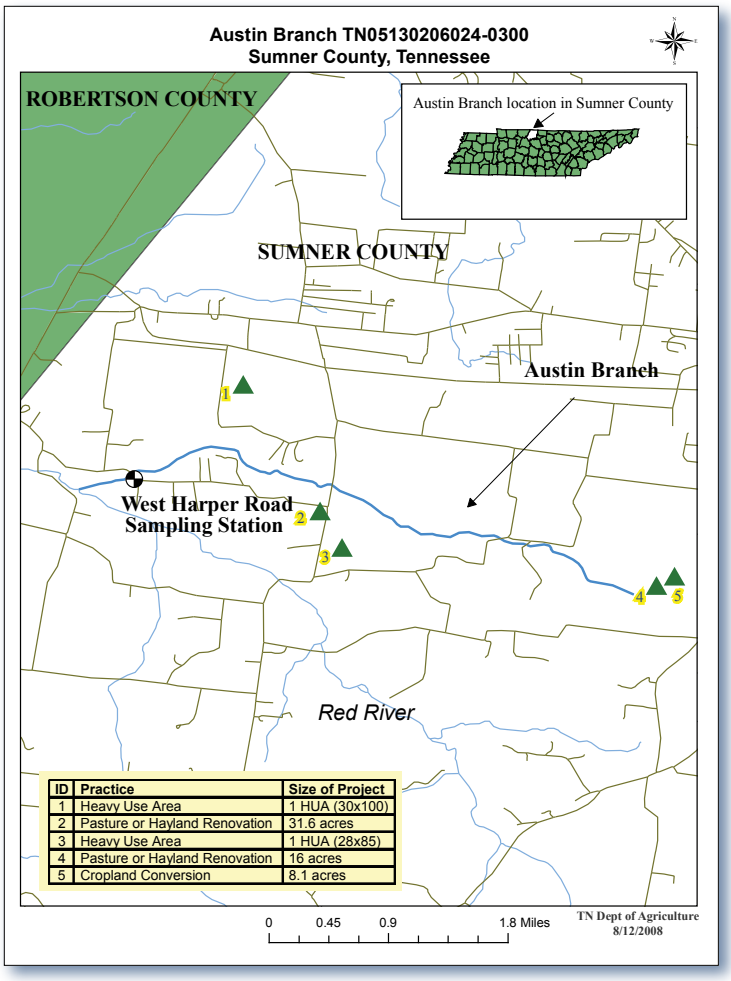

Figure 1. Austin Branch empties into Tennessee's Red River. The triangles on the map denote where landowners implemented BMPs.

referred to as EPT—short for the order names Ephemeroptera, Plecoptera and Trichoptera); and the number of pollution-intolerant families (or genera) found in a stream. Austin Branch's 2001 biorecon survey score was poor, prompting TDEC to add the entire 3.9-mile creek segment to Tennessee's CWA section 303(d) list of impaired waters in 2002. TDEC identified poorly managed livestock grazing/pasture areas as the primary source of the creek's siltation and consequent loss of biological integrity.

Project Highlights

Local farmers installed agricultural BMPs along Austin Branch using money from both the CWA section 319 program and Tennessee's Agricultural Resources Conservation Fund (ARCF). Between 2003 and 2005, landowners used CWA section 319 funds to renovate 47.6 acres of pasture and hayland (reseeding and otherwise improving grazing management) and to protect two heavy-use areas (see Figure 1 for BMP locations). Protecting heavy-use areas involves stabilizing land areas that are frequently used by people, animals or vehicles. For instance, the practice is applied in streams where cattle or farm equipment frequently cross, around cattle watering or feeding facilities or in cattle feedlots or walkways. In 2003 landowners used money from the ARCF to convert 8.1 acres of cropland to grassland (Figure 2).

Figure 2. Example of cropland conversion in a Tennessee field.

Results

In 2004 TDEC performed a follow-up biorecon survey of Austin Branch, which indicated that the stream had improved since the 2001 survey. The 2004 survey documented 8 EPT families, 4 intolerant families and 25 total families—yielding an overall habitat score of 112, which met TDEC's regional goals. On the basis of these data, TDEC believes that Austin Branch meets its designated uses and removed the stream from the state's list of impaired waters in 2008.

Partners and Funding

Watershed partners used $3,877 of CWA section 319 funding (including additional matching funds of $1,292) and $330 from the Tennessee ARCF (including matching funds of $110) to implement BMPs in the Austin Branch watershed. Key partners include the Sumner County Soil Conservation District (for helping to design and implement BMPs) and landowners (for contributing the majority of the in-kind match for BMPs).

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