



NONPOINT SOURCE SUCCESS STORY

Tennessee

Unknown Toxicity from Agricultural Sources Mitigated by Implementing Best Management Practices Along Skillern Creek

Waterbody Improved

Skillern Creek was added to Tennessee's Clean Water Act (CWA) section 303(d) list for *Escherichia coli* bacteria in 2004 and for an unknown toxicity (caused by pasture grazing) in 2008. Watershed partners implemented agricultural best management practices (BMPs) and septic system repairs with support from CWA section 319 funding and the Tennessee Department of Agriculture's (TDA's) Agricultural Resources Conservation Fund (ARCF) to help mitigate the impacts of the unknown toxicity. A biological reconnaissance (biorecon) survey performed by the Tennessee Department of Environment and Conservation (TDEC) indicated that conditions within Skillern Creek were improving. As a result, a 10.6-mile segment of Skillern Creek was delisted for unknown toxicity on Tennessee's 2014 CWA section 303(d) list.

Problem

Skillern Creek (TN06020004007-2200) is within the Sequatchie River–Hall Creek watershed (060200040103) in Bledsoe County (Figure 1). The Sequatchie River–Hall Creek watershed receives runoff from the Southern Cumberland Plateau and the Walden Ridge South regions, which include coal mining areas. The watershed's primary land cover is forest and hay production/pasture. The designated use classifications for Skillern Creek include fish and aquatic life, irrigation, livestock watering and wildlife, and recreation.

Skillern Creek was originally placed on Tennessee's CWA section 303(d) list in 2002 for failing to support all designated uses due to impacts from *E. coli* from pasture grazing. In 2005 TDEC staff performed a biological reconnaissance (biorecon) survey, which is a screening tool that evaluates the health of a biological community by using macroinvertebrates as indicators. During the 2005 survey, the creek received a score of 5. A score equal to or less than 5 indicates stressed macroinvertebrate population. As a result, 10.6 miles of Skillern Creek were placed on Tennessee's CWA section 303(d) list in 2008 due to an unknown toxicity from pasture grazing.

Story Highlights

To mitigate the unknown toxicity while also combating excess pathogens in Skillern Creek, the Southeast

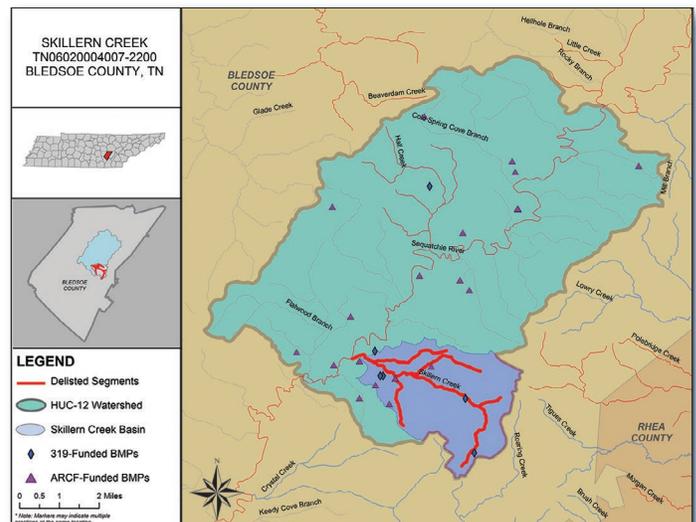


Figure 1. Best management practices were implemented throughout the Sequatchie River–Hall Creek watershed, including many in the Skillern Creek drainage basin.

Tennessee Resource Conservation and Development Council (SETN RC&D) installed a variety of BMPs in the Sequatchie River–Hall Creek watershed. Between 2013 and 2015, the SETN RC&D used CWA section 319 grant funds to implement 10 agricultural practices, including exclusion fencing, pasture and hayland planting, and alternative watering facilities to limit the impacts of livestock on the stream (Table 1). Three alternative septic systems/septic system repairs were also completed within the watershed, two of which were installed before Skillern Creek's delisting. Of the

Table 1. Total amount of BMPs installed with CWA section 319 and ARCF funding in the Sequatchie River–Hall Creek watershed and Skillern Creek drainage area.

Practice	Total Amount Installed		Unit of measurement
	Sequatchie River–Hall Creek watershed	Skillern Creek basin	
Access road	140	140	Linear feet
Alternative watering facility	7	4	Units
Cover crops	538.5	38	Acres
Critical area planting	1	1	Acre
Fence (including exclusion)	8,963	725	Linear feet
Heavy use area	2	1	Units
Livestock water pipeline	12,100	2,300	Linear feet
Mulching	1	1	Acre
Pasture and hayland planting (seeding)	62	32	Acres
Pumping plant	3	0	Units
Roof runoff structure	300	300	Linear feet
Septic system repair/ replacement	3	2	Units
Water well	3	1	Units

13 practices installed by the SETN RC&D in the watershed, seven were located in the Skillern Creek drainage basin. A total of 37 practices have been installed by Bledsoe County Soil Conservation District (SCD) with the assistance of ARCF from 2005 through 2017; 24 of the projects were completed before the 2014 delisting. The BMPs include fencing, heavy use areas, and alternative watering facilities, among others. Eleven of the ARCF-supported practices installed in the Sequatchie River–Hall Creek watershed were within the Skillern Creek drainage basin.

Results

In 2011 TDEC performed another bioecon survey on Skillern Creek. At that time, the creek received a score of 9, a marked improvement over the previous assessment. In 2014 TDEC determined that the unknown toxicant from pasture grazing that had been impacting Skillern Creek was no longer present. As a result, TDEC removed Skillern Creek from the 2014 CWA section 303(d) list for its unknown toxicity impairment



Figure 2. Habitat conditions in Skillern Creek, seen here in July 2017, have improved.

(Figure 2). The creek continues to be listed for *E. coli* from pasture grazing. Restoration work by the SETN RC&D, the Bledsoe County SCD, and others is ongoing.

Partners and Funding

The SETN RC&D was awarded a CWA section 319 grant totaling \$190,000 in fiscal year 2011. Approximately \$26,302 of the grant was spent in the Sequatchie River–Hall Creek watershed (\$18,508 of which was invested in the Skillern Creek drainage basin alone), with additional work performed by SETN RC&D in and around tributaries to the Sequatchie River (not reflected in Figure 1 because the BMPs installed in nearby watersheds do not directly impact the segment being discussed). Cooperator contributions and in-kind donations were approximately \$14,915, for a total of \$41,217 invested in BMPs throughout the watershed. Key partners with SETN RC&D include the University of the South; the TDEC Division of Water Resources; the TDEC Division of Groundwater Protection; the Bledsoe County SCD; U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS); and the Tennessee Wildlife Resources Agency.

Tennessee’s ARCF program has invested approximately \$58,369 in the watershed, with \$5,532 of the total funded practices implemented in the Skillern Creek drainage basin. An additional \$26,034 was contributed by cooperators with the watershed, for a total of \$84,403 invested in the Sequatchie River–Hall Creek watershed. Partners that cooperated with TDA to install BMPs through ARCF include USDA NRCS and the Bledsoe County SCD.



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