COMMONWEALTH of VIRGINIA

2011 Clean Water Act Section 319 Nonpoint Source Pollution Management Program Annual Report

and

2011 Progress Report on the 'Chesapeake Bay and Virginia Waters Cleanup Plan'

Supplement: TMDL Watershed Implementation Progress Summary

March 2012

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March 9, 2012

Ms. Ann Carkhuff,
Region 3 - Environmental Protection Agency
Nonpoint Source Pollution Program (3WP10)
1650 Arch Street,
Philadelphia PA 19103

Re: 2011 Virginia TMDL Implementation Report

Dear Ms. Carkhuff:

I am pleased to submit the attached report in accordance with legislative requirements under § 319(h) (8) and (11) of the Federal Clean Water Act (33 USC 1329). This report is a supplement to the Nonpoint Source Management Plan Annual Report previously submitted as part of the 2011 Chesapeake Bay and Virginia Waters Cleanup Plan Progress Report.

This report contains a summary of the targeted Total Maximum Daily Load (TMDL) Implementation activities conducted over the past year by the Department of Conservation and Recreation and its agency and non-agency partners. These activities include nonpoint source pollution management program implementation best management practice (BMP) implementation as well as the development of TMDL Implementation Plans.

Virginia is proud to share its success of supporting twenty-six implementation projects which collectively spent $2,963,203 of state and federal funds implementing 529 agricultural and residential BMPs. This implementation resulted in over 374,397 feet of stream exclusion, and the reduction of 2.72041E+16 colony forming units (CFU) of fecal coliform bacteria, 238,777 pounds of nitrogen, 44,820 pounds of phosphorous, and 43,380 tons of sediment.

As always, I look forward to our continuing efforts to improve water quality in the Commonwealth of Virginia.

Respectfully submitted,

A. Reese Peck,
Director, Division of Stormwater Management

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EXECUTIVE SUMMARY

This report fulfills the Department of Conservation and Recreation's (DCR) legislative requirement under § 319(h)(8) and (11) of the Federal Clean Water Act (33 USC 1329). This report describes the nonpoint source pollution (NPS) management program activities undertaken by DCR and cooperating agencies during Virginia fiscal year 2011. These activities include nonpoint source pollution management program (NPSPMP) implementation, agricultural cost-share funding allocations and best management practice (BMP) implementation, support for other NPS programs, 2010-2011 grant awards for NPS programs and projects, and planned use of recent funding. This Executive Summary includes highlights from the 2011 Chesapeake Bay and Virginia Waters Clean-up Plan (CBVWCP) as well as the 2011 Total Maximum Daily Load (TMDL) Supplement.

- **Water Quality Improvement Fund and Cooperative Nonpoint Source Pollution Programs:** During FY11, the Department of Conservation and Recreation contracted $7.1 million to local Soil and Water Conservation Districts to cost-share the installation of agricultural best management practices. Practices installed on farms during FY11 will result in estimated edge of field reductions of 2.8 million pounds of nitrogen/year, almost 700,000 pounds of phosphorous/year and sediment reductions of 500,000 tons/year. Utilizing funds remaining after closing a number of previous grant projects, the Department of Conservation and Recreation awarded $2,652,550 in grants to nonpoint source water quality improvement projects in response to the 2010 Virginia Water Quality Improvement Fund (WQIF) Request for Proposals (RFP).
- **Chesapeake Bay and Virginia Waters Clean-up Report:** During FY11, many strategies were implemented to reduce pollutants entering the Chesapeake Bay tributaries and Southern Rivers basins. Significant progress was made in installing agricultural best management practices, reducing the phosphorus content of poultry litter through effective dietary management of poultry, enhanced compliance with state erosion and sediment control regulations, and the adoption of revised Stormwater Management Regulations. Most notable during the period was the development of Virginia's Phase I Watershed Implementation Plan, in response to the Chesapeake Bay TMDL, which was approved by the Environmental Protection Agency (EPA) in December, 2010. Since several of the goals and objectives identified in the initial CBVWCP have been essentially achieved, the agencies will consider revising the plan during FY12.
- **TMDL Implementation Planning**: From July 1, 2010 thru June 30, 2011 Virginia developed nine implementation plans. Since 2000, Virginia has completed 52 TMDL implementation plans addressing 164 impaired stream segments and over 187 impairments. Currently Virginia is working on the development of an additional 13implementation plans addressing 60 impaired stream segments and 64 impairments.
- **TMDL Implementation Activities**: From January 1, 2010 thru June 30, 2011 there were 26 active projects supported by Federal EPA §319(h) funding, state WQIF and state Virginia Natural Resources Commitment Funds (VNRCF) implementing TMDL Implementation Plans. Collectively these projects spent $2,963,203 of cost-share funds implementing 529 agricultural and residential BMPs. This included 11 active §319(h) funded implementation projects which implemented 369 BMPs and 31 agricultural BMPs funded with VNRCF (these were in aforementioned 319 project areas). In addition 129 agricultural BMPs were funded thru WQIF/VNRCF in 15 other implementation project areas. Collectively, this implementation resulted in over 374,397 feet of stream exclusion, and the reduction of 2.72041E+16 colony forming units (CFU) of fecal coliform bacteria, 238,777 pounds of nitrogen, 44,820 pounds of phosphorous, and 43,380 tons of sediment.
- **The Virginia Stormwater Program:** As of June 30, 2011, revised stormwater regulations were approved and were effective on September 13, 2011. The implementation date is July 1, 2014. DCR's intent is to have all localities choose to adopt the program with the Commonwealth having oversight responsibilities. Localities must notify DCR of their intent to adopt the program by early 2012. During 2011, DCR issued 2,029 stormwater permits including 205 Virginia Department of Transportation (VDOT) permits and 1,824 non-VDOT permits. Note: in the January 2012 legislative session changes to this program are expected.
- **Resource Extraction:** Since 1981, the Virginia Department of Mines, Minerals and Energy (DMME) has reclaimed 638 acres on 123 abandoned mine sites. It has been estimated that there are 4,000 total abandoned sites in the Commonwealth. DMME has completed the inventory of 2,565 of these 4000 sites. During 2011, 4 sites were reclaimed covering 19.4 acres. In addition, 319 funding also supported the inventory of 101 sites. These additional sites are now ready for additional support and subsequent reclamation work.

INTRODUCTION:
NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

Nonpoint Source Pollution Management Program

Virginia's Nonpoint Source Pollution (NPS) Management Program is a diverse network of state and local government programs. Collectively, these programs help prevent water quality degradation and restore the health of our lakes, rivers, streams and estuaries by promoting and funding state and local watershed planning efforts, stream and wetland restoration and protection, education and outreach, and other measures to reduce and prevent NPS pollution from impacting waters of the Commonwealth. Statewide NPS pollution control programs and services support both individual natural resource stewardship and assist local governments with resource management. These statewide programs are funded through state agency budgets, non-general fund revenues and federal granting programs. There are several state and federal laws that result in comprehensive programs that address the management of NPS pollution in the Commonwealth of Virginia. Collectively these state and federal programs and laws make up the legislative backdrop to Virginia's comprehensive NPS Pollution Management Program.

Federal Clean Water Act – Section 319 – Nonpoint Source Pollution

Section 319 of the Federal Clean Water Act (CWA) requires that states develop and implement NPS pollution management programs. Section 10.1-104.1 of the Code of Virginia designates DCR as the lead agency for the Commonwealth's NPS pollution management program. This section assigns responsibility to DCR for the distribution of funds, identification and establishment of priorities of NPS related water quality problems, and the administration of an NPS advisory committee. In 1999, the EPA approved Virginia's NPS Pollution Management Program Plan In 2006, state legislation was passed (House Bill 1150) directing the Commonwealth to develop a plan to address water quality impairments and protect the waters from further degradation. In 2008, it was decided that the plan established by this new legislation, the "Chesapeake Bay and Virginia Waters Clean-up Plan," (referenced as the Cleanup Plan) would serve as the Commonwealth's NPS Pollution Program Plan. In 2011 DCR continued to work with the EPA to recognize the Cleanup Plan as the Commonwealth's official updated NPS Management Plan.

Chesapeake Bay and Virginia Waters Clean-Up and Oversight Act of 2006 – HB1150

The *Chesapeake Bay and Virginia Waters Clean-up and Oversight Act (HB1150)* was passed during the 2006 legislative session of the Virginia General Assembly (GA) and signed into law on April 3, 2006 (Title 62.1, Chapter 3.7, section 62.1-44.117-62.1-44.118). The Act established the requirement to develop a plan for the cleanup of the Chesapeake Bay and Virginia's waters designated as impaired by EPA. Subsequently the plan also addresses the protection of water resources not yet impaired by pollution. The resulting Cleanup Plan provides clear objectives, well-developed strategies, predictable time frames, realistic funding needs, common-sense mitigation strategies, and straightforward recommendations to the General Assembly for its consideration for stream restoration and protection. The initial plan was presented to the GA in 2007. The plan was last updated in June 2009. A progress report is produced annually as well. The latest status report was presented by the Secretary of Natural Resources of the Commonwealth of Virginia to members of the GA of Virginia in January 2012. It should be noted that this plan is very comprehensive in nature and addresses both point and nonpoint pollution sources, as well as air pollution. There are, however, very specific elements of the plan related to nonpoint source pollution. As noted the above section on the CWA Section 319 program, the relevant portions of Cleanup Plan are now considered Virginia's NPS Pollution Management Program Plan. EPA Region 3 NPS Program staff has reviewed the Cleanup Plan for its appropriateness to serve as Virginia's NPS Pollution Management Program Plan. Throughout this document the progress of this plan will be highlighted.

The Virginia Water Quality Improvement Act of 1997

The *Virginia Water Quality Improvement Act (WQIA)* was passed during the 1997 legislative session of the Virginia GA and signed into law on March 20, 1997. This Act establishes a comprehensive statewide program to address point and non-point sources of water pollution. It creates the Virginia Water Quality Improvement Fund (WQIF) to provide assistance for water quality improvements to a broad array of entities, including local governments, soil and water conservation districts, and landowners. The fund is the principle source of state cost-share money for agricultural practices and to implement the nutrient and sediment reduction "Tributary Strategies" prepared pursuant to the Chesapeake 2000 Agreement and the *Code of Virginia.* The fund also provides grants for practices to control NPS pollution in "Southern Rivers" (SR); which are watersheds in Virginia that drain to waters other than the Chesapeake Bay. The non-point source efforts will also focus in part on nutrient reduction. Technical and financial assistance will be provided to local governments, soil and water conservation districts, and individuals through the Fund. In addition, provisions for water quality assessment and state and local cooperation are provided. DCR is charged in assisting in the development of local cooperative NPS pollution programs and programs to implement Virginia's nonpoint source pollution management program, in accordance with the WQIA, Section 10.1-2124.B of the *Code of Virginia*. The purpose of the cooperative nonpoint source pollution program is to maintain and/or restore water quality standards in stream segments where NPS pollution is a significant loading factor. NPS pollution programs require locally based remedies that address the unique, site-specific, and varied causes of NPS contaminants. Cooperative NPS pollution programs are combinations of programmatic tools, and technical and financial resources of varying emphasis used to target water quality impairments in a given watershed and political jurisdiction. A cooperative approach to protecting water quality helps local stakeholders develop their capabilities individually and collectively to address local water quality impairments.

Summary of the 2011 Virginia NPS Pollution Management Program Annual Report

The 2011 NPS Management Program Annual Report for Virginia is made up of two parts, which in their entirety make up the full report of accomplishments for the Commonwealth. The first part is the "Chesapeake Bay and Virginia Waters Clean-up Plan Progress Report" and the second part is the "TMDL Implementation Supplement". As stated previously, Virginia has a NPS planning document called the Chesapeake Bay Virginia Waters Cleanup Plan that has progress reports and strategy updates submitted to the Virginia GA on an annual basis. The annual NPS report requirement will be fulfilled by the annual progress report for the Cleanup Plan The second part of the NPS annual report is a supplement describing the progress made in watershed TMDL implementation. This report is a comprehensive summary of the activities accomplished by the Commonwealth in TMDL implementation plan development and implementation.

2011 SUPPLEMENTAL REPORT:
TMDL IMPLEMENTATION PROGRESS

CHAPTER 1: *TMDL Implementation Program Summary Report*

Since 2000, Virginia's Total Maximum Daily Load (TMDL) Program has made great strides in the development of TMDLs to meet the EPA consent decree (CD) the development of TMDL implementation plans (IPs) and the implementation of TMDLs through focused watershed restoration. To meet the NPS annual reporting requirement for 2011 and to summarize the activities from July 1, 2010 through June 30, 2011 (FY11), DCR has developed this ***TMDL Implementation Program Summary Report.*** This report summarizes the accomplishments of the TMDL program, focusing on Virginia's fiscal year 2011. Additional information regarding this program can be found in Appendix I, which contains case studies of both the state WQIF funded and Federal Section 319 funded TMDL implementation projects.

TMDL Program Background

Virginia's goal is that all rivers, lakes, streams and tidal waters attain the appropriate beneficial uses. These beneficial uses are described by the following use goals: drinking water, primary contact/swimming, fishing, shellfishing, and aquatic life. These uses are protected by application of the state's numeric and narrative water quality criteria. When the beneficial uses are not being met these waters are considered "impaired" and the state must take steps to meet water quality standards to ensure that water quality is restored. One very important step in restoring water quality in the impaired streams is the development of TMDLs.

The goal of TMDL program is to achieve attainment of water quality standards. The Commonwealth achieves this goal by means of a three-phase process: TMDL development, development of TMDL IPs and/or permit conditions, and implementation of permit conditions and/or best management practices. TMDL reports, implementation plans and implementation progress updates are available on the Department of Environmental Quality's (DEQ) TMDL website at https://www.deq.virginia.gov/TMDLDataSearch'ReportSearch.ispx.

TMDL Implementation Plans

Virginia state law, WQMIRA, requires the development of a TMDL IP after a TMDL is developed and approved by EPA. The IP describes the measures that must be taken to meet the TMDL, and includes a, estimated costs, and a monitoring plan. In FY2011, DCR, DEQ and other partners developed nine IPs covering 51 impaired segments. In addition, 4 implementation plans covering 4 impaired segments (see Table I-1) were started in 2011, but were not completed by the end of the fiscal year. Since 2000, Virginia has completed 52 IPs, addressing 164 TMDL impaired stream segments.

Figures I-1 summarizes TMDL implementation plan development in Virginia since 2001. In the majority of cases, watersheds that have a completed implementation plan also have TMDL implementation projects underway. A summary of completed TMDL implementation plans is provided in Table I-1, while Figure I-2 shows the location of TMDL planning/implementation watersheds across the state.

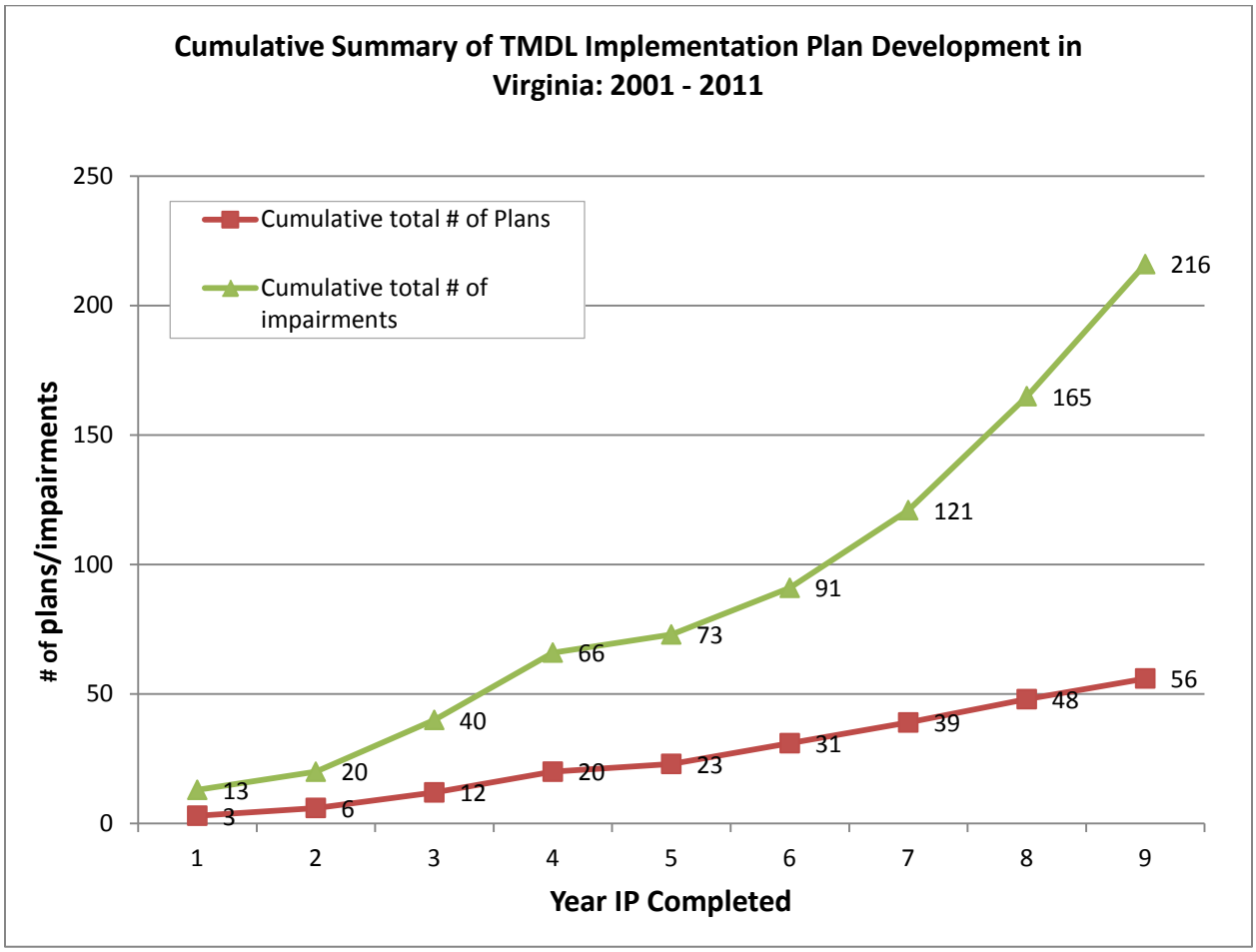


Figure I-1. Cumulative summary of TMDL Implementation Plan development

Figure I-2. Status of TMDL Implementation planning in Virginia

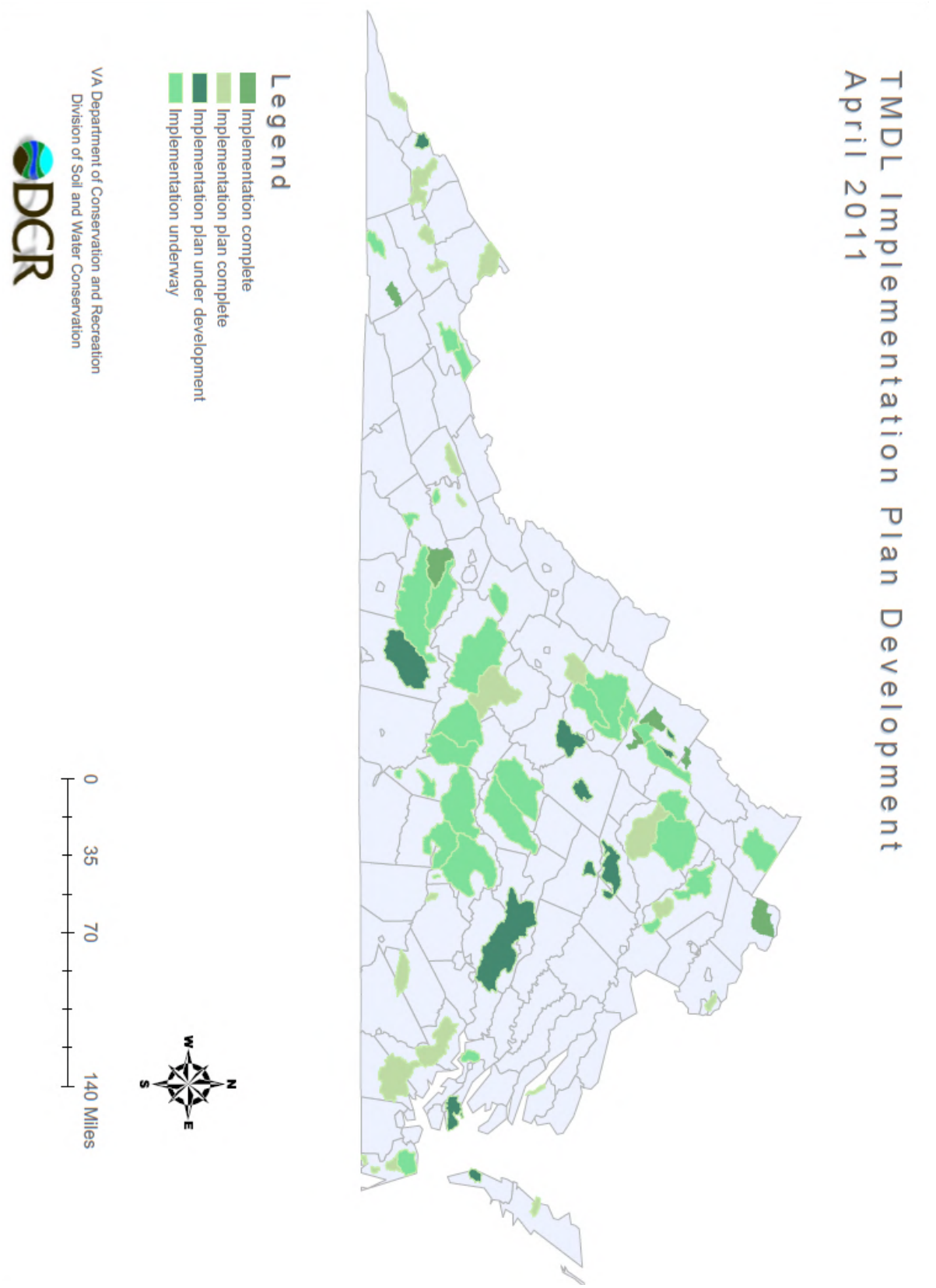


Table I-1. Completed TMDL Implementation Plans, January 2001- June 2011

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Middle Fork Holston (3/3)	Washington	Bc	DCR	2001 (a)
North River (Muddy, Lower Dry, Pleasant, and Mill Creek) (5/4)	Rockingham	Bc, Be	DCR	2001 (a)
Upper Blackwater River (4/4)	Franklin	Bc	DCR	2001 (a)
Catoctin Creek (4/4)	Loudoun	Bc	DCR	2004 (a)
Holmans Creek (2/2)	Shenandoah	Bc, Be	DCR	2004 (a)
Four Mile Run (1/1)	Arlington, Alexandria	Bc	DEQ*	2004
Willis River (1/1)	Cumberland, Buckingham	Bc	DCR	2005 (a)
Chowan Study Area (9/9)	Multiple Counties	Bc	DEQ*	2005
Moores Creek (1/1)	Charlottesville, Albemarle	Bc	DEQ*	2005 (c)
Guest River (5/5)	Wise, Scott, Dickenson	Be	DEQ*	2005
Lower Blackwater, Maggoddee and Gills Creek (3/3)	Franklin	Bc	DCR*	2005 (a,b)
Lynnhaven (shellfish) (2/2)	VA Beach	Bc	DEQ*	2005 (c)
Cooks Creek and Blacks Run (6/2)	Rockingham, Harrisonburg	Bc, Be	DCR	2006 (a,b,c,d)
Thumb, Deep, Carter and Great Runs (4/4)	Fauquier, Stafford	Bc	DCR	2006 (a,b)
Big Otter (8/8)	Bedford, Campbell	Bc	DCR	2006 (a,b,c)
Mill and Dodd Creeks (2/2)	Floyd, Montgomery	Bc	DCR	2006 (a)
Little and Beaver Creek (3/2)	Bristol, Washington	Bc, Be	DCR	2006 (a,b,c)
Stroubles Creek (1/1)	Montgomery	Be	DEQ*	2006 (c)
Back Creek (2/1)	Pulaski	Bc, Be	DEQ*	2006/2007
Abrams and Opequon Creek (8/5)	Frederick, Winchester	Bc, Be	DEQ*	2006 (b)
Knox and PawPaw Creek (4/2)	Buchanan	Bc, Be	DEQ*	2007
Hawksbill and Mill Creek (2/2)	Page	Bc	DCR	2007 (a,b)
Looney Creek (1/1)	Botetourt	Bc	DCR	2007 (a,b)
Upper Clinch River (1/1)	Tazewell	Be	DCR	2008 (b,c)
Occahannock Creek (shellfish) (1/1)	Accomac	Bc	DCR	2008 CNP
Falling River (1/1)	Campbell, Appomattox	Bc	DCR	2008 (b)
Dumps Creek (2/1)	Russell	TSS, TDS	DEQ*	2008
Bluestone River (1/2)	Tazewell, Bluefield	Bc, Be (sed)	DCR	2008
Smith Creek (1/2)	Rockingham, Shenandoah	Bc, Be (sed)	DEQ*	2008 (a,b,d)
Appomattox River – Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek (5/5)	Prince Edward, Amelia	Bc	DCR	2008 (b)
Appomattox River – Flat, Nibbs, Deep and West Creeks (4/4)	Amelia, Nottoway	Bc	DCR	2008 (b)
Straight Creek, Stone Creek and Tributaries (3/3)	Lee	Bc, Be (sed)	DEQ	2009
Long Glade Run, Mossy Creek and Naked Creek (5/3)	Augusta, Rockingham	Bc, Be (sed)	DCR	2009 (b)
Back Bay Watershed (1/1)	City of Virginia Beach	Bc	DEQ*	2009
North Landing Watershed (4/4)	City of Virginia Beach	Bc	DEQ*	2009
Pigg River and Old Womans Creek (8/8)	Franklin, Pittsylvania	Bc	DEQ	2009 (b,c)
Cub, Turnip, Buffalo and UT Buffalo Creeks (4/4)	Appomattox,	Bc	DCR	2009 (b)

	Charlotte			
Hazel River Watershed (4/4)	Culpeper, Madison, Rappahannock	Bc	DCR	2009 (a,b,c)
Greenvale Creek, Paynes Creek and Beach Creek (shellfish)(3/2)	Lancaster	Bc	DCR*	2010
Ash Camp and Twitty's Creek (2/2)	Charlotte	Be (sed)	DCR*	2010 (b)
Upper and Lower Middle River, Moffett Creek and Polecat Draft (7/5)	Augusta	Bc, Be (sed)	DCR	2010 (b)
Mill and Powhatan Creek (2/2)	James City County	Bc	DEQ*	2010
Nansemond River, Shingle Creek (3/3)	Suffolk	Bc	DEQ*	2010
Lewis Creek (1/1)	Russell	Be (sed)	DCR	2010 (c)
Browns, Craig and Marsh Runs (3/3)	Fauquier	Bc	DCR	2010 (b,c)
Little Dark Run and Robinson River (3/3)	Culpeper & Madison	Bc	DCR	2010 (b,c)
Rock Island, Austin, Frisby, Troublesome Creeks, North and Slate Rivers (6/6)	Buckingham	Bc	DCR	2010 (a)
Hays, Moffatts, Otts and Walker Creeks (4/4)	Augusta & Rockbridge	Bc	DCR*	2010 (c)
Christians Creek and South River (6/3)	Augusta & Waynesboro	Bc, Be (sed)	DCR	2010 (b)
South James River, Ivy, Tomahawk, Burton, Judith, Fishing, Blackwater and Beaver Creeks (8/8)	Campbell, Bedford, Amherst, Lynchburg	Bc	DEQ	2010
Cherrystone Inlet, Kings Creek (shellfish) (1/1)	Northampton	Bc	DCR*	2011
Roanoke River Watersheds – Upper Banister River and Stinking River, Bearskin, Cherrystone and Whitethorn Creeks (5/5)	Pittsylvania	Bc	DCR	UD
York Basin Watersheds – Beaver Creek, Goldmine Creek, Mountain Run, Pamunkey Creek, Plentiful Creek, Terry's Run (6/6)	Louisa, Orange, Spotsylvania	Bc	DCR	UD
James River Watersheds- James River and Bernards, Powhite Reedy, Gilles, Almond, Goode, Falling and Noname Creeks (10/10)	Chesterfield, Powatan, Henrico, Richmond	Bc	DEQ	2011 (d)
Little River Watershed – Little River, Meadow Run, Pine, West Fork Dodd, Dodd, Meadow, Brush, Laurel, Big Indian Creeks (26/26)	Montgomery & Floyd	Bc, Be (sed), Temp	DEQ	UD
Clinch River, Coal, Middle, and Plum Creeks (7/7)	Tazewell	Bc, Be (sed)	DEQ	UD
Total IPs Completed: 52 Plans, 187 Impairments, 164 Impaired segments				

Impairment types: Bc = bacteria, Be = Benthic, TSS = Total suspended solids, TDS = Total dissolved solids, Sed = sediment

NOTE: All IPs were funded by 319(h) except those done in house by either DCR or DEQ, indicated by an (*). For all completed IPs, implementation is funded by either (a) EPA Section 319, (b) state WQIF/VNRCF targeted TMDL cost share, (c) received limited or one time funding from WQIF RFP, or (d) received other non 319 and non state grants (e.g. National Fish and Wildlife Foundation) administered by DCR. Otherwise the project is not being funded by DCR.

Watershed Restoration and TMDL Implementation

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, identified in TMDL IPs, which will result in water quality improvements and subsequent delisting of impaired streams. Virginia uses a staged approach that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner.

From January 1, 2010 thru June 30, 2011 there were 26 implementation projects supported by Federal EPA §319(h) funding, state WQIF and state VNRCF. Collectively these projects spent $2,963,203 of cost-share funds implementing 529 agricultural and residential BMPs. This included 369 BMPs funded with 319(h), 31 BMPs funded with VNRCF (these were in 319 project areas) and 129 BMPs funded thru WQIF. This implementation resulted in over 374,397 feet of stream exclusion, and the reduction of 2.72041E+16 colony forming units (CFU) of fecal coliform bacteria, 238,777 pounds of nitrogen, 44,820 pounds of phosphorous, and 43,380 tons of sediment.

Federal §319(h) Projects: DCR's first TMDL implementation projects, also known as "pilot projects" were funded through federal section 319 beginning in 2001 with the Upper Blackwater River, Middle Fork Holston River, and North River. The first two projects ended in 2007 while the North River finished in August 2008. Since completion of these pilot projects, DCR has initiated a total of 12 additional TMDL implementation projects across the state (Table I-2) with 319(h) funding. In 2011 implementation was started in the Slate River and Rock Island Creek watersheds.

These projects are primarily funded with Section 319 federal funds; however, several projects have also received non-federal money to fund urban and/or septic BMP installation (Hazel River, Cooks Creek and Blacks Run, Little and Beaver Creek, etc.). In addition DCR was successful in securing over $1.5 million of state VNRCF to augment federal 319 funds for agricultural BMPs. In 2011 a total of 11 projects were implemented using Federal 319 funds; of these projects five (Big Otter, Little and Beaver Creeks, Thumb/Deep/Carter/Great Runs, Lower Blackwater River and Hazel River) received state WQIF money to fund agricultural practices. It is expected that DCR will eventually fund all agricultural practices for TMDL implementation projects using non-319 sources . (state cost-share, Natural Resources Conservation Service (NRCS), private funds, etc.), while section 319 will fund mining, residential septic and urban/residential and pet waste projects identified in TMDL implementation plans.

State funded WQIF Targeted TMDL Projects: In 2006 DCR started implementation projects for 46 impaired segments utilizing state funding through the WQIF. These projects were the start of the state's "WQIF Targeted TMDL" program. Currently these projects receive funding for agricultural practices through the state cost-share program, while several project sponsors have pursued competitive grant funds to implement urban and septic management practices. DCR hopes that eventually it will be able to identify and secure consistent funding for all aspects of the TMDL implementation plans for these project areas.

Virginia's TMDL Implementation Program in 2011

As of June 2011, Virginia's TMDL Implementation Program includes 15 implementation projects funded with Federal 319(h) funds as well as some state funds (Table I-2, sections A and B), 6 projects which received one time allotments of a variety of federal, state, local and non-profit sources (Table I-2, section C) and 9 projects (section D) receiving state funds for agricultural implementation.

Table I-2. Status of TMDL/ Watershed Implementation Projects: 2011

Watershed Area	TMDL Segment	Status	Years of Implementation	Lead Agency	Funds Used
A. Projects the received 5-7 years of continuous funding from 319(h) administered by DCR. These projects are no longer receiving 319 funds, but may continue to receive funding from other sources.					
Middle Fork Holston River	VAS-O05R	Moderate improvement	2001-2007	DCR	§319(h)
Upper Blackwater	LAW-L08R	Some improvement	2001-2007	DCR	§319(h)
North River	VAN-B21R, B22R, B27R, B29R	Improvement	2001-2008	DCR	§319(h)
Holmans Creek	VAV-B45R	Some improvement	2005-2008	DCR	§319(h)
Catoctin Creek	VAN-A-02R	Some improvement	2005-2009	DCR	§319(h)
B. Projects funded by Federal 319(h) as well as State WQIF and VNRCF administered by DCR					
Willis River	VAC-H36R	Improvement, Delisted (3)	2005-2012	DCR	§319(h), VNRCF
Lower Blackwater	VAW-L09R, L10R and L11R	Some improvement, candidate for delisting 2008	2006-2011	DCR	§319(h), VNRCF
Thumb, Great, Carter and Deep Runs	VAN-E01R, E02R & E10R	Some improvement	2006-2012	DCR	§319(h), VNRCF
Big Otter River	VAW-L23R, L25R, L27R, L28R	Improvement, Delisted 2008	2006-2012	DCR	§319, VNRCF, RFP
Cooks Creek and Blacks Run	VAV-B25R, B26R	Some improvement	2006-2011	DCR	§319 RFP,NFWF
Mill and Dodd Creeks	VAW-N20R, N21R	None reported	2007-2011	DCR	§319 & VNRCF
Little and Beaver Creeks	VAS-O07	None reported	2007-2012	DCR	§319, VNRCF, RFP
Hawksbill and Mill Creeks	VAN-B38R, B39R	Too Early	2008-2012	DCR	§319(h),VNRCF
Looney Creek	VAW-I26R	Too Early	2009-2013	DCR	§319, VNRCF
Hazel River	VAN-E03R, E04R, E05R	Too Early	2009-2013	DCR	§319, VNRCF, WQIF RFP
Slate River and Rock Island Creek	VAC-H1/R, H21R, H22R	Too Early	2010-2014	DCR	§319, VNRCF
C. Projects receiving minimal, one time funding through DCR (RFPs etc)					
Moores Creek	VAV-H28R	Some improvement	2005+	N/A	WQIF RFP
Guest River	VAS-P11R	Some improvement	2005+	N/A	WQIF RFP
Smith Creek	VAV-1347R	Too Early	2008+	DCR	§319, NFWF, NRCS
Stroubles Creek	VAW-N22R	Too Early	2006+	N/A	WQIF RFP
Craig Run, Browns, and Marsh Runs	VAN-E08R	Too early	2011	DCR	CBLEI-TMDL (WQIF)
Little Dark Run and Robinson River	VAN-E15R	Too early	2011	DCR	WQIF RFP, CBLEI-TMDL (WQIF)
D. Projects receiving WQIF/VNRCF funds for agricultural BMPs (and RFP for septic work)					
Nottoway	VASC-K14R	N/A	2005-2009 +(Ag)	DCR	WQIF/VNRCF
Falling River	VAW-L34R	Some	2007+(Ag)	DCR	WQIF/VNRCF

		improvement			
Mossy and Naked Creeks, Long Glade Run	VAV-B19R, B24R, B28R	Some improvement	2007+(Ag)	DCR	WQIF/VNRCF
Pigg River (Blue Ridge SWCD)	VAW-L14R, L15R, L16R, L17R	Improvement	2007+(Ag)	DCR	WQIF/VNRCF/RFP
Pigg River (Pittsylvania SWCD)	VAW-L13R, L17R, L18R	Some improvement	2007+(Ag)	DCR	WQIF/VNRCF/RFP
Twittys and Ash Camp Creeks	VAC-L39R	Inadequate data	2007+(Ag)	DCR	WQIF/VNRCF
Abrams and Opequon Creeks	VAV-B08R, B09R	N/A	2006+	DCR	WQIF/VNRCF
Cub, Turnip and Buffalo Creeks	VAC-L36R, L37R, L40R	No data	2007+(Ag)	DCR	WQIF/VNRCF
Flat, Nibbs, Deep and West Creeks	VAP-J08R, L09R, J11R	Improvement	2007+(Ag)	DCR	WQIF/VNRCF
Moffett Creek, Middle River, Polecat Draft	VAV-B10, B13, B15	Some improvement	2007+(Ag)	DCR	WQIF/VNRCF
Christians Creek and South River	VAV-B14, B30	Improvement	2007+(Ag)	DCR	WQIF/VNRCF
Upper Clinch River	VAS-P01R	Inadequate data	2007+(Ag)	DCR	WQIF/VNRCF
Bluestone River	VAS-N36R	Some improvement	2007+(Ag)	DCR	WQIF/VNRCF
Briery, Little Sandy, Spring, Saylers Creeks and Bush River	VAC-J02, J03, J04, J05 AND J06R	Some improvement	2007+(Ag)	DCR	WQIF/VNRCF
Total projects initiated = 36, under implementation w/ 319 funds (A&B) = 16, Implemented with minimal DCR funds (C) = 6, Implemented with WQIF (D) = 14, *NFWF=National Fish and Wildlife Fund grant, NRCS – USDA Natural Resource Conservation Service, VNRCF=Virginia Natural Resource Commitment Fund*					

Funding of Implementation

As the agency taking the lead in nonpoint TMDL watershed implementation, DCR utilizes both state funds and §319(h) funds to pay for DCR regional staff to provide project management and technical support to watershed stakeholders to implement these projects. As a match to Federal 319(h) funds, DCR provides state funds for operational support of the 47 Soil and Water Conservation Districts, which provide technical assistance with the design and installation of agricultural BMPs In addition, Virginia runs a comprehensive cost-share program for BMP implementation utilizing both federal 319(h) grant funding, other grant funding and state resources from the Water Quality Improvement Fund and the Virginia Natural Resources Commitment Fund. This program is summarized in the 2011 Virginia Waters Cleanup Plan. A summary of targeted TMDL cost share funds spent in FY2011 is provided in Table I-3.

Table I-3. Summary of targeted TMDL cost-share funds spent on TMDL implementation: July 2010 – June 2011

Funding Source	Number of BMPs installed	Cost-share paid	Other match funding
Federal 319(h)	369	$1,104,867	$65,500
State VNRCF	31	$336,370	----------
State WQIF	129	$1,521,967	$78,797
TOTAL	529	$2,963,203	$144,297

Note: VNRCF cost-share was for agricultural BMPs only and was in conjunction with Federal 319(h) funded projects.

BMP Implementation and Pollution Reductions

Tracking both BMP implementation and water quality improvements in TMDL watersheds is critical in measuring success within the TMDL program. BMPs are effective and practical ways to prevent or reduce pollution from nonpoint sources to ensure water quality. While DCR has a highly effective BMP tracking program in place to account of BMPs installed using state or federal cost share funds, tracking BMPs installed voluntarily (without government assistance) has proven challenging. DCR is currently developing a mechanism by which voluntary practices can be accounted for; however, BMP implementation and associated pollutant reductions reported to date are largely practices installed with government cost share funds. Table I-4 provides a summary of BMPs installed in targeted TMDL project areas in FY2011 and Table I-5 shows associated pollutant reductions by BMP funding source. An additional break down of BMP implementation values for state WQIF funded implementation projects is provided in Appendix 1.

From January 1, 2010 thru June 30, 2011, there were 26 active implementation projects jointly funded by Federal EPA §319(h), state Water Quality Improvement (WQIF) funds, and state Virginia Natural Resources Commitment Funds (VNRCF) implemented 529 agricultural and residential BMPs. This implementation resulted in over 374,397 feet of stream exclusion and the reduction of 2.72041E+16 colony forming units (CFU) of fecal coliform bacteria, 238,777 pounds of nitrogen, 44,820 pounds of phosphorous, and 43,380 tons of sediment.

Table I-4. Summary of BMP implementation for Targeted TMDL Projects from 7/1/10-6/30/11

Practice code	Description	Units	Extent installed	# of practices installed
FR-1	Reforestation of crop and pastureland	Acres	23	3
FR-3	Woodland buffer filter	Acres	---	1
LE-1T	Livestock exclusion with riparian buffers for TMDL implementation	Linear feet	313,609	105
LE-2T	Livestock exclusion with reduced setback for TMDL implementation	Linear feet	18,896	11
RB-1	Septic tank pumpout	System	212	212
RB-2	Connection to public sewer	System	1	1
RB-3	Septic system repair	System	55	55
RB-4	Septic system replacement	System	31	31
RB-4P	Septic system installation/replacement with pump	System	17	17
RB-5	Alternative waste treatment system	System	4	4
SL-1	Permanent vegetative cover on cropland	Acres	269	13
SL-6	Stream exclusion with grazing land management	Linear feet	9,865	5
SL-6T	Stream exclusion with grazing land management for TMDL implementation	Linear feet	4,522	2
SL-7T	Support for extension of CREP watering systems for TMDL implementation	Acres	21	4
SL-8B	Small grain cover crop for nutrient management	Acres	1,619	51
WP-2T	Stream protection for TMDL implementation	Linear feet	27,505	3
WP-3	Sod waterway	Acres	1	1
WP-4	Animal waste control facility	System	6	6
WP-4B	Loafing lot management system	System	5	4
			TOTAL	509

Table I-5. Summary of Pollutants Reduced from 7/1/2010 - 6/30/2011 thru Targeted TMDL Implementation

Data	Federal 319(h)	State VNRCF	State WQIF	Grand Total
Number of BMPS Installed	369	31	129	529
Total Pounds Nitrogen Reduced	37,884.57	30,298.62	170,593.59	238,776.78
Total Pounds Phosphorus	6,862.20	6,030.31	31,927.50	44,820.00
Total Tons Sediment Reduced	6,394.72	5,626.60	31,359.12	43,380.43
Total of Bacteria Reduced	9.31003E+15	4.27718E+15	1.36168E+16	2.72041E+16

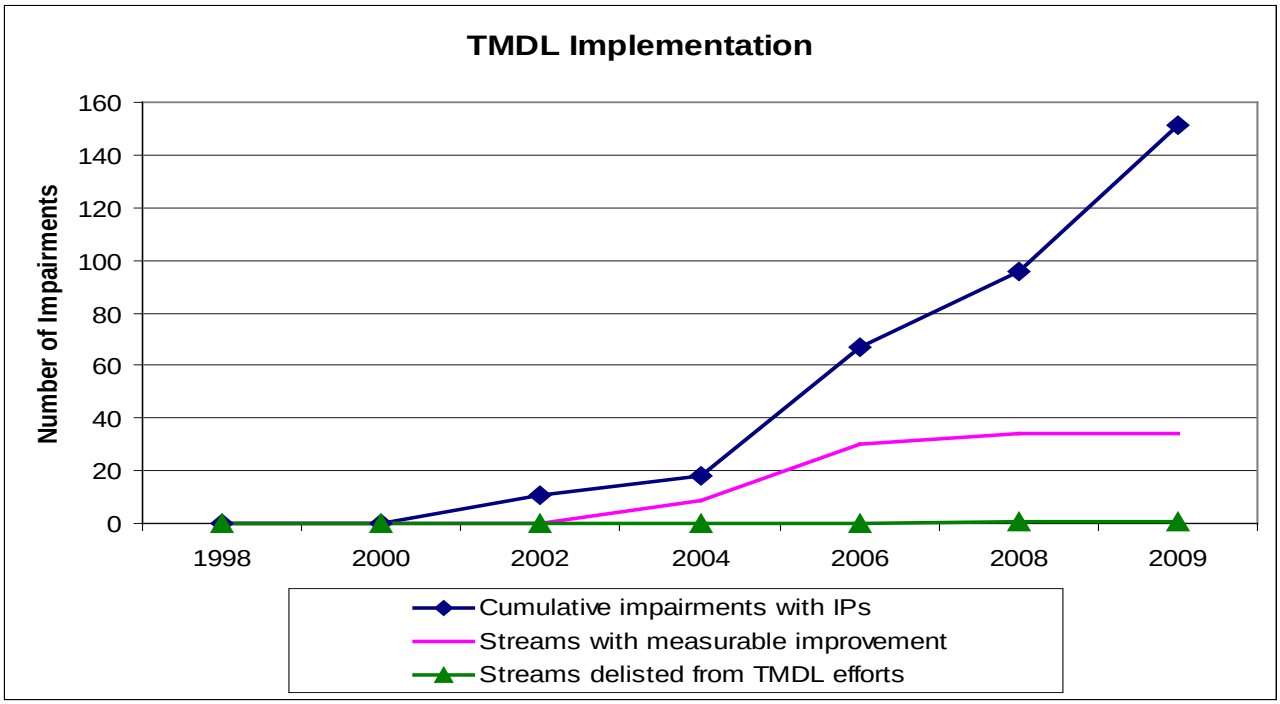
Note: VNRCF was for agricultural BMPs and was in conjunction with 319(h) projects. Thus a total of 400 BMPs were installed in 319 project areas.

Water Quality Improvements, Watershed Restoration, Delisting and Future Actions

Translating TMDLs developed at an ambitious pace into actual water quality improvements is a growing challenge in the TMDL program. Virginia has been implementing TMDLs using existing nonpoint source programs and funding sources despite inadequacies in staffing and funding to handle the volume of TMDLs. Existing resources include regulatory permitting programs from DEQ, DCR and DMME that limit discharges to state waters. These programs are utilized when stream impairments are attributed to a permitted facility. For non-permitted activities, Virginia's approach has been to use incentive-based programs such as the Virginia Agricultural Cost Share Program and Section 319 grant funds. Virginia also offers grant funding for the implementation of BMPs and for technical assistance funding in watersheds with approved implementation plans.

Despite the challenges in attaining water quality standards, Virginia's TMDL program has shown that properly applied and maintained best management practices can result in measurable improvements in water quality (Table I-11). Virginia's natural resource agencies will continue to engage and work with watershed communities to restore their local rivers and streams using existing programs and resources, and exploring innovative ideas and funding strategies for the future.

Figure I-3. Summary of TMDL Implementation versus Measurement of Water Quality Improvement



(Figure excerpted from the "*Chesapeake Bay and Virginia Waters Clean-Up Plan 6 month Progress Report*")

CHAPTER 2: *Progress Reports for TMDL Implementation Projects*

Annual and comprehensive summaries of the following TMDL implementation projects are provided in Chapter 2:

Federal Section 319(h) TMDL Implementation Projects: These projects address agricultural, residential septic, urban BMP activities. These projects are funded mainly with Federal 319(h) but some projects have received supplemental state funding from either the Water Quality Improvement Fund (WQIF) or the Virginia Natural Resources Commitment Fund (VNRCF).

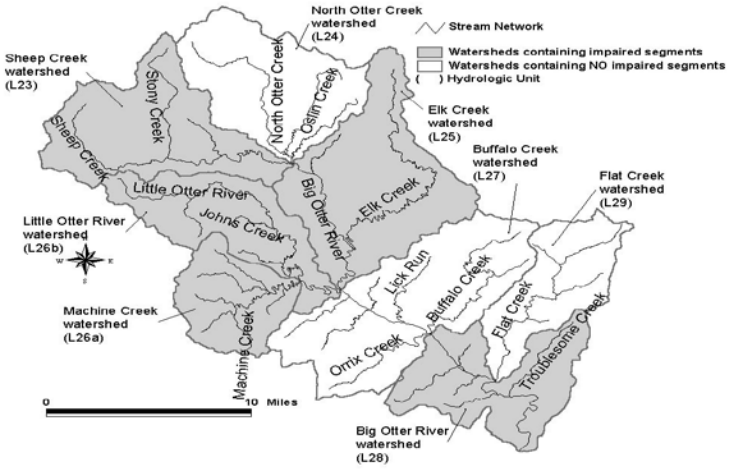
1) Big Otter River TMDL Implementation Project
2) Cooks Creek and Blacks Run TMDL Implementation Project
3) Hazel River TMDL Implementation Project
4) Little and Beaver Creeks TMDL Implementation Project
5) Looney Creek TMDL Implementation Project
6) Lower Blackwater River TMDL Implementation Project
7) Mill and Dodd Creeks TMDL Implementation Project
8) Mill and Hawksbill Creeks TMDL Implementation Project
9) Thumb, Deep, Carter and Great Runs TMDL Implementation Project
10) Willis River TMDL Implementation Project

WQIF Targeted TMDL Implementation Projects: These projects are exclusively funded by State WQIF resources to address agricultural BMPs.

1) Christians Creek and South River TMDL Implementation Project
2) Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project
3) Mossy Creek, Long Glade Run and Naked Creek TMDL Implementation Project
4) Falling River TMDL Implementation Project
5) Pigg River TMDL Implementation Project (Blue Ridge SWCD)
6) Pigg River TMDL Implementation Project (Pittsylvania SWCD)
7) Flat, Nibbs, Deep and West Creeks TMDL Implementation Project
8) Spring, Briery and Saylers Creeks, Little Sandy and Bush Rivers TMDL Implementation Project
9) Bluestone River TMDL Implementation Project
10) Upper Clinch River TMDL Implementation Project
11) Ash Camp and Twittys Creeks TMDL Implementation Project
12) Cub, Turnip and Buffalo Creeks TMDL Implementation Project

Big Otter River TMDL Implementation Project: July 2006- June 2011

Project Location



The Big Otter River Basin (BOR) is located in Bedford and Campbell Counties, Virginia. The basin covers a 388 square miles area; contains 267 miles of streams, includes the Cities of Bedford and suburbs of Lynchburg; and is a tributary of the Roanoke River that empties into Lake Gaston and into Albemarle Sound in North Carolina. The BOR Basin contains eight watersheds: Sheep Creek, Elk Creek, Machine Creek, Little Otter River, Lower Big Otter River, North Otter Creek, Buffalo Creek (Falling & Elk Creeks), and Flat Creek. The latter 3 watersheds contain no impairments, but are included in the project area because they drain directly to the project area and contribute to the pollution load.

Implementation Highlights

Since the July 2006, the Peaks of Otter Soil & Water Conservation District has administered the Big Otter TMDL Implementation Project. From July 1, 2010 through June 30, 2011 a total of 48 BMPs were installed as part of this effort, which are included in the total column in the table on the right. A total of 21 agricultural BMPs were installed during this period including 51,137 feet of stream exclusion fencing. In addition, 27 residential BMPs were completed including one septic system connection to public sewer, three septic tank system repairs, 15 septic systems replacements, and one alternative waste treatment system.

Big Otter River BMP Summary: July 2006-June 2011

Control Measure*	Unit	Total	Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	934,56	334,022	36
Riparian Buffer Established	Acre		41.0	
Livestock Exclusion System	System	270	127	47
Forest Buffer	Acre		148	
Animal Waste Control			2	
Pasture Management	Acre	7,001		
Residential				
Septic Pump Out	System		25	
Connection to Sewer	System		5	
Septic System Repair	System	34	19	56
Septic System Installation	System	187	73	39.3
Alternative Waste Treatment System	System	26	5	19

**NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS , CREP or Federal EQIP are not included after this date (though they may have been included previously)*

Water Quality Goals Met	Unit	Miles Listed	Miles Delisted	%
Stream Impairment on the 303(d) list	Miles	76.78	-	-

Since July 2006 143 agricultural BMPs have been installed including 127 stream exclusion systems resulting in 334,022 linear feet of stream exclusion fencing, and creating 466 acres of riparian buffers. In addition, 127 residential BMPs have been installed including 25 septic tank pumpouts, 19 septic tank system repairs, five connections to public sewer, 73 septic system replacements, and five alternative waste treatment systems. The pollution reductions as a result of the BMPs installed included below are only for 319(h) funded practices.

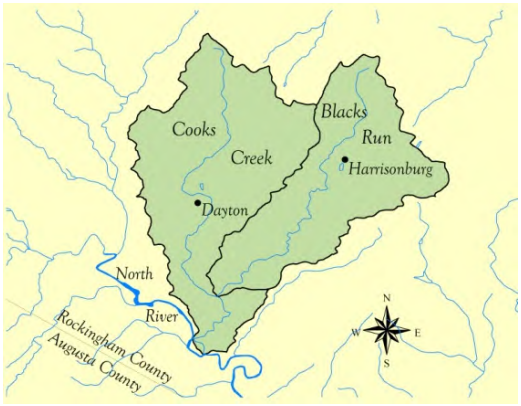
Pollution Reductions for the Big Otter River: July 2006-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2006-June 2010	1.54E+16	12678	2498	2227
July 2010-June 2011	3.025E+15	48	48	2767
TOTAL	1.84E+16	12726	2546	4994

Cooks Creek & Blacks Run TMDL Implementation Project: May 2006-June 2011

Project Location

The Blacks Run and Cooks Creek watersheds are located in Rockingham County and the City of Harrisonburg, Virginia. The streams flow into the North River near Mount Crawford, into the South Fork Shenandoah River, then on to the Chesapeake Bay by way of the Potomac River. Blacks Run is impaired for 10.73 miles from its headwaters to the confluence with Cooks Creek. The watershed is 12,256 acres and is largely urban in northern sections as the stream flows through the City of Harrisonburg, becoming increasingly rural as it nears Cooks Creek. Cooks Creek is impaired for 13.69 miles, extending from its headwaters to the confluence with the North River. The Cooks Creek watershed is 15,919 acres, and is largely rural with the exception of the Town of Dayton and areas adjacent to Harrisonburg.



Implementation Highlights

The Cooks Creek and Blacks Run TMDL implementation project is administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows BMPs implemented in the watersheds since the project began in May 2006 and overall implementation goals established for the project areas. Between July 1, 2010 and June 30, 2011, the SVSWCD installed 3,150 feet of livestock exclusion fencing resulting in 2.5 acres of riparian buffer on pasture, one waste storage facility, and 173 acres of cover crops. In addition, two septic tank pumpouts and two alternative waste treatment systems were completed in the watersheds during this period. Most agricultural BMP implementation has taken place in Cooks Creek due to its rural land use base. Cooks Creek is home to a large population of Mennonite farmers who typically do not accept cost share funding. Consequently, considerable agricultural BMP implementation has occurred on a voluntary basis with the SVSWCD providing technical assistance. Efforts to capture and report voluntary BMP implementation are ongoing.

In order to achieve the extensive urban and residential BMP goals established in the implementation plan, the SVSWCD has formed close partnerships with the City of Harrisonburg, the Harrisonburg Housing and Redevelopment Authority, James Madison University and Eastern Mennonite University. These partners have worked collaboratively to implement a series of urban stormwater management practices through a National Fish and Wildlife Foundation grant that

Cooks Creek and Blacks Run: May 2006 – June 2011

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	M	50	3.60	7
Stream Exclusion Fencing	S	17	2	12
Riparian Buffer	Ac	-------	15.13	-------
Voluntary Exclusion Systems	F	86,914	14,389	17
Waste Storage Facility	S	46	1	2
Loafing Lot Management	S	-------	1	-------
Pasture Management	Ac	758	-------	0
Conservation Tillage	Ac	4,748	-------	0
Small Grain Cover Crop	Ac	-------	1,468	-------
Veg. Cover on Cropland	Ac	-------	11.5	-------
Nutrient Management	Ac	3,565	25	1
Woodland Buffer Filter Area	Ac	-------	0.5	-------
Urban/Residential				
Pet Litter Control Program	P	2	1	50
Pet Waste Digesters	S	-------	41	-------
Pet waste Stations	Stations	-------	15	-------
Rain Barrels	Barrels	-------	454	-------
Bioretention Filters	AT	1,025	6.4	1
Retention Ponds	AT	400	-------	0
Street Sweeping	LM	7,574	16,978	224
Streambank Stabilization	F	7,000	8,000	114
Vegetated Buffer	F	197,704	9,650	5
Rain Gardens	AT	600	1	0
Nutrient Management	Ac	1,100	11.5	1
Residential Septic				
Septic Tank Pump Out	S	100	22	22
Sewer Connection	S	3	3	100
Septic System Repair	S	24	4	17
Septic System Installation	S	14	1	7
Alternative Waste Treatment	S	14	5	36

** AT = Acres Treated, Ac = Acres, S = System, F = Feet of stream, P = Program, LM= Lane/mi/yr, M = miles of stream ** BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously)*

began in 2009. Partners were awarded a total of $325,000 for implementation of approximately 200 stormwater management practices. To date, project partners have used this funding to leverage over $415,000 in matching funds. Project highlights for 2010-2011 included the formation of a neighborhood stewardship group, installation of a 10,000 gallon cistern, completion of a 650 foot streambank project, and the installation of a bioretention filter and a pervious sidewalk treating over two acres of impervious runoff. The table below provides a summary of implementation goals and progress to date. Over the past two years, this project has built a greater awareness and understanding of stormwater management amongst the residents and local officials, increased the capacity of the watershed community to integrate innovative stormwater practices into residential, commercial, municipal and educational landscapes, and has provided training and capacity building for the community and landscaping professionals in installation and maintenance of stormwater practices.

Blacks Run NFWF Grant Project Summary

Grantee	Deliverable	Completion date
James Madison University	Install 500 storm drain markers	Complete
	Install bioretention filter & pervious concrete walkway (300 ft^2)	Complete
	Restore and buffer 650 linear feet of streambank	Complete
	Install 10,000 gallon cistern on Wayland Hall	Complete
	Restore and buffer 1200 linear feet of streambank	Underway
	Restore and buffer 1150 linear feet of streambank	4/2012
Eastern Mennonite University	Flow through planter at Cedarwood dorm	Complete
	Bioretention filter at Cedarwood parking lot	Complete
	Install green roof on bike shed	Complete
	Remove asphalt lot at Parkwood Apt.	Complete
	Install cistern and restore downstream stream bank	5/1/2012
	Install 15 rain barrels around campus	Complete
	Install rain garden at Parkwood Apt	8/2011
Shen Valley SWCD	Hold rain garden training at Boxerwood	Complete
	Hold 5 neighborhood meetings	Complete
	Install 7 residential rain gardens and a cistern	Underway
	Hold 2 rain barrel workshops	Complete
HRHA	Install 104 rain barrels, develop maintenance guide	Complete
City of Harrisonburg	Hold 3 Blacks Run Clean Up events	2 Complete
	Write riparian buffer maintenance manual	Complete
	Host riparian buffer maintenance workshop(s)	11/2011
	Conduct quarterly monitoring	Ongoing

The pollution reductions as a result of the BMPs installed are summarized in the table below. These figures do not include the Urban and Residential (non-septic) practices due the fact that the pollution reductions for these practices were not available at the time of this report. The pollution reductions as a result of the BMPs installed included below are only for 319(h) funded practices.

Pollution Reductions for Cooks Creek and Blacks Run: March 2006-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
March 2006-June 2010	7.85E+14	6,745	1,379	895
July 2010-June 2011	4.04E+14	4,047	1,058	734
TOTAL	1.19E+15	10,792	2,437	1,630

Hazel River TMDL Implementation Project: July 2009 – June 2011

Project Location

The Hazel River watershed covers approximately 135,610 acres and includes, along with the Hazel River, the Hughes, Rush, and Thornton Rivers. The Hazel River begins in Rappahannock County, Virginia south of Panorama and continues downstream to its confluence with Rappahannock River northwest of Remington, Virginia. The Rappahannock River forms in Fauquier County, Virginia southeast of Front Royal and continues downstream to the Chesapeake Bay. The Hazel River and its tributaries were placed on Virginia's 303(d) list of impaired waters for violations of the fecal coliform bacteria standard between 2002 and 2004. A TMDL was developed to address these impairments in 2007.

Implementation Highlights

A TMDL implementation plan was developed for the Hazel River in May 2009. The Culpeper Soil and Water Conservation District (CSWCD) began administering the residential and agricultural BMP programs in July 2009. The table on the right shows BMPs implemented in the project area since it began and cumulative implementation goals established in the plan.

From July 2010 thru June 2011 the CSWCD installed 30 BMPs. This included nine livestock stream exclusion practices that fenced out over 14,000 feet of stream and created 9.8 acres of riparian buffers on pasture. An additional 14 acres of vegetative buffers were installed on cropland during this period. In the residential program 19 BMPs were installed between July 2010 and June 2011. This included eight pumpouts, four septic system repairs and seven replacements.

Pollution reductions resulting from BMPs installation since 2009 are summarized in the table below. These figures are only for 319(h) funded practices.

Hazel River BMP Summary: July 2009 – June 2011

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	2,307,360	111,046	5
Stream Exclusion Fencing	S	1,072	43	4
Riparian Buffer	Ac	-------	86	-------
Manure Incorporation	Ac	569	-------	0
Pasture Management	Ac	53,621	-------	0
Woodland buffer filter	Ac	-------	2.5	-------
Reforestation of erodible crop and pasture land	Ac	283	-------	0
Veg. buffer on cropland	Ac	283	185	65
Residential				
CCU Treatment*	S	20	-------	0
Pet waste Composters	S	4,211	-------	0
Residential Septic				
Septic Tank Pump Out	S	-------	74	-------
Septic System Repair	S	443	34	8
Septic System Installation	S	673	29	4
Alternative Waste Treatment	S	230	1	<1

** Ac = Acres, S = System, F = Feet, CCU =Confined Canine Unit*

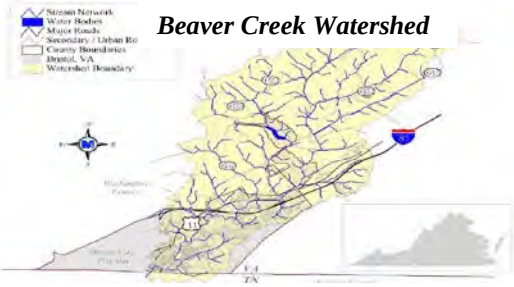
*** BMP counts only include 319 funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been*

Pollution Reductions for Hazel River: July 2009-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2009 – June 2010	1.66E+15	866	130	146
July 2010-June 2011	1.53E+15	1,162	145	163
TOTAL	3.19E+15	2,028	276	309

Little and Beaver Creeks TMDL Implementation Project: January 2007- June 2011

Project Location



Beaver Creek and Little Creek watersheds are located in Washington County and the City of Bristol, Virginia. Beaver Creek flows into South Fork Holston River eventually flowing into the Tennessee River and the Gulf of Mexico. Beaver Creek is a 22, 654 acre watershed and 13.46 miles are impaired from near the headwaters to the state line with Tennessee. Little Creek is a major tributary of Beaver Creek that is impaired along a 5.52 miles segment from the headwaters and continuing downstream to the Tennessee state line. The Little Creek watershed is approximately 5,520 acres.

Implementation Highlights

Beginning in the fall of 2006, the Holston River Soil and Water Conservation District began administering the Beaver Creek and Little Creek TMDL Implementation Project. From July 1, 2010 thru June 30, 2011 a total of 60 best management practices were installed including three stream exclusion practices (2,500 feet of stream exclusion fencing), 212 acres of cover crops, 37 septic tank pumpouts, seven septic system repairs, and five septic system replacements.

Since the beginning of the project 248 BMPs have been installed. This includes: 16 stream fencing practices establishing 14,025 feet of fencing; 421 acres of cover crops, one loafing lot management system for 195 animals; 181 septic tank pumpouts and 26 septic systems repairs or replacements. In addition 25 rain barrels were installed and 1,300 square feet of rain garden was built treating 2.5 acres. The pollution reductions as a result of the BMPs installed included below are only for 319(h) funded practices

Beaver and Little Creeks BMP Summary: January 2007 - June 2011

BMP	Unit	Total	Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	300,000	14,025	4.7
Stream Exclusion Fencing	System	309	16	5.2
Riparian Buffer Established	Acres		97.9	
Stream Crossing & Hardened Access	System	126		
Pasture Management	Acres	8,505		
Vegetative Cover on Cropland	Acres	75	19	25
Vegetative Cover on Critical Area	Acres		15	
Protective Cover for Specialty Crops	Acres	136	449	330
Manure Incorporation	Acres	110		
CREP Vegetated Buffers	Acres	16	1	6
Urban/Residential (Beaver Creek)				
Bioretention Filter	AT	600	2.5	0.42
Rain Barrels	System		25	
Infiltration Trench	AT	1,087		
Rain Garden	AT	488	.95	0.02
Stormwater Collection Retro-fits	AT	15		
Vegetated Stream Buffer	Acre	311		
Residential				
Pet Waste Control Program	Program	2		
Septic System Pump Out	System	144	183	127
Sewer Connection (Beaver Creek)	System	78		
Septic System Repairs	System	113	21	18.6
Septic System Installation	System	55	10	18
Alternative Waste Treatment System	System	15		

**NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS , CREP or Federal EQIP are not included after this date (though they may have been included previously),* AT = Acres treated

Pollution Reductions for Little and Beaver Creeks: January 2007-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
January 2007-June 2010	2.14E+15	2232	508	368
July 2010-June 2011	6.61E+14	60	60.00	3137
TOTAL	2.80E+15	2292	568	3505

Looney Creek TMDL Implementation Project: July 2009- June 2011

Project Location

Looney Creek is located in Botetourt County, Virginia. The creek empties directly into the James River south of the Town of Buchanan. The Looney Creek watershed is approximately 40,000 acres with an estimated population of just over 4,100 people. The major land use in this watershed is forest. Looney Creek was listed as impaired on Virginia's 1998 303(d) list due to violations of the State's water quality standards for fecal coliform bacteria from the confluence of Mill and Back Creek to the James River confluence, a total of 2.48 miles. The VA Department of Environmental Quality completed a bacteria TMDL for Looney Creek in May 2004, and DCR completed the TMDL implementation plan in November 2007.

Implementation Highlights

The Looney Creek TMDL implementation project is administered by the Mountain Castles Soil and Water Conservation District (MCSWCD). The table on the right shows BMPs implemented in the watershed since the project began in July 2009 and overall implementation goals for the project area. While the project got off to a slow start in 2009, considerable progress has been made in 2010 and 2011. Over the past two years, the MCSWCD has been making contacts in the watershed and increasing local awareness of cost share programs. As a result of this targeted outreach, 31% of the livestock exclusion goal for the project area was met within the first two years of implementation.

Between July 1, 2010 and June 30, 2011, five livestock exclusion practices were completed resulting in 15,911 linear feet of stream exclusion fencing and 12.8 acres of riparian buffers on pasture in the watershed. In addition, six septic tank pumpouts, two septic system repairs and three replacements were completed. Pollution reductions resulting from BMPs installation since 2009 are summarized in the table below. These figures are only for 319(h) funded practices.

Looney Creek BMP Summary: July 2009 – June 2011

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	68,583	21,078	31
Stream Exclusion Fencing	S	44	8	18
Riparian Buffer	Ac	-------	13	-------
Waste Storage Facility	S	2	1	50
Manure Incorporation	Ac	318	-------	0
Pasture Management	Ac	9,467	-------	0
Sinkhole Protection	F	4,000	-------	0
Veg. Buffer on Cropland	Ac	4	-------	0
Residential				
Pet Waste Digesters	S	453	-------	0
Vegetated Buffer	F	100,810	-------	0
Residential Septic				
Septic Tank Pump Out	S	100	9	9
Septic System Repair	S	16	5	31
Septic System Installation	S	77	3	4
Alternative Waste Treatment	S	10	1	10

** Ac = Acres, S = System, F = Feet*

*** BMP counts only include 319 funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously*

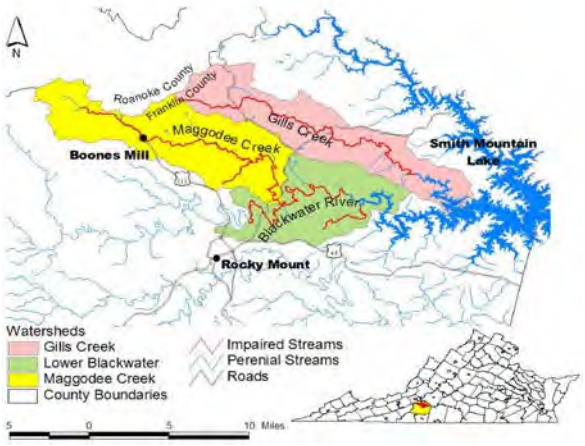
Pollution Reductions for Looney Creek: July 2009-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2009 – June 2010	2.01E+11	23	0	0
July 2010-June 2011	1.01E+15	4,646	701	834
TOTAL	2.01E+11	4,669	701	834

Lower Blackwater TMDL Implementation Project: January 2006- June 2011

Project Location

The Lower Blackwater River, Maggodee Creek and Gills Creek project area is located in Franklin County, Virginia (HUC# 0301010). Gills Creek is impaired for fecal coliform in a 27.9-mile segment extending to the confluence with Smith Mountain Lake. Maggodee Creek watershed is dominated by forest (62%), agriculture (33%) and is impaired for fecal coliform along a 21.2 mile stretch extending to the confluence with the Blackwater River. The portion of the Blackwater River addressed in this plan (referred to as the Lower Blackwater River) is impaired for 20 miles extending to the upper reaches of Smith Mountain Lake. Water from the Blackwater River and Gills Creek flows through Smith Mountain Lake, into the Roanoke River and eventually into the Albemarle Sound on North Carolina's coast



Implementation Highlights

DCR and local stakeholders completed the TMDL implementation plan for the Lower Blackwater River, Maggodee Creek and Gills Creek in January 2006. Project implementation started in March 2006 by the Blue Ridge SWCD. From July 1, 2010 thru June 30, 2011 a total of 16 BMPs were completed. Five fencing practices installed resulted in 14,708 feet of stream exclusion fencing. One Loafing Lot Management system was also installed. During this period a total of 8 septic tank pumpouts, one septic system repair and one septic system installation/replacement were completed.

Lower Blackwater River BMP Summary: March 2006-June 2011

Control Measure*	Unit	Units Needed	# Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	147,840	109,653	74
Stream Exclusion Fencing	System	77	32	42
Riparian Buffer Established	Acre		103.82	
Waste Storage Facility	System		4	
Loafing Lot Management	System	3	1	33
Vegetative Cover on Critical Area	Acre		2	
Residential				
Septic System Pump Out	System	100	69	69
Septic System Repair	System		2	
Septic System Installation	System	65	8	12
Alternative Waste Treatment System	System	7		
**NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS , CREP or Federal EQIP are not included after this date (though they may have been included previously)*				
Water Quality Goals Met	**Unit**	**Miles Listed**	**Miles Delisted**	**%**
Impaired miles on the 303(d) list	Miles	69.1	4.41	6

From March 2006 through June 2011, 42 agricultural practices have been completed resulting in approximately 21 miles of stream fencing, and establishing 104 acres of riparian buffer. In addition 79 residential BMPs have been installed, including 69 septic tank pumpouts and ten septic system repairs/replacements. The pollution reductions resulting from BMPs installed included below are only for 319(h) funded practices.

Pollution Reductions for the Lower Blackwater River, Maggodee Creek and Gills Creek: March 2006-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
March 2006-June 2010	9.43E+15	1826	482	181
July 2010-June 2011	1.76E+15	16	16	387
TOTAL	11.19E+15	1,842	498	569

Mill and Dodd Creek TMDL Implementation Project: Jan 2007- June 2011

Project Location

The Mill Creek watershed is located in the New River Basin in Montgomery County, Virginia. Mill Creek is a tributary of Meadow Creek, which flows into the Little River. The land area of the Mill Creek watershed is approximately 9,308 acres (14.5 sq. mi.). The majority of developed areas are in and around the Town of Riner with pockets of development close to Childress and Fairview in the eastern portion of the watershed.

Figure 1: Mill Creek Watershed

Figure 2: Dodd Creek Watershed

The Dodd Creek watershed is located in the New River Basin in Floyd County, Virginia. Dodd Creek is a tributary of the West Fork of the Little River. The land area of the Dodd Creek Watershed is approximately 14,440 acres (22.6 sq. mi.) and is comprised of forest (55%), pasture (43%), and urban/residential (1%) land uses. The majority of developed areas are in and around the Town of Floyd.

Implementation Highlights

The Skyline Soil and Water Conservation District began administering the agricultural program for the Mill and Dodd Creek TMDL Implementation Project in January 2007. The project addresses fecal coliform impairments in the Mill Creek and Dodd Creek watersheds. From July 1, 2010 thru June 30, 2011 a total of ten best management practices were installed. During this period two stream exclusion practices were installed, protecting 2,316 feet of stream. Eight residential BMPS were completed through the residential program, including seven septic tank pumpouts and one septic repair.

Mill and Dodd Creek BMP Summary: January 2007-June 2011

Control Measure *	Unit	Total	Installed	%
Agricultural				
Stream Exclusion Fencing	Feet	156,223	21,545	14
Stream Exclusion Fencing	System	100	12	12
Riparian Buffer Established	Acres		22.1	
Waste Storage Facility	System	3		
Loafing Lot Management System	System	1	1	100
Vegetative Cover on Critical Area	Acres	2		
Improved Pasture Management	Acres	1,439		
Residential				
Septic System Pump Out	System	200	50	25
Septic System Repair	System	51	5	10
Septic System Installation	System	183	3	2
Alternative Waste Treatment Systems	System	27		

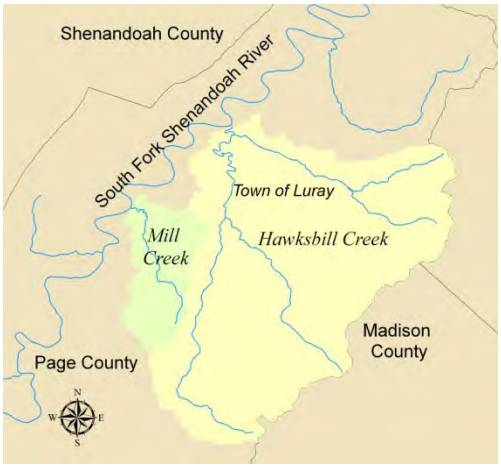
**NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS , CREP or Federal EQIP are not included after this date (though they may have been included previously)*

Since the beginning of the project a total of 71 practices have been installed. This includes 12 livestock exclusion practices protecting 21,545 feet of stream, 50 pump-outs and the repair/replacement of 8 septic systems. The pollution reductions occurring as a result of the BMPs installed included below are only for 319(h) funded practices.

Pollution Reductions for Mill and Dodd Creeks: January 2007-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
January 2007-June 2010	2.10E+15	4420	694	799
July 2010-June 2011	1.11E+14	10	10	345
TOTAL	2.21E+15	4430	704	1144

Mill and Hawksbill Creek TMDL Implementation Project: Jan 2008- June 2011



Project Location

Mill Creek and Hawksbill Creek are located in Page County in the South Fork Shenandoah watershed. Additionally, Hawksbill Creek runs through the Town of Luray. Mill Creek watershed is 8,178 acres and Hawksbill Creek watershed is 56,951 acres. The creeks were listed as impaired on Virginia's *1998 303(d) Total Maximum Daily Load Priority List and Report* (DEQ, 1998) due to violations of the State's water quality standards for fecal coliform (modified listing for *E. coli*). The impaired segment includes Mill Creek from the headwaters to the confluence with the South Fork Shenandoah River (6.78 miles) and Hawksbill Creek from its headwaters downstream to its confluence with the South Fork Shenandoah River (19.3 miles).

Implementation Highlights

The Mill and Hawksbill Creek TMDL implementation project is administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows BMPs implemented in the watersheds since the project began in January 2008 and overall implementation goals for the project areas.

The residential septic program has been a great success in Mill and Hawksbill Creeks, with approximately 75% of the septic repair goal met to date. A series of five reduced setback fencing projects have been completed in the watersheds with the last with financial assistance from the VA Dept of Environmental Quality's Supplementary Environmental Project Program (SEP).

Mill and Hawksbill Creek BMP Summary: January 2008 – June 2011

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	138,828	20,578	15
Stream Exclusion Fencing	S	62	13	21
Riparian Buffer	Ac	-------	82.8	-------
Voluntary Exclusion Systems	S	24	0	0
Waste Storage Facility	S	8	-------	0
Manure Incorporation	Ac	838	0	0
Pasture Management	Ac	14,739	0	0
Veg. Buffer on Cropland	Ac	9	26	289
Urban/Residential				
Pet Litter Control Program	P	1	0.5	50
Pet Waste Digesters	S	1,577	4	<0
Vegetated Buffer	Ac	12	0	0
Residential Septic				
Septic Tank Pump Out	S	936	183	20
Septic System Repair	S	57	43	75
Septic System Installation	S	60	23	38
Alternative Waste Treatment	S	32	2	6

** Ac = Acres, S = System, F = Feet of stream, P = Program*

*** BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously)*

Between July 1, 2010 and June 30, 2011, 8,513 linear feet of stream exclusion fencing was installed in the watersheds. In addition, 56 septic tank pumpouts, 24 septic system repairs and six replacements were completed. Pollution reductions resulting from BMPs installation since 2008 are summarized in the table below. These figures do not include the Urban/ Residential (non-septic) practices due the fact that the pollution reductions for these practices were not available at the time of this report. Reductions included below are only for 319(h) funded practices.

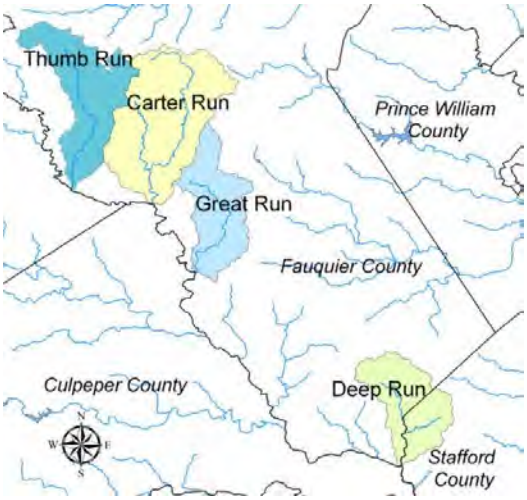
Pollution Reductions for Mill and Hawksbill Creeks: January 2008-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
January 2008-June 2010	4.49E+14	986	180	169
July 2010-June 2011	8.66E+14	5,688	1,209	889
TOTAL	1.32E+15	6,674	1,390	1,058

Thumb, Deep, Carter and Great Runs TMDL Project July 2006- June 2011

Project Location

Thumb Run, Carter Run, Great Run, and Deep Run are part of the Rapidan-Upper Rappahannock Basin in the Chesapeake Bay watershed. The Thumb Run, Carter Run and Great Run watersheds are completely 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 forest (60%), agricultural (39%) and residential (1%) land uses. A 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 for fecal coliform on the 1996 303(d) list (DEQ, 1996). Thumb, Carter and Great Runs followed in 1998.



Implementation Highlights

The Thumb, Deep, Carter and Great Runs TMDL implementation project is administered by the John Marshall Soil and Water Conservation District (JMSWCD) and the Fauquier County Health Department. The Health Department was contracted to provide technical assistance and educational outreach to homeowners while JMSWCD delivers the agricultural BMP program and associated education and outreach. The table on the right shows BMPs implemented in the watersheds since the project began in July 2006 and implementation goals established for the project areas. Outreach efforts for the project have included newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2010 and June 2011, six livestock exclusion projects were completed in the watersheds totaling approximately 63,000 feet of streamside fencing. In addition, 67 septic tank pumpouts, ten septic system repairs and four replacements were completed.

Thumb, Deep, Carter and Great Runs BMP Summary: July 2006 – June 2011

Control Measure**	Units*	Needed	Installed	%
Agricultural				
Stream Exclusion Fencing	F	421,947	68,780	16
Stream Exclusion Fencing	S	167	33	20
Riparian Buffer	Ac	-------	154	-------
Pasture Management	Ac	16,271	-------	0
Manure incorp. on cropland	Ac	5,331	-------	0
Veg. Cover on Cropland	Ac	-------	31	-------
Woodland Buffer Filter Area	Ac	-------	19	-------
Urban/Residential Pet Waste				
Pet Litter Control Program	P	3	-------	0
CCU BMP Demonstration*	S	2	-------	0
CCU BMP Installation*	S	25	-------	0
Pet waste landscape demo.	S	2	2	100
Residential Septic				
Septic Tank Pump Out	S	-------	162	-------
Septic System Repair	S	102	31	30
Septic System Installation	S	146	9	6
Alternative Waste Treatment	S	44	-------	0

**Ac =Acres, S =System, F = Feet, P = Program, CCU = Concentrated Canine Unit*

***BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS , CREP or Federal EQIP are not included after this date (though they may have been included previously)*

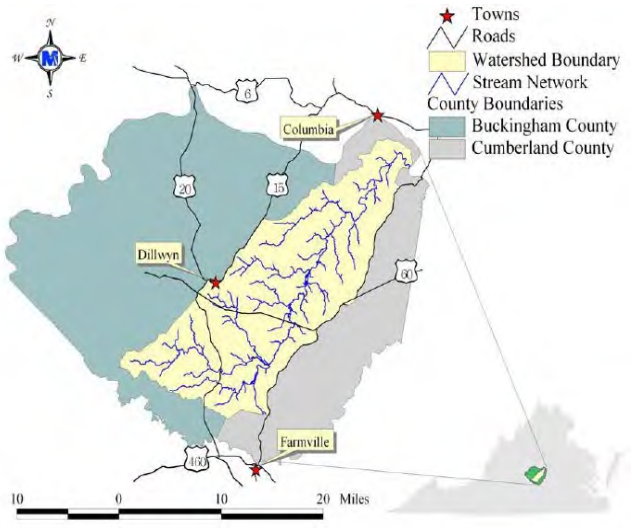
The pollution reductions resulting from BMP installations (319(h) funded practices) beginning in 2006 are summarized in the table below.

Pollution Reductions for Thumb, Deep, Carter and Great Runs: July 2006-June 2011

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2006-June 2010	4.27E+15	1,823	654	775
July 2010-June 2011	2.67E+15	7,059	1,038	1,298
TOTAL	6.94E+15	8,882	1,692	2,073

Willis River TMDL Implementation Project: July 2005-June 2011

Project Location



Located approximately 60 miles west of Richmond in the Piedmont, the Willis River and its tributaries in Buckingham and Cumberland counties were first listed as not meeting water quality standards on Virginia's 1996 303(d) list of impaired waters. The impairment was due to violations of the State's fecal coliform bacteria standard for recreational contact. Through the joint efforts of the Virginia Department of Conservation and Recreation (DCR) and the Peter Francisco Soil and Water Conservation District (PFSWCD), as well as other stakeholders, various agricultural and residential best management practices (BMPs) have been installed through a Total Maximum Daily Load (TMDL) implementation project funded with EPA Section 319(h) funds that began in 2005. These BMPs include: a dairy loafing lot management system, composting facilities, animal waste storage, and livestock stream exclusion with grazing land protection systems, riparian buffers, septic tank pump-outs, septic system repairs and replacements.

As a result of six years of implementation activities 67 agricultural best management practices have been installed, including 36.3 miles of stream exclusion fencing and the establishment of almost 147 acres of riparian vegetative buffers. The widespread installation of BMPs throughout the Willis River Watershed has reduced bacterial levels to allow three stream segments, totaling 34.71 miles of streams, to attain water quality standards for primary contact recreation. These two segments of the Willis River were removed from Virginia's 303(d) list of impaired waters in 2006 and 2008 as a direct result of TMDL implementation activities.

Project Background and Problem Identification

The Willis River watershed is part of the James River Basin (HUC 02080205, VAC-H35R and VAC H36R). The land area is approximately 177,936 acres, with woodlands and pasture as the primary land uses. The watershed is comprised of forest (75%), water (1%), wetlands (2%) agricultural (21%), and urban (1%) land uses.

In 1996, the Willis River was placed on the Commonwealth of Virginia's 1996 303(d) list because of violations of the fecal coliform bacteria water quality standard. The original 1996 impaired segment of the Willis River stretched from the confluence with the James River upstream to Reynolds Creek (14.53 miles). The segment was extended in the 2004 cycle to include the entire Willis River from the headwaters to the mouth (61.34 miles). The fecal coliform TMDL for the Willis River was completed in 2002. In 2005, DCR and Peter Francisco Soil and Water Conservation District, with extensive input from other stakeholders, completed a TMDL implementation plan and commenced a 5-year implementation project to reduce fecal coliform levels in the Willis River through implementation of agricultural and residential BMPs.

Project Highlights

Residential and agricultural conservation successes have largely been the result of partnerships between the PFSWCD and several state agencies including the Virginia Departments of Conservation and Recreation and Environmental Quality, Virginia Cooperative Extension, Farm Bureau, Cattlemen's Association, and USDA – Natural Resources Conservation Service. Numerous tours have been held to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with presentations at civic clubs throughout the watersheds, postcard mailings advertising the program, personal contacts with farmers and residents, and meetings updating the community about the water quality improvements.

From July 1, 2010 thru June 30, 2011 three livestock stream exclusion practices were installed protecting 10,350 feet of stream and creating 8.3 acres of riparian buffer area. During this period ten septic pump outs, three septic system repairs and one septic system replacement were also completed. Since the beginning of the project in July 2005 (through June 30, 2011), there have been 67 agricultural practices completed. Approximately 36.3 miles of stream fencing has been installed, establishing almost 147 acres of buffer. For the residential program, to date, 37 septic projects have been implemented including 26 septic tank pump out, seven septic systems repairs and four septic systems replacements. The pollution reductions as a result of the BMPs installed included at the bottom of the page are only for 319(h) funded practices.

Willis River BMP Summary: August 2005-June 2011

Control Measure*	Unit	Units Needed	# Installed	% Goal
Agricultural				
Stream Exclusion Fencing	Miles	475,000	194,80	41%
Stream Exclusion Fencing	System	318	53	17%
Riparian Buffer Established	Acre		147	
Stream Crossing & Hardened Access	System		6	
Loafing Lot Management	System		1	
Animal Waste Storage Facility	System		4	
Composting Facility	System		3	
Residential				
Septic System Pump Out	System	100	26	26%
Septic System Repair	System	3	7	233%
Septic System Installation	System	2	4	200%
BMP counts after 7/1/2010 only include 319, WQIF and VNRCF funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously)				
Water Quality Goals Met	**Unit**	**Miles needed**	**Miles Delisted**	**% Goal**
Stream Miles impaired on 303(d) list	Miles	61	345	57%

The Virginia Department of Environmental Quality (DEQ) monitors the impaired streams through the agency's ambient monitoring program. DEQ monitors several stations throughout the Willis River Watershed. Analysis of data from several sites has shown drastic improvements in the water quality conditions of various segments of the Willis River. Subsequently three stream reaches were delisted due to the bacteria violation rates being 10% or less. These sites include:

- VAC-H35R_WLS02A04, 9.92 miles (station 2-WLS004.27), which had a violation rate of 2/20 with a 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R_WLS02A06, 8.11 miles, which had a violation rate of 1/20 with a less than 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R_WLS01A00, 16.68 miles (station 2-WLS042.78), which had a violation rate of 2/21 with a 9.5% violation rate and was listed in the 2008 303(d)/305(b) report as attaining standard.

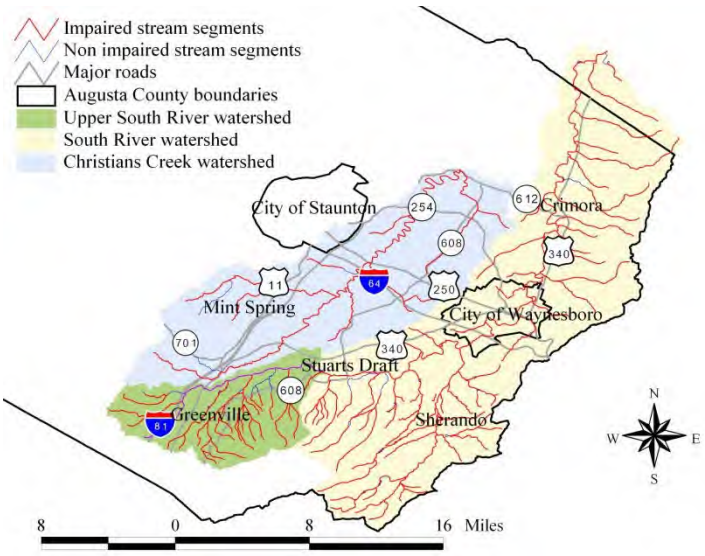
As a result of activities a total of 34.71 miles are now meeting water quality standards and changed to category 2C. For the 2006 303(d) list the bacteria standard was based on fecal coliform, 400 colony forming units (CFU) per 100 ml of water. For the 2008 303(d) list the standard changed to *E. coli* at 235 CFU per 100 ml of water.

Pollution Reductions for the Willis River: August 2005-June 2010

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2005-June 2010	1.36+16	4,838	1,040	616
July 2010-June 2011	1.55E+15	17	17	320
TOTAL	1.52E+16	4,855	1,057	935

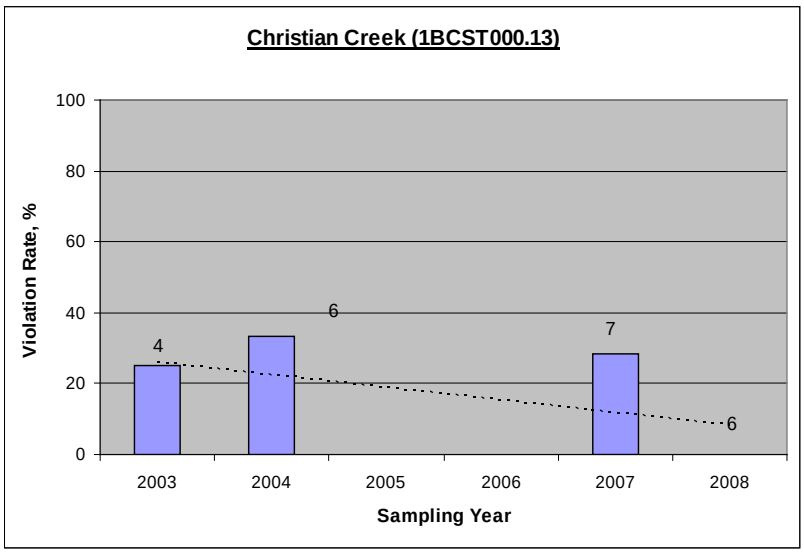
Christians Creek and South River TMDL Implementation Project

The Christians Creek and South River implementation project for bacteria, sediment and phosphorus impairments was initiated in 2006. DCR contracted with the Headwaters Soil and Water Conservation District and provided funding through the Water Quality Improvement Fund (WQIF) for project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $521,769.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (46,106 linear feet), and CRWP-2 practice (1,440 linear feet) and the TMDL fencing practices: LE-1T (10,806 linear feet), LE-2T (7,151 linear feet), and SL-6 (43,248 linear feet). This totals 20.5 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Christians Creek and the South River from the Impaired Waters List. The bar graph shows the percent violation rates for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graphs. A linear trend fitted to the Christians Creek data shows a significant decreasing trend in violation rate over the sampling period, but no samples have been collected since 2008. The decreasing trends in violation rates indicate significant improvement in water quality conditions in Christians Creek.

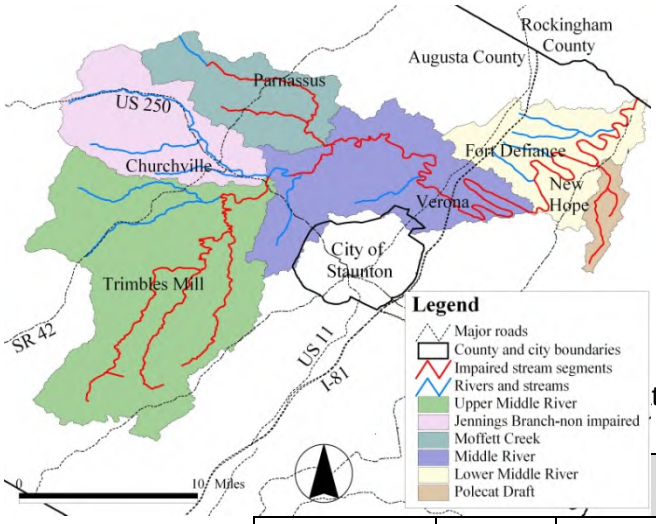


Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-22	140	Acres
CRFR-3	101	Acres
CRLF-1 (buffer)	5,800	Lin. Feet
CRSL-6	46,106	Lin. Feet
CRWP-2	1,440	Lin. Feet
FR-1	22	Acres
LE-1T	10,806	Lin. Feet
LE-2T	7,151	Lin. Feet
NM-3	311	Acres
NM-4	128	Acres
SL-1	302	Acres
SL-6	43,248	Lin. Feet
SL-7T	4	Acres
SL-8B	3,593	Acres
SL-8H	2,670	Acres
WL-1	4	Acres
WL-2	2	Acres
WP-4	4	System
WQ-4	40	Acres

Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project

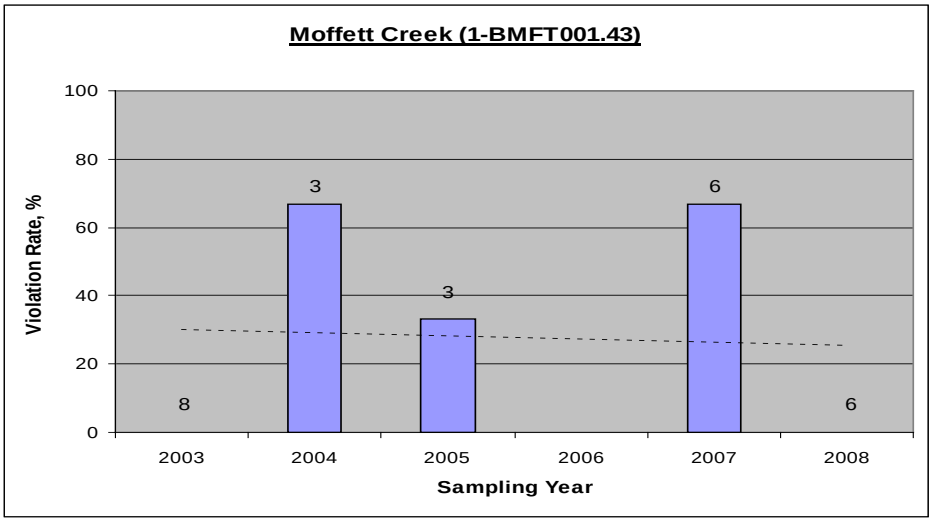
The Moffett Creek, Middle River and Polecat Draft implementation project for bacteria impairments in all three watersheds and sediment impairments in the Moffett Creek and the Upper Middle River was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $1,228,920. The change in water quality reflects the cumulative impact of BMPs implemented.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (72,041 linear feet), and CRWP-2 practice (2,389 linear feet) and the TMDL fencing practices: LE-1T (11,594 linear feet), LE-2T (7,665 linear feet), and SL-6 (135,769 linear feet). This totals 43 miles of livestock stream exclusion fencing installed.

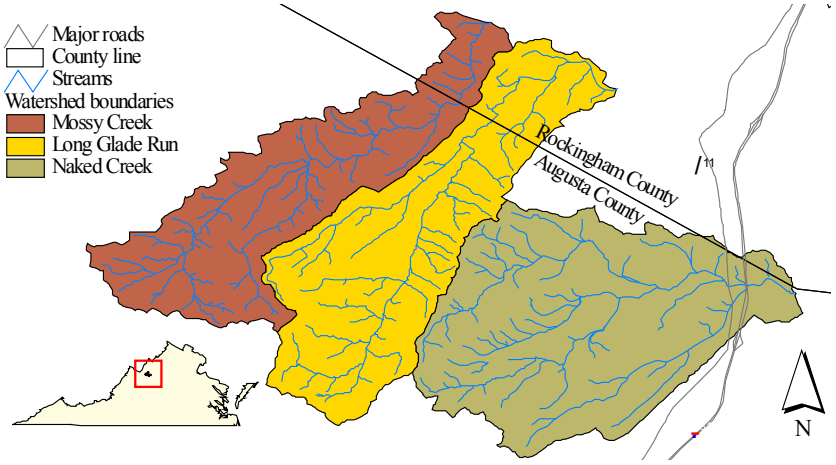
The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Moffett Creek, Middle River, and Polecat Draft from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the Moffett Creek data shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in water quality conditions in Moffett Creek.



CP-21	11	Acres
CP-22	368	Acres
CRFR-3	331	Acres
CRLF-1 (buffer)	9,611	Lin. Feet
CRSL-6	72,041	Lin. Feet
CRWP-2	2,389	Lin. Feet
FR-1	40	Acres
LE-1T	11,594	Lin. Feet
LE-2T	7,665	Lin. Feet
NM-3	539	Acres
SL-1	710	Acres
SL-6	135,769	Lin. Feet
SL-8B	5,278	Acres
SL-8H	6,933	Acres
SL-11	1	Acres
WL-1	24	Acres
WL-2	30	Acres
WL-3	2	Acres
WP-2	22,045	Lin. Feet
WP-4	6	System
WP-4B	1	System
WP-4C	2	Facility
WQ-1	11	Acres
WQ-4	413	Acres

Mossy Creek, Naked Creek & Long Glade Run TMDL Implementation Project



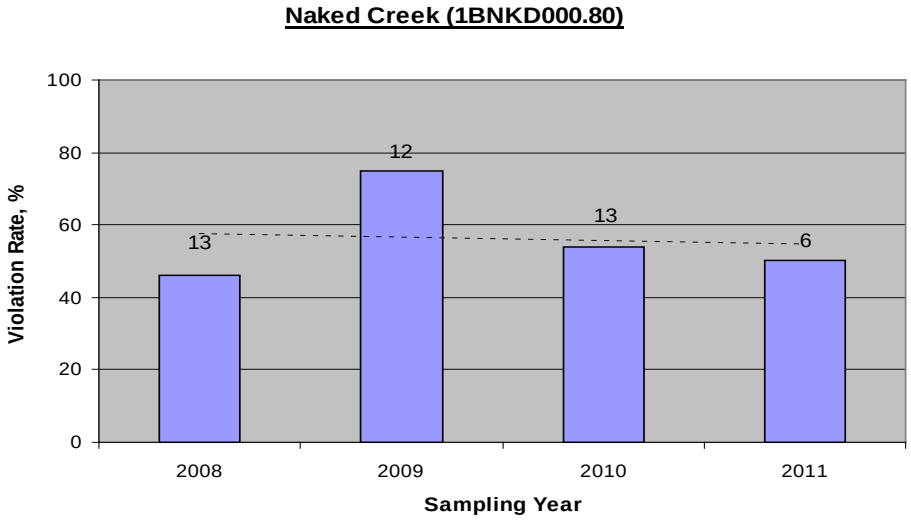
The Mossy and Naked Creeks and Long Glade Run implementation project for bacteria impairments in all three watersheds and aquatic life impairment attributed to sediment in Mossy Creek was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided funding from the Water Quality Improvement Fund (WQIF) for project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $522,254. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.

Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (4,150 linear feet), and CRWP-2 practice (3,800 linear feet) and the TMDL fencing practices: LE-1T (8,425 linear feet), LE-2T (3,225 linear feet), and SL-6 (29,895 linear feet). This totals nine miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Mossy and Naked Creeks and Long Glade Run from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. Data for Naked Creek shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in Naked Creek.

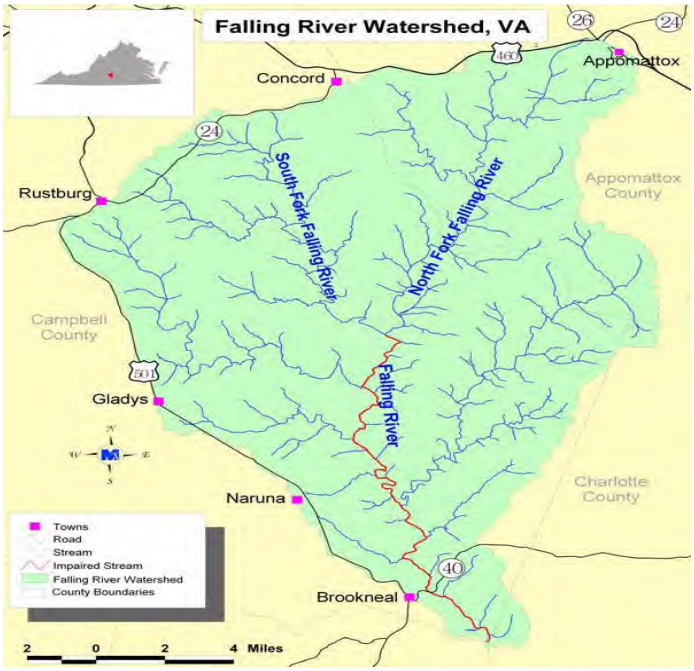
Mossy & Naked Creeks & Long Glade Run BMP Summary: 06-11

Practice Code	Extent Installed	Unit
CP-22	90	Acres
CRFR-3	78	Acres
CRLF-1 (buffer)	15,311	Lin. Feet
CRSL-6	4,150	Lin. Feet
CRWP-2	3,800	Lin. Feet
LE-1T	8,425	Lin. Feet
LE-2T	3,225	Lin. Feet
SL-1	65	Acres
SL-6	29,895	Lin. Feet
SL-8B	3,217	Acres
SL-8H	2,132	Acres
WL-1	2	Acres
WL-2	33	Acres
WL-3	35	Acres
WP-4	4	System
WQ-4	197	Acres



Falling River TMDL Implementation Project

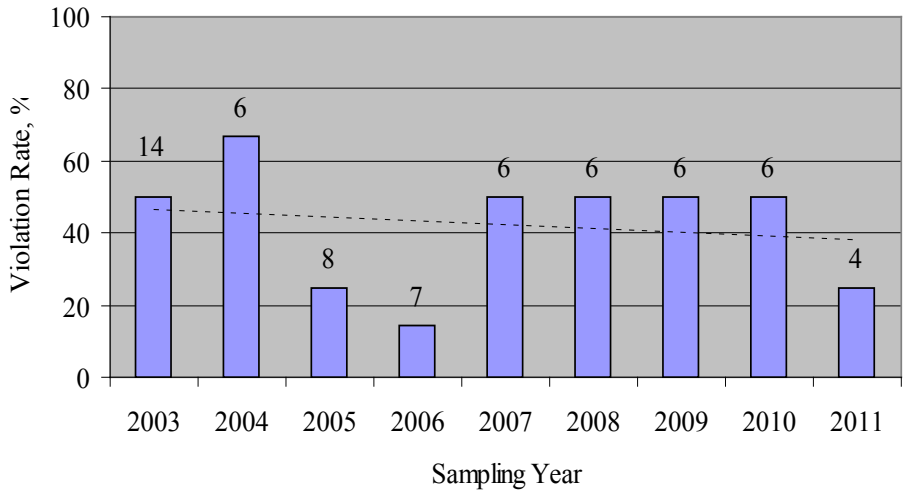
The Falling River implementation project for bacteria impairment was initiated in 2006. DCR contracted with the Robert E. Lee Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $1,233,865. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.



A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (29,480 linear feet), and the TMDL fencing practices: LE-1T (83,200 linear feet), SL-6 (89,176 linear feet), and WP-2T (14,700 linear feet). This totals 41 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Falling Creek from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in water quality condition in the Falling River.

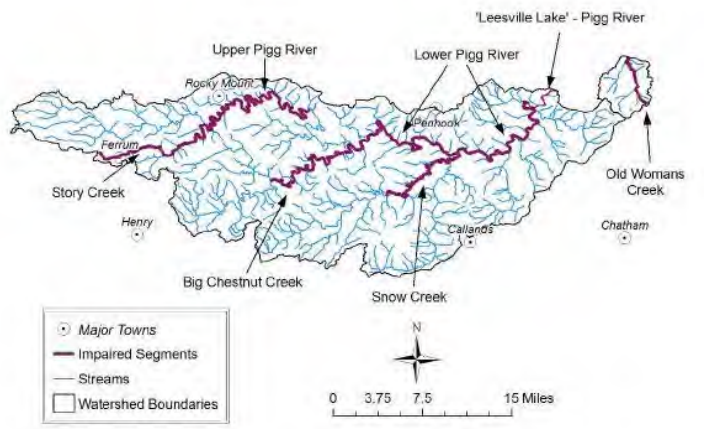
Falling River (4AFRV010.99)



Falling River BMP Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-22	67	Acres
CP-29	19	Acres
CRFR-3	53	Acres
CRSL-6	29,480	Lin. Feet
CRWQ-1	6	Acres
FR-1	196	Acres
LE-1T	83,200	Lin. Feet
NM-1	1,020	Acres
NM-2	697	Acres
SL-6	89,176	Lin. Feet
SL-6B	6,664	Acres
SL-7T	19	Acres
SL-8B	1,711	Acres
SL-8H	1,070	Acres
SL-11	2	Acres
WP-2A	255	Lin. Feet
WP-2T	14,700	Lin. Feet
WP-3	3	Acres

Pigg River TMDL Implementation Project (Blue Ridge SWCD)



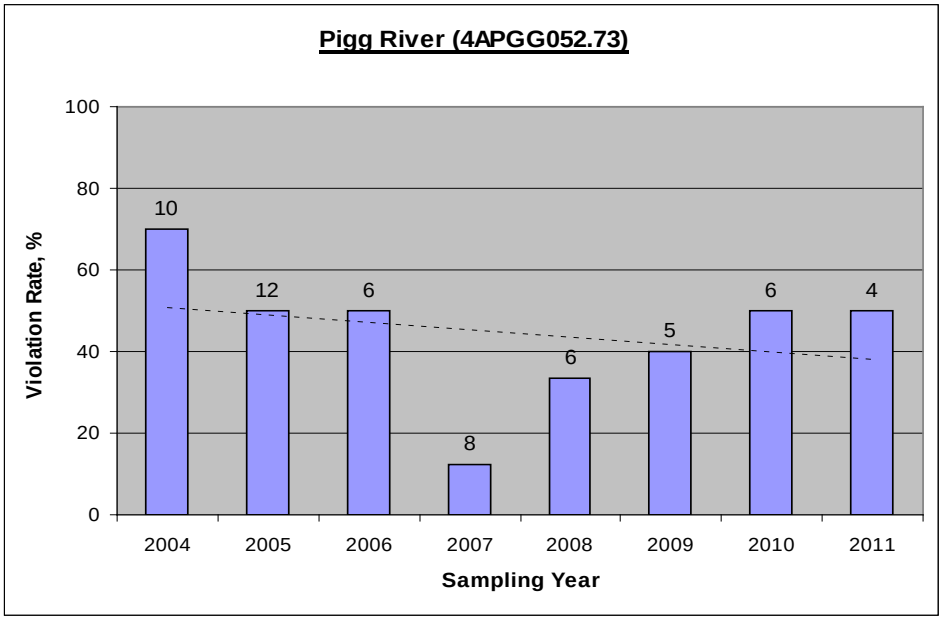
The Pigg River implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Blue Ridge and Pittsylvania Soil and Water Conservation Districts and provided funding from the Water Quality Improvement Fund (WQIF) for implementation. This project summary includes project progress made by the Blue Ridge SWCD in the Upper Pigg River, Story Creek, Chestnut Creek, and Snow Creek watersheds. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watersheds within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $1,165,209. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.

The stream fencing has been installed through the TMDL fencing practices: LE-1T (79,950 linear feet), LE-2T (1,784 linear feet), and SL-6 (56,692 linear feet). This totals 26 miles of livestock stream exclusion fencing installed which is 50 percent of the fencing goal quantified in the TMDL implementation plan.

Pigg River BMP Summary (Blue Ridge SWCD): 2006-2011

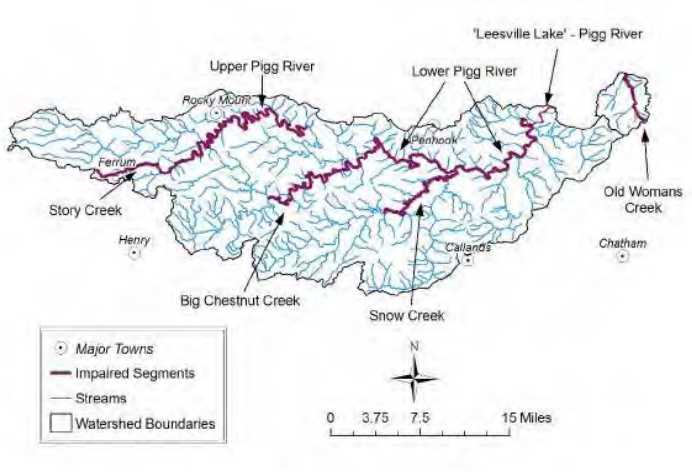
Practice	Extent	Unit
FR-1	68	Acres
LE-1T	79,950	Lin. Feet
LE-2T	1,784	Lin. Feet
SL-6	56,692	Lin. Feet
SL-8B	3,192	Acres
SL-8H	2,953	Acres
SL-11	10	Acres
WP-4	2	System
WP-4B	6	System

The *E coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired stream segments from the Impaired Waters List.
The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A trend fitted to the data at river mile 52.73 shows a significant decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates improvement in water quality conditions in the Pigg River.



Pigg River TMDL Implementation Project (Pittsylvania SWCD)

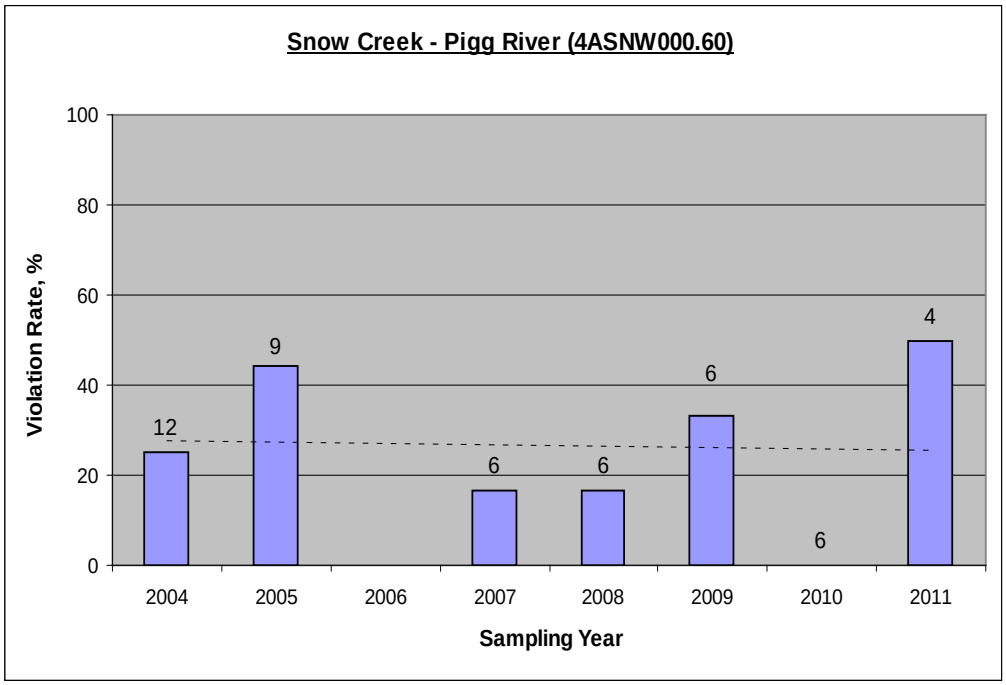
The Pigg River implementation project including Story, Snow, Chestnut Creeks and the Pigg River mainstem for bacteria impairments was initiated in 2006. DCR contracted with the Blue Ridge and Pittsylvania Soil & Water Conservation Districts and provided Water Quality Improvement Funds (WQIF) towards the project implementation. This summary includes project progress made by year in Pittsylvania SWCD in the Lower Pigg River and Snow Creek watersheds. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists all BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $600,421. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed. Stream fencing has been installed through the TMDL fencing practices: LE-1T (16,540 linear feet), SL-6 (20,348 linear feet) and WP-2T (14,179 linear feet). This totals 10 miles of livestock stream exclusion fencing installed.



Pigg River (Pittsylvania SWCD) BMP Summary: 2006-2011

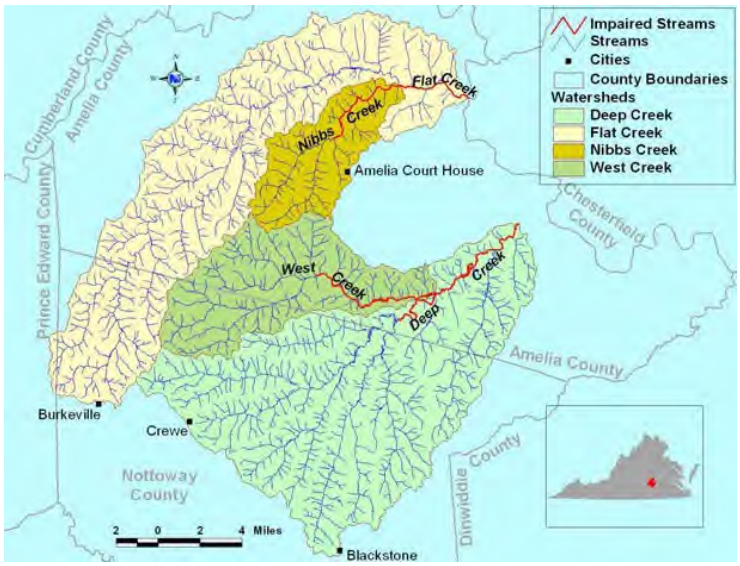
Practice Code	Extent Installed	Unit
FR-1	34	Acres
LE-1T	16,540	Lin. Feet
SL-1	145	Acres
SL-5	1,461	Lin. Feet
SL-6	20,348	Lin. Feet
SL-8	65	Acres
SL-8B	485	Acres
SL-8H	228	Acres
WP-2T	14,179	Lin. Feet
WP-4	4	System

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Pigg River (Pittsylvania SWCD) from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. The linear trend fitted to Snow Creek shows a slightly decreasing trend in the violation rates, indicating only a slight improvement in water quality.



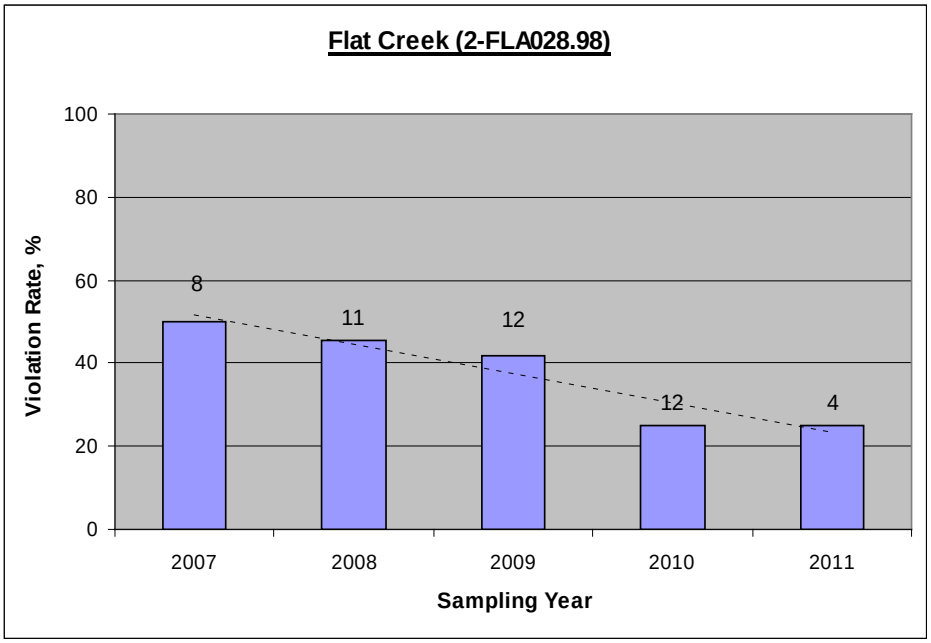
Flat, Nibbs, Deep and West Creeks TMDL Implementation Project

The Flat, Nibbs, Deep, and West Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $639,282. The change in water quality reflects the cumulative impact of all BMPs implemented in the watershed.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (11,995 linear feet) and the state fencing practices: LE-1T (14,577 linear feet), SL-6 (45,489 linear feet), SL-6T (80 linear feet), and WP-2T (7,099 linear feet). This totals 15 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired creeks from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. The trend fitted to the data at river mile 28.98 shows a significant decreasing trend in the violation rates over the sampling period. The decreasing trend indicates significant improvement in water quality conditions in Flat Creek.



Flat, Nibbs, Deep & West Creeks BMP Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-CNT	111	Acres
CP-22	42	Acres
CRFR-3	42	Acres
CRSL-6	11,995	Lin. Feet
FR-1	124	Acres
LE-1T	14,577	Lin. Feet
NM-3B	55	Acres
SL-1	174	Acres
SL-6	45,489	Lin. Feet
SL-6T	80	Lin. Feet
SL-8B	2,590	Acres
SL-8	38	Acres
SL-8H	3,973	Acres
SL-11	1	Acres
SL-15A	146	Acres
SL-15B	176	Acres
WP-2T	7,099	Lin. Feet
WP-3	1,477	Acres
WP-4	3	Systems
WQ-4	1,471	Acres

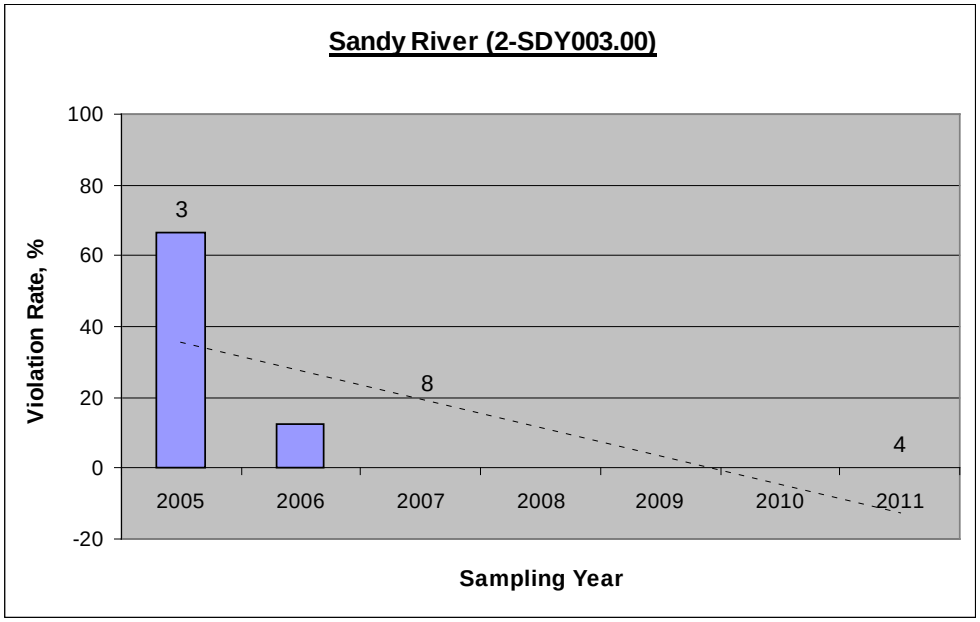
Spring, Briery & Saylers Creeks, Little Sandy & Bush Rivers TMDL Implementation Project

The Spring Creek, Little Sandy River, Bush River, Briery and Saylers Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) for BMP implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost- share payments for these BMPs were $741,572. The change in water quality reflects the cumulative impact of all BMPs implemented in the watershed.

A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (32,124 linear feet), and the TMDL fencing practices: LE-1T (56,780 linear feet), LE-2T (1,700 linear feet), SL-6 (65,841 linear feet), SL-6T (4,522 linear feet), WP-2 (2,993 linear feet) and WP-2T (6,827 linear feet). This totals 32 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Spring Creek, Little Sandy River, Bush River, and Briery and Saylers Creeks from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data of Little Sandy River shows significant decreasing trend in the violation rate over the sampling period.



Spring, Briery, Saylers Creeks & Bush and Little Sandy Rivers BMP Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-22	351	Acres
CRFR-3	147	Acres
CRSL-6	32,124	Lin. Feet
FR-1	335	Acres
LE-1T	56,780	Lin. Feet
LE-2T	1,700	Lin. Feet
SL-1	218	Acres
SL-6	65,841	Lin. Feet
SL-6T	4,522	Lin. Feet
SL-8B	1,202	Acres
SL-8H	1,030	Acres
SL-11	4	Acres
WP-1	1	Count
WP-2	2,993	Lin. Feet
WP-2T	6,827	Lin. Feet
WP-4C	1	System

Bluestone River TMDL Implementation Project

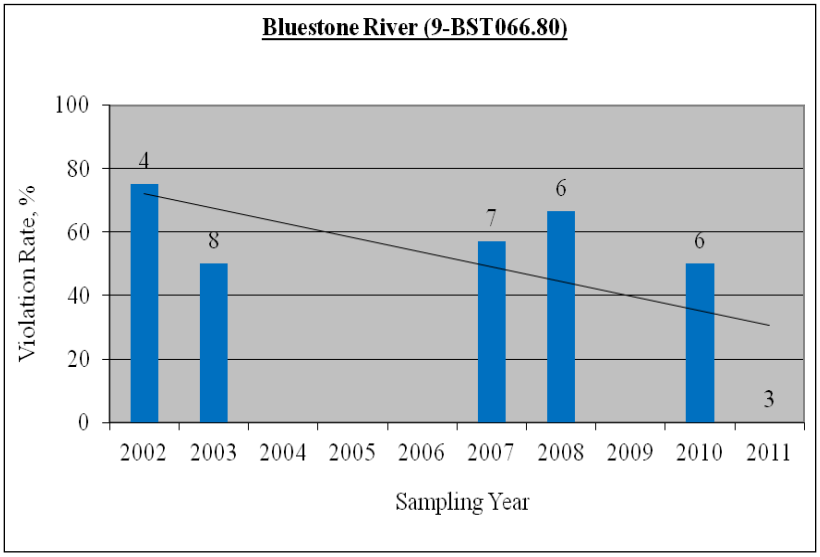
The Bluestone River implementation project for bacteria and sediment impairments was initiated in 2006. DCR contracted with the Tazewell Soil and Water Conservation District and provided funding through the Water Quality Improvement Fund (WQIF) for project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost- share payments for these BMPs was $253,148. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.

The stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (791 linear feet) and the TMDL fencing practices: LE-1T (3,219 linear feet), and SL-6 (4,690 linear feet). This totals about 2 miles of livestock stream exclusion fencing installed.

Bluestone River BMP Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-22	2.3	Acres
CRFR-3	2.3	Acres
CRSL-6	791	Lin. Feet
LE-1T	3,219	Lin. Feet
SL-6	4,690	Lin. Feet

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Bluestone River from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. A linear trend fitted to the Bluestone River data shows a decreasing trend in violation rate over the sampling period. The decreasing trend in violation rates indicates some improvement in water quality conditions in Bluestone River. Moreover, the data collected in 2011 did not show any violation of the water quality standard.



Upper Clinch River TMDL Implementation Project

The Upper Clinch River implementation project for an aquatic life impairment attributed to sediment was initiated in 2006. DCR contracted with the Tazewell Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists all BMPs implemented in the watershed within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $443,968. The change in water quality reflects the cumulative impact of all BMPs implemented in the watershed.

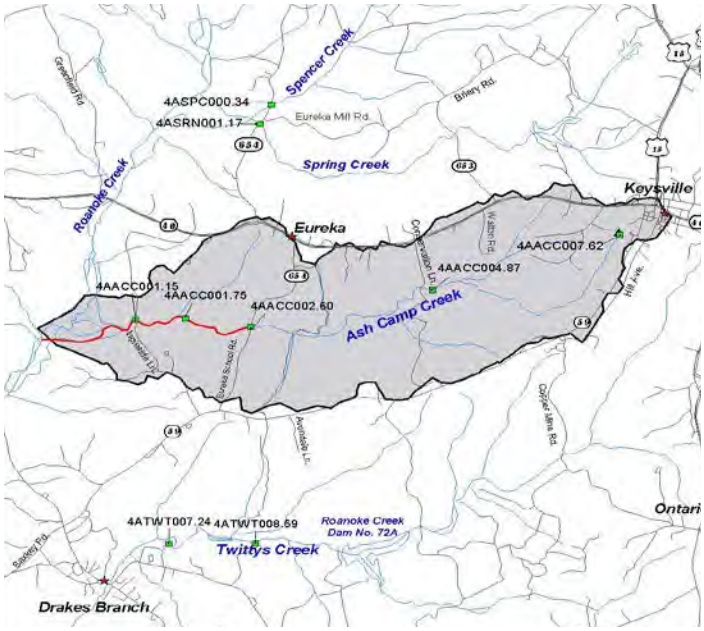
The stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (10,403 linear feet), and the TMDL fencing practices: LE-1T (8,783 linear feet) and SL-6 (44,262 linear feet). This totals 12 miles of livestock stream exclusion fencing installed. Only ten acres of cropping practices (SL-8H, cover crops) have been implemented, and cropland is a significant source of sediment.

Upper Clinch River BMP Summary: 2006-2011

Practice Code	Extent Installed	Unit
CP-22	26.5	Acres
CRFR-3	28	Acres
CRLF-1 (buffer)	900	Lin. Feet
CRSL-6	10,403	Lin. Feet
LE-1T	8,783	Lin. Feet
SL-6	44,262	Lin. Feet
SL-8H	10	Acres

Ash Camp and Twittys Creeks TMDL Implementation Project

The Ash Camp and Twittys Creeks implementation project for benthic impairments was initiated in 2006. DCR contracted with the Southside Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its sixth year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in these watersheds within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $77,618 ($55,920 for Ash Camp Creek and $21,698 for Twittys Creek watersheds). The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.

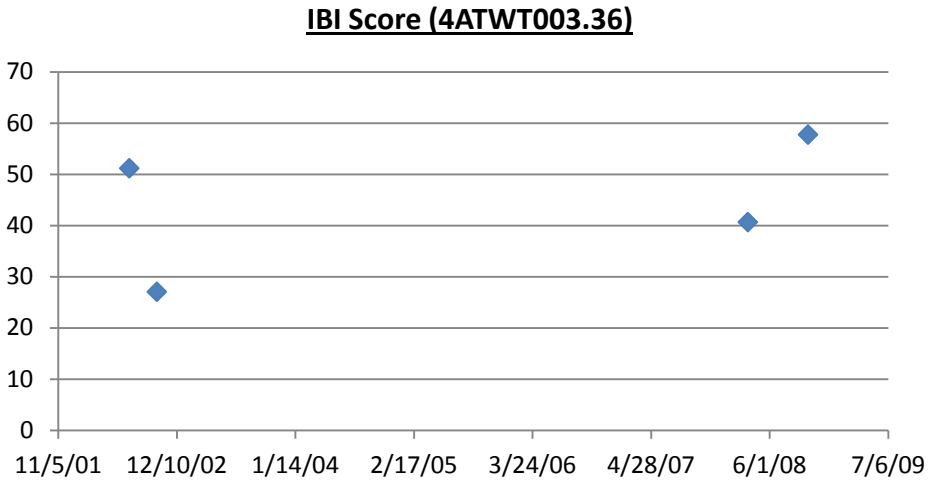


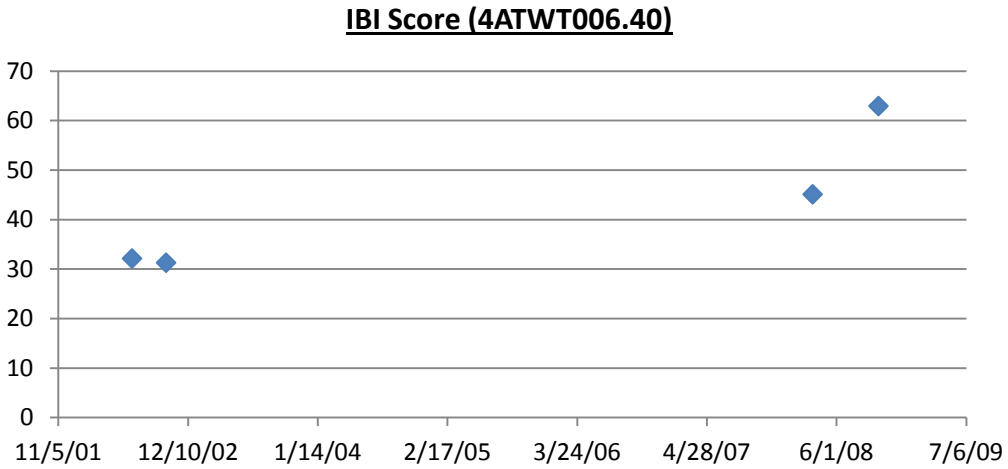
The stream fencing installed in Ash Camp Creek and Twittys Creek watersheds through the TMDL program includes: LE-1T (6,685 linear feet) and SL-6 (4,800 linear feet). This totals about 2 miles of livestock stream exclusion fencing installed.

The aquatic life standard is the standard that has to be met to remove Ash Camp and Twittys Creeks from the Impaired Waters List. A Stream Condition Index (SCI) is used in Virginia to assess biological integrity of streams. Streams that score greater than 60 are considered to be non-impaired, whereas streams that score less than 60 are considered impaired.

Ash Camp and Twittys Creeks BMP Summary: 2006-2011

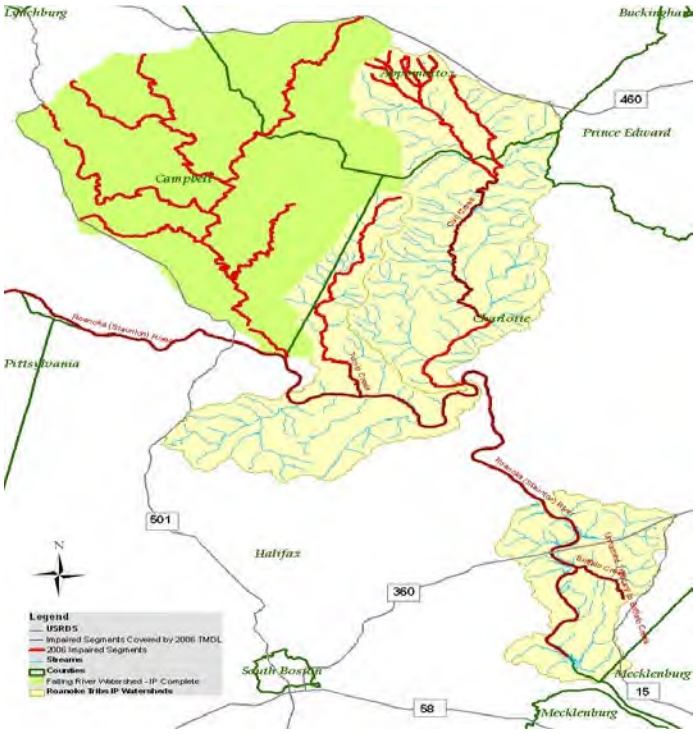
Practice Code	Extent Installed	Unit
FR-1	19	Acres
LE-1T	6,685	Lin. Feet
SL-6	4,800	Lin. Feet
SL-8B	22	Acres




IBI Score (4ATWT006.40)
70
60
50
40
30
20
10
0
11/5/01
12/10/02
1/14/04
2/17/05
3/24/06
4/28/07
6/1/08
7/6/09

Cub, Turnip and Buffalo Creeks TMDL Implementation Project

The Cub, Turnip and Buffalo Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Robert E. Lee and Southside Soil and Water Conservation Districts (SWCD) and provided funding from the Water Quality Improvement Fund (WQIF) towards project implementation. The BMPs implemented and cost-share amounts paid by each district are noted separately. The project is now in its sixth year of the implementation of various agricultural BMPs. The tables below list all BMPs implemented within the period of 2006 through June 2011. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were $563,821 ($474,098 through Southside SWCD and $89,723 through Robert E. Lee SWCD). The change in water quality reflects the cumulative impact of all BMPs implemented in the watersheds.



The stream fencing by Southside SWCD has been installed through the TMDL fencing practices LE-1T (16,226 linear feet) and SL-6 (64,536), and CCI-SE1 voluntary practice (1,620 linear feet). Robert E. Lee stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 (4,100 linear feet), and the TMDL fencing practices: LE-1T (6,300 linear feet) and SL-6 (5,600 linear feet). This totals 18.6 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Cub, Turnip and Buffalo Creeks from the Impaired Waters List.

Cub, Turnip, and Buffalo Creeks Southside SWCD BMP Summary: 2006-2011

SWCD	Practice	Extent	Extent
Southside	CCI-CNT	25	Acres
	CCI-SE1	1,620	Lin. Feet
	FR-1	105	Acres
	LE-1T	16,226	Lin. Feet
	SL-1	70	Acres
	SL-6	64,536	Lin. Feet
	SL-15A	53	Acres
	SL-3	12	Acres
	SL-8B	63	Acres
	WP-4B	1	System
	WP-4F	1	Facility
R.E. Lee	CRSL-6	4,100	Lin. Feet
	FR-1	27	Acres
	LE-1T	6,300	Lin. Feet
	SL-6	5,600	Lin. Feet
	SL-8B	47	Acres

Glossary of Acronyms

BMP – Best Management Practice
CB – Chesapeake Bay
CD – Consent Decree
CFU – Colony Forming Units
CREP – Conservation Reserve Enhancement Program
DCR – Department of Conservation and Recreation
DEQ – Department of Environmental Quality
DMME – Department of Mines, Minerals and Energy
DOT – Department of Transportation
EPA – U.S. Environmental Protection Agency
FY – Virginia Fiscal Year
FFY – Federal Fiscal Year
GA – General Assembly
NPS – Nonpoint Source
NRCS – USDA Natural Resources Conservation Service
SR – Southern Rivers
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
TMDL IP – Total Maximum Daily Load Implementation Plan
USDA – United States Department of Agriculture
VSMP – Virginia Stormwater Management Program
VNRCF – Virginia Natural Resources Commitment Fund
WIP – Watershed Implementation Plan
WQIF – Water Quality Improvement Fund

APPENDIX I. Summary of Targeted TMDL Implementation

Summary of Targeted TMDL Implementation from July 1, 2010 to June 30, 2011 for TMDL Watersheds

Name of TMDL Watershed	LE-1T	LE-2T	RB-1	RB-2	RB-3	RB-4	RB-4P	RB-5	SL-1	SL-6	SL-6T	SL-7T	SL-8B	WP-2T	WP-3	WP-4	WP-4B
	Linear FT	Linear FT	system	system	system	system	system	system	Acres	Linear FT	Linear FT	Acres	Acres	Linear FT	system	system	system
Beaver Creek and Little Creek	2,500		37		7	2	3						212				
Big Otter River Watershed	48,287	2,850		1	3	15	7	1									
Blackwater River										2,850							
Bluestone River	2,210																
Carter Run, Great Run, Deep Run and Thumb Run	62,907		67		10	3	1										
Christians Creek and South River Watersheds	4,275	2,701							29			1	448				
Cooks Creek and Blacks Run	3,150		2					2					173			1	
Cub Creek, Turnip Creek and UT to Buffalo Creek	13,700																1
Mill and Dodd Creeks	2,316		7		1												
Falling River	41,800									6,600		19		14,700			
Flat, Nibbs, Deep and West Creeks	7,589									415					1		
Hawksbill Creek and Mill Creek	7,813	700	56		24	3	3										
James River (Slate River) Watershed			11														
Looney Creek	15,911		6		2	1	1									1	
Lower Blackwater River, Maggodee and Gills Creek	14,708		8		1	1											1
Middle River Watershed	3,230	7,290							36				297		1		
Mossy Creek, Naked Creek and Long Glade Run									30				59			1	
Opequon Creek Watershed	2,206								160				342				
Pigg River and Old Womans Creek Watersheds	26,575	1,784												8,728		2	3
Smith Creek Watershed											4,522		87				
Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek	20,842	1,700															
Twitty's and Ash Camp Creeks	3,085																
Upper Clinch River	7,733																
Upper Hazel River	8,112	1,871	8		4	5	1	1	14					4,077			
Upper Nottoway River Watershed	4,310																
Willis River Watershed	10,350		10		3	1	1										
Total	**313,609**	**18,896**	**212**	**1**	**55**	**31**	**17**	**4**	**269**	**9,865**	**4,522**	**21**	**1,619**	**27,505**	**1**	**6**	**5**

Line:

Indicates projects were 319(h) funds were spent.

Indicates projects funded only by State funds for Agricultural BMPs


DCR
Virginia Department of Conservation & Recreation