



NONPOINT SOURCE SUCCESS STORY

North Carolina

Agricultural Best Management Practice Implementation Leads to Improvements in the Dan River

Waterbodies Improved

Row crop production and livestock operations led to high pollutant runoff and degraded biological conditions in the North Carolina portion of the Dan River. As a result, two segments of the river were added to North Carolina's Clean Water Act (CWA) section 303(d) impaired waters list for fecal coliform and biological impairment in 1998. Watershed partners implemented numerous agricultural best management practices (BMPs) that have decreased pathogen runoff. These efforts have led to the improvement in water quality of two stream segments; these were removed from the state's list of impaired waters in 2012.

Problem

The Dan River's headwaters span the North Carolina and Virginia borders (Figure 1). The main stem of the Dan River begins in North Carolina, then meanders back and forth for its entire 221-mile length between Virginia and North Carolina before emptying into the Roanoke River in Virginia.

North Carolina's CWA section 303(d) list (i.e., the impaired waters list) denotes many streams as being impaired by agriculture and other sources. According to the state's 2008 CWA section 303(d) list, multiple segments of the Dan River (a total of 38.2 miles) were found to be impaired due to elevated levels of fecal coliform bacteria. A water is considered impaired by fecal coliform if the stream sample has a count of 400 colonies/100 milliliters of water in a 5-day sampling window during a 30-day period.

The U.S. Environmental Protection Agency (EPA) approved a total maximum daily load (TMDL) for the Dan River in January 2005. According to the TMDL, a 59 percent reduction in total suspended solids distributed over both point and nonpoint sources will reduce fecal coliform levels and achieve acceptable water quality levels.

Project Highlights

The soil and water conservation districts (SWCDs) participating in this project have been giving high priority to BMP sites in subwatersheds that contain impaired streams. The cooperation between the SWCDs, farmers, and local and state government agencies has

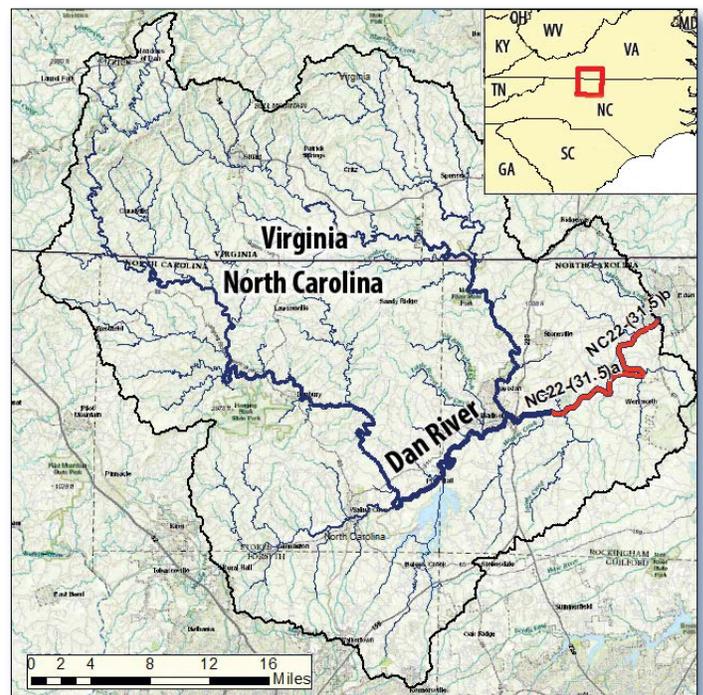


Figure 1. The upper Dan River watershed drains portions of North Carolina and Virginia.

played a key role in achieving the reductions need to partially delist the Dan River.

Stokes County SWCD implemented a number of agricultural BMPs which directly impact the Dan River. More than 200 acres of land were improved by project implementation. Heavy use protection (12,400 feet) and livestock exclusion fencing (20,767 feet) were implemented on a number of production cattle farms

in the watershed (Figure 2). Watering tanks, wells and pipelines were installed to provide water to the cattle (previously only stream access had been provided (Figure 3). In addition to the pasture work, a total of 3.5 acres of critical area plantings were installed and over 35 acres of cropland was placed in sod-based rotation (Figure 4). The CWA Section 319 Program funded a seed project in FY2008 at a cost of \$399,900; from that, participation in the BMP implementation skyrocketed and led to additional projects in FY2011, FY2014 and FY2016.

Results

Of the Dan River's 38.2 impaired miles, a total of 14.2 miles were improved by local agricultural efforts and TMDL implementation. Fecal coliform levels are declining and the health of the fish community is improving. Recent sampling show small incremental improvements in the benthic macroinvertebrate community. In 2013 the North Carolina Benthic Index score was 36 (fair); in 2015 the score had improved to 44 (good-fair). The North Carolina Department of Environmental Quality, Division of Water Resources (DWR), expects to see additional improvement in the 2016 sampling data.

As expected, fecal coliform counts are also declining. Data collected from 2010 indicated that two Dan River assessment units (AUs) now meet the fecal coliform levels and are deemed safe for recreation: AU 22-(31.5)a (4.8 miles long) and AU 22-(31.5)b (9.4 miles long). As a result, these AUs were delisted for fecal coliform impairment in 2012. Livestock exclusion and plantings will continue to help control pollution for years to come, and bacteria levels are expected to decline further over time. DWR anticipates additional delistings in the near future.

Partners and Funding

The water quality improvement in the Dan River can be attributed to many stakeholders active in the restoration effort throughout the watershed, including the EPA, North Carolina Department of Environmental Quality DWR, North Carolina Agricultural Cost Share Program, and county landowners. A combined total of \$1,104,883 has been invested in the watershed with a portion of EPA CWA section 319 funding (\$694,900) directed towards plan development and BMP implementation.



Figure 2. Livestock exclusion fences installed in Rockingham County.



Figure 3. Alternative water tank installed in Stokes County.



Figure 4. A farm field, before (top) and after (bottom) a cropland conversion BMP was applied.



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