

# TMDL Project Closeout Report

## THUMB RUN, DEEP RUN, CARTER RUN, GREAT RUN WATERSHED

## Virginia Nonpoint Source MANAGEMENT PROGRAM

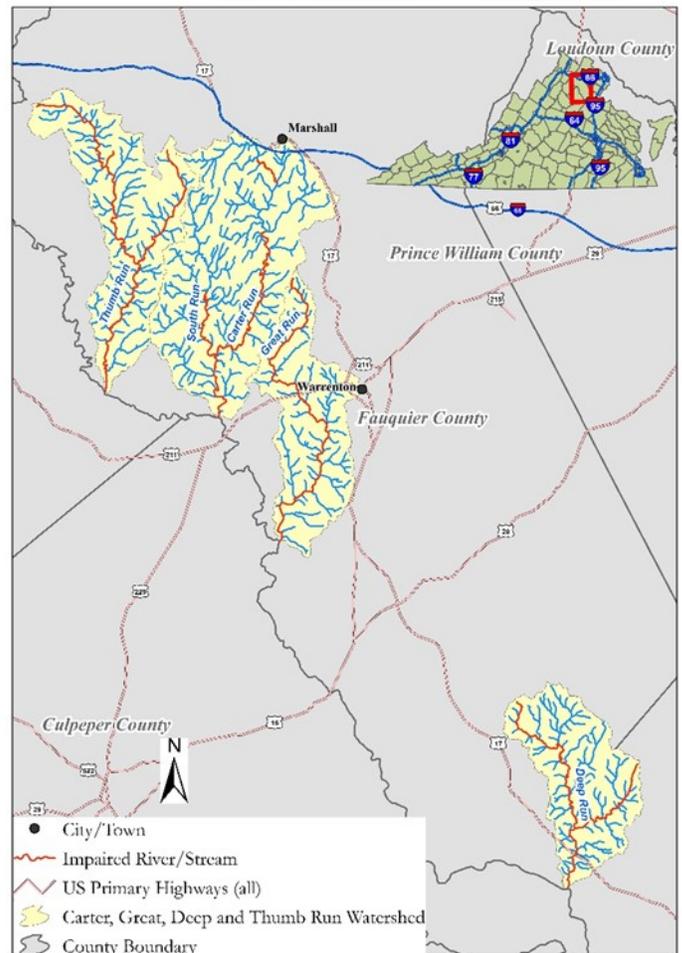
### Project Location and Background

Thumb Run, Carter Run, Great Run, and Deep Run are part of the Rapidan-Upper Rappahannock River Basin in the Chesapeake Bay watershed. The Thumb Run, Carter Run and Great Run watersheds are located in Fauquier County, Virginia. The northern portion of Deep Run watershed lies in Fauquier County with the southern portion in Stafford County. The 92,800-acre project area is made up of forested (60%), agricultural (39%) and residential (1%) land uses. A total maximum daily load (TMDL) implementation plan was developed to address a fecal coliform impairment on Thumb Run and *E. coli* impairments on Deep, Carter and Great Runs. Deep Run was first listed as impaired on the 1996 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. Carter, Thumb, and Great Runs were listed in 1998. A TMDL for the watersheds was developed in 2002, and a TMDL implementation plan was completed in 2006. An implementation project began in July of that year. In 2012, only project funding in Carter and Thumb Runs continued, and the project ended in June 2017.

**Table 1: Thumb, Deep, Carter and Great Runs BMP Summary: July 2006 – June 2017**

Control Measure	Units*	Goal	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	421,947	358,736	85
	S	167	80	48
Riparian Buffer	A	N/A	242	N/A
Pasture Management	A	16,459	445	3
Veg. Cover on Cropland	A	N/A	94	N/A
<b>Pet Waste</b>				
Pet Waste Landscape demo.	S	2	2	100
<b>Residential Septic</b>				
Septic Tank Pump-out	S	N/A	247	N/A
Septic System Repair	S	102	69	68
Septic System Installation	S	146	16	11
Alternative Waste System	S	44	1	2

A = Acres, S = System, F = Feet; **NOTE:** BMP counts only include 319-funded project and BMPs funded by the VA Agricultural Cost Share Program.



### Implementation Highlights

The Thumb, Deep, Carter and Great Runs TMDL Implementation Project was administered by the John Marshall Soil and Water Conservation District (JMSWCD) and the Fauquier County Health Department (FCHD). FCHD was contracted to provide residential septic technical assistance and educational outreach to homeowners while JMSWCD delivered the agricultural BMP program and associated education and outreach. The table on the left shows BMPs implemented in the watersheds since the project began in July 2006 and the implementation goals established for this project area. The agricultural BMPs installed include 80 livestock stream exclusion with grazing land protection systems resulting in approximately 68 miles of stream exclusion and stream protection. Also, 242 acres of riparian buffer and 94 acres of permanent vegetative cover on cropland were planted in the watersheds. Pasture management was practiced on 445 acres, and about 5,548 linear feet of stream exclusion maintenance work was completed.

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### Implementation Highlights— Continued

Under the Urban/Residential program, two pet waste projects were completed in the watersheds. Further, 247 septic tank pump-outs and 69 septic system repairs were performed, while 16 septic systems and one alternative waste system were installed. The pollutant reductions resulting from BMP installations beginning in 2006 are summarized in Table 2 below.

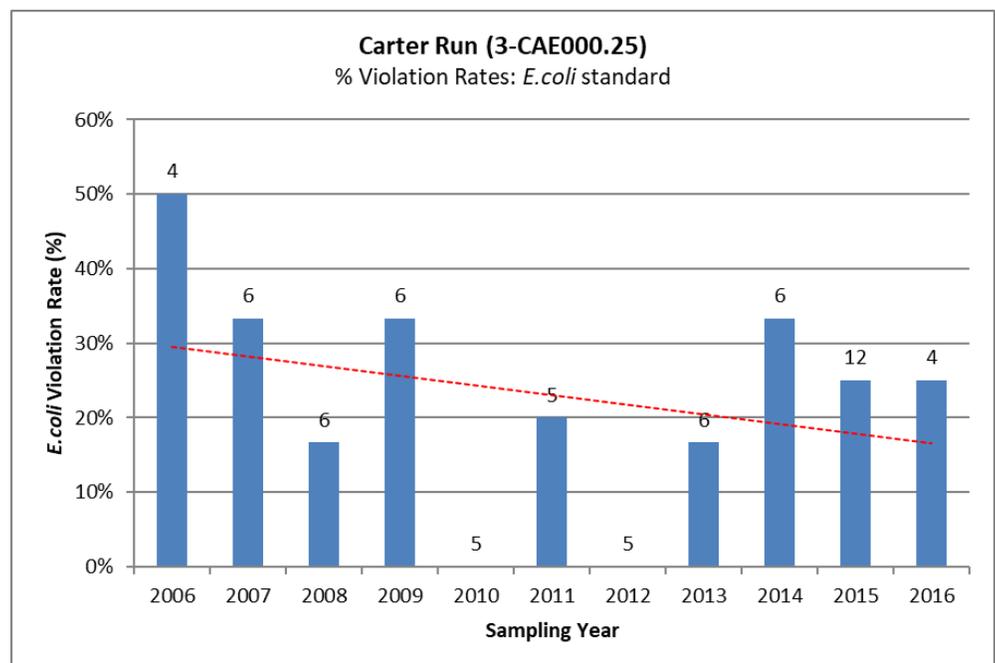
Period	Pathogens (Coliform) (CFU)	Nitrogen (lbs/year)	Phosphorus (lbs/year)	Sedimentation (tons/year)
July 2006-June 2017	1.27E+16	145,017	10,613	12,594

**Table 2: Pollution Reductions for Thumb, Deep, Carter and Great Runs Watershed**

### Water Quality Monitoring Results

Water quality data collected by DEQ for period of 2006 through 2016 were analyzed to determine the impact of BMPs implemented in the project area on *E. coli* violation rates and associated long-term trends, if any, in water quality. The bar graph below shows the percent violation rate for samples collected annually at monitoring station 3-CAE000.25, which did not meet the water quality standard of 235 cfu/100 ml. The number of samples collected each year is shown above each bar. The linear regression fitted to the data shows a decreasing trend in violation rates over the sampling period, indicating possible improvement in water quality in Carter Run.

**Graph 1: *E. coli* data for Carter Run (Station 3-CAE000.25), 2006-2016**



**The Virginia Nonpoint Source Management Program:** The Virginia NPS Management Program is managed by the Virginia Department of Environmental Quality (DEQ) and is funded, in part, through grants from the U.S. Environmental Protection Agency, under the Clean Water Act Section 319(h). For more information regarding Virginia's Nonpoint Source Management Program, please visit us on the web at: <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/NonpointSourcePollutionManagement.aspx> . An electronic copy of this report can be found here: <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLImplementation/TMDLImplementationProjects.aspx> General NPS Program questions? email: [npsgrants@deq.virginia.gov](mailto:npsgrants@deq.virginia.gov)

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### *Partnerships*

Agricultural and residential conservation successes in the watersheds were largely the result of partnerships between the JMSWCD, FCHD, Natural Resources Conservation Services, Virginia Cooperative Extensive Services, and other federal, state and local officials. The Fauquier County Department of Social Services and Foothills Housing Alliances assisted with the residential program by providing referrals and other resources. A total of 118 separate outreach events and educational programs were conducted during the grant period. Approximately 50% of those promotional activities included both the agricultural and residential programs. The outreach activities included a series of direct mailings, exhibits at public events, and numerous presentations to community organizations. About 42% of the promotional activities were targeted to farmers and owners of agricultural lands. They included exhibits at Cattlemen's Association programs and events sponsored by the local co-operatives, farm tours, and pasture management classes.



Photos: (Top) hardened livestock hardened crossing; (Bottom) rotational grazing system. Courtesy of JMSWCD.



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### *Closeout Analysis*

The Carter Run and Thumb Run Implementation Project continued for 11 years, from June 2006 until June 2017. Various agricultural, residential, and urban BMPs were installed in the watersheds. The JMSWCD administered the program, except for 2008-2013 period for which FCHD was contracted out the residential program. Highlights of the implementation project include the following:

- ⇒ As shown in Table 1, stream exclusion fencing (linear feet) and the number of system installed met 85% and 51% of the IP goals, respectively. Under the residential program, 68% of septic system repairs and 11% of septic system installation/replacement goals were met. Additionally, 247 of septic tank pump-outs were performed in the watersheds. Finally, 100% of the Urban/Residential Pet Waste IP goal was achieved.
- ⇒ In 2014, EPA published a Success Story based on the water quality improvement in Carter Run watershed. It can be found [here](#).
- ⇒ An active partnership developed among state, federal and local agencies and stakeholders contributed to the completion of various agricultural, residential and urban projects.
- ⇒ Two landowners received awards for BMPs implemented as part of this implementation project. One was recognized as the 2010 Clean Water Farm Grand (Rappahannock) Basin Award winner for significant work on stream protection, and the other received the JMSWCD TMDL Award in 2013 for an improved rotational grazing system.
- ⇒ Carter Run and Thumb Run watersheds were selected for state-funded pilot projects on the pasture management BMPs.
- ⇒ The primary challenge faced, particularly in Thumb Run, was that a large number of cattle herds are grazed on farms that are owned by other landowners or family LLC. Most of the operators had short-term leases or verbal agreements and were uncertain of how long they would continue. Further, many landowners were not interested in paying the upfront cost of stream exclusion and other BMPs.

### **For More Information Please Contact:**

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