



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

North Carolina

Partners Reduce Polluted Runoff from Agricultural Areas

Waterbody Improved

Runoff carrying sediment from agricultural areas impaired aquatic habitat in North Carolina's Little Ivy Creek. North Carolina added the creek to its 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Using CWA section 319 and state funding, Madison County Soil and Water Conservation District installed best management practices (BMPs) including livestock exclusion fencing, alternative watering facilities, pastureland management and riparian buffer plantings. Water quality improved, and North Carolina removed a 2.6-mile segment of Little Ivy Creek from its CWA section 303(d) list of impaired waters in 2008.

Problem

Little Ivy Creek, in Madison County, North Carolina, is a subwatershed of the larger Ivy River watershed in the Upper French Broad River Basin. Nonpoint source pollution has plagued the 60,000-acre Ivy River watershed for years. Contaminants include fecal coliform, nutrients and sediment. Biological monitoring on Little Ivy Creek in 2002 showed a score of *fair*, which failed to support the creek's aquatic life designated use. As a result, North Carolina added Little Ivy Creek to its CWA section 303(d) list for impaired waters in 2002.

Project Highlights

Community partners came together to combat the fecal coliform bacteria and sedimentation problems identified by North Carolina Division of Water Quality in the watershed. This multi-project effort focused primarily on installing agricultural BMPs. To date, partners have installed four projects using CWA section 319 funds in the Little Ivy Creek and Ivy River watersheds.

Partners installed more than 48,000 linear feet of livestock exclusion fencing to keep livestock out of the stream and reduce erosion (Figure 1). Project participants also installed 170 alternative watering facilities (Figure 2). One farmer adopted pasture and hay management plans, protecting an additional 530 acres of natural area. Additional BMPs funded by CWA section 319 grants helped develop a farm access road, 30 acres of riparian buffer and 25 feed/waste management structures (Table 1).



Figure 1. This fence prevents livestock from accessing Little Ivy Creek.



Figure 2. This alternative water source allows livestock to drink without entering Little Ivy Creek.

Table 1. BMPs installed in Little Ivy Creek watershed

BMP installed	Size/unit
Riparian Buffer Planting	31 ac
Livestock Exclusion Fencing	48,500 ft
Critical Area Planting	17 ac
Feed/Waste Structures	25 unit
Rotational Grazing	830 ac
Pastureland Management	530 ac
Tree Planting	15 ac
Stream Restoration	1,500 ft
Farm Road Stabilization	1,000 ft
Nutrient Waste Management	530 ac

Results

Biological monitoring data indicate that water quality in Little Ivy Creek has improved. North Carolina developed the North Carolina Index of Biological Integrity (NCIBI) to assess a stream's biological integrity by examining the structure and health of the fish community. NCIBI incorporates information about species richness and composition, trophic conditions, and fish abundance and condition. The NCIBI effectively summarizes all classes of factors that influence aquatic faunal communities such as water quality, energy source, habitat quality, flow regime and biotic interactions.

The North Carolina Division of Water Quality breaks the Little Ivy Creek watershed into two main segments hosting one macroinvertebrate and one fish sampling station. At the most recent sampling interval in June 2007, segment 6-96-10a received a *good* rating for fish, and segment 6-96-10b received a *good-fair* rating for both macroinvertebrate and fish (Table 2). These data indicate marked biological improvement and evidence of macroinvertebrate habitat recovery in Little Ivy Creek. On the basis of these data, the North Carolina Division of Water Quality removed the 2.6-mile segment from the state's CWA section 303(d) list of impaired waters in 2008.

Table 2. Environmental monitoring data NCIBI score

Waterbody	Location	Index #	Date	Score	Rating
Little Ivy Creek	SR 1547	6-96-10	08/03/02	44	Fair
Little Ivy Creek	SR 1547	6-96-10	06/18/07	52	Good

Partners and Funding

Support for this project came from \$359,606 in U.S. Environmental Protection Agency CWA section 319 funds and \$291,750 in state funds. CWA section 319 grant funds awarded in the larger Ivy River watershed to date totals \$1,384,356. Partners include North Carolina Division of Water Quality, North Carolina Division of Soil and Water Conservation, Madison County, University of North Carolina at Asheville, Clean Water Management Trust Fund, North Carolina Department of Transportation, North Carolina Wildlife Resources Commission and the Tennessee Valley Authority, which cumulatively have provided an additional \$1,069,855 in matching funds.



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

EPA 841-F-09-001Y
September 2009

For additional information contact:

Heather Jennings
North Carolina Division of Water Quality
919-807-6437 • Heather.B.Jennings@ncdenr.gov

Sara Nichols
Madison County Soil and Water Conservation
828-649-9099 • Sara.nichols@nc.nacdnet.net