

Smith Creek

Virginia's Chesapeake Bay Showcase Watershed



Overview

In 2010, USDA's Natural Resources Conservation Service (NRCS) established three showcase watersheds to demonstrate what can be accomplished when people and groups come together to solve natural resource problems in a targeted area.

The goal of the project was to reduce nitrogen, phosphorous and sediment contributions from soil erosion, over-application of nutrients, poor pasture management and uncontrolled animal access to streams.

Maryland's Upper Chester River and Pennsylvania's Conewago Creek collaborations have concluded, but Virginia's Smith Creek project is still going strong.

NRCS is working with more than 20 partners committed to helping local farmers and landowners voluntarily implement conservation practices to reduce nutrient and sediment runoff into the Chesapeake Bay.

Smith Creek Profile

The Shenandoah Valley is home to 75 percent of Virginia's poultry operations and approximately 46 percent of its dairies. This concentration of animal farms has contributed to nitrogen, phosphorus, sediment and bacteria pollution in local streams, the Shenandoah and Potomac Rivers, and the Chesapeake Bay.

The Smith Creek Watershed covers 67,335 acres and includes four sub-watersheds: Dry Fork, Mountain Run, War Branch and Gap Creek. Karst topography dominates the area with 329 sinkholes and 35 caves.

Seventy-five percent of the watershed is in Rockingham County and 25 percent is in Shenandoah County. Of 286.9 miles of streams, 64.34 miles (22 percent) are impaired.

Thirty-three percent of the land is prime or important farmland. Pastureland (10,408 acres) is the dominant agricultural land use. Approximately

43 percent of this intensively farmed watershed is agricultural land with significant amounts of cropland (5,713 acres) and hayland (13,105 acres).

Supporting State Goals

NRCS is partnering with more than 20 groups and organizations in the watershed to improve water quality and support the current Smith Creek Total Maximum Daily Load (TMDL) Implementation Plan.

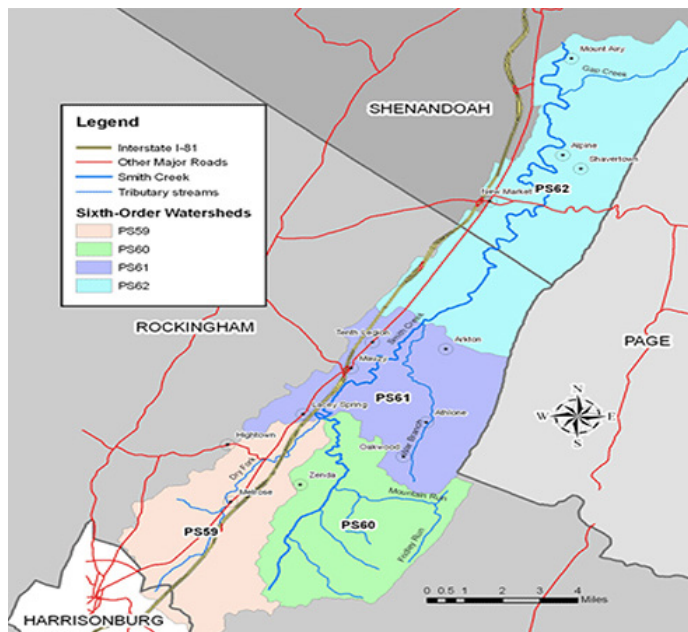
Best management practices to address resource concerns include installing riparian buffers, cover crops, rotational grazing and alternative watering systems; constructing waste storage facilities; excluding livestock from streams; and implementing nutrient management practices.

Smith Creek is the only small agricultural watershed in Virginia where the U.S. Geological Survey (USGS) is monitoring progress as BMPs are installed. USGS collects river samples from the Smith Creek watershed



Landowners in the Smith Creek watershed are receiving financial assistance to install stream crossings (above left), riparian forest buffers and other practices to help improve local water quality.

Smith Creek Counties and Subwatersheds



Map Key:

PS59 - Dry Fork

PS60 - Mountain Run

PS61 - War Branch

PS62 - Gap Creek



Innovation in Action

In 2020, Smith Creek landowners Peyton and Myra Yancy began working with the nonprofit Ridge to Reefs to install a denitrifying bioreactor that will help reduce nitrogen levels in the spring on their property and discharge the treated water back into the headwaters of Smith Creek.

A woodchip bioreactor is an edge-of-field practice designed to treat agricultural water from drainage tile lines, drainage ditches, springs or ponds. A buried trench filled with woodchips is the main component of this system.

An in-line water control structure diverts the water to the woodchip trench, which provides the proper environment (carbon from woodchips, nitrate-nitrogen from agricultural drainage and low dissolved oxygen) to promote denitrification.

Denitrification converts nitrates to harmless nitrogen gas that makes up 78 percent of the air we breathe. Water quality data shows that this innovative technology is highly effective at reducing nitrates with a greater than 90 percent removal rate.

Virginia Tech and the National Fish and Wildlife Foundation (NFWF) are funding the project. Tech will also monitor bioreactor usage to assess how well it is working.

to understand BMP water-quality effects. With over five years of data already collected in this study, the USGS has identified locations of high nitrate concentrations and documented nitrogen sources (i.e., manure, commercial fertilizer and septic fields). Ongoing efforts are focused on linking water-quality changes with practice implementation.

Highlights for 2010-2019

The Smith Creek Partnership has conducted extensive outreach over the past 10 years, personally contacting local producers and landowners and conducting multiple partnership meetings.

Across the watershed, NRCS and partners have completed 350 Farm Resource Inventories on 70 percent of the watershed's acreage used for agriculture.

In fiscal years 2010-2019, NRCS approved 143 contracts totaling \$5 million on 8,380 individual acres.

Farmers have helped to improve water quality by:

- Applying nutrient management practices on 6,888 acres

- Installing over 40.2 miles of livestock fencing
- Planting 3,375 acres of cover crops
- Developing plans for 35 waste storage facilities
- Implementing prescribed grazing on 1,305 acres

Contact Information

Smith Creek Partnership Website
<https://smithcreekwatershed.com/>

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