

UPPER HAZEL RIVER WATERSHED

Project Location and Background

The Upper Hazel River watershed is approximately 135,610 acres in size and located in the Rappahannock River basin in Rappahannock, Madison, and Culpeper Counties, Virginia. The Hazel River begins in Rappahannock County, south of Panorama and continues downstream to its confluence with Rappahannock River northwest of Remington, Virginia. The Rappahannock River forms in Fauquier County, southeast of Front Royal and continues downstream to the Chesapeake Bay. The Hazel River and its tributaries, the Hughes, Rush, and Thornton Rivers, were placed on Virginia’s 2002 and 2004 Section 303(d) Total Maximum Daily Load (TMDL) Priority List and Reports due to violations of the state’s water quality standard for fecal coliform bacteria. TMDLs were completed for the rivers in April 2007 as part of the Rappahannock River Basin TMDL. A TMDL implementation plan was completed in May 2009, and the implementation project commenced in July 2009.

Implementation Highlights

The Culpeper Soil and Water Conservation District (CSWCD) administers the agricultural and residential septic BMP programs for the Upper Hazel River Implementation Project. Table 1 shows BMPs implemented in the project area since 2009 and overall progress relative to the implementation plan goals.

From July 2018 through June 2019, the CSWCD continued work with area producers toward installation of ten approved livestock stream exclusion practices. Three projects covering 232 acres were planted with small grain and mixed cover crops for nutrient and residue management. In the residential septic program, 83 BMPs were implemented between July 2018 and June 2019. This included 48 septic system pump-outs, 17 septic system repairs, and 18 conventional septic system replacements. *(continued on page 2)*

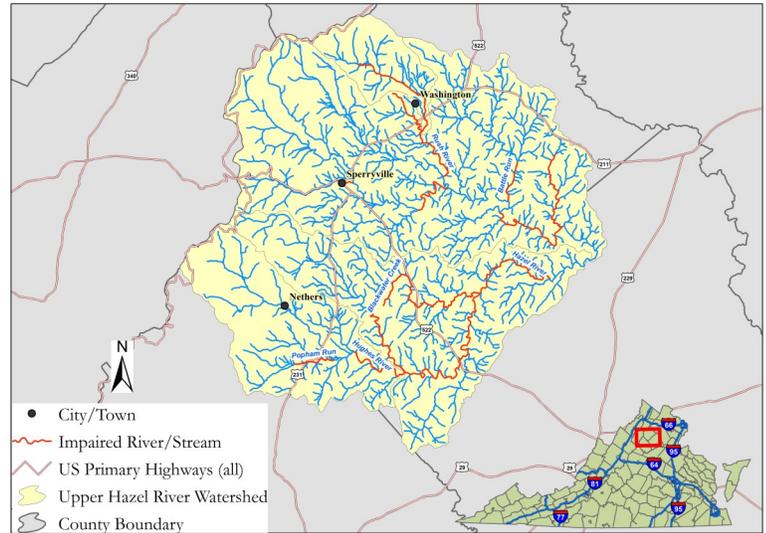


Table 1: Upper Hazel River BMP Summary: Jan. 2009—June 2019

Control Measure	Units	Goal	Installed*	%
Agricultural				
Stream Exclusion Fencing	F	2,307,360	253,897	11
Stream Exclusion Fencing	S	1,072	87	8
Streamside Fencing Maintenance	F	N/A	115,893	N/A
Riparian Buffer	A	N/A	292	N/A
long-term Vegetative Cover on Cropland	A	283	154	54
Streambank Stabilization	F	N/A	412	N/A
Pasture Management	A	53,621	2,448	5
Reforestation of Erodible Cropland	A	283	7	2
Residential Septic				
Septic Tank Pump-out	S	N/A	328	N/A
Septic System Repairs	S	439	95	22
Septic System Installation	S	777	55	7
Alternative Waste Treatment System	S	130	2	2

A = Acres, F = Linear Feet, S = System; **Note:** BMP counts only include 319-funded and state VACS. NRCS EQIP funded practices are not included. *Corrections have been made to numbers of installed BMPs provided in previous annual reports.

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Implementation Highlights— Continued

To date, the project has completed 87 stream exclusion practices that fenced livestock from over 48 miles of stream and has addressed septic issues for 480 homes. Additionally, maintenance work was completed on 115,893 feet of stream fencing. Bacteria reductions resulting from BMP installations are summarized in Table 2 below.

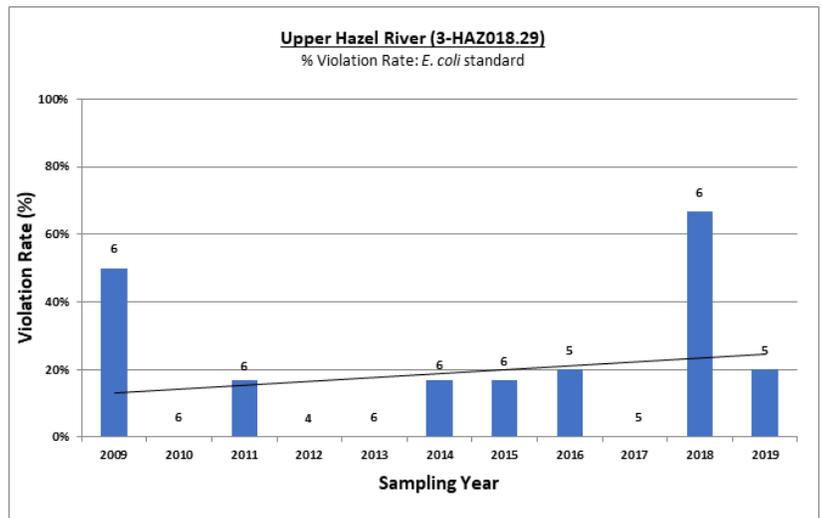
Period	Pathogens (Coliform) (CFU)
July 2009-June 2019	1.78+16

Table 2: Pollution Reductions for Upper Hazel River Watershed

Water Quality Monitoring Results

DEQ monitors the water quality of Upper Hazel River at several stations through the Agency’s ambient monitoring program. The water quality data available for the period of 2009 through 2019 have been analyzed to determine the impact of implemented BMPs on *E. coli* violation rate and to identify water quality trends. The bar graph to the right shows the annual exceedance rates for samples collected at monitoring station 3-HAZ018.29, located at State Route 729, relative to the water quality standard of 235 cfu/100 mL. The number of samples collected each year is shown above each bar.

Through 2017, the linear regression fitted to the data had showed a decreasing trend in violation rates over the sampling period with several years having no violations of the bacteria standard. Possibly due to frequent and heavy precipitation in the watershed, monitoring during 2018 resulted in a very high (4 of 6 samples) exceedance rate. Just one of five 2019 samples exceeded 235 cfu/100 mL. Monitoring over a longer period of time will be needed to confidently determine water quality changes associated with BMP installations.



Graph 1: E.Coli data for Upper Hazel River (Station 3-HAZ018.29), 2009-2019

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