Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY
Tennessee

Agricultural BMPs Reduce the Impact of Cattle Grazing and Improve Quality of Creek's Habitat

Waterbody Improved

A portion of Lick Creek located in Marshall and Rutherford Counties was listed as impaired due to *Escherichia coli (E. coli)* and habitat alterations on the 2004 303(d) list. Using section 319 and state funding, the Marshall County Soil Conservation District installed Heavy Use Area (HUA) best management practices (BMPs), including exclusion fencing, animal waste lagoons, and planted hay and pasture grasses along Lick Creek. These nonpoint source pollution control efforts allowed this 8.8-mile segment of Lick Creek to be removed from the 2006 303(d) list for habitat alterations.

Problem

Lick Creek is located within the Duck River Watershed in Marshall and Rutherford Counties, Ecoregion 71i. The source of the pollutants was identified as livestock grazing in pasturelands where cattle had direct access to the stream, which resulted in the degradation of habitat through the trampling of streambanks and the input of pathogens.

Lick Creek was listed in 2004 for not meeting water quality standards for its designated beneficial uses due to elevated *E. coli* values and habitat alterations as a result of unrestricted cattle access to the creek. Lick Creek Marshall has multiple designated use classifications, including fish and aquatic life, livestock watering and wildlife, irrigation, and recreation. Lick Creek Marshall was listed for not meeting standards to fully support two of its four designated beneficial uses: fish and aquatic life, and recreation.

Tennessee's water quality standards for recreation state that the concentration of the *E. coli* group in any individual sample shall not exceed either (a) 487 cfu/100ml for lakes, reservoirs, State Scenic Rivers, or Tier II or III waterbodies or (b) 941 cfu/100ml for all other waterbodies. Lick Creek Marshall falls into the latter category.

E. coli and siltation total maximum daily loads (TMDLs) were established in 2006 by the Tennessee Department of the Environment and Conservation (TDEC) for Lick Creek in Marshall County.

Project Highlights

Funding from the Agricultural Resources Conservation Fund (ARCF) was used to plant 25 acres of hay and pasture grasses along this segment of Lick Creek and its tributary Plum Branch, to filter pollutants, reduce erosion, and stabilize the stream banks (Figure 1). In addition, exclusion fencing and an animal waste lagoon were installed along the stream to reduce the direct input of pathogens such as *E.coli*.

Results

The Tennessee Macroinvertebrate Community Assessment is used to calculate the Tennessee Stream Condition Index (TSCI), which is a measure of biological health of an aquatic system. The principal metrics used are the total macroinvertebrate families (or genera), the number of families (or genera) of mayflies, stoneflies, and caddisflies (EPT), and the number of pollution intolerant families (or genera) found in a stream. This index is used by the state to determine a waterbody's compliance to state water quality standards for the beneficial use of fish and aquatic life. The TSCI was used to compare subregions and determine a score, for a total possible score of 42. Using EPA's rapid biological protocol III sampling at station 1.8 (Mt. Vernon Road), state biologists found six EPT species and a total diversity of 23 different types of macro-invertebrates. The TSCI score for the station was 36, which is greater than the regional goal of 32 and within the "very good" range. Since biological integrity appears to be no longer impaired, the stream was delisted for habitat alteration and removed from the 2006 303(d) list. However, this segment of Lick Creek remains on the list for *E.coli*.

Partners and Funding

Lick Creek Marshall has benefited from $536.40 provided through cost-share from section 319 grant pool projects. In addition, $1608.60 was provided from the State's ARCF.

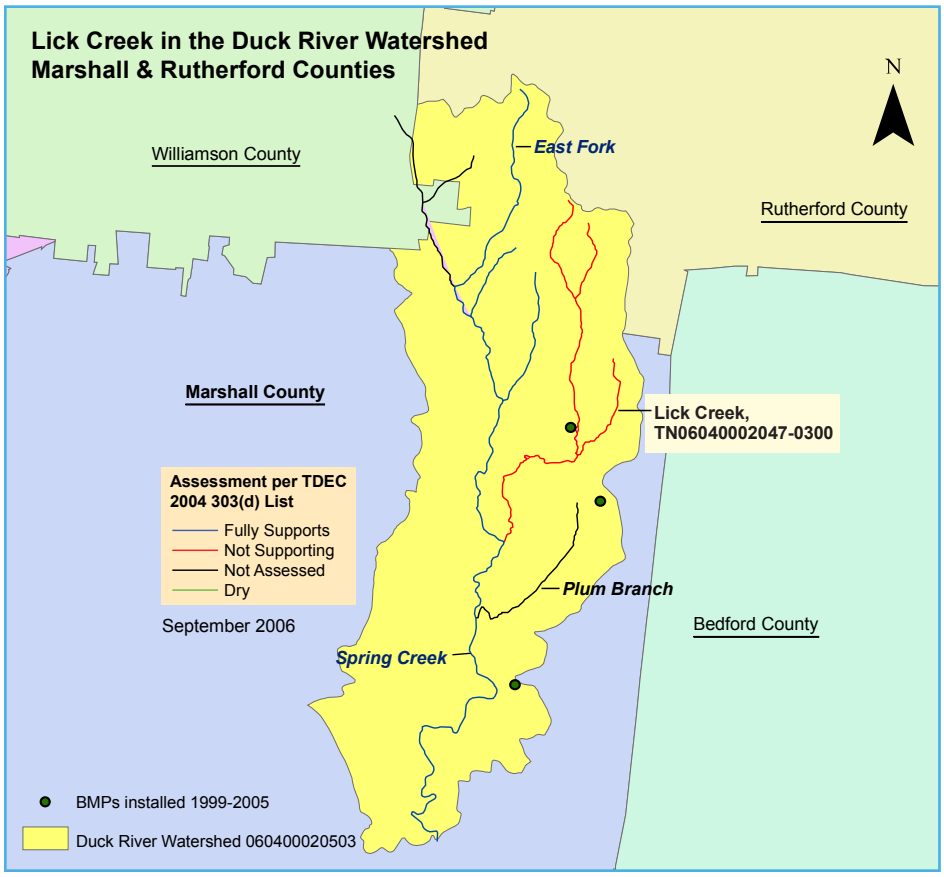

Figure 1. Map of BMPs installed.

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

EPA 841-F-07-001U
September 2007

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