



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Tennessee

Implementing Agricultural Best Management Practices Reduces Siltation

Waterbody Improved

Erosion on non-irrigated cropland in Tennessee's Thompson Creek watershed contributed sediment and reduced the creek's biological integrity. As a result, the Tennessee Department of Environment and Conservation (TDEC) added 20.2-mile-long Thompson Creek to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 2002. To improve water quality, landowners installed agricultural best management practices (BMPs) that included water and sediment control basins and a runoff diversion. These BMPs improved water quality, prompting TDEC to remove Thompson Creek from the state's list of impaired waters in 2008.

Problem

The 20.2-mile-long Thompson Creek drains portions of Carroll and Gibson counties and empties into the South Fork Obion River in western Tennessee (Figure 1). Land use in the Thompson Creek watershed is primarily deciduous and evergreen forest, row crops and hay/pastureland. Numerous streams in the South Fork Obion River watershed, including Thompson Creek, have been affected by habitat alteration, which has included riparian loss and stream bank disturbances attributed to agricultural practices.

A 2001 macroinvertebrate survey of Thompson Creek yielded a biological reconnaissance (biorecon) index score of poor. 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 considered very poor. A score over 10 is considered good. The principal metrics used are the total number of macroinvertebrate families (or genera); the number of families (or genera) of mayflies, stoneflies and caddisflies (collectively 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.

The 2001 biorecon score of poor indicated that the creek did not support its designated uses of fish and aquatic life because of non-irrigated crop production. Sediment from crop production areas resulted in a loss of biological integrity caused by siltation and alteration in streamside or littoral vegetative cover. Because Thompson Creek received a poor biorecon score in 2001, TDEC added it to the state's CWA section 303(d) list of impaired waters in 2002.

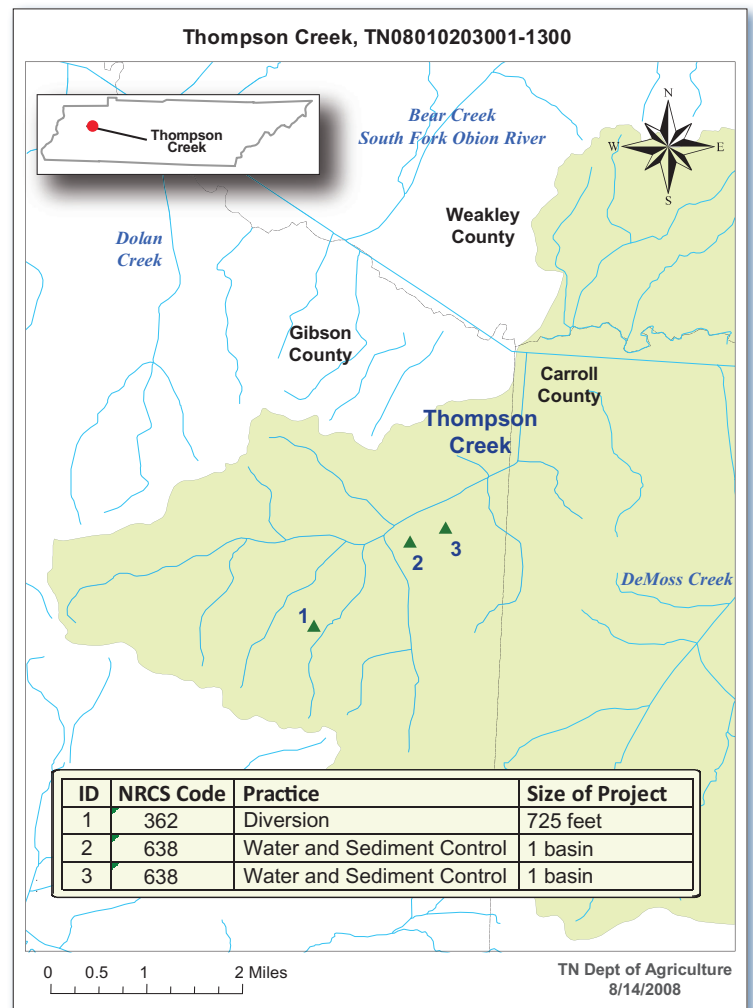


Figure 1. Thompson Creek flows into the South Fork Obion River in western Tennessee. Landowners installed several BMPs in the watershed to control erosion.



Figure 2. During a rainstorm, runoff drains across this field and collects in the water and sediment control basin seen in the background (Gibson County, Tennessee).

Project Highlights

Local landowners installed agricultural BMPs along Thompson Creek using funds provided by Tennessee's Agricultural Resources Conservation Fund, or ARCF (see Figure 1 for project locations). The BMPs include two water and sediment control basins and one 725-foot runoff diversion. The water and sediment control basins help to reduce and retain runoff, as well as trap sediment (Figure 2). The runoff diversion channels water across a slope and away from sensitive habitat areas. The channel ends at a bubble outlet (perforated pipe), which slows the runoff and releases it gradually to reduce the velocity of the flow across the ground surface (Figure 3). A sod chute below the outlet helps to stabilize the soil and prevent soil erosion.

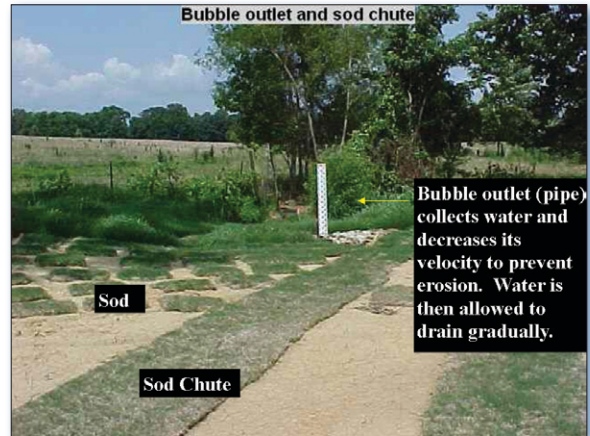


Figure 3. Water in the runoff diversion channel exits slowly through a perforated pipe and drains through the sod-covered areas (the squares of sod shown in the photo will eventually grow together).

Results

The combination of BMPs installed by landowners decreased siltation and improved water quality in Thompson Creek. In 2006 TDEC performed a biocon evaluation along Thompson Creek at mile 3.0 (Highway 105). The results showed three EPT families, two intolerant families and 13 total families. The stream received a biocon score of 11 (good) with a habitat score of 106, indicating that it now supports its fish and aquatic life use. On the basis of these data, TDEC removed Thompson Creek from the state's CWA section 303(d) list of impaired waters in 2008.

Partners and Funding

Projects for Thompson Creek received \$10,619 in funding from the Tennessee ARCF, with additional matching funds of \$3,540. Key partners include the soil and water conservation district offices of Gibson and Carroll counties for offering BMP assistance and landowners for contributing most of the in-kind matching funds.



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