Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Tennessee

Implementing Agricultural Best Management Practices Reduces Siltation

Waterbody Improved

Erosion from poorly managed livestock pasture grazing areas caused increased sediment and siltation in Turkey Creek. As a result, the Tennessee Department of Environment and Conservation (TDEC) added the creek to the state's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters because of siltation and habitat alteration. Landowners implemented agricultural best management practices (BMPs) to reduce siltation levels in the stream. Water quality improved, prompting the TDEC to remove a 5.8-mile-long segment of Turkey Creek from Tennessee's CWA section 303(d) list of impaired waters in 2008.

Problem

The Turkey Creek watershed (Figure 1) is just south of Morristown in Hamblen County, Tennessee. The 5.8-mile long creek flows through the Southern Shale Valley ecoregion, which includes intensive agricultural, urban/industrial and thick forested areas, and empties into the Nolichucky River. Erosion and runoff from poorly managed livestock pasture grazing areas caused increased sediment levels in the creek. The increased siltation caused the creek to lose its biological integrity. TDEC performed a water quality biological assessment survey in 2000 that confirmed that Turkey Creek was unable to support its designated use of aquatic life. On the basis of this information, TDEC placed a 5.8-mile segment of Turkey Creek on the state's CWA section 303(d) list of impaired waters in 2002.

TDEC completed a total maximum daily load (TMDL) study on the Nolichucky River and its tributaries (including Turkey Creek) for impairments attributed to siltation and habitat alteration. The U.S. Environmental Protection Agency, Region IV, approved the TMDL on February 26, 2008.

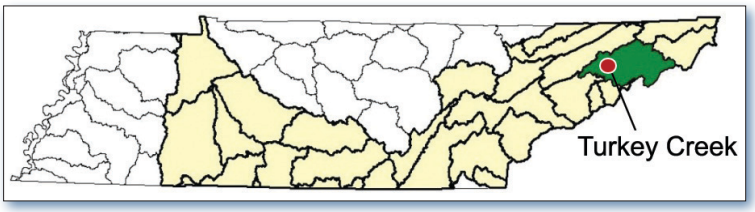


Figure 1. Turkey Creek is in Tennessee's Nolichucky River watershed, which is seen highlighted in green, above.

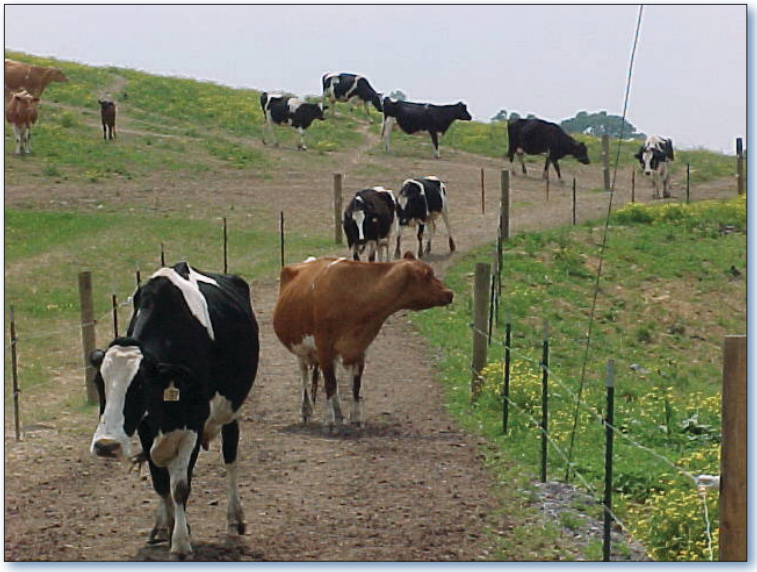
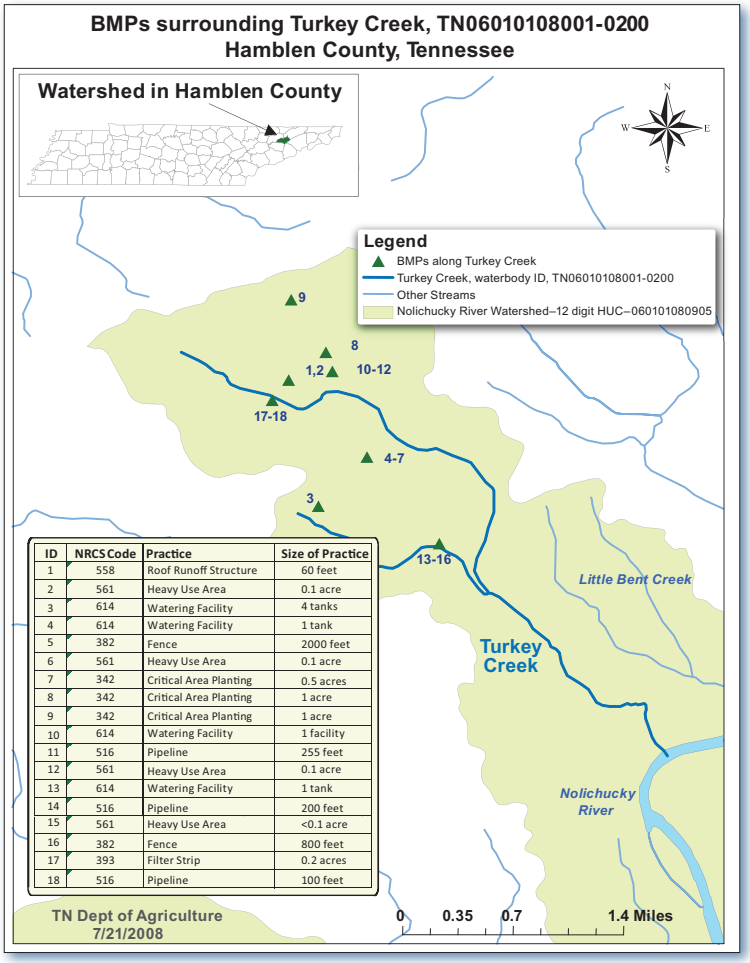


Figure 2. Turkey Creek watershed landowners built fences like this one to keep livestock away from the creek.

Project Highlights

Local landowners installed agricultural BMPs in the Turkey Creek watershed using grants from the CWA section 319 program, Tennessee's Agricultural Resources Conservation Fund (ARCF) and Tennessee's voluntary cost share program. Farmers installed 2,800 feet of fencing to exclude cattle from the creek (Figure 2), 0.2-acre of filter strip, seven alternative watering facilities, 555 feet of pipeline that carry water to new alternative watering facilities, 2.5 acres of critical area planting, a 60-foot roof runoff structure, protection on more than 0.3-acre of heavy-use area, and other BMPs that control erosion and sediment. Protecting

heavy-use areas involves stabilizing land areas that people, animals or vehicles frequently. For instance, the practice is applied in streams where cattle or farm equipment frequently cross, around cattle watering and feeding facilities, and in cattle feedlots or walkways. The locations and types of BMPs implemented in the Turkey Creek watershed are shown in Figure 3.



ID	NRCS Code	Practice	Size of Practice
1	558	Roof Runoff Structure	60 feet
2	561	Heavy Use Area	0.1 acre
3	614	Watering Facility	4 tanks
4	614	Watering Facility	1 tank
5	382	Fence	2000 feet
6	561	Heavy Use Area	0.1 acre
7	342	Critical Area Planting	0.5 acres
8	342	Critical Area Planting	1 acre
9	342	Critical Area Planting	1 acre
10	614	Watering Facility	1 facility
11	516	Pipeline	255 feet
12	561	Heavy Use Area	0.1 acre
13	614	Watering Facility	1 tank
14	516	Pipeline	200 feet
15	561	Heavy Use Area	<0.1 acre
16	382	Fence	800 feet
17	393	Filter Strip	0.2 acres
18	516	Pipeline	100 feet

Figure 3. This map shows the location and types of BMPs installed in Turkey Creek watershed.

Results

The new BMPs are helping to control erosion, reduce siltation and restore biological integrity in Turkey Creek. To assess the restoration effort's success, TDEC established a Semi-Quantitative Single Habitat Assessment (SQSH) station at mile 0.1 at Bent Ridge Road in 2005. SQSH 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 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 SQSH documented 8 EPT genera and 28 total genera of macroinvertebrates, earning a score of 32 out of 42 on the Tennessee Macroinvertebrate Index—a good score. On the basis of these data, the TDEC removed the 5.8-mile segment of Turkey Creek from the state's 303(d) list of impaired waters in 2008.

Partners and Funding

Turkey Creek projects received funding from the CWA section 319 program ($5,454 with additional matching funds of $3,616) and the Tennessee ARCF ($6,551 plus matching funds of $7,250). The Hamblen County Soil Conservation District and Smoky Mountain Resource Conservation and Development Council provided BMP implementation assistance. Local landowners contributed the majority of the in-kind matching funds for BMPs.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-10-001P
September 2010

For additional information contact:

Sam Marshall
Tennessee Department of Agriculture
sam.marshall@tn.gov • 615-837-5306