

Project Location and Background

Flat, Nibbs, Deep, and West Creeks are located in Amelia and Nottoway Counties. They drain to the Appomattox River, which is part of the James River Basin. The Flat Creek watershed is 90,752 acres in size, the Nibbs Creek watershed encompasses 16,566 acres, the Deep Creek watershed includes 117,914 acres, and the West Creek watershed comprises 30,995 acres. All four creeks were listed as impaired on Virginia’s 1996 Section 303(d) Total Maximum Daily Load (TMDL) Priority List and Report due to violations of the state’s water quality standards for fecal coliform bacteria. (This standard was changed to *E. coli* in 2003.) A TMDL was approved by EPA in 2004, and a TMDL implementation plan was developed in 2006. The agricultural implementation project began in 2006, and the residential septic implementation project began in 2015.

Implementation Highlights

The Flat, Nibbs, Deep, and West Creeks agricultural implementation project was administered by Piedmont Soil and Water Conservation District (PSWCD) using targeted state funds. Agricultural funding was eventually discontinued in June 2015; however, agricultural BMPs continue to be implemented by PSWCD through other state programs. The table on the right shows overall BMP goals and implementation progress since the project began in 2006. From July 2018 through June 2019, five stream exclusion practices have been installed, fencing livestock from nearly 8,324 feet of stream and 22,256 feet of stream fencing was maintained during this period.

(continued on page 2)

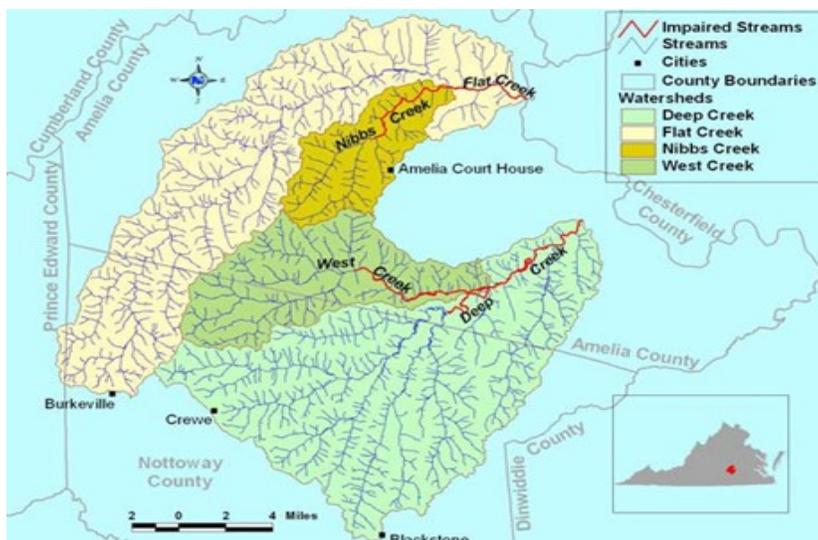


Table 1: Flat, Nibbs, Deep, and West Creeks BMP Summary: 2006-June 2019

Control Measure	Unit	Goal	Installed	%
Agricultural				
Stream Exclusion Fencing	F	369,072	352,807	96
Stream Exclusion Fencing	S	268	137	51
Streamside Fence Maintenance	F	15,446	94,372	611
Improved Pasture Management	A	9,593	231	2
Animal Waste Control Facilities	S	10	5	50
Woodland/Vegetated Buffers	A	20.5	185	902
Aforestation of Erodible Crop and Pastureland	A	N/A	194	N/A
Long Term Vegetative Cover on Cropland	A	N/A	424	N/A
Legume Based Cover Crop	A	N/A	414	N/A
Small Grain and Mixed Cover Crop for Nutrient & Residue Management	A	N/A	1,767	N/A
Continuous High Residue Minimal Soil Disturbance Tillage System	A	N/A	146	N/A
Continuous No-Till System	A	N/A	258	N/A
Residential Septic				
Septic Tank Pump-out	S	2,740	47	2
Septic Tank System Repair	S	615	2	<1
Septic Tank System Installation	S	616	14	2
Alternative Waste Treatment System	S	65	3	5

A = Acres, F = Linear Feet, S = System; **Note:** BMP counts only include 319-funded and state VACS. NRCS EQIP funded practices are not included.

Implementation Highlights— Continued

In addition to agricultural efforts, PSWCD was awarded 319(h) grant funds in July of 2015 to reduce residential septic-associated bacterial inputs from both Flat Creek and Nibbs Creek watersheds. This grant, which originally excluded Deep and West Creeks, was scheduled to end in December 2017. However, due to interest of homeowners in those watersheds, the grant was expanded to include Deep and West Creeks and extended for another year (end date of December 2018). From July 2018-June 2019 period, the residential septic grant program funded 19 septic tank pump-outs, five septic system installations and one alternative waste treatment system. PSWCD has additionally gathered information on the number of residential septic BMPs that have been installed since the development of the TMDL implementation plan in 2006. Bacteria reductions resulting from BMP installations are summarized in Table 2 below.

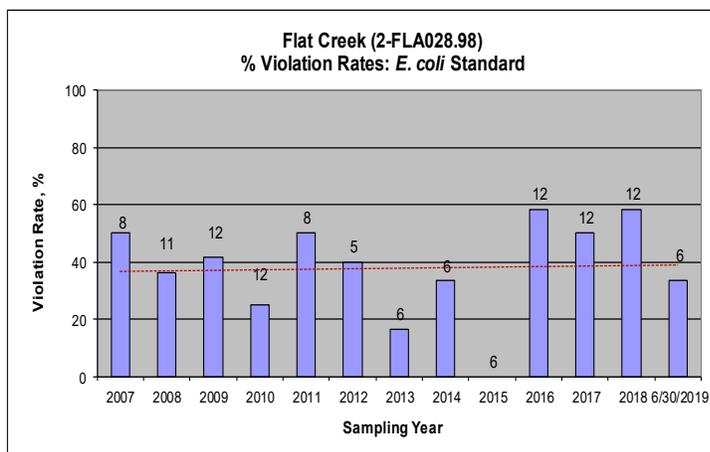
Period	Pathogens (Coliform) (CFU)
July 2006—June 2019	1.57E+16

Table 2: Pollutant Reductions for Flat, Nibbs, Deep, and West Creeks Watershed

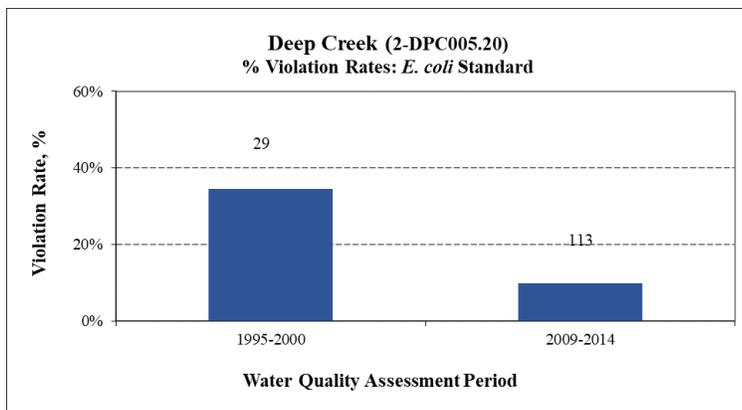
Water Quality Monitoring Results

Water quality data collected by DEQ were analyzed to determine *E. coli* violation rates in the project area for the water quality standard of 235 cfu/100 mL and determine the impact of BMPs implemented in the watersheds on violation rates and associated long-term trends, if any, in water quality. The bar graphs to the right show the percent violation rates for samples collected annually at two monitoring stations: 2-FLT028.98 in Flat Creek and 2-DPC005.20 in Deep Creek. The number of samples collected each year is shown above each bar. The linear regression fitted to 2-FLT028.98 data suggests little change in violation rates, indicating consistent water quality in Flat Creek. However, monitoring over a longer period of time with consistent trends is needed to corroborate water quality changes.

Data collected at station 2-DPC005.20 show a decline in violation rate in two assessment periods, indicating improvement in water quality. In fact, an 11.55-mile long segment of Deep Creek attained water quality standard and was delisted from impaired waters list. Based on this, a success story has been submitted for EPA publication.



Graph 1: E. coli data from Flat Creek (Station 2-FLA028.98), 2007-2019



Graph 2: E. coli data from Deep Creek (Station 2-DPC-005.20) for two different assessment periods, 1995-2000 and 2009-2014.

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