

**REPORT OF THE DEPARTMENT OF CONSERVATION AND  
RECREATION**

**2009 FEDERAL CLEAN WATER ACT SECTION 319  
NONPOINT SOURCE POLLUTION MANAGEMENT  
PROGRAM ANNUAL REPORT**

**and**

**2009 PROGRESS REPORT ON THE ‘CHESAPEAKE  
BAY AND VIRGINIA WATERS CLEANUP PLAN’  
(Through 06/30/2009)**

**SUPPLEMENT: TMDL WATERSHED  
IMPLEMENTATION PROGRESS SUMMARY**



**COMMONWEALTH OF VIRGINIA  
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# TABLE OF CONTENTS

## EXECUTIVE SUMMARY

### INTRODUCTION: NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

Nonpoint Source pollution Management Program .....	i
Federal Clean Water Action – Section 319 – Nonpoint Source Pollution .....	i
Chesapeake Bay and Virginia Waters Clean-up and Oversight Act of 2006 ( HB1150).....	i
Virginia Water Quality Improvement Act of 1997 (WQIF).....	ii
Summary and Content of the 2009 VA NPS Management Program Annual Report .....	iii

## 2009 SUPPLEMENTAL REPORT: TMDL IMPLEMENTATION PROGRESS SUMMARY

### CHAPTER 1: TMDL IMPLEMENTATION PROGRAM SUMMARY REPORT

Background of TMDL Implementation Program.....	01
Summary of 2009TMDL Implementation Program .....	02
TMDL Implementation Plans.....	05
Watershed Restoration and TMDL Implementation.....	06
History of TMDL Implementation .....	06
Funding of Implementation.....	09
BMP Implementation and Pollution Reductions.....	10
WQIF Targeted TMDL Projects .....	10
Federal Section 319 Projects .....	11
Water Quality Improvements, Watershed Restoration, Delisting and Success Stories .....	13
Measurable Environmental Results .....	13
Water Quality Improvements .....	14
Delistings.....	14
Success Stories.....	14

### CHAPTER 2: PROGRESS REPORTS FOR FEDERALLY FUNDED TMDL IMPLEMENTATION PROJECTS

Background .....	16
TMDL Implementation Progress Reports	
Willis River TMDL Implementation Project: July 2005-June 2009 .....	17
Catocin Creek TMDL Implementation Project: July 2004 – June 2009 .....	20
Lower Blackwater River TMDL Implementation Project: 2006- June 2009 .....	22
Cooks Creek and Blacks Run TMDL Implementation Project: 2006- June 2009 .....	23
Big Otter River TMDL Implementation Project: 2006-June 2009 .....	25
Thumb, Deep, Carter and Great Runs TMDL Implementation Project: 2006-June 2009 .....	26
Little and Beaver Creeks TMDL Implementation Project: 2007-June 2009 .....	27
Mill and Dodd Creeks TMDL Implementation Project: January 2007-June 2009 .....	28
Hawksbill Creek and Mill Creek TMDL Implementation Project: January 2008 – June 2009 .....	29

## 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 management program activities undertaken by DCR and cooperating agencies during 2008. These activities include nonpoint source pollution management program implementation, agricultural cost-share funding allocations and BMP implementation, support for other NPS programs, 2008 grant awards for nonpoint source programs and projects, and planned use of recent funding.

- In 2009 Virginia developed 7 implementation plans. Since 2000, Virginia has completed 39 TMDL implementation plans addressing 109 impaired stream segments and over 130 impairments. Currently Virginia is working on the development of an additional 6 implementation plans addressing 17 impaired stream segments.
- From January 1 – June 30, 2009, there were 11 active §319(h) funded implementation projects. Collectively these projects implemented 177 agricultural and residential best management practices (BMPs) that resulted in the reduction of 2.13 E+16 colony forming units (CFU) of fecal coliform bacteria, 1,358.42 pounds of nitrogen, 214.98 pounds of phosphorous, and 127 tons of sediment.
- In July 2006, 17 additional TMDL implementation projects were started, utilizing State funding for agricultural practices. From July 1, 2008 – June 30, 2009 these projects implemented 111 agricultural BMPs that resulted in the following 'edge of field' pollution reductions: 34,249.1 lbs/year nitrogen, 4,287.16 lbs/year phosphorous and 480.85 tons sediment.
- No Discharge Zones (NDZs) are federally designated areas where the current prohibition on the discharge of untreated sewage from boats is extended to include discharge of any sewage, regardless of treatment status. The 2009 Virginia General Assembly adopted HB 1774, which resolves that Virginia seek this designation for all its tidal Bay tributaries.
- Land conservation and preservation has been a major endeavor. Protecting land, particularly riparian lands, is a critical element of Virginia's Chesapeake Bay Tributary Strategies and will help restore and protect waters. In 2006 the Commonwealth set an ambitious goal of protecting 400,000 acres by 2010. As of December 16, 2009, 384,899 acres have been permanently preserved, leaving 15,101 acres remaining. The Bay watershed in Virginia is 18.46% permanently protected, as of June 30, 2009.
- The Virginia Department of Mines, Minerals and Energy (DMME) reclaimed 240 acres of abandoned coal mine land, 5 acres of abandoned mineral mine land, restored 1,700 feet of stream, revegetated over 7 acres of mine spoil, removed over 25 tons of trash and planted 20,000 trees. Remaining efforts reclaimed 2100 acres of mine land and planted 979,000 trees.
- As of 2008, 92 free-flowing segments have been approved by EPA for de-listing from the list of Consent Decree waters. Six segments were nominated for delisting in 2006 and 2008. Water quality monitoring by DEQ is indicating that water quality is improving in a number of streams where TMDL targeted implementation is ongoing in the watershed.
- In early October, 2009 Governor Kaine highlighted the adoption of enhanced stormwater regulations by the Virginia Soil and Water Conservation Board. The new regulations are expected to reduce the impact of polluted runoff from newly developed land into the waters throughout the Commonwealth. The Virginia Soil and Water Conservation Board (VSWCB), through DCR staff, recently completed a number of regulatory actions to amend and modify the Virginia Stormwater Management Program (VSMP) Permit Regulations.

## INTRODUCTION: NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

### ***Nonpoint Source Pollution Management Program***

Virginia's Nonpoint Source (NPS) Pollution 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 and bays by promoting and funding state and local watershed planning efforts, stream and wetland restoration and protection, education and outreach, and other measures to reduce, prevent and track NPS pollution reduction 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 Nonpoint Source Pollution Management Program.

### ***Federal Clean Water Act – Section 319 – Nonpoint Source Pollution***

Section 319 of the 1987 Federal Clean Water Act requires that states develop and implement NPS pollution management programs. Section 10.1-104.1 of the Code of Virginia designates the Virginia Department of Conservation and Recreation (DCR) as the lead agency for the Commonwealth's NPS pollution management programs. This section assign responsibility to DCR for the distribution of assigned funds, identification and establishment of priorities of NPS related water quality problems, and the administration of an NPS advisory committee. A decade ago, the Environmental Protection Agency (EPA) approved Virginia's Nonpoint Source Pollution Management Program Plan. This Plan summarizes the State's effort to prevent and control NPS pollution. The 1999 plan identifies programs and initiatives to achieve long-term statewide NPS goals. The Program utilizes partnerships to advance long and short-term goals for the reduction of nonpoint source pollution; through financial, technical, and outreach assistance, and local capacity building to achieve specific nonpoint source pollution control targets. The original plan was intended to provide five-year achievable goals and activities, updated at five year intervals. As of 2007 the plan had not been updated and was very out of date; as a result DCR began to evaluate the need to update the 1999 plan to make it more relevant to current NPS activities and priorities.

It was determined that 2006 state legislation (House Bill 1150) directing the Commonwealth to develop a plan to address water quality impairments and protect the waters of the commonwealth from further degradation was sufficient in addressing NPS activity in Virginia and could be utilized to fill the need for an updated NPS Pollution Management Plan. In fact, it was decided that the new legislation "Chesapeake Bay and Virginia Waters Clean-up Plan" referenced in the following section should serve as the Commonwealth's NPS plan. During 2008, Virginia officially adopted the "Chesapeake Bay and Virginia Waters Clean-up Plan" as the Commonwealth's NPS Pollution Management Plan update. In 2009 DCR continued to work with the US Environmental Protection Agency (EPA) to recognize the Cleanup Plan as the Commonwealth's official 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 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 the U.S. Environmental Protection Agency. Subsequently the plan also addresses the protection of water resources not yet impaired by pollution. The resulting "Chesapeake Bay and Virginia Waters Clean-Up 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 General Assembly in 2007. The plan is updated ever year and was last updated in June 2008. A progress report is produced annually as well; the latest status report was submitted on December 31, 2009 by L. Preston Bryant, Jr., Secretary of Natural Resources of the Commonwealth of Virginia to members of the General

## **Virginia's 2009 NPS Annual Report (Final December 2009)**

Assembly of Virginia. It should be noted that this plan is very comprehensive in nature and actually 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 and as noted the above section on the CWA Section 319 program, the relevant portions of Clean-up plan are now considered Virginia's Nonpoint Source Pollution Management 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 General Assembly 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 principal 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"; 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 Water Quality Improvement Act, 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 2009 Virginia NPS Pollution Management Program Annual Report***

The 2009 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. As stated previously, Virginia has a NPS planning document call the "Chesapeake Bay and Virginia Waters Clean-up Plan" that has progress reports and strategy updates submitted to the Virginia Commonwealth General Assembly on an annual basis. It should be noted that the Chesapeake Bay and Virginia Waters Clean-up Plan (CBVWCP) is a comprehensive planning document that outlines the Commonwealth's strategy for cleaning up, restoring and protecting Virginia's waters from nonpoint source and point source issues. Although it was not developed based on EPA guidance, the Clean-Up Plan effectively supersede and updates the Commonwealth's NPS Management Plan. During 2009, Virginia worked with EPA Region 3 to formally adopt this plan as the Commonwealth's NPS Management Plan. Although final approval by EPA has not yet been granted, the annual NPS report requirement will be fulfilled by the annual progress report for the *Chesapeake Bay and Virginia Waters Clean-up Plan*. The latest status report was submitted on December 131 2009 by L. Preston Bryant, Jr., Secretary of Natural Resources of the Commonwealth of Virginia to members of the General Assembly of Virginia. For the 2009 NPS Management Program Annual Report, the above referenced progress report on the "Chesapeake Bay and Virginia Waters Clean-up Plan" has been submitted separately. Please note that the Cleanup Plan report, in its entirety contains references to point sources and air quality. Though the entire report is included in this NPS report, only the pertinent nonpoint elements of the Cleanup Plan report are serving as Virginia's NPS Annual Report. Contained in this report is a summary of activities in core program areas of the Chesapeake Bay and Virginia Waters Clean-up Plan and NPS Management Plan. The second part of the NPS Annual report is a supplement describing the progress made in TMDL Implementation. This report is a comprehensive summary of the activities accomplished by the Commonwealth in TMDL implementation plan development and implementation

## 2009 SUPPLEMENTAL REPORT: TMDL IMPLEMENTATION PROGRESS SUMMARY

### 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, the development of implementation plans (IPs) and the implementation of TMDLs through watershed restoration. In February 2007, the Department of Environmental Quality (DEQ), in cooperation with the Department of Conservation and Recreation (DCR) and the Department of Mines, Minerals and Energy (DMME), released a report describing the 6-year progress, issued March 2007, of TMDL development, implementation plans and the application of best management practices in Virginia's TMDL program. The report is available on DEQ's website at: <http://www.deq.virginia.gov/tmdl/pdf/06prgrpt.pdf>.

To meet the NPS Annual Reporting requirement for 2009 and to summarize the activities from January 1, 2009 through June 30, 2009; DCR has developed this *TMDL Implementation Program Summary Report*. This report summarizes the successes and accomplishments of the TMDL program, focusing on the first half of 2009. Additional information regarding this program can be found in Appendix 2 which contains case studies of the Section 319 funded TMDL implementation projects; summarizing their progress from conception through June 30, 2009.

#### ***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 Total Maximum Daily Loads, or TMDLs.

The goal of Virginia's Total Maximum Daily Load (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 implementation plans (IP) 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>.

TMDLs are required for water bodies that are determined to be impaired. In general, TMDL development is required under Section 303(d) of the Federal Clean Water Act and the U.S. Environmental Protection Agency's (EPA) Water Quality Planning and Management Regulations (40 CFR Part 130). The Virginia TMDL program is also governed by a federal court Consent Decree that lays out a schedule for TMDL development through 2010 for waters identified as impaired as of 1998. For all other water bodies, TMDL development will be scheduled within 8-12 years of finding the water body impaired. Upon completion of a TMDL usually a TMDL Implementation Plan is developed and then upon completion of that plan implementation can begin.

## ***Summary of 2009 TMDL Implementation Program***

In 2009, DCR and DEQ, along with other agency and non-agency partners, continued to develop TMDLs and TMDL implementation plans and to implement these plans throughout Virginia. As a result of the work of these agencies Virginia has developed 7 implementation plans (IPs) since June 30 2009. Since 2000 Virginia has completed 39 TMDL IPs addressing 109 impaired stream segments and 130 impairments. In addition IPs are in progress for an additional 6 plans addressing 17 stream segments and 16 impairments. In addition, to date and as a result of the program water quality conditions are improving in 30 stream segments and 7 stream segments have either been delisted or are candidates for delisting due to TMDL activities.

From January 1 – June 30, 2009, there were 11 active §319(h) funded implementation projects. Collectively these projects implemented 177 agricultural and residential best management practices (BMPs) that resulted in the reduction of 2.13 E+16 colony forming units (CFU) of fecal coliform bacteria, 1358.42 pounds of nitrogen, 214.98 pounds of phosphorous, and 127 tons of sediment.

In July 2006, 17 additional TMDL implementation projects were started, utilizing State funding for agricultural practices. From July 1, 2008 – June 30, 2009 these projects implemented 111 agricultural BMPs that resulted in the following 'edge of field' pollution reductions: 34,249.1 lbs/year nitrogen, 4,287.16 lbs/year phosphorous and 480.85 tons sediment.

During 2009 DEQ, DCR and their partners have been very busy developing TMDL plans/studies, developing TMDL implementation plans and then making sure the implementation plans are initiated and BMPs are installed. Figures I-1 and I-2 shows further detail in the progress of TMDL implementation plan development as well as implementation. In almost all cases, watersheds that have a completed implementation plan have current and active TMDL implementation projects on-going. In some specialized cases, TMDL implementation is active even if the implementation plan is under development.

Figure I-1: Status of TMDL Implementation Status in Virginia

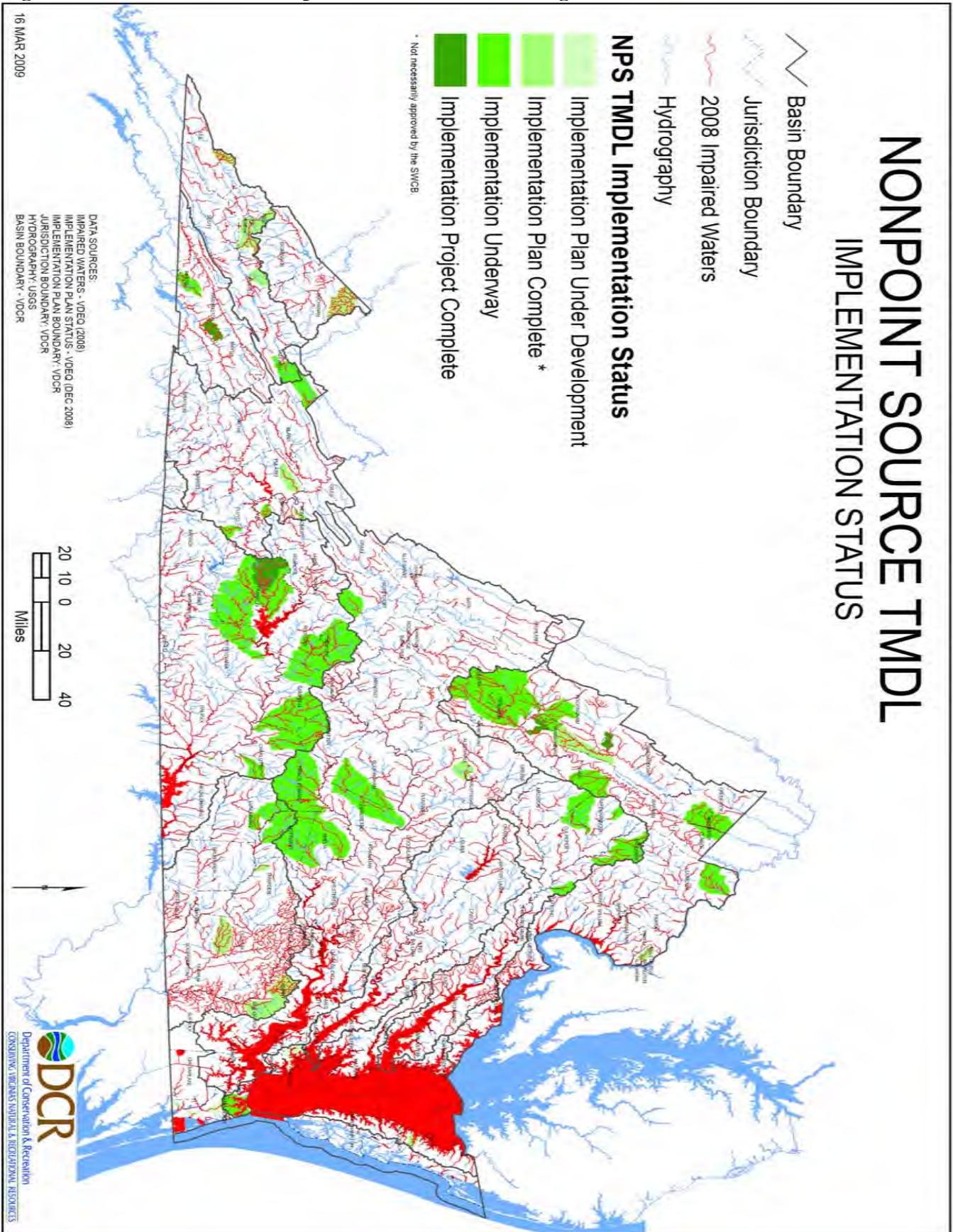
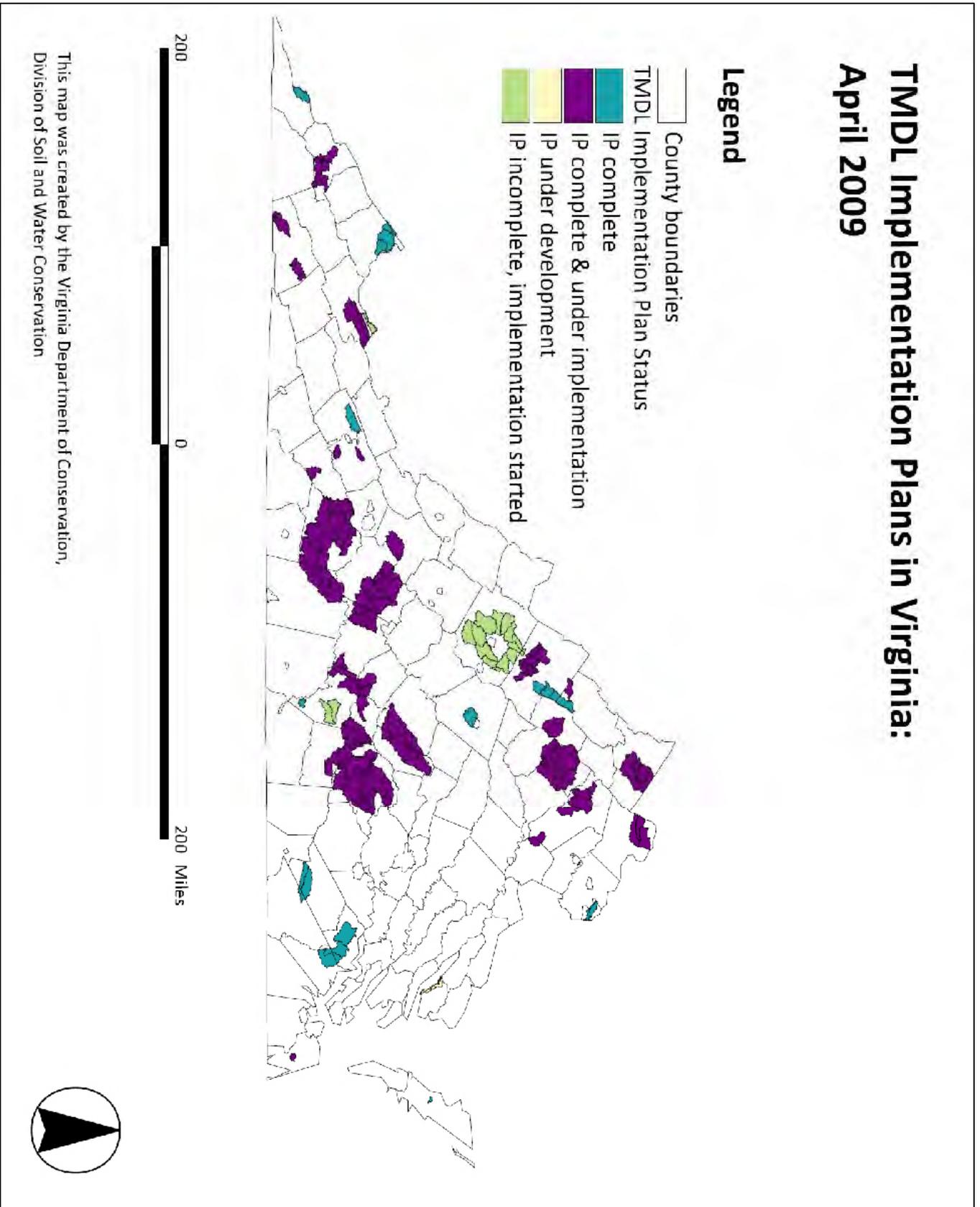


Figure I-2: Status of TMDL Implementation Plan Development in Virginia



### ***TMDL Implementation Plans***

Once the TMDL is developed the report is submitted to EPA for approval. Virginia state law (1997 Water Quality Monitoring, Information, and Restoration Act (§62.1- 44.19:4 through 19:8 of the Code of Virginia), or WQMIRA, requires the development of a TMDL implementation plan (IP) after a TMDL is developed and approved. There is not a mandated schedule for IP development; however local or state agencies, as well as community watershed groups, can take the lead in developing TMDL IPs. The IP describes the measures that must be taken to reduce pollution levels in the stream, and includes a schedule of actions, costs, and monitoring. DCR and DEQ have both worked on the development of approved IPs. In 2009 DCR and DEQ completed 7 implementation plans covering 25 impaired segments and have drafts ready for an additional 3 implementation plans covering 8 impaired segments. To date 39 IPs have been completed, covering over 109 TMDL segments and 130 impairments. During 2009, DCR along with DEQ staff, have been working on an additional six TMDL implementation plans; which cover 12 segments (Table I-1), this includes the 3 IPs that were in draft form at the time of this report and analysis. It is anticipated that most of these will be completed or will be under development by December 31, 2009.

Virginia's 2009 NPS Annual Report (Final December 2009)

**Table II: Summary of Completed Implementation Plans (IP)**

Watershed (# of impaired segments)	Location	Impairment	Lead	Complete
Middle Fork Holston (3)	Washington Co.	Bc	DCR	2001
North River (Muddy, Lower Dry, Pleasant, & Mill Creek) (4)	Rockingham Co.	Bc, Be, NI	DCR	2001
Upper Blackwater River (4)	Franklin Co	Bc	DCR	2001
Catoctin Creek (4)	Loudoun Co.	Bc	DCR	2004
Holmans Creek (2)	Shenandoah Co.	Bc, Be	DCR	2004
Four Mile Run (1) *	Arlington & Alexandria	Bc	DEQ	2004**
Willis River (1)	Cumberland & Buckingham	Bc	DCR	2005
Chowan Study Area (8)*	(Multiple counties)	Bc	DEQ	2005**
Moore's Creek (1) *	Charlottesville, Albemarle Co.	Bc	DEQ	2005**
Guest River (5) *	Wise, Scott, Dickenson	Be	DEQ	2005**
Lower Blackwater, Maggoddee & Gills Creek (3)*	Franklin Co.	Bc	DCR	2005
Lynnhaven (Shellfish) (1)*	VA Beach	Bc, Be	DEQ	2005**
Cooks Creek and Blacks Run (4)	Rockingham Co., City of Harrisonburg	Bc, Be	DCR	2006
Thumb, Deep, Carter & Great Runs (4)	Fauquier and Stafford Counties	Bc	DCR	2006
Big Otter (5)	Bedford & Campbell Co.	Bc	DCR	2006
Dodd Creek and Mill Creek (2)	Floyd & Montgomery Co.	Bc	DCR	2006
Little Creek and Beaver Creek (3)	Bristol, Washington Co.	Bc, Be	DCR	2006
Stroubles Creek (1) *	Montgomery Co	Be	DEQ	2006**
Back Creek (2) *	Pulaski Co.	Bc, Be	DEQ	2006/07* *
Abrams & Opequon Creek (5)*	Frederick Co. & Winchester	Bc, Be	DEQ	2006**
Knox & PawPaw Creek (2) *	Buchanan Co.	Bc, Be	DEQ	2007**
Hawksbill & Mill Creek (2)	Page Co.	Bc	DCR	2007
Looney Creek (1)	Botetourt Co.	Bc	DCR	2007
Upper Clinch River (1)	Tazewell Co	Be	DCR	2008**
Occahannock Creek (Shellfish) (1)	Accomack	BC	DCR	2008 CNP
Falling River (1)	Campbell and Appomattox	Bc	DCR	2008**
Dumps Creek (1)*	Russell Co.	TSS,TDS	DEQ	2008**
Bluestone River (1)	TazewellCo. & Bluefield	Bc, Be (Sed)	DCR	2008**
Smith Creek (1)*	Rockingham & Shenandoah Co.	Bc, Be (Sed)	DEQ	2008**
Appomattox River - Spring Creek, BrieryCreek, Bush River, Little Sandy River and Sayers Creek (5)	Prince Edward and Amelia Co.	Bc	DCR	2008**
Appomattox River - Flat, Nibbs, Deep and West Creeks (4)	Amelia and Nottoway Co.	Bc	DCR	2008**
Straight Creek and Tributaries (3)	Russell Co.	Bc, Be (sed)	DEQ	2009
Long Glade Run, Mossy Creek, and Naked Creek (3)	Augusta and Rockingham Co.	Bc Be (sed),	DCR	2009
Greenvale Creek, Paynes Creek (2), and Beach Creek), (shellfish)	Lancaster Co.	Bc	DCR	Draft
Ash Camp Creek, Twitty's Creek (2)	Charlotte Co.	Be	DCR	Draft
Upper Middle R.r, Lower Middle Rr., Moffett Cr, Polecat Cr (4).	Augusta Co.	Bc, Be (sed)	DCR	Draft
Back Bay Watershed (1)*	Virginia Beach	Bc	DEQ	2009
North Landing Watershed (2)*	Virginia Beach	Bc	DEQ	2009
Pigg River and Old Womans Creek (8)	Franklin, Henry and Pittsylvania Counties	Bc	DEQ	2009
Cub, Turnip, Buffalo and UT Buffalo Creeks (4)	Appomatox and Charlotte Counties	Bc	DCR	2009
Hazel River Watershed (4)	Culpepper, Madison and Rappahannock	Bc	DCR	2009
<b>TOTAL IPs Completed = Plans (33), Segments (90), impairments (106). In addition 3 IPs are in draft form that cover 9 impaired segments. [ Bc=Bacteria, Be = Benthic, Ni= Nitrogen], TSS=Total Suspended Solids, TDS=Total Dissolved Solids, Sed=Sediment</b> Note: All IPs were funded by §319(h), except those done in-house by either DCR or DEQ, indicated by a (*). For all completed IPs, except those indicated with (**), implementation is being partially or fully funded by Section 319(h) funds.				

## ***Watershed Restoration and TMDL Implementation:***

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, through TMDL implementation plans, that result in watershed restoration and increased water quality improvements and delisting of impaired stream segments. Virginia uses a staged approach which 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.

### ***History of TMDL Implementation Program***

The history of TMDL implementation in Virginia dates back seven years ago when DCR started three pilot TMDL implementation projects: North Fork (Cedar Creek, Pleasant Run, Mill Creek and Lower Dry River), Middle Fork Holston River (Three Creeks), and the Upper Blackwater River. Since that time DCR has started another 12 projects with Section 319 funds and 17 projects with state funding. In addition several other projects have been initiated throughout Virginia using other sources of funds other than Section 319 or State WQIF cost-share. Today there are more than 23 active TMDL Implementation Projects.

**§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 following watersheds: Upper Blackwater River, Middle Fork Holston River, and North River. The first two projects ended in 2007 after 6 years. The North River finished in August 2008 (after over 7 years). To keep the momentum going for implementation activities DCR started additional projects over the years, including: two projects in 2004 (Catoctin Creek and Holmans Creek), one project in 2005 (Willis River), four projects in 2006 (Lower Blackwater River, Cooks Creek & Blacks Run, Big Otter River, and Thumb, Deep Carter and Great Runs), 2 projects in 2007 (Little and Beaver Creeks and Mill and Dodd Creeks), one project in 2008 (Hawksbill and Mill Creeks), and two projects in 2009 (Looney Creek and Upper Hazel River). 2008 was the last year of implementation for both the North River project as well as Holmans Creek. 2009 will be the last year of federal 319 funding for the Catoctin Creek project which will have completed its 5.5 years in December 2009.

For the most part these projects are funded with Section 319 federal funds. However several of these projects have 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 Virginia Natural Resource Commitment Funds (VNRFCF) to augment federal 319 funds to be used for the installation of agricultural BMPs. In 2009 a total of 11 projects are being implemented using Federal 319 funds; of these projects four of the projects (Big Otter, Little and Beaver Creeks, Lower Blackwater River and Hazel River) are receiving some state WQIF money to fund their agricultural practices. DCR is moving in the direction that eventually all agricultural practices for TMDL Implementation projects will be funded using non-319 sources (state cost-share, USDA/NRCS, private funds, etc.) and that 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 Water Quality Improvement Fund (WQIF). These projects were the start of the state's "WQIF Targeted TMDL" program. These projects are progressing with adequate installation of BMPs related to the TMDL studies. Currently these projects only receive consistent funding for agricultural practices through the state cost-share program. However several of these projects have also received grant funds to work on urban and septic issues. In 2009 DCR included a project in its Section 319 application to EPA that provides a source of consistent funding for residential septic BMPs, pet waste programs as well as some urban BMPs. With the current state budget crises DCR is unsure if it is wise to start up a new residential implementation program. This will be evaluated in fall of 2009 to determine if new residential septic programs will be started in 2010. 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.

As of June 2009, the program consists of 39 organized implementation projects funded through a variety of federal, state, local and non-profit sources (Table I-2).

**Virginia's 2009 NPS Annual Report (Final December 2009)**

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

Watershed Area	TMDL Segment	Status	Year Implementation	Lead Agency	Funds Used
<b>A. Projects 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.</b>					
1. Middle Fork Holston River	VAS-O05R	MI	2001-2007	DCR	\$319(h)
2. Upper Blackwater River	LAW-L08R	SI	2001-2007	DCR	\$319(h)
3. North River	VAN-B21R, B22R, B27R & B29R	I	2001-2008	DCR	\$319(h)
4. Holmans Creek	VAV-B45R	SI	2005-2008	DCR	\$319(h)
<b>B. Projects are being funded by Federal 319(h) as well as State VNRFC administered by DCR (for select projects)</b>					
1. Catoctin Creak	VAN-A-02R	I	2005-2009	DCR	\$319(h)
2. Willis River	VAC-H36R	I, D(3)	2005-2010	DCR	\$319(h)
3. Lower Blackwater River	VAW-L09R, L10R and L11R	SI, CFD (2008)	2006-2011	DCR	\$319 & VNRFC
4. Cooks Creeks & Blacks Run	VAV-B25R & B26R	TETD	2006-2011	DCR	\$319, WOIF, NFWF
5. Thumb, Great, Carter & Deep Runs	VAN-E01R, E02R & E10R	TETD	2006-2011	DCR	\$319(h) & VNRFC
6. Big Otter River	VAW-L23R, L25R, L27R, & L28R	I, CFD, D2008	2006-2011	DCR	\$319 & VNRFC
7. Mill and Dodd Creeks	VAW-N20R & N21R	TETD	2007-2012	DCR	\$319 & VNRFC
8. Little and Beaver Creeks	VAS-O07	TETD	2007-2012	DCR	\$319 & VNRFC
9. Hawksbill and Mill Creeks	VAN-B38R, B39R	TETD	2008-2012	DCR	\$319(h)
10. Looney Creek	VAW-I26R	TETD	2009-2013	DCR	\$319 & VNRFC
11. Hazel River	VAN-E03R, E04R, E05R	TETD	2009-2013	DCR	\$319, WOIF RFP, NFWF & VNRFC
<b>C. Projects have received some WOIA RFP funds (and other funds as well)</b>					
1. Moore's Creek	VAV-H28R	TETD	2005+	N/A	RFP
2. Guest River	VAS-P11R	TETD	2005+	N/A	RFP
3. Stroubles Creek	VAW-N22R	TETD	2006+	N/A	RFP
<b>D. Projects are not receiving designated funding from DCR</b>					
1. Four Mile Run	VAN-A12R	D	N/A	DEQ	OTHER
2. Middle Creek/Tazewell County	VAS-P03R	D 2006	N/A	DMME	OTHER
3. Quail Run/Rockingham County	VAV-B35R	D 2005	N/A	DEQ	OTHER
4. Lynnhaven (Shellfish)	VAT-V08E	D/SFB 2008	2005-2008	VA Beach	OTHER
5. Smith Creek	VAV-1347R	TETD	2008+	DEQ/DCR	NFWF, NRCS, \$319
6. Back Creek	VAW-N22R	TETD	2008+		OTHER
7. Knox and Paw Paw Creek	VAS-Q03R	TETD	2008+		OTHER
8. Occahannock Creek	VAT-C13E	TETD	2008+	DCR	OTHER
9. Dumps Creek	VAS-P08R	TETD	2008+		OTHER
10. Back Bay Watershed	VAT-K41R	TETD	2008+	DEQ	OTHER
11. North Landing River	VAT-K41R	TETD	2008+	DEQ	OTHER
12. Straight Creek and Tributaries	VAS-P20R	TETD	2009+		OTHER
13. Grennvale, Paynes, and Beach Creeks	VAP-E25E	TETD	2009+	DCR	OTHER
<b>E. Projects are receiving some WOIF / VNRFC funds (and other funds as well)</b>					
1. Chowan Study Area	VASC-K14R,	TETD	2005-2009+ (Ag)	DCR	WOIF/VNRFC
2. Falling River	VAW-L34R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
3. Mossy & Naked Creeks, Long Glade Run	VAV-B19R, B24R, B28R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
4. Pigg River (Blue Ridge SWCD)	VAW-L14R, L15R, L16R, L17R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
5. Pigg River (Pittsylvania SWCD)	VAW-L13R, L17R, L18R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
6. Twittys and Ash Camp Creeks	VAC-L39R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
7. Abrams & Opequeon Creeks	VAV-B08R & VAV-B09R	TETD	2006+	DCR/DEQ	WOIF/VNRFC, RFP
8. Cub, Turnip and Buffalo Creek	VAC-L36R, L37R, L40R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
9. Appomattox: Flat, Nibbs, Deep, West Creeks	VAP-J08R, J09R, J11R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
10. Moffett Creek, Middle River, Polecat Draft	B10, B13, B15	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
11. Christians Creek & South River	B14, B30	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
12. Upper Clinch River	VAS-P01R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
13. Bluestone River	VAS-N36R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC
14. Appomattox: Briery, Little Sandy, Spring, Sayers Creeks and Bush River	VAC-J02, J03, J04, J05 and J06R	TETD	2007+ (Ag only)	DCR	WOIF/VNRFC

**TOTAL IP implemented 36, under implementation w/ 319 funds 15, implemented with WOIF 14, Not implemented or implemented with other funds 8, (319\*) = One-time 319 Base Project TETD=To early to determine, I=Improvement, SI=Some improvement, MI=Moderate Improvement, NI= No Improvement, D=Segment Delisted, CFD=Segment candidate for delisting, SFB= Shellfish beds were reopened, NFWF=National Fish and Wildlife Fund grant, NRCS – USDA Natural Resource Conservation Service, VNRFC=Virginia Natural Resource Commitment Fund**

## Virginia's 2009 NPS Annual Report (Final December 2009)

### ***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 to work with landowners by providing technical assistance for 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 provided resources from the Water Quality Improvement Fund and the Virginia Natural Resources Commitment Fund. All together in Virginia fiscal year 2009 (July 1, 2008 thru June 30, 2009), the Virginia Cost-share program provided cost-share assistance to install 8,848 BMPs and issued cost-share payments totaling over \$23 million of state and grant funding). Total BMP costs (including farmer match) were over \$31 million (Table I-3).

Table I-3 : Summary of Virginia Cost-Share BMP Implementation by Soil and Water Conservation District

### All BMPs To Date - by Funding Program

Program Year - 2009

July 1, 2008 - June 30, 2009

District	# of people	Number of Completed BMPs	Number of Cancelled BMPs	Number of Pending BMPs	Estimated BMP Cost*	Total BMP Cost*	State Cost Share Payment	Tax Credit Amount Issued*	Other Cost Share Funding Amount*
APPOMATTOX RIVER	19	117	0	53	\$434,641.30	\$434,015.95	\$166,223.82	\$11,569.24	
BIG SANDY	11	11	0	0	\$28,480.00	\$28,870.98	\$4,493.24		\$2,000.00
BIG WALKER	44	186	0	0	\$333,830.95	\$263,733.95	\$161,318.59	\$6,526.87	
BLUE RIDGE	62	206	0	0	\$777,930.46	\$730,451.57	\$474,864.09	\$8,272.06	\$25,872.25
CHOWAN BASIN	78	913	0	623	\$1,270,977.99	\$1,028,171.05	\$542,632.53	\$103,074.68	\$39,004.00
CLINCH VALLEY	37	110	0	0	\$1,166,554.89	\$1,079,054.33	\$136,008.66	\$85,103.37	\$385,069.20
COLONIAL	31	336	0	125	\$312,034.64	\$325,659.23	\$262,606.30		
CULPEPER	109	241	0	2	\$1,139,647.20	\$1,201,647.17	\$732,799.23	\$34,759.09	\$34,432.84
DANIEL BOONE	48	145	0	0	\$560,637.15	\$512,321.30	\$93,144.01	\$6,013.08	\$244,726.48
EASTERN SHORE	68	398	0	639	\$792,638.60	\$872,559.55	\$553,373.39	\$33,122.41	\$23,353.00
EVERGREEN	41	96	0	0	\$886,246.36	\$985,785.73	\$140,900.99	\$42,116.96	\$736,560.00
HALIFAX	31	40	0	0	\$437,142.36	\$392,362.61	\$275,370.82	\$9,816.03	\$13,047.00
HANOVER-CAROLINE	39	152	0	373	\$646,996.37	\$667,973.60	\$1,682,408.76	\$16,063.43	\$3,659.00
HEADWATERS	130	483	1	38	\$1,920,877.60	\$1,904,784.40	\$602,023.62	\$58,016.68	\$584,418.79
HENRICOPOLIS	4	3	1	24	\$2,707.00	\$3,849.00	\$3,849.00		
HOLSTON RIVER	121	285	0	0	\$2,010,239.69	\$2,062,793.63	\$507,610.66	\$77,321.06	\$730,672.00
JAMES RIVER	10	56	0	0	\$57,946.20	\$58,710.35	\$57,892.03		
JOHN MARSHALL	57	115	0	0	\$735,947.21	\$772,974.23	\$416,096.65	\$37,658.64	\$30,483.00
LAKE COUNTRY	25	50	0	0	\$161,969.72	\$141,337.67	\$113,485.14	\$6,270.11	
LONESOME PINE	7	7	0	0	\$90,086.06	\$87,125.35	\$64,445.75	\$3,025.33	
LORD FAIRFAX	109	347	25	74	\$1,515,225.33	\$1,398,968.85	\$588,250.85	\$73,391.49	\$95,353.75
LOUDOUN	36	64	0	0	\$470,598.87	\$443,465.45	\$234,310.31	\$9,882.45	
MONACAN	12	31	4	4	\$354,281.22	\$324,256.36	\$395,499.78	\$20,127.13	
MOUNTAIN	29	101	0	0	\$427,841.10	\$472,382.35	\$158,661.43	\$6,875.62	\$77,466.00
MOUNTAIN CASTLES	19	52	0	3	\$221,161.28	\$270,192.51	\$61,747.44	\$17,688.05	\$74,723.63
NATURAL BRIDGE	44	111	0	0	\$420,758.63	\$444,365.58	\$194,509.77		\$84,087.00
NEW RIVER	64	333	0	0	\$896,509.26	\$919,027.82	\$267,566.88	\$11,369.82	\$276,431.00
NORTHERN NECK	55	242	22	181	\$612,374.42	\$561,522.13	\$441,866.30		\$7,964.00
PATRICK	30	109	0	0	\$233,584.51	\$226,674.95	\$148,448.02	\$7,608.11	\$33,071.20
PEAKS OF OTTER	73	193	0	3	\$1,854,758.82	\$1,680,700.68	\$578,238.35	\$67,189.89	\$441,795.00
PEANUT	83	697	0	110	\$1,147,689.62	\$1,142,747.35	\$7,172,872.84	\$1,282,822.63	\$6,121.00
PETER FRANCISCO	41	108	0	0	\$645,593.78	\$569,935.82	\$253,285.97	\$32,348.21	\$87,489.00
PIEDMONT	48	258	50	8	\$1,246,593.38	\$1,304,439.72	\$492,879.29	\$44,794.23	\$293,007.00
PITTSYLVANIA	49	115	0	0	\$784,735.74	\$841,962.97	\$459,561.48	\$60,876.04	\$115,752.50
PRINCE WILLIAM	6	16	0	0	\$109,477.95	\$92,122.14	\$51,684.29	\$8,110.00	
ROBERT E LEE	49	109	22	22	\$676,767.75	\$609,298.90	\$351,232.96	\$18,939.76	\$144,402.22
SCOTT COUNTY	34	88	0	0	\$353,510.43	\$325,071.38	\$203,939.50	\$14,982.35	\$27,452.00
SHENANDOAH VALLEY	194	451	3	29	\$1,264,772.25	\$1,410,282.43	\$561,993.15	\$74,949.76	\$325,832.36
SKYLINE	39	92	0	0	\$1,069,266.31	\$1,062,125.75	\$377,949.63	\$80,786.85	\$170,737.85
SOUTHSIDE	36	42	0	0	\$592,243.16	\$572,852.16	\$284,226.82	\$43,494.70	\$103,283.61
TAZEWELL	25	54	0	0	\$641,300.32	\$781,787.44	\$221,206.00	\$22,912.02	\$204,549.44
THOMAS JEFFERSON	64	124	0	11	\$1,357,072.10	\$1,439,240.17	\$335,066.22	\$62,383.06	\$462,346.61
THREE RIVERS	67	242	140	697	\$555,629.80	\$619,194.97	\$389,899.53	\$178.16	\$7,510.00
TIDEWATER	32	724	46	246	\$22,317.09	\$266,715.04	\$146,872.85	\$1,538.88	\$3,851.40
TRI-COUNTY/CITY	53	235	104	47	\$265,647.00	\$244,252.72	\$167,720.81	\$5,268.01	
VIRGINIA DARE	18	69	0	74	\$176,272.08	\$190,366.15	\$167,650.75	\$2,784.38	
<b>TOTAL</b>	<b>2,232</b>	<b>8,848</b>	<b>396</b>	<b>3,364</b>	<b>\$31,006,746</b>	<b>\$31,158,834.54</b>	<b>\$21,347,455.34</b>	<b>\$2,491,090.88</b>	<b>\$5,752,121.91</b>

319 TMDL Targeted Projects: Prior to July 2006, the only targeted funding available for TMDL implementation in Virginia had been from EPA's 319 program. Incremental Section 319 funding is used to pay for agricultural, urban, and residential BMPs (such as failing on-site septic systems), technical assistance (provided through Soil and Water Conservation Districts and local Health Departments) and outreach/technology transfer. In 2005 approximately \$1.1 million was spent on 6 TMDL implementation projects. In 2006, over \$1.84 million was spent on TMDL implementation for 10 projects. In 2007 over \$1.83 million was spent on 12 TMDL Implementation projects. In 2008 over \$1,530,000 million Federal 319 funds were spent on 11 TMDL implementation projects. From January 1 – June 30, 2009 approximately \$ 1.1 million of Federal 319 funds were spent on 11 TMDL implementation projects. Due to the limited amount of §319(h) funds available, Virginia identifies and leverages other sources of funding to fully implement the TMDLs, especially with regard to agricultural BMPs. In July 2007 thru spring 2009 DCR allocated a total of over \$1.5 million of state WQIF funds years to fund agricultural cost-share practices of the above referenced Section 319 projects.

WQIF Targeted TMDL Projects: Starting in July 2006, DCR began targeting a portion of the Water Quality Improvement Fund (WQIF) agricultural cost-share funds to eight (8) Soil and Water Conservation Districts to fund 'WQIF Targeted TMDL' projects for and additional 46 impaired segments. Approximately \$4,822,500 was contracted to Districts for Agricultural BMP installation during state fiscal year 2006-2008, and it is anticipated that another \$2-3 million will be available through 2009. In addition, DCR allocated \$2 million (over 4 years) in state general funds to provide staff for these 8 districts to offer technical assistance to land owners in order to utilize the cost-share funds and get projects on the ground. From July 1, 2008 through June 30, 2009 \$ 1,294,617.10 was spent on agricultural cost-share BMPs using these special, targeted state funds. By utilizing other available funding, such as CREP [Conservation Reserve Enhancement Program (Federal - NRCS), the amount of Cost Share payments was almost doubled to \$ 2,496,368.00

### ***BMP Implementation and Pollution Reductions:***

The TMDL program and its partners work to achieve water quality standards by reducing pollution through installing the BMPs that are established in the implementation plan and the eventual de-listing of a particular stream. Documenting success and results is important for tracking progress. BMPs are effective and practical ways to prevent or reduce pollution from nonpoint sources to ensure water quality. They can range from repairing and/or installing septic systems, stream fencing, and planting riparian buffers. Hundreds of voluntary and government funded BMPs are also used throughout the watersheds. For the most part all projects were very successful in continuing their installation of BMPs.

### ***WQIF Targeted TMDL Projects:***

In 2006, 17 WQIF Targeted TMDL implementation projects were started, utilizing State funding. From July 1, 2006 – June 30, 2007 these projects implemented 23 agricultural BMPs that resulted in the following 'edge-of-field' pollution reductions: 210,091 lbs/year nitrogen, 42,113 lbs/year phosphorous and 38,620 tons/year sediment. From July 1, 2008 – June 30, 2009 these projects implemented 111 BMPS involving 83 farmers and that resulted in the following 'edge-of-field' pollution reductions: 34,249 lbs/year nitrogen, 4287.16 lbs/year phosphorous and 480.85 tons/year sediment (Table I-4).

**Virginia's 2009 NPS Annual Report (Final December 2009)**

Table I-4: WQIF Targeted TMDL Projects – Extent and Pollution Reduction July 1, 2008-June 30, 2009

<b>BMP</b>	<b># Practices Installed</b>	<b># of Farmers</b>	<b>Acres</b>	<b>Sediment Tons</b>	<b>Nitrogen Lbs</b>	<b>Phosphorous Lbs</b>	<b>\$ State Cost-share Spent</b>
FR-1	1	1	5	1.05	25.5	5.4	\$ 752.00
FR-3	1	1	128	45.12	563.13	10.03	\$ 1,118.00
LE-1T / SL-6	52	48	1501	373.56	14470.41	2752.52	\$ 802303.00
LE-2T							
SL-1	11	6	151	48.78	2093.42	66.33	\$ 24,884.00
SL-11				2	11	2	
SL-8B	16	9	596	0	4054.4	0	\$ 21,459.00
SL-8H	22	10	773	0	3583.35	0	\$ 26,124.00
WP-2 / WP-2T	4	4	34	6.42	248.82	47.33	\$ 2,412.00
WP-3							
WP-4	4	4	-	0	8980.8	1361.94	\$ 99,733.00
WP-4B							
<b>TOTAL</b>	<b>111</b>	<b>83</b>	<b>3208</b>	<b>480.85</b>	<b>34.249</b>	<b>4,287.16</b>	<b>\$978,783.00</b>

FR-1 Reforestation of Erodible Crop and Pastureland	SL-8H Harvestable Cover Crop
FR-3 Woodland Buffer Filter Area	WP-1 Sediment Retention, Erosion or Water Control Structures
LE-2T Livestock Exclusion with Riparian Buffers	WP-2A Streambank Stabilization
LE-2T Livestock Exclusion with Reduced Setback	WP-2T Stream Protection
SL-1 Permanent Vegetative Cover on Cropland	WP-3 Sod Waterway
SL-6 Grazing Land Protection	WP-4 Animal Waste Control Facility
SL-11 Permanent Vegetative Cover on Critical Areas	WP-4B Loafing Lot Management System
SL-8B Small Grain Cover Crop for NM	

Note: These values are reported “edge-of-field” numbers and not calculated/modeled ‘edge-of-stream’ or ‘stream loading’ numbers. These numbers are not consistent with the Chesapeake Bay Model.

***Federal Section 319 Projects.***

During 2009, there were 11 active §319(h) funded implementation projects. These projects utilized Federal 319 funds as well as State WQIF funds to implement agricultural, residential and urban BMPs. These TMDL implementation projects all achieved various levels of success in implementing BMPs, on-the-ground activities, and progress towards full implementation of their IPs to achieve the ultimate goal of delisting.

During the first 6 months of 2009, collectively these projects implemented 177 best management practices (BMPs), including 109 residential septic system practices and 68 agricultural practices. The implementation of these BMPs resulted in almost 116,682 feet of stream exclusion fencing excluding 1,462 animals from access to the stream. In addition these practices resulted in the establishment of almost 150 acres of riparian buffers (assuming 35 foot buffer).

## Virginia's 2009 NPS Annual Report (Final December 2009)

The BMPs installed in 2009 resulted in the reduction of 2.13E+16 colony forming units (CFU) of fecal coliform bacteria, 1358.42 pounds of nitrogen, 214.98 pounds of phosphorus and 127 tons of sediment. From the beginning of the implementation of these projects in 2005, these projects have accomplished the following pollution reductions: 3.80E+16 colony forming units (CFU) of fecal coliform bacteria, 9700.47 pounds of nitrogen, 2135.8 pounds of phosphorus and 745.28 tons of sediment. Table 1-5 summarizes the pollutant loads from BMPs funded by EPA's 319(h) federal funds and implemented during the years 2005 – June 2009.

Table I-5 Summary of Pollution Reductions by 319 TMDL Project 2005-2009

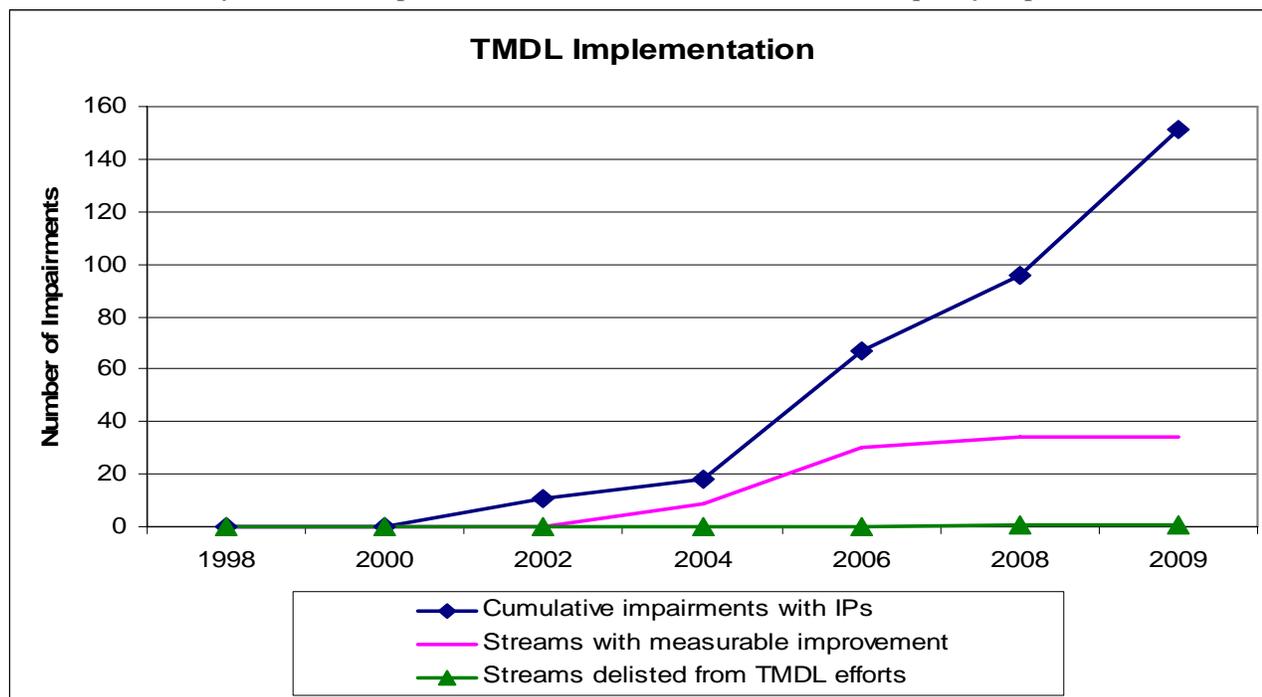
<b>Section 319 TMDL Implementation Projects – Pollution Reduction 2005 - 2009</b>						
<b>Pollution Reductions (edge of stream) January 1, 2005-June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Catoctin Creek TMDL Project	2005	3.15E+13	225.90	43.20	27.70	
	2006	1.07E+14	84.48	1.71	0.59	
	2007	5.40E+14	50.72	4.65	1.64	
	2008	7.19E+13	255.38	11.05	6.26	
	2009	1.24E+11	24.96	0.00	0.00	
	<b>Sub-Total</b>	<b>7.51E+14</b>	<b>641.44</b>	<b>60.62</b>	<b>36.20</b>	
<b>Pollution Reductions (edge of stream) March 1, 2006-June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Cooks Creek and Blacks Run TMDL Project	Mar-06	2.44E+11	851.46	79.31	50.82	
	2007	1.39E+11	1,742.14	346.65	210.71	
	2008	3.73E+10	988.56	171.11	104.01	
	2009	7.84E+14	714.27	135.53	80.95	
		<b>Sub-Total</b>	<b>7.85E+14</b>	<b>4,296.43</b>	<b>732.59</b>	<b>446.48</b>
<b>Pollution Reductions (edge of stream) July 1, 2006 - June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Big Otter River TMDL Project	Jul-06	9.35E+14	39.14	7.04	1.62	
	2007	4.78E+15	200.51	27.71	6.39	
	2008	5.03E+15	375.22	65.13	48.95	
	2009	3.13E+15	360.83	56.02	35.47	
		<b>Sub-Total</b>	<b>1.39E+16</b>	<b>975.70</b>	<b>165.89</b>	<b>92.44</b>
<b>Pollution Reductions (edge of stream) January 1, 2008 - June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Hawksbill and Mill Creeks TMDL Project	2008	7.96E+10	8.24	0.00	0.00	
	2009	1.39E+14	70.68	0.21	1.94	
		<b>Sub-Total</b>	<b>1.39E+14</b>	<b>78.92</b>	<b>0.21</b>	<b>1.94</b>
<b>Pollution Reductions (edge of stream) January 1, 2007 - June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Little and Beaver Creeks TMDL Project	2007	1.63E+14	22.59	1.25	0.29	
	2008	1.85E+15	727.14	214.41	107.15	
	2009	1.42E+11	15.83	0.00	0.00	
		<b>Sub-Total</b>	<b>2.02E+15</b>	<b>765.56</b>	<b>215.66</b>	<b>107.44</b>
<b>Pollution Reductions (edge of stream) March 1, 2006-June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Lower Blackwater River, Maggodee Creek and Gills Creek TMDL Project	Mar-06	9.56E+14	188.49	10.58	2.66	
	2007	8.52E+14	303.11	135.58	1.74	
	2008	1.70E+15	395.21	150.65	5.50	
	2009	8.27E+14	32.48	5.24	2.39	
		<b>Sub-Total</b>	<b>4.34E+15</b>	<b>919.30</b>	<b>302.05</b>	<b>12.29</b>
<b>Pollution Reductions (edge of stream) January 1, 2007 - June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Mill and Dodd Creeks TMDL Project	2007	5.20E+14	10.24	0.81	0.19	
	2008	1.11E+15	24.78	1.65	0.38	
	2009	1.99E+10	32.15	4.26	4.08	
		<b>Sub-Total</b>	<b>1.63E+15</b>	<b>67.17</b>	<b>6.72</b>	<b>4.65</b>
<b>Pollution Reductions (edge of stream) July 1, 2006 - June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Thumb, Deep, Carter and Great Runs TMDL Project	Jul-06	1.91E+14	15.65	6.08	4.48	
	2007	1.53E+15	76.46	12.79	2.96	
	2008	5.72E+14	222.40	26.66	12.56	
	2009	6.98E+14	49.05	4.53	1.05	
		<b>Sub-Total</b>	<b>2.99E+15</b>	<b>363.55</b>	<b>50.06</b>	<b>21.05</b>
<b>Pollution Reductions (edge of stream) July 1, 2005-June 30, 2009</b>						
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr	
Willis River TMDL Project	Jul-05	2.70E+15	43.59	7.56	1.76	
	2007	3.20E+15	428.68	158.76	6.36	
	2008	2.13E+15	57.68	9.00	2.08	
	2009	1.97E+15	58.17	8.79	2.03	
		<b>Sub-Total</b>	<b>9.99E+15</b>	<b>588.11</b>	<b>184.11</b>	<b>12.23</b>
	Other		1.36E+15	1,004.29	427.89	8.56
	<b>Total</b>	<b>1.14E+16</b>	<b>1,592.40</b>	<b>612.00</b>	<b>20.79</b>	
<b>Sub-Total 2009:</b>		<b>2.13E+16</b>	<b>1358</b>	<b>215</b>	<b>127</b>	
<b>TOTAL 2005-2009:</b>		<b>3.80E+16</b>	<b>9700</b>	<b>2136</b>	<b>745</b>	

## Water Quality Improvements, Watershed Restoration, Delisting and Future Actions

A growing challenge for the program is the transition from developing TMDLs to actual water quality improvements. Virginia has been implementing TMDLs using existing nonpoint source programs and funding sources despite inadequacies in staff 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 and the State Revolving Loan Fund. Virginia also offers grant funding for the implementation of best management practices and technical assistance in watersheds with approved implementation plans.

Despite the challenges, Virginia's TMDL program has shown that properly applied and maintained best management practices result in measurable improvements in water quality (Table I-6). It will be the goal of Virginia's natural resource agencies to work with the general public to take this success to the next level by successful remediation of some impaired streams within the next few years.

Table I-6: Summary of TMDL Implementation versus measurement of water quality improvement



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

### Measurable Environmental Results:

Most of the NPS TMDL implementation that is taking place in Virginia is only several years old and therefore it is generally too early for the projects to result in water quality improvements; however in some case these improvements do exist (Table I-3). There are several projects that are showing marked improvement in water quality. Willis River has shown remarkable success in the short 2.5 years it has been active and in 2008 several segments were nominated by DEQ to be candidates for delisting in the 2008 305(b)/303(d) Integrated Report. A full description of this project can be found in the Case Studies Section of this report.

### ***Water Quality Improvements:***

It is generally too early to show water quality improvements and results for projects in the early stages of implementation (those less than two years old). For older projects it is possible to track water quality improvements as the level of implementation increases and the number of BMPs that are installed increases. There are several implementation projects that are showing marked improvement in water quality, but for many of them the TMDL implementation process is still too early in the process to assess the degree of water quality improvement.

Since 2001 a total of thirty (30) of the forty-five (45) TMDL IP projects have shown some level of improvement in water quality conditions. Seven projects have had some of there stream miles listed on the 303(3)/305(b) Integrated Report as 'candidates for delisting'.

It should be noted that since 2001 when the first two pilot projects were initiated in the Southern Rivers (Middle Fork Holston and Upper Blackwater River), the State's water quality bacteria standard has been modified twice, and a third revision was approved through the State Water Control Board's Triennial Review of Water Quality Standards. In the case of the two previous modifications, the revisions have been more conservative and this has impacted the achievement of measurable progress for water quality improvements.

### ***Delisting:***

As of 2008, 92 free-flowing segments have been approved by EPA for de-listing from the Consent Decree since 2002. Six segments were nominated for delisting in 2006 and 2008. Water quality monitoring by DEQ is indicating that water quality is improving in a number of streams where TMDL targeted implementation is ongoing in the watershed. In the 2008 305(b) Report DEQ identified portions of six streams that are eligible for delisting from the Impaired Water List due to attaining the bacteria water quality standard, these include:

1. Willis River, Buckingham and Cumberland Counties, 34.71 miles (18.03 miles in 2006 and 16.2 in 2008);
2. Big Otter River, Bedford and Campbell Counties, 13.98 miles (2008);
3. Maggodee Creek, Franklin County, 4.40 miles (2008);
4. Stroubles Creek Middle, Montgomery County, 2.20 miles (2008);
5. Deep Creek, Nottoway County, 5.59 miles (2008); and
6. Lynnhaven River in the City of Virginia Beach., 1,462 acres (2008)

### ***Success Stories:***

Throughout the year information is gathered regarding the successes of various projects. In 2008 three success stories were written as a result of the implementation activities of the Commonwealth. These projects are discussed in thorough detail in Appendix II – Case Studies.

1) **Willis River** (Buckingham and Cumberland counties): In 2005, DCR and Peter Francisco Soil and Water Conservation District, with extensive public input, started a five-year TMDL project to reduce fecal coliform levels in the Willis River through implementation of agricultural and residential BMPs in accordance with an approved TMDL implementation plan. The Willis River TMDL Implementation Project has been active for three years and has shown remarkable success during this time. 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

## Virginia's 2009 NPS Annual Report (Final December 2009)

water quality standards for primary contact recreation. These three 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. As a result of three plus years of TMDL implementation activities 54 agricultural best management practices have been installed, including 32 miles of stream exclusion fencing, the fencing out of 3,500 livestock from streams, and the establishment of 82 acres of riparian vegetative buffers. In addition this project succeeded in pumping out of 13 septic tanks, three septic systems repaired and replacement of one septic system. As a result of these actions, the bacteria standard violation rate has been reduced to 10% or less for portions of the Willis River resulting in a partial de-listed from the Impaired Waters List. In the 2008 305(b)/303(d) Integrated Report DEQ recommended that 16.68 miles of stream in Willis River (Buckingham and Cumberland Counties) be removed from the impaired waters list as these areas were meeting the water quality standard for pathogens. The Willis River TMDL Implementation Project was nominated in 2009 as an EPA Success Story due to its delisting.

### EPA Performance Measures:

EPA has issued targets to each state to achieve various program activity measures that will help us track our progress towards watershed restoration. **Goal 2:** Safe and Clean Water - Ensure drinking water is safe. **Objective 2:** Protect Water Quality. **Program Measure:** WQ-17 Waterbodies identified by States (in 2000 or subsequent years) as being primarily NPS-impaired that will be partially or fully restored (cumulative) by 2008 and 2012. As of the end of 2008, Virginia was still working on meeting these goals.

## CHAPTER 2: PROGRESS REPORTS FOR FEDERALLY FUNDED TMDL IMPLEMENTATION PROJECTS

This chapter provides more detailed information on the on-going status of TMDL implementation throughout the Commonwealth of Virginia including a summary of the best management practices currently in place and water quality changes over the past 10 years (approximate).

### *Background*

This appendix provides updated progress reports on the TMDL Implementation projects, including: Catoctin Creek, Holman Creek, Willis River, Lower Blackwater River, Cooks Creek and Blacks Run, Thumb-Deep-Carter-Great Runs, Big Otter River, Little and Beaver Creek, Mill and Dodd Creeks, and Hawksbill and Mill Creeks; which are largely rural watersheds (except for Blacks Run and Beaver Creek) dominated by urban non-point source pollution.

### *Contents Progress Reports*

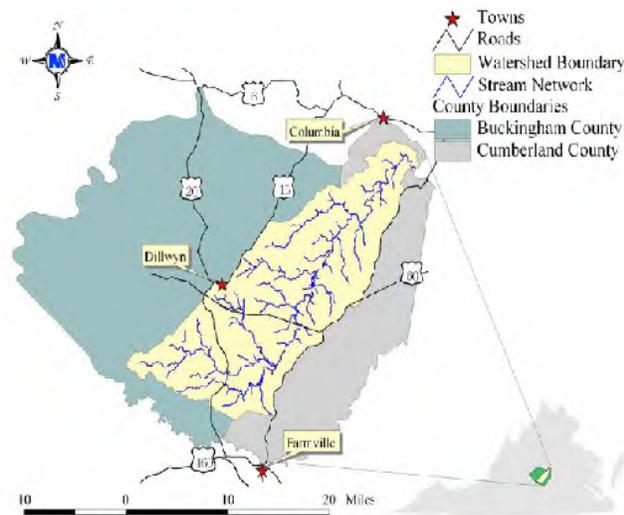
- 1) PROGRESS REPORT: Catoctin Creek TMDL Implementation Project 2004-2009 (On-going)
- 2) PROGRESS REPORT and SUCCESS STORY: Willis River TMDL Implementation Project 2005-2009 (On-going)
- 3) PROGRESS REPORT: Lower Blackwater River, Maggodee Creek and Gills Greek TMDL Implementation Project 2006-2009 (On-going)
- 4) PROGRESS REPORT: Blacks Run and Cooks Creek TMDL Implementation Project 2006-2009 (On-going)
- 5) PROGRESS REPORT: Big Otter River TMDL Implementation Project 2006-2009 (On-going)
- 6) PROGRESS REPORT: Thumb, Deep, Carter and Great Runs TMDL Implementation Project 2006-2009 (On-going)
- 7) PROGRESS REPORT: Little and Beaver Creeks TMDL Implementation Project 2006-2009 (On-going)
- 8) PROGRESS REPORT: Mill and Dodd Creeks TMDL Implementation Project 2006-2009 (On-going)
- 9) PROGRESS REPORT: Hawksbill and Mill Creeks TMDL Implementation Project 2006-2009 (On-going)

## ***Willis River TMDL Implementation Project July 2005-June 2009***

### **Buckingham and Cumberland Counties, Virginia**

#### ***Waterbody Improved***

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, livestock stream exclusion with grazing land protection systems, riparian buffers, septic tank pump-outs, septic system repairs and replacements.



As a result of three plus years of implementation activities 54 agricultural best management practices have been installed, including 32 miles of stream exclusion fencing, the fencing out of 3,500 livestock from streams, and the establishment of 82 acres of riparian vegetative buffers. The widespread installation of BMPs throughout the Willis River Watershed has reduced bacterial levels to allow two stream segments, totaling 26.5 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.

Since the beginning of the project in July 2005 (through June 30, 2009), there have been 54 agricultural practices completed. Approximately 3,944 head of livestock have been excluded with 168,960 feet (32 miles) of finished stream fencing, establishing over 129 acres of buffers. Approximately 1,780 acres of pastureland has been improved. For the residential program, to date, 19 septic projects have been implemented. The District has 14 septic tank pump outs completed. So far, four septic systems have been repaired and four more are approved. One septic system replacement and installation is completed and three more septic system installations are approved. As a result of the BMPs installed above, the Willis River implementation project has accomplished the following pollution reductions:

BMP Implementation Summary for the Willis TMDL Project (August 2005-June 2009)				
Control Measure	Unit	Units Needed	# Installed	% Goal
<b>Agricultural Program:</b>				
Stream Exclusion Fencing,	Mile	90	32	35%
Riparian Buffer Established	Acre		129	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	318	45	14%
Stream Crossing & Hardened Access	System		6	
Loafing Lot Management (WP-4B)	System		1	
Animal Waste Storage Facility (WP-4)	System		4	
Composting Facility (WP-4C)	System		3	
<b>Residential Program:</b>				
Septic System Pump Out, RB-1	System	100	14	14%
Septic System Repair, RB-3	System	3	4	133%
Septic System Installation, RB-4	System	2	1	50%

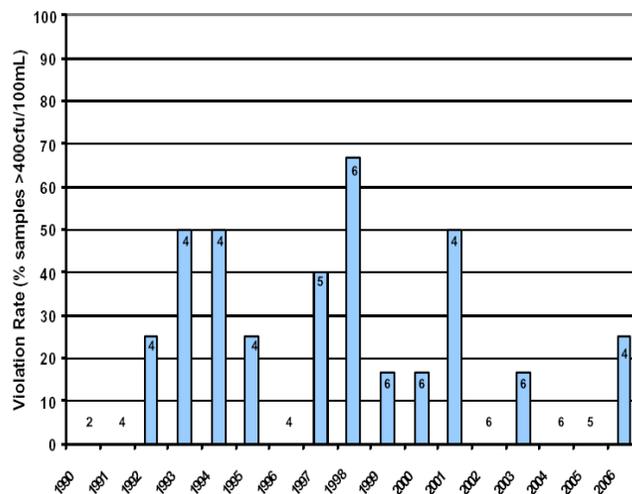
Pollution Reductions (edge of stream) July 1, 2005-June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Willis River TMDL Project	Jul-05	2.70E+15	43.59	7.56	1.76
	2007	3.20E+15	428.68	158.76	6.36
	2008	2.13E+15	57.68	9.00	2.08
	2009	1.97E+15	58.17	8.79	2.03
	<b>Sub-Total</b>	<b>9.99E+15</b>	<b>588.11</b>	<b>184.11</b>	<b>12.23</b>
	Other	1.36E+15	1,004.29	427.89	8.56
	<b>Total</b>	<b>1.14E+16</b>	<b>1,592.40</b>	<b>612.00</b>	<b>20.79</b>

**Results**

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 two 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\_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 26.5 miles are now meeting water quality standards and changed to category 2C. The chart to the left shows violation rates of the bacteria standard from the period of 1996 through 2008 for the sampling station at the mouth of the Willis River (WLS000.4.27). For the 2006 303(d) list the bacteria standard was based on fecal coliform, 400 colony forming units (CFU) per 100 ml of



Violation rate of the 400 colony forming units per 100 ml standard for fecal coliform at WLS004.27.

water. For the 2008 303(d) list the standard changed to *E. coli* at 235 CFU per 100 ml of water.

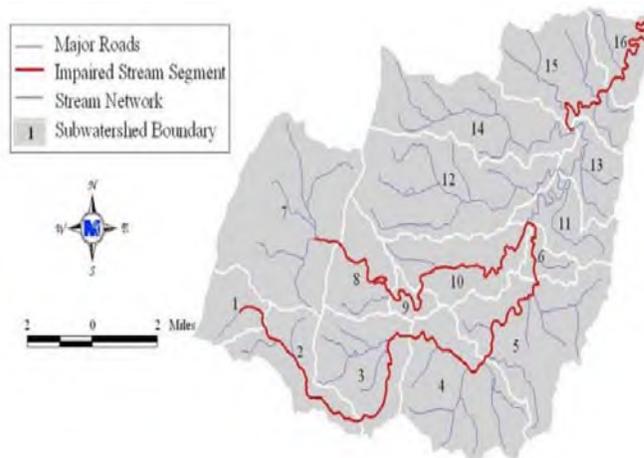
### **Partners and Funding**

The PFSWCD agreed to take on the responsibility of overseeing both the agricultural and residential programs during the implementation project. A full time staff position was funded at PFSWCD to work with landowners in the project area. Several partners have contributed to the success of this project including PFSWCD, DCR, DEQ and the Natural Resources Conservation Service. For the first three years of the project almost \$1.6 million in funds have been invested in the project area. This includes approximately \$1,023,608 in federal EPA Section 319 NPS funds administered by DCR. This included: ~\$100,000 of Section 319 funds to support staff who manage the implementation project; ~\$923,000 to PFSWCD for the Willis River project, including almost \$750,000 for BMP installation. Additional federal funding totaling \$250,000 included: \$56,578 from the USDA Conservation Reserve Enhancement Program and \$158,903 from the USDA Environmental Quality Incentives Program (EQIP), and \$60,079 of funding used as a combination of EQIP and state cost-share funds for practices. Aside from federal funds, an estimated \$317,000 was contributed by the farmers and residents as their share of the cost of the BMP installation.

## Catoctin Creek TMDL Implementation Project 2004-June 2009

### Project Location

The project area focuses on a portion of the Catoctin Creek Watershed (HUC# 02700008), located in Loudoun County, Virginia and just north of Purcellville and approximately five miles northwest of Leesburg. Catoctin Creek is part of the Potomac River Basin. The area contains four watersheds – Upper South Fork Catoctin Creek, Lower South Fork Catoctin Creek, North Fork Catoctin Creek and Catoctin Creek Mainstem. The entire project area consists of 59,000 acres and the predominant land uses are forestry and agriculture. The estimated population within Catoctin Creek was 9,757 in 2001.



### Implementation Highlights

The Loudoun Soil & Water Conservation District began administering the agricultural component of the Catoctin Creek TMDL Implementation Project in September 2004. During 2009 the District completed 18 best management practices, including 8 agricultural BMPs, all stream exclusion practices. The completed practice resulted in 15,689 feet of stream exclusion fencing and the exclusion of 46 livestock from the stream and the establishment of 12.6 acres of buffer. The Loudoun County Health Department began administering the residential septic system component in 2005. During 2009 the following were completed: six septic pumpouts, two septic repairs and two connections to the public sewer system. The staff of the District and the Loudoun County Health Dept. combined efforts in a 12 minute. TV segment, a Loudoun Times blog, and a joint outreach mailing to promote conservation practices in the Catoctin Creek TMDL project watershed. Staff actively presented practice changes at four community and governmental meetings, participated in an 'Rural Innovations' forum, and made 12 site visits.

BMP Summary for the Catoctin Creek TMDL Project (July 2004-June 2009)				
Control Measure	Unit	Units Needed	# Installed	% Goal
<b>Agricultural Program:</b>				
Stream Exclusion Fencing	Mile	32	4.2	13%
Riparian Buffer Established	Acre		17.7	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	126	34	27%
Stream Crossing & Hardened Access	System	76		
<b>Residential Program:</b>				
Septic System Pump Out (RB-1)	System		10	
Septic System Repair (RB-3)	System		14	
Septic System Installation (RB-4)	System	10	14	140%
Alternative Waste Treatment System (RB-5)	System	10	8	80%

Since the beginning of the project (through June 2009) a total of 80 best management practices have been installed. These practices have produced 22,016 feet of stream exclusion fencing, 18 acres of buffer, excluding of approximately 501 animals from streams. In the residential program a total of 46 residential BMPs, including the repair or replacement of 28 malfunctioning septic systems or straight pipes, the installation of 8 alternative waste treatment systems and the pumpout of 10 systems. The pollution reductions that are a result of the BMPs installed are summarized in the table below.

**Virginia's 2009 NPS Annual Report (Final December 2009)**

Pollution Reductions (edge of stream) January 1, 2005-June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Catoctin Creek TMDL Project	2005	3.15E+13	225.90	43.20	27.70
	2006	1.07E+14	84.48	1.71	0.59
	2007	5.40E+14	50.72	4.65	1.64
	2008	7.19E+13	255.38	11.05	6.26
	2009	1.24E+11	24.96	0.00	0.00
	<b>Sub-Total</b>		<b>7.51E+14</b>	<b>641.44</b>	<b>60.62</b>

***Water Quality Improvements***

The Virginia Department of Environmental Quality (DEQ) monitors the impaired streams through the agency's ambient monitoring program. The Catoctin Creek mainstem segment begins at the confluence of Milltown Creek and Catoctin, approximately 1.2 river miles downstream of Route 673, and continues downstream to its confluence with the Potomac River. The monitoring station on this segment has the lowest bacteria violation rate historically and has the lowest rate currently. Based on the 2006 assessment report it violated the fecal coliform 400 cfu/100 ml standard for the assessment period of 2000 – 2004. The 2008 Water Quality Assessment Report based the bacteria violation rate of 17.5% on the *E. coli* 235 cfu/100 ml standard, and the assessment period was 2001 – 2006. This segment was assessed as fully supporting the swimming use for the 2004 assessment cycle with a fecal coliform bacteria exceedance rate of 7.9% for the 1,000 cfu/100 ml standard for the period from 1998 until 2002. It is not known why this segment was not nominated to EPA as a candidate for delisting, but it went back on the impaired waters list based on the 2006 assessment.

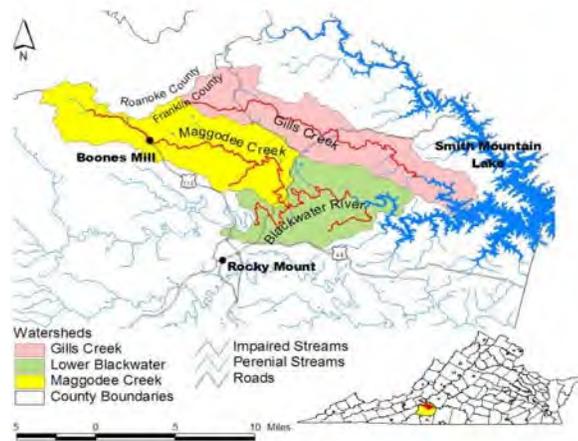
**DEQ Bacteria Monitoring in Catoctin Creek for 2003 – 2008.**

Sream Name	Number of Samples	Number of Exceedances	E. coli Exceedance Rate
Catoctin Creek	79	16	20%
N.F. Catoctin Creek	12	8	67%
N.F. Catoctin Creek	7	6	86%
N.F. Catoctin Creek	10	4	40
S.F. Catoctin Creek	21	6	29%
S.F. Catoctin Creek	10	6	60%

## Lower Blackwater TMDL Implementation Project 2006- June 2009

### Project Location

The Lower Blackwater River, Maggoodee 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 the Blackwater River in Smith Mountain. Maggoodee 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, Maggoodee Creek and Gills Creek in January 2006. A grant agreement to administer the project was signed with the Blue Ridge SWCD on March 1, 2006. During 2009 a total of 9 BMPs were completed. Streambank and shoreline protection practices installed resulted in 7339 feet of stream exclusion fencing and the exclusion of 485 animals from the stream. During this period a total of 3 septic tank pumpouts (RB-1) were completed. The new conservation specialist and staff presented the TMDL conservation practice changes to two local Cattlemen's Association meetings, and at Ferrum College. Forty site visits were made.

BMP Summary for the Lower Blackwater TMDL Project (March 2006-June 2009)				
Control Measure	Unit	Units Needed	# Installed	# Goal
<b>Agricultural Program:</b>				
Stream Exclusion Fencing	Mile	28	17	61%
Riparian Buffer Established	Acre		87.4	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	77	24	31%
Waste Storage Facility (WP-4)	System		2	
Loafing Lot Management (WP-4B)	System	3		
Vegetative Cover on Critical Area (SL-11)	Acre		2	
<b>Residential Program:</b>				
Septic System Pump Out (RB-1)	System	100	60	60%
Septic System Repair (RB-3)	System		1	
Septic System Installation (RB-4)	System	65	4	6.6%
Alternative Waste Treatment System (RB-5)	System	7		

From March 2006 through June 2009 28 agricultural practices have been completed resulting in 17 miles of stream fencing, excluding 2,845 livestock and establishing 87.5 acres of riparian buffer. In addition 65 residential BMPs have been installed, including: pumping out of 60 septic systems and five septic systems have been repaired or replaced. The pollution reductions resulting from the installed BMPs are summarized in the table below.

Pollution Reductions (edge of stream) March 1, 2006-June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Lower Blackwater River, Maggoodee Creek and Gills Creek TMDL Project	Mar-06	9.56E+14	188.49	10.58	2.66
	2007	8.52E+14	303.11	135.58	1.74
	2008	1.70E+15	395.21	150.65	5.50
	2009	8.27E+14	32.48	5.24	2.39
	<b>Sub-Total</b>		<b>4.34E+15</b>	<b>919.30</b>	<b>302.05</b>

## Cooks Creek & Blacks Run TMDL Project 2006- June 2009

### Project Location

The Blacks Run and Cooks Creek watersheds are located in Rockingham County and the City of Harrisonburg, Virginia. Water from Blacks Run and Cooks Creek flows into the North River near Mount Crawford, into the South Fork Shenandoah River, and eventually makes its way 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; and the watershed is approximately 12,256 acres and is largely urban in northern sections as the stream flows through the City of Harrisonburg and becomes increasingly rural as the stream nears Cooks Creek. Cooks Creek is impaired along a 13.69-mile stretch extending from its headwaters to the confluence with the North River. The Cooks Creek watershed is approximately 15,919 acres, and is predominately 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 began in summer of 2006 and is administered by the Shenandoah Valley Soil and Water Conservation District. In 2009, a total of 18 best management practices were completed. Six streambank protection practices were implemented that resulted in the addition of 15689 feet of shoreline excluded from livestock. Residential practice changes included five septic system pump-outs, two connections to public sewer systems, and one septic tank system repair. The TMDL coordinators collaborated with the Pure Water Forum, Cargill and the Shenandoah Resource Conservation Council in community conservation practice change projects, gave presentations at 8 different events including the Beef Marketing Workshop, and a poultry growers meeting.

To date there have been 63 agricultural BMPs completed, including: 11 acres of permanent vegetative cover on cropland (SL-1), 982 acres of small grain cover crops, one loafing lot management system, and 3 miles of stream exclusion fencing installed. To date there have been 29 residential practices completed, including: 19 septic pump outs completed, 2 connections to public sewer, 5 septic system repaired or installed and 3 alternative waste treatment systems installed.

BMP Summary for the Cooks Creek & Blacks Run (May 2006-June 2009)				
Control Measure	Units	Units	#	%
<b>Agricultural</b>				
Stream Exclusion Fencing	M	50	3	6%
Riparian Buffer Established	Ac		12.6	
Livestock Exclusion System (SL-6, LE-1T, LE-2, WP-2T)	S	17	1	6%
Voluntary Exclusion Systems	F	86,914	14,389	17%
Waste Storage Facility (WP-4)	S	46		
Loafing Lot Management	S		1	
Pasture Management	Ac	758		
Conservation Tillage	Ac	4,748		
Small Grain Cover Crop (SL-8B)	Ac		982	
Vegetative Cover on Cropland (SL-1)	Ac		11	
Nutrient Management	Ac	3,565		
Woodland Buffer Filter Area (FR-3)	Ac		0.5	
<b>Urban/Residential BMPs</b>				
Pet Litter Control Program	P	2	1	50%
Pet Waste Digesters	System		5	
Pet waste Stations	System		15	
Rain Barrels	Systems		38	
Bioretention Filters	AT	1025	1.672	.02%
Retention Ponds	AT	400		
Street Sweeping	LM	7,574	16,978	224%
Streambank Stabilization	F	7,000	7350	105%
Vegetated Buffer	F	197,704	9000	4.5%
Rain Gardens	AT	600	1.0	.02%
Nutrient Management	Ac	1100	4	.02%
<b>Residential Septic</b>				
Septic Tank Pump Outs (RB-1)	S	100	19	19%
Sewer Connection (RB-2)	S	3	2	67%
Septic System Repair (RB-3)	S	24	4	17%
Septic System Installation (RB-4)	S	14	1	7%
Alternative Waste Treatment System (RB-5)	S	14	3	21%

AT = Acres Treated, Ac = Acres, S = System, F = Feet of stream, P = Program, LM= Lane/mi/yr, M = miles of stream

## Virginia's 2009 NPS Annual Report (Final December 2009)

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.

Pollution Reductions (edge of stream) March 1, 2006-June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
<b>Cooks Creek and Blacks Run TMDL Project</b>	Mar-06	2.44E+11	851.46	79.31	50.82
	2007	1.39E+11	1,742.14	346.65	210.71
	2008	3.73E+10	988.56	171.11	104.01
	2009	7.84E+14	714.27	135.53	80.95
	<b>Sub-Total</b>		<b>7.85E+14</b>	<b>4,296.43</b>	<b>732.59</b>

In addition this project has received funding to do urban/residential (non-septic) practices in Blacks Run from various sources of funding. The Section 319 program funded several vegetated buffer and stream restoration projects in Blacks Run through a grant to the City of Harrisonburg. In addition 319 funds were partnered with state Water Quality Improvement Funds (WQIF) to pay for the installation of 5 rain gardens, several stream restoration and buffer projects as well as several pet waste digester projects. In addition this partnership paid for the installation of 38 rain barrels. DCR also issued several other WQIF grants to entities within the Blacks Run watershed, including the City of Harrisonburg to do several other urban projects. These projects included the purchasing of another street sweeper with doubled the number of miles of streets that were swept of debris.

During 2008-2009 DCR facilitated the development of a stormwater project for the Blacks Run watershed and submitted a proposal to the National Fish and Wildlife Foundation that was subsequently awarded in August of 2009. The Department of Conservation and Recreation (DCR), the City of Harrisonburg, the Shenandoah Valley Soil and Water Conservation District (SVSWCD), James Madison University (JMU), Eastern Mennonite University (EMU), Harrisonburg Redevelopment and Housing Authority (HRHA), and the Virginia Department of Environmental Quality (DEQ) are partnering on a project that focuses on reducing stormwater pollution and enhancing stormwater management on three scales in the Blacks Run Watershed: the neighborhood/individual, the institutional, and the community/watershed scale. This project will result in the installation of over 200 stormwater best management practices (BMPs). In addition this project will build a greater awareness and understanding amongst the residents, business and property owners and local officials regarding stormwater management concepts and the impact of nonpoint source pollution; increasing the capacity of the watershed community to integrate innovative stormwater practices into residential, commercial, municipal and educational landscapes. This project will provide training and capacity building for the community and landscaping professionals to use cost-effective methodologies for the design, installation and maintenance of stormwater practices that will continue to benefit the community and watershed after this NFWF project is complete. The total NFWF contributions are \$325,000 which is matched with \$350,237 of non-federal funds and in-kind services as well as \$110,102 of federal funds in the form of the current 319 TMDL Implementation project for Blacks Run and Cooks Creek. This project will end in 2012. Below is a preliminary summary of the BMPs that are proposed to be installed:

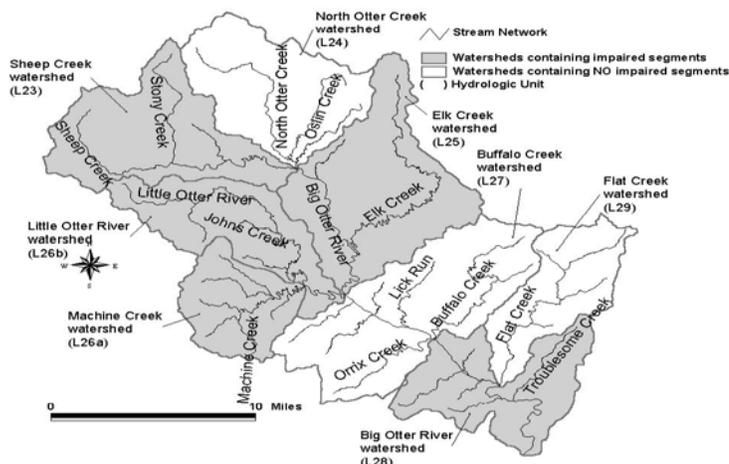
**BMPs Installed through Blacks Run & Cooks Creek Stormwater Management Projected funded by NFWF**

Best Management Practice	NEIGHBORHOOD BLACKS RUN PROJECT	COMMUNITY STORMWATER MANAGEMENT	INSTITUTIONAL - JMU	INSTITUTIONAL - EMU	TOTAL Area Covered/treated (acres except for streambank stabilization)	TOTAL BMPs Installed
Bioretention/infiltration Filter or flow-through plantings (treating acres)		0.5	0.1	0.4	1	4
Stormdrain Stenciling			700			700
Green roof (250 sf. or 0.0057ac treated)				250	0.0057	1
Permeable Pavers (area in acres, 1000 sf)			1000feet		0.023	1
Conversion from pervious to impervious (acres)		75ft			0.025	1
Pet waste Digesters (treating 0.2 acres)	65				13	65
Rain Barrels (treating ~0.03 acres each)	65	104	1		5.1	170
Rain Gardens (treating ~0.2 acres each)	10				2	10
Rain Gardens (more than 0.5 acres each)			1	3	2	4
Rainwater Harvesting 100,000 gal Cistern treating 40 acres (acres)				100,000 gal treating 40 ac	40	1
Soil Tests (each treating 0.2 acres)	65				13	65
Stream bank Stabilization (linear feet)		450		1200	1650	4
Trees/Shrubs Planted (acres) 400 trees/acre	1000	2250			8,125	3250
Vegetated Riparian Buffer (acres)	1.2	3.8		2.28	7.28	6
Wetlands/riparian area created from converting detention pond (acres) (size of pond ~.28 acres, treating 20 acres)				0.28	20	1
Yard Waste Composters each treating about 0.2 acres(acres)	12				2.4	12

## Big Otter River TMDL Implementation Project 2006- June 2009

### 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 impaired segments 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 project. During 2009 a total of 38 BMPs were installed, including 11 agricultural BMPs. This included 7 grazing land protection systems (SL-6, stream exclusion) resulting in 50029 feet (9.5 miles) of fencing, and 7 BMPs created 36.8 acres of forested riparian buffers in the CREP (Conservation Reserve Enhancement) program. These practices excluded 922 animals from the stream and creating 40.0 acres of vegetated riparian stream buffer. In 2009, 19 residential BMPs were installed, including: four septic tank system repairs, 2 systems were connected to sanitary sewer, and 13 septic systems were replaced. Staff presented conservation practices at a community Earth Day event, and made 34 site visits during the reporting period.

BMP Summary for the Big Otter River TMDL Project (July 2006-June 2009)				
BMP	Unit	Total	Installed	%
<b>Agricultural BMPs:</b>				
Stream Exclusion Fencing	Miles	177	46	26
Riparian Buffer Established	Acre		361.4	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	270	85	31
Forest Buffer (CP-22, CRFR-3)	Acre		143	
Stream Crossing & Hardened Access	System	91		
Pasture management	Acre	7,001		
<b>Residential BMPs:</b>				
Septic Pump Out (RB-1)	System		25	
Connection to Sewer (RB-2)	System		4	
Septic System Repair (RB-3)	System	34	11	32
Septic System Installation, (RB-4, RB-4P)	System	187	36	19
Alternative Waste Treatment, System (RB-5)	System	26	3	12

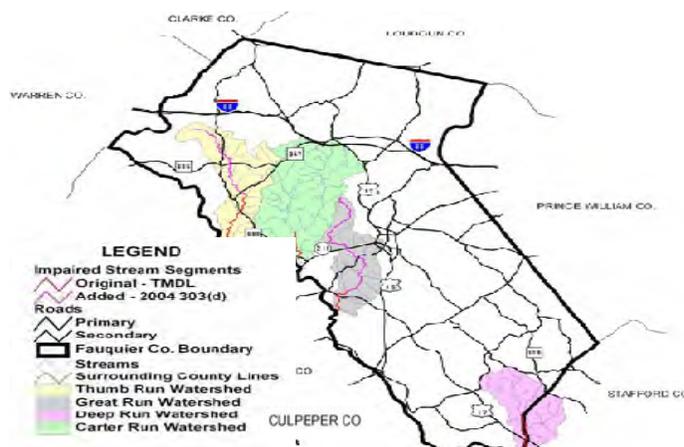
Since July 2006 the agricultural program has installed 107 BMPs including 85 stream exclusion systems for livestock. These practices resulted in total of 46 miles of stream exclusion fencing, and creating 361.4 acres of riparian buffers. In terms of the residential septic program, to date the program has installed 79 residential BMPs, including: 25 septic tank pumpouts, 11 septic tank system repairs (RB-3), 4 connections to sewer, 36 septic system replacements (RB-4 and RB-4P), and 3 alternative waste treatment systems (RB-5). The pollution reductions as a result of the BMPs installed are summarized in the table below.

Pollution Reductions (edge of stream) July 1, 2006 - June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Big Otter River TMDL Project	Jul-06	9.35E+14	39.14	7.04	1.62
	2007	4.78E+15	200.51	27.71	6.39
	2008	5.03E+15	375.22	65.13	48.95
	2009	3.13E+15	360.83	56.02	35.47
	<b>Sub-Total</b>		<b>1.39E+16</b>	<b>975.70</b>	<b>155.89</b>

## Thumb, Deep, Carter and Great Runs TMDL Project 2006- June 2009

### Project Location

Thumb Run, Carter Run, Great Run, and Deep Run are part of the Rapidan-Upper Rappahannock Basin. The Rappahannock River flows into the Chesapeake Bay. 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 entire 92,800 acre project is made up of forest (60%), agricultural (39%) and residential (1%) land uses. The Thumb Run watershed area is approximately 21,800 acres; Carter Run is approximately 35,600 acres; Great Run watershed area is approximately 18,100 acres; and, Deep Run land area is approximately 17,300.



### Implementation Highlights

The TMDL implementation project for a fecal coliform impairment on Thumb Run and *E. coli* impairments on Thumb, Deep, Carter and Great Runs in Fauquier County began in July 2006. DCR contracted with the John Marshall Soil and Water Conservation District to provide technical assistance and educational outreach to agricultural producers through a full time agricultural specialist. The Fauquier County Health Department was contracted to provide technical assistance and educational outreach to homeowners. During 2009 a total of 12 best management practices were installed. Four agricultural BMPs were installed, including: 7 acres of permanent vegetation on cropland, and 3,556 feet of stream fencing repair. A total of 8 residential septic practices were installed, including: 7 septic tank pumpouts, and one septic system repair. The District staff and the Fauquier County Health Dept. combined efforts to promote conservation practice changes in the watershed through articles provided to the Fauquier Times Democrat, Discover Publications, and targeted mailings to landowners. Forty-four site visits were made by the combined Depts. Coordinators. To date the project has completed 107 best management practices, including: 23 stream exclusion practices resulting in 49,413 feet of stream exclusion fencing, that excluded 977 livestock from streams; 4 permanent vegetative cover on cropland practices for 31 acres, 60 septic tank pump-outs and the repair or replacement of 17 malfunctioning septic systems or straight pipes.

BMP Summary for the Thumb, Deep, Carter and Great Runs (July 2006-June 2009)				
BMP	Unit	Total	Installed	%
<b>Agricultural BMPs:</b>				
Stream Exclusion Fencing	Miles	68	9	13
Riparian Buffer Established	Acre		86.4	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	167	22	13
Woodland Forest Buffer (FR-3)	Acre		19	
Vegetative Cover on Cropland (SL-1)	Acre		31	
Manure/ Incorporation on Cropland	Acre	5,331		
Pasture management	Acre	16,271		
<b>Pet Waste BMPs:</b>				
Pet Waste Control Program	System	3		
CCU BMP Demonstration*	System	2		
CCU BMP Installation	System	25		
Pet Waste Landscape Demonstration	System	2	2	100
<b>Residential BMPs:</b>				
Septic Pump Out (RB-1)	System		60	
Septic System Repair (RB-3)	System	102	14	14
Septic System Installation, (RB-4)	System	146	3	2
Alternative Waste Treatment, System (RB-5)	System	44	0	0
*CCU = Concentrated Canine Unit				

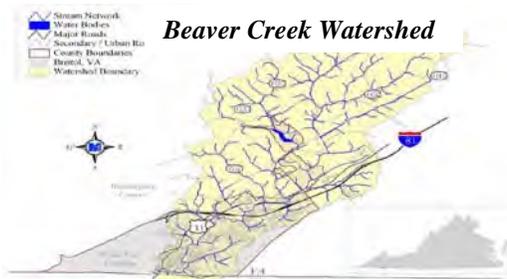
The District staff and the Fauquier County Health Dept. combined efforts to promote conservation practice changes in the watershed through articles provided to the Fauquier Times Democrat, Discover Publications, and targeted mailings to landowners. Forty-four site visits were made by the combined Depts. Coordinators. To date the project has completed 107 best management practices, including: 23 stream exclusion practices resulting in 49,413 feet of stream exclusion fencing, that excluded 977 livestock from streams; 4 permanent vegetative cover on cropland practices for 31 acres, 60 septic tank pump-outs and the repair or replacement of 17 malfunctioning septic systems or straight pipes.

Pollution Reductions (edge of stream) July 1, 2006 - June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Thumb, Deep, Carter and Great Runs TMDL Project	Jul-06	1.91E+14	15.65	6.08	4.48
	2007	1.53E+15	76.46	12.79	2.96
	2008	5.72E+14	222.40	26.66	12.56
	2009	6.98E+14	49.05	4.53	1.05
	<b>Sub-Total</b>		<b>2.99E+15</b>	<b>363.55</b>	<b>50.06</b>

## Little and Beaver Creeks TMDL Implementation Project 2007- June 30, 2009

### 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.

### Little Creek Watershed



### Implementation Highlights

Beginning in the fall of 2006, the Holston River Soil and Water Conservation District began administered both the agricultural and residential programs for the Beaver Creek and Little Creek TMDL Implementation Project. During 2009 a total of 24 best management practices were installed. Eight agricultural practices were installed, two of which were stream exclusion practices, preventing 150 animals from 1775 feet of stream. In addition, six small grain cover crop practices were installed creating 82 acres of cover crops (SL-8B & SL11). During this period a total of 16 residential BMPs were completed, including the pumping out of 11 septic tanks (RB-1) the repair of four septic systems (RB-3), and one septic system installation. TMDL staff promoted the program's conservation practice changes in a radio interview discussing the cost-share options, sponsored an eight-farm tour demonstrating conservation methods, installed a 1300 square-foot rain garden at a middle school, presented the cost-share program at two large meetings, and conducted 2 rain-barrel workshops. Since the beginning of the project a total of 155 BMPs have been installed. This includes: 12 grazing land protection (SL-6) stream exclusion practices excluding 546 livestock with the establishment of 11,075 feet of fencing; eight BMPs for small grain cover crop for 209 acres; one loafing lot management system installed for 195 animals; 113 septic systems were pumped out; and five septic systems were repaired or replaced. In addition 25 rain barrels were installed and one 1,300 sf rain garden was built that treats 2.5 acres.

### BMP Summary for the Beaver and Little Creeks TMDL Implementation Project (January 1, 2007 - June 2009)

BMP	Unit	Total	Installed	%
<b>Agricultural BMPs:</b>				
Stream Exclusion Fencing	Mile	66	2	3
Riparian Buffer Established	Acre		95.9	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	S	309	12	4
Stream Crossing & Hardened Access	System	126		
Pasture Management	Acres	8,505		
Vegetative Cover on Cropland (SL-1)	Acre	75	19	25
Vegetative Cover on Critical Area (SL-11)	Acre		15	
Protective Cover for Specialty Crops (SL-8)	Acre	136	209	65
Manure Incorporation	Acre	110		
CREP Vegetated Buffers	Acres	16	1	6
<b>Urban/Residential BMPs (Beaver Creek)</b>				
Bioretention Filter (Acre-treated, AT)	AT	600	2.5	0.42
Rain Barrels	System		25	
Infiltration Trench	AT	1,087		
Rain Garden	AT	488	.6	.12
Stormwater Collection Retro-fits	AT	15		
Vegetated Stream Buffer	Acre	311		
<b>Residential BMPs:</b>				
Pet Waste Control Program	Program	2		
Septic System Pump Out (RB-1)	System	260	124	48
Sewer Connection (RB-2 -Beaver Creek Only)	System	121		
Septic System Repairs (RB-3)	System	172	4	2
Septic System Installation ( RB-4, RB-4P)	System	87	1	
Alternative Waste Treatment System (RB-5)	System	23		

Pollution Reductions (edge of stream) January 1, 2007 - June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Little and Beaver Creeks TMDL Project	2007	1.63E+14	22.59	1.25	0.29
	2008	1.85E+15	727.14	214.41	107.15
	2009	1.42E+11	15.83	0.00	0.00
	<b>Sub-Total</b>	<b>2.02E+15</b>	<b>765.56</b>	<b>215.66</b>	<b>107.44</b>

## Mill Creek and Dodd Creek TMDL Implementation Project 2007- June 2009

### 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 boundaries and impaired stream segments



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.

Figure 2: Dodd Creek Watershed boundaries and impaired stream segments

### Implementation Highlights

The Skyline Soil and Water Conservation District began administering the agricultural components of 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. During 2009 a total of 7 best management practices were installed. During this period five grazing land protection and stream exclusion practices (SL-6) were installed, fencing out 620 animals and protecting 12362 feet of stream. The residential program installed four residential BMPS, all septic tank pumpouts. District staff presented the conservation practice changes of the TMDL program to a farmer focus group, held a separate farmer field day, marketed the program through printed media, and made 63 site visits. Since the beginning of the project a total of 30 practices have been installed. These included 6 stream exclusion and grazing land protection practices (SL-6) for 12,362 feet of stream exclusion and 370 livestock excluded. In terms of the residential program 23 residential practices have been installed including 20 pump outs and the repair or replacement of 3 septic systems.

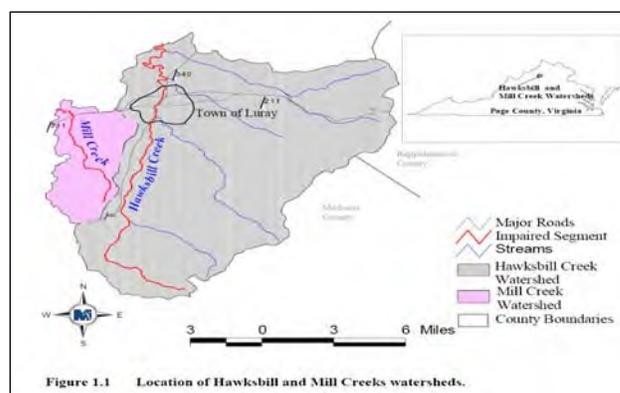
BMP Summary for the Dodd Creek and Mill Creek TMDL Implementation Project – (January 2007-June 2009)				
BMP	Unit	Total	Installed	%
<b>Agricultural BMPs:</b>				
Stream Exclusion Fencing	Miles	n/a	2	
Riparian Buffer Establishes	Acre		14.7	
Livestock Exclusion System (SL-6, LE-1T, LE-2T, WP-2T)	System	100	6	6%
Waste Storage Facility (WP-4)	System	3		
Loafing Lot Management System (WP- 4B)	System	1	1	100%
Vegetative Cover on Critical Area (SL- 11)	Acre	2		
Improved Pasture Management	Acres	1,439		
<b>Residential BMPs:</b>				
Septic System Pump Out (RB-1)	System	200	20	10%
Septic System Repair (RB-3)	System	51	1	2%
Septic System Installation (RB-4)	System	183	2	1%
Alternative Waste Treatment Systems (RB-5)	System	27		

Pollution Reductions (edge of stream) January 1, 2007 - June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Mill and Dodd Creeks TMDL Project	2007	5.20E+14	10.24	0.81	0.19
	2008	1.11E+15	24.78	1.65	0.38
	2009	1.99E+10	32.15	4.26	4.08
	<b>Sub-Total</b>	<b>1.63E+15</b>	<b>67.17</b>	<b>6.72</b>	<b>4.65</b>

## Hawksbill Creek & Mill Creek TMDL Implementation 2008 - June 2009

### Project Location

Mill Creek and Hawksbill Creek are part of USGS hydrologic unit code 02070005, the Shenandoah River Basin (Figure 1.1) and located in Page County. Additionally, Hawksbill Creek runs through the Town of Luray. Mill Creek watershed is 8,178 acres and Hawksbill Creek watershed is 56,951 acres. Mill Creek (VAV-B38R-01) and Hawksbill Creek (VAV-B39R-02) 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

A TMDL implementation Plan was developed in 2007 that includes a list of BMP implementation goals to meet the TMDL. The Shenandoah Valley Soil and Water Conservation District began administering the project in 2008. Implementation during the first of the year of the project was slow as the District began making contacts with the agricultural and residential communities. During 2009, seven (7) agricultural BMPs were completed, excluding 125 grazing animals from 5775 feet of streambank (LE-1T); and 61 acres of permanent cover crops were established (SL-1). On the residential side, the district completed 36 BMPs. The BMPs installed were 28 septic system pumpouts, five septic system repairs and 3 septic system replacements. The agricultural and residential coordinators presented the cost-share options for conservation practice changes at several different meetings of the Page County Farm Bureau Association, including a Beef Coop formation meeting regarding third party stewardship certification requiring livestock stream exclusion. Since the beginning of the project a total of 65 practices have been installed. These included one stream exclusion and grazing land protection practices (SL-6) for 400 feet of stream exclusion and 40 livestock excluded. In terms of the residential program 64 residential practices have been installed including 54 pump outs, the repair or replacement of nine septic systems and the installation of one alternative waste treatment system.

BMP Summary for the Hawksbill and Mill Creek TMDL Implementation Project (January 1, 2008 - June 2009)				
BMP	Unit	Total In IP	Installed	%
<b>Agricultural BMPs:</b>				
Stream Exclusion Fencing	Miles		0.08	
Riparian Buffer Established	Acre		65.5	
Livestock Exclusion System (LE-1T, LE-2T, SL-6, WP-2T)	System	62	1	
Polywire Fencing (no cost-share)	System	24		
Pasture Management	Acre	14,739		
Waste Storage Facility (WP-4)	System	8		
Manure Incorporation	Acre	838		
Vegetative Buffer on Cropland (SL-1)	Acre	9		
<b>Urban BMPs</b>				
Residential Pet Waste Program	System	1		
Residential Pet Waste Composting	Composter	1577		
Vegetated Buffers	Acre	12		
<b>Residential BMPs:</b>				
Septic System Pump Out (RB-1)	System	936	54	6
Septic System Repair (RB-3)	System	57	3	5
Septic System Installation (RB-4, RB-4P)	System	60	6	10
Alternative Waste Treatment (RB-5)	System	32	1	3

Since the beginning of the project a total of 65 practices have been installed. These included one stream exclusion and grazing land protection practices (SL-6) for 400 feet of stream exclusion and 40 livestock excluded. In terms of the residential program 64 residential practices have been installed including 54 pump outs, the repair or replacement of nine septic systems and the installation of one alternative waste treatment system.

Pollution Reductions (edge of stream) January 1, 2008 - June 30, 2009					
Project Title	Calendar Year	Pathogens (Coliform) CFU	Nitrogen lbs/yr	Phosphorus lbs/yr	Sedimentation-Siltation tons/yr
Hawksbill and Mill Creeks TMDL Project	2008	7.96E+10	8.24	0.00	0.00
	2009	1.39E+14	70.68	0.21	1.94
	<b>Sub-Total</b>	<b>1.39E+14</b>	<b>78.92</b>	<b>0.21</b>	<b>1.94</b>