

Maryland Nonpoint Source Program 2008 Annual Report

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TABLE OF CONTENTS

- I. Executive Summary
- II. Mission and Goals of the Nonpoint Source Program
- III. Overview
- IV. Accomplishments, Successes and Progress
 - A. Total Daily Maximum Loads Development
 - B. Active 319(h) Grant-Funded Projects and Project Outcomes
 - C. Multi-Year NPS Projects Supported By Federal 319(h) Grant Funds
 - Aaron Run Watershed
 - Agricultural Technical Assistance
 - Bennett Creek Watershed
 - Corsica River Watershed
 - D. Implementation Tracking for Nonpoint Source Management
 - E. Watershed Planning
- V. Areas of Concern/Recommendations/Future Actions

LIST OF TABLES

- 1 TMDLs Submitted to or Approved by EPA in 2008
- 2 Active Projects In Calendar Year 2008 Using Federal 319(h) Grant Funds
- 3 Projects Completed In Calendar Year 2008 Using Federal 319(h) Grant Funds
- 4 Agricultural Technical Assistance Multi-Year Projects
- 5 Bennett Creek Watershed – Summary of 319(h) Grant-Funded Projects
- 6 Corsica River Watershed – Summary of 319(h) Grant-Funded Projects
- 7 Corsica Urban Stormwater Constituent Ranges Before Retrofit Implementation
- 8 Watershed Planning Activities For NPS Management and Implementation Status

LIST OF FIGURES

- 1 2007 Total Nitrogen Sources In Maryland
- 2 2007 Total Phosphorus Sources In Maryland
- 3 Federal 319(h) Grant – Maryland Funding Summary

LIST OF APPENDICES

- Appendix A – General Approach and Schedule to Implement Applicable Management Measures
- Appendix B – 2007 BMP Implementation Progress in Maryland
- Appendix C – Cooperating Agencies and Contacts

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I. Executive Summary

This report documents the activities and accomplishments of the State of Maryland in general and the Maryland Department of Environment (MDE) Water Quality Protection and Restoration Program, in particular the administration of the State's §319(h) Grant Program. MDE plays a lead role in helping to achieve protection and improvement of Maryland's water quality by promoting and funding state and local efforts, water quality monitoring, stream and wetland restoration, education and outreach, and other measures to reduce and track nonpoint source pollution loads.

MDE is the lead agency responsible for coordination of policies, funds, and cooperative agreements with state agencies and local governments. Several other state agencies have key responsibilities, including the Departments of Natural Resources (DNR), Agriculture (MDA), and Planning (MDP). The NPS Program is housed within MDE's Science Services Administration (SSA). During the past 19 years, Maryland has received a total of nearly \$38.8 million through the Federal Clean Water Act Section 319(h) Grant.

In calendar year 2008, there have been notable successes and accomplishments:

- TMDLs: 21 approved by EPA and 14 submitted for EPA review.
- Projects funded by 319(h) Grant reported implementing 291 best management practices resulting in pollutant load reductions: nitrogen 100,000 pounds/year; phosphorus 8,500 pounds/year; sediment 844 tons/year. (Figures include technical assistance projects.)
- EPA accepted four watershed plans, which makes these areas eligible for 319(h) Grant implementation funding.

The program faces several challenges and concerns. Because of increasing development, there has been an increase in the urban/suburban component of nonpoint source pollution. Also because federal and state budgets are steadily decreasing there is an ever-tightening restraint on the amount of help, either technical or financial, that a state can provide. There is also the need to show effectiveness or environmental results in an area that may take years or decades to do so.

II. Mission and Goals of the NPS Program

Maryland's mission is to implement effective nonpoint source pollution control programs. These programs are designed to achieve and maintain beneficial uses of water, improve and protect habitat for living resources, and protect public health through a mixture of water quality and/or technology based programs including: regulatory and/or non-regulatory programs; and financial, technical, and educational assistance programs.

Through leadership and financial support Maryland's Section §319(h) Nonpoint Source (NPS) Program plays a lead role in helping to achieve protection and improvement of Maryland's water quality. The Program promotes and funds state and local watershed planning efforts, water quality monitoring, stream and wetland restoration, education and outreach, and other measures

to reduce, prevent and track nonpoint source pollution loads. The NPS Program plays a key role in promoting partnerships and inter- and intra-governmental coordination to reduce nonpoint sources of pollution, and helps bring the necessary technical and financial resources to local watershed management planning, best management practices, and restoration of streams and wetland habitats. Program partners include State agencies, local government (counties, municipalities, Soil Conservation Districts), private landowners and watershed associations.

The NPS Program's three priority goals are:

- Eliminating or reducing nonpoint source pollution
- Removing waters from the State's list of impaired waters (the 303(d) list)
- Restoring and protecting habitat in streams, riparian buffers and wetland areas

III. Overview

Maryland surface waters flow into three major drainage areas:

- The Chesapeake Bay watershed receives runoff from of Maryland's mid section and encompasses about 90% of the State.
- Maryland's Coastal Bays receives runoff from Maryland's east side.
- The Youghiogeny River, which is part of the Ohio and Mississippi Rivers drainage, receives runoff from Maryland's west side.

Overall, Maryland has over 9,940 miles of non-tidal streams and rivers. Several major rivers (Monocacy, Patuxent, Potomac, Choptank, Nanticoke, Gunpowder, Pocomoke and Susequehanna) run through the state. Maryland's water resources provide food and water for its residents, jobs for the economy and a place where people may relax and enjoy the natural environment. Maryland's water resources are under stress from a variety of causes, with nonpoint source pollution the greatest single factor.

Maryland's rich heritage and the bounty of its waters are threatened by the very prosperity that continues to draw newcomers. Recreation, tourism, commercial and recreational fishing, wildlife habitats, and our quality of life are ultimately dependant upon healthy watersheds. Yet, the state's waters are increasingly impacted by and remain impaired due largely to nonpoint sources of pollution and related habitat degradation due to altered land uses.

What is Nonpoint Source Pollution?

Nonpoint source (NPS) pollution is defined as polluted runoff caused by stormwater (rainfall or snowmelt) or irrigation water moving over and through the ground. As this runoff moves, it picks up and carries away pollutants, such as sediments, nutrients, toxics, and pathogens. These pollutants are eventually deposited in lakes, rivers, wetlands, coastal waters, ground waters and, most of the time in Maryland, the Chesapeake Bay.

NPS pollution is associated with a variety of activities on the land including farming, logging, mining, urban/construction runoff, onsite sewage systems, streambank degradation, shore erosion and others. For example, stormwater flowing off the land carries the nutrients nitrogen and phosphorus into local streams and eventually into the Chesapeake Bay. Under natural

conditions, this action is beneficial up to a point. However, if excessive amounts of these nutrients enter a lake or the Chesapeake Bay, and result in nuisance algae blooms, then these nutrients are then considered pollutants.

The pollution contributed by nonpoint sources is the main reason why many of Maryland's waters are considered "impaired." Impaired waters are those waters that do not meet Water Quality Standards for designated uses (e.g., fishing, swimming, drinking water, shellfish harvesting, etc.). The most recent Chesapeake Bay model associates nonpoint source pollution into several land use categories as shown in Figures 1 and 2. The figures also show that the relative amount of nitrogen and phosphorus generated by the different land uses in Maryland varies significantly.

Addressing Nonpoint Source Pollution

A wide array of approaches and programs help to prevent, reduce or eliminate pollution from nonpoint sources. The general approach employed in Maryland to manage NPS pollution is summarized in Appendix A.

The best methods for controlling NPS pollution are frequently called Best Management Practices (BMPs). These BMPs are designed to meet specific needs, like grassed buffers to control sediment and phosphorus that could leave farm fields, or wet stormwater ponds to capture sediment and nutrients in urban runoff. Every year, Maryland generates a cumulative total of BMPs implemented in the State. The most recent findings through 2007 are summarized in Appendix B.

Many agencies and programs in Maryland, including State agencies, Counties, Soil Conservation Districts and municipalities, have responsibilities in managing NPS pollutant. Contacts for key State agency programs with NPS management responsibility are listed in Appendix C.

Figure 1
2007 Total Nitrogen Sources In Maryland*

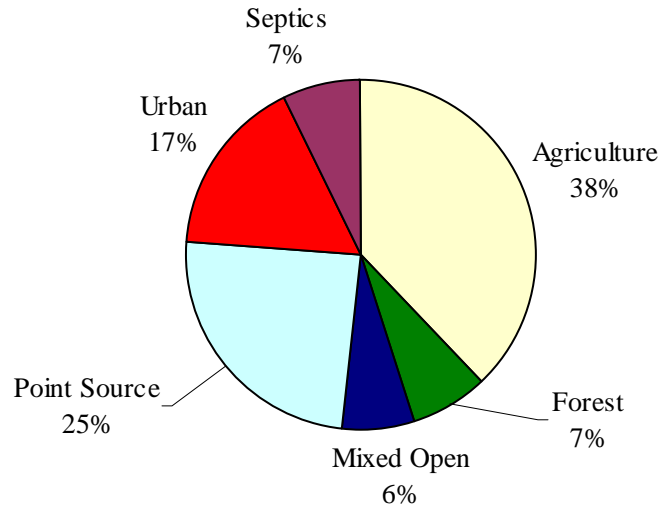
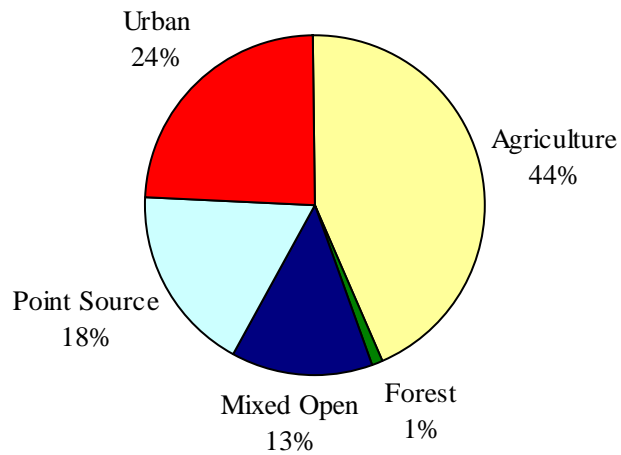
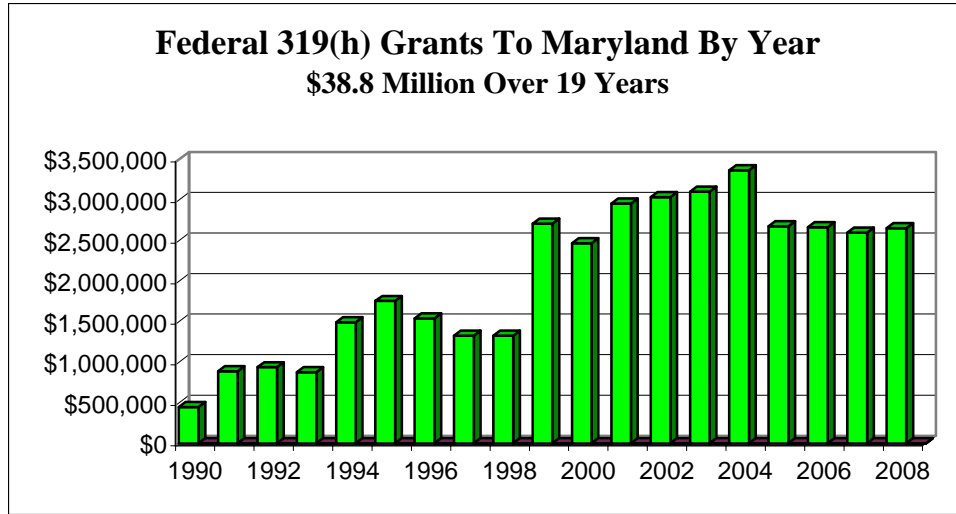


Figure 2
2007 Total Phosphorus Sources In Maryland*



* Data referenced from the Phase 4.3 Chesapeake Bay Model. The reported statistics include all of Maryland lands within the Chesapeake Bay Watershed except the main body of the Bay.

Figure 3



Federal Fiscal Year	319(h) Grant Funds
1990	\$447,771
1991	\$890,039
1992	\$939,298
1993	\$877,070
1994	\$1,494,413
1995	\$1,755,964
1996	\$1,541,980
1997	\$1,327,699
1998	\$1,327,699
1999	\$2,708,298
2000	\$2,467,576
2001	\$2,958,486
2002	\$3,035,576
2003	\$3,104,500
2004	\$3,369,190
2005	\$2,675,598
2006	\$2,666,655
2007	\$2,598,600
2008	\$2,653,500
Total	\$38,839,912

IV. Accomplishments, Successes and Progress

In the past year, there have been notable program accomplishments, successes and challenges. Progress was made in implementing best management practices in all nonpoint source areas through the provision of technical assistance, project funding or both.

A. Total Maximum Daily Loads Development

MDE is responsible for updating and maintaining Maryland's list of impaired waters (the 303(d) list) and for developing Total Maximum Daily Loads (TMDLs) to address those impairments. A TMDL establishes the maximum amount of a pollutant that a waterbody can assimilate and still meet Water Quality Standards. It also allocates pollution loads for both point sources and nonpoint sources. Typically, a TMDL addresses a single pollutant. However, if two pollutants are closely associated, like phosphorus and sediment, a single TMDL document may include a TMDL for both pollutants. Multiple TMDLs may be prepared for a waterbody to address multiple impairments listed for that waterbody.

During calendar year 2008, MDE submitted 35 TMDLs to EPA for review and approval as listed in Table 1 below. In addition to TMDL development activities, Maryland continues to advance TMDL implementation activities. Maryland recognizes that the §319(h) Program should address the restoration and protection of water quality standards under the Clean Water Act.

Basin Name	DNR 8-digit Basin Number	Impairment	Status
Anacostia River	02140205	Nutrients	Approved 6/5/08
Antietam Creek	02140502	Nontidal Bacteria	Submitted 6/5/08
Antietam Creek	02140502	Sediment	Approved 12/18/08
Bodkin Creek	02130902	Lead, Zine (WQA)	Submitted 7/24/08
Casselman River	05020204	Low pH	Approved 4/17/08
Chester River, Lower	02130505	Fecal Coliform	Approved 6/11/08
Chester River, Middle	02130509	Fecal Coliform	Approved 6/11/08
Chester River, Middle	02130509	Nutrients	Approved 11/28/08
Conococheaque Creek	02140504	Nontidal Bacteria	Submitted 6/16/08
Conococheaque Creek	02140504	BOD	Approved 11/24/08
Dividing Creek	02130204	Bacteria	Submitted 5/9/08
Double Pipe Creek	02140304	Sediments	Submitted 9/21/08
Georges Creek	02141004	Low pH	Approved 4/17/08
Jone Falls	02130904	Nontidal Bacteria	Approved 2/21/08
Liberty Reservoir	02130907	Nontidal Bacteria	Submitted 9/26/08
Little Patuxent River	02131105	Cadmium (WQA)	Submitted 7/24/08
Lower Monocacy River	02140302	Sediments	Submitted 9/26/08

**Table 1
TMDLs Submitted to or Approved by EPA in Calendar Year 2008**

Basin Name	DNR 8-digit Basin Number	Impairment	Status
Lower Patuxent River (Mill Cr.)	02131101	Bacteria	Submitted 7/2/08
Lower Susquehanna River	02120301	Cadmium	Submitted 7/25/08
Lower Wicomico River	02130301	Bacteria	Approved 6/18/08
Middle Patuxent River	02131106	Zinc (WQA)	Submitted 6/11/08
Nanticoke River	02130305	Bacteria	Approved: 6/11/08
Northeast River	02130608	Lead (WQA)	Submitted 7/25/08
Prettyboy Reservoir	02130806	Nontidal Bacteria	Submitted 8/26/08
Rocky Gorge/T. Howard Duckett Reservoirs (Patuxent River)	02131107	Phosphorus	Approved 11/24/08
Savage River	02141006	Low pH	Approved 4/17/08
Savage River	02141006	Nutrients (WQA)	Approved 4/16/08
Severn River	02131002	Bacteria	Approved 4/10/08
Southeast Creek (Chester River)	02130508	Fecal Coliform	Approved 6/11/08
Triadelphia Reservoir (Patuxent River)	02131108	Phosphorus & Sediments	Approved 11/24/08
Upper Monocacy River	02140303	Sediments	Submitted 9/16/08
Upper North Branch Potomac River	02141005	Low pH	Approved 4/17/08
Wills Creek	02141003	Low pH	Approved 4/17/08
Wills Creek	02141003	Cyanide (WQA)	Approved 8/16/08
Wye River	02130503	Bacteria	Approved 2/29/08

B. Active 319(h) Grant-Funded Projects and Project Outcomes

During calendar year 2008, 31 projects in Maryland were reimbursed using the Federal 319(h) Grant. The status of projects as of December 31, 2008 is summarized in Table 2.

Of these projects, five were completed in 2008 and six multi-year projects submitted annual reports. Outcomes resulting from these projects are summarized in Table 3. Overall, pollutant load reductions per year reported by these projects for the following key pollutants were nearly:

- Nitrogen: 100,000 pounds
- Phosphorus: 8,500 pounds
- Sediment: 844 tons

**TABLE 2 Active Projects
In Calendar Year 2008 Using Federal 319(h) Grant Funds**

Project	Watershed (Maryland 8-Digit)	TMDL or WQA	303(d) List Impairment	Status
Aaron Run Watershed Acid Mine Drainage Remediation	02141006	pH (Savage River)	pH, Mercury (lakes)	Project start Oct. 2005 Anticipate completion 2010
Antietam Creek Watershed Ag Technical Assistance	02140502	Bacteria, BOD, Sediment	Bacteria, Sediments, Nutrients, Biological	Multi-Year Project with Annual Outcome reported
Assawoman Bay Watershed Plan	02130102	Nutrients (N Coastal Bays) WQA Bacteria	Nitrogen, Phosphorus	Project start April 2006 Completed Dec. 2008
Bennett Creek Pilot Urban Wetlands Prog.	L. Monoc. River 02140302	Submitted Bacteria, Sediments	Biological, Fecal Coliform, Phosphorus, Sediment	Project start Nov. 2006 Anticipate completion 2010
Bennett Creek Implementation	L. Monoc. River 02140302	Submitted Bacteria, Sediments	Biological, Fecal Coliform, Phosphorus, Sediment	Project start July 2008 Anticipate completion 2010
Casselman River Watershed Plan	Yough. Riv. 05020204	pH, Sediment, WQA Nutrients	pH, Mercury (lakes)	Project start July 2008 Anticipate completion 2009
Coastal Bays Interns	021301	N/A	N/A	Project start July 2007 Anticipate completion 2009
Corsica and Beyond (Incl. Local Gov. Asst.)	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Project start Oct. 2006 Completed Dec. 2008
Corsica River Watershed Bioretention Swale	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Project start July 2008 Anticipate completion 2009
Corsica River Watershed, Centreville Capacity	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Project start April 2006 Anticipate completion 2011
Corsica River Watershed Ag. Technical Assistance	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Multi-Year Project with Annual Outcome reported
Corsica Riv., Monitor Living Resources, BMP Implem.	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Project start April 2006 Anticipate completion 2009
Corsica Monitoring On-Site Domestic Systems	02130507	Bacteria, Sediment, Nutrients	Bacteria, Sediment, Nutrients	Project start Oct. 2005 Anticipate completion 2010
Deer Creek Watershed Ag Technical Assistance	02120202	No	Biological	Multi-Year Project with Annual Outcome reported
GIS Hydro Model	Statewide	N/A	N/A	Project start July 2007 Anticipate completion 2009
Isle of Wight Bay Watershed Plan Enhancement	02130103	Nutrients (N Coastal Bays) Bacteria (2 creeks)	Nitrogen, Phosphorus	Project start Oct. 2007 Anticipate completion 2009
Laurel Valley Stream Restoration	Bynum Run 02130704	WQA Nutrients	Biological, PCBs, Sediment	Project start Jan. 2007 Anticipate completion 2009
Liberty Reservoir Targeted Watershed Project	02130907	Bacteria, Mercury, WQA Chrome/Lead	Nutrients, Mercury	Multi-Year Project with Annual Outcome reported

**TABLE 2 Active Projects
In Calendar Year 2008 Using Federal 319(h) Grant Funds**

Project	Watershed (Maryland 8-Digit)	TMDL or WQA	303(d) List Impairment	Status
Lower Monocacy Watershed Restoration, Lake Linganore Demonstration	02140302	Phosphorus, Sediment	Biological, Fecal Coliform Phosphorus, Sediment	Project start Jan. 2006 Completed May 2008
Marshyhope Creek and Nanticoke River Watersheds Ag Technical Assistance	02130305	Nutrients (Marshyhope) Bacteria (Nanticoke)	Bacteria, Sediments, Nutrients, Biological	Multi-Year Project with Annual Outcome reported
Maryland Biological Stream Survey (monitoring)	multiple	N/A	N/A	Ongoing Project
Miles River Watershed Plan	02130502	Bacteria	Fecal Coliform	Project start Oct. 2005 Completed Dec. 2008
NPS Program	Statewide	N/A	N/A	Ongoing Project
Spring Branch Stream Restoration	Loch Raven Reservoir 02130805	Nutrients Sediment, Mercury, WQA Heavy Metals	Nutrients, Sediments, Mercury	Project start July 2008 Anticipate completion 2009
Sligo Creek Watershed Plan and Implementation	Anacostia River 02140205	Bacteria, Sediment, PCB, Nutrients	Bacteria, Sediment, PCB, Nutrients	Project start July 2008 Anticipate completion 2010
Targeted Watershed Incl. Monitoring & Analysis	Statewide	N/A	N/A	Ongoing Project
Track and Analyze Data including Chesapeake Bay Implementation Tracking	Statewide	N/A	N/A	Ongoing Project
Upper Choptank River Watershed Ag Technical Assistance	02130404	No	Bacteria, Sediments, Nutrients	Multi-Year Project with Annual Outcome reported
Upper Choptank River Watershed Cover Crops	02130404	No	Bacteria, Sediments, Nutrients	Project start October 2005 Completed June 2008
Urban Stormwater Management Implementation Tracking	Statewide	N/A	N/A	Ongoing Project
Western Chesapeake Coastal Plain Stream Restoration Targeting	multiple	N/A	N/A	Project start Dec. 2006 Anticipate completion 2009

TABLE 3 Projects Completed
In Calendar Year 2008 Using Federal 319(h) Grant Funds

Project/Grantee	Funding (\$)*		Accomplishments
	Federal	Match	
Antietam Cr Watershed Ag Tech. Assistance Md Dept of Agriculture with the Washington Soil Conservation Dist.	139,259	92,839	Ongoing project outcome for July 2007 through June 2008: 1) BMPs: 122 were implemented resulting in annual pollutant load reductions: 30,230 lbs/yr nitrogen; 2,713 lbs/yr phosphorus; 81.2 tons/yr sediment. 2) Nutrient Management Plans: 191 were completed resulting in annual pollutant load reductions: 36,210 lbs/yr nitrogen; 3,493 lbs/yr phosphorus.
Assawoman Bay Watershed Plan Worcester County	40,000	26,667	1) Final plan set goals and priorities for reducing nutrient impairment. 2) Produced manual to promote stormwater/nutrient management by private landowners: <i>Rain Gardens in Maryland's Coastal Plain</i> . 3) Support documents include: watershed characterization, stream corridor assessment, synoptic stream survey.
Corsica and Beyond Queen Anne's County	124,281	82,854	1) Created/adopted manual for environmentally sensitive site development/design. 2) County code for stormwater management was changed to incorporate the environmentally sensitive design manual. 3) GIS map/database system was created to track stormwater management implementation. 4) Water quality retrofit opportunity identification/tracking capability was instituted. (Implementation started using other fund sources.) 5) Nonpoint source management education/outreach capability was developed and instituted.
Corsica River Watershed Ag. Technical Assistance Md Dept of Agriculture with the Queen Anne's Soil Conservation Dist.	22,187	14,791	Ongoing project outcome for July 2007 through June 2008: 1) BMPs: 9 were implemented resulting in annual pollutant load reductions: 286 lbs/yr nitrogen; 10 lbs/yr phosphorus; 755 tons/yr sediment. 2) Certified 1700 acres of cover crops. 3) Conducted manure composting education/outreach program.
Deer Creek Watershed Ag Technical Assistance Md Dept of Agriculture with the Harford Soil Conservation Dist.	53,075	35,383	Ongoing project outcome for July 2007 through June 2008: 1) BMPs: 39 were implemented resulting in annual pollutant load reductions: 5,197 lbs/yr nitrogen; 405 lbs/yr phosphorus. 2) Conducted landowner education/outreach program resulting in 11 new and 22 revised conservation plans.
Liberty Reservoir Targeted Watershed Project Md Dept of Agriculture with the Carroll Soil Conservation Dist.	16,720	11,147	Ongoing project outcome for July 2007 through June 2008: 1) Initiated landowner education/outreach program. 2) Since the beginning of this ongoing project in 1989, 229 BMPs have been implemented.

TABLE 3 Projects Completed
In Calendar Year 2008 Using Federal 319(h) Grant Funds

Project/Grantee	Funding (\$)*		Accomplishments
	Federal	Match	
Lower Monocacy Watershed Restoration, Lake Linganore Demonstration Frederick County	216,237	144,158	Frederick County project accomplishments: The project focused on capacity building and urban demonstration projects during 29 months resulting in 1) implementation of 29 urban BMPs at 12 demonstration project sites, 2) reducing annual pollutant loads: nitrogen 616 pounds; phosphorus 44 lbs; sediment 8.2 tons.
Marshyhope Creek and Nanticoke River Watersheds Ag Technical Assistance Md Dept of Agriculture with the Dorchester Soil Conservation Dist.	41,930	27,953	Ongoing project outcome for July 2007 through June 2008: 1) BMPs: 67 were implemented resulting in annual pollutant load reductions: 17,753 lbs/yr nitrogen; 4,319 lbs/yr phosphorus. 2) Conservation Plans: 11 new plans on 494.5 acres and 61 revised plans on 5,202 acres.
Miles River Watershed Plan Talbot County	18,941	12,627	Talbot County accomplishments: 1) Final plan set goals and priorities for reducing nutrient impairment. 2) Support documents include: watershed characterization, stream corridor assessment, synoptic stream survey.
Upper Choptank River Watershed Ag Technical Assistance Md Dept of Agriculture with the Caroline Soil Conservation Dist.	66,224	44,149	Ongoing project outcome for July 2007 through June 2008: 1) BMPs: 25 were implemented resulting in annual pollutant load reductions: 11,399 lbs/yr nitrogen; 967 lbs/yr phosphorus. 2) Conservation Plans: 30 new plans on 1,585 acres and 46 revised plans on 6,064 acres.
Upper Choptank River Watershed Cover Crops Md Dept of Agriculture with the Caroline Soil Conservation District	121,600	81,067	Payments were made to farmers for seasonal cover crops in response to 45 applications by farmers. 3,905 acres of cover crops were planted resulting in an estimated 33,192 pounds reduction in nitrogen load.

* Federal: Project expenditures reimbursed by Federal grant. Match: Project expenditures covered by non-Federal fund sources. Some projects may also involve funding sources in addition to the Federal grant and the funding documented as match for the grant.

C. Multi-Year NPS Projects Supported By Federal 319(h) Grant Funds

Maryland has employed Federal 319(h) Grant funds for over 19 years to help reimburse selected expenditures for State's Nonpoint Source Program and for eligible nonpoint source projects. This consistent financial support has promoted Maryland's interest to achieve nonpoint source management results that require more than a single year's investment. Beginning in the 1990s, Maryland identified nonpoint source management projects that required multi-year investment and earmarked Federal 319(h) Grant funds to help support these efforts:

- Aaron Run Watershed
- Agricultural Technical Assistance
- Bennett Creek Watershed
- Corsica River Watershed
- Implementation Tracking for Nonpoint Source Management

Aaron Run Watershed

In 1976, the Maryland Abandoned Mine Inventory (MAMI) estimated that over 450 miles of Maryland streams had been damaged by acid mine drainage (AMD) from abandoned pre-law coal mine sites. One of the streams on this list, Aaron Run, drains a 3.5 square mile sub-watershed within the North Branch Potomac River Watershed in Garrett County, Maryland. It was once healthy mountain trout stream prior to mining activities that operated from the 1930s through the early 1970s.

Low pH values in Aaron Run, in the range of 3.3-4.0, have been documented since 1966. Associated with the low pH, high concentrations of acidity, sulfates, iron, aluminum and manganese are also documented. Additionally, Aaron Run has severe bank erosion at several locations. As a result, the benthic index of biotic integrity for Aaron Run ranges from poor to very poor and fish populations are extremely limited. No trout currently survive in impacted stream segments.

However, studies of physical and biological conditions in the Aaron Run stream and watershed indicate that remediation can be effective. This multi-year project is designed to remediate acid mine drainage by: 1) installing passive acid mine drainage treatment technologies to neutralize the acid and reduce the metal concentrations, and 2) reclaim 10 acres of abandoned surface mine land along the mainstem of Aaron Run to eliminate surface water contamination from uncontrolled sedimentation leaving these sites.

In general, goals of the Aaron Run project are to:

- Bring pH and metals concentrations into a normal range.
- Allow native fish/trout to naturally repopulate in the lower reaches of Aaron Run and the lower portion of the Savage River, which is currently impaired by the inflow of AMD impaired water from Aaron Run.
- Eliminate the impairment listing for Aaron Run on Maryland's 303(d) List.

Overall, the Aaron Run project involves funding from multiple sources:

- Federal 319(h) Grant from three grant years totaling up to \$950,000. (EPA approval is pending for some of these funds).
- Match of about \$635,000 including MDE Special Funds, Title IV Abandoned Mine Funds (Surface Mining Control and Reclamation Act), funding through the Western Maryland RC&D, Maryland Bay Restoration Funds, and others.

Completion of the Aaron Run project is projected for 2010.

Agricultural Technical Assistance

In the early 1990's, the Maryland Department of Agriculture (MDA) prioritized Maryland watersheds based on nonpoint source management issues associated with agriculture. In cooperation with other State agencies, priorities were established to help focus resources for selected watersheds. In some of these watersheds, additional technical personnel were needed, to work through the Soil Conservation Districts with local landowners and operators of agricultural land, to help implement best management practices to protect water quality and conserve soil. For selected watersheds listed in Table 4 below, the Federal 319(h) Grant has helped to cover a portion of these costs.

Table 4 Agricultural Technical Assistance Multi-Year Projects Receiving 319(h) Grant Funds in FFY2008		
Watershed	Grantee	Sub-Grantee
Antietam River	MDA	Washington Soil Conservation District
Corsica River	MDA	Queen Anne's Soil Conservation District
Deer Creek	MDA	Harford Soil Conservation District
Liberty Reservoir	MDA	Carroll Soil Conservation District
Marshyhope Creek & Nanticoke River	MDA	Dorchester Soil Conservation District
Upper Choptank River	MDA (pre-FFY08) Caroline SCD (FFY08)	Caroline Soil Conservation District

Bennett Creek Watershed

In the Bennett Creek watershed within the Monocacy River watershed, Frederick County is employing Federal 319(h) funds to help support several projects. Currently, three grant-funded projects involve establishing and institutionalizing a wetland assessment and monitoring program and implementing at least four wetland creation/restoration projects. Collectively, currently envisioned projects are slated to run from October 2006 through June 2010 to produce pollutant load reductions greater than: 4900 lb/yr nitrogen; 1600 lb/yr phosphorus; 110 ton/yr sediment. Up to about \$537,000 Federal 319(h) Grant funds and about \$394,000 of local funds will be invested to achieve the goals of these projects. Table 5 provides additional summary information.

Table 5
Bennett Creek Watershed – Summary of 319(h) Grant-Funded Projects (Feb. 2009)
Grantee: Frederick County

Project Name	Status	Grant \$	Match \$	Description
Supplement for Lower Monocacy River Watershed Plan (includes Bennett Creek)	Accepted by EPA July 2008	zero	**40,000	Provides information needed to meet EPA A-I Criteria for the 2004 Lower Monocacy River Watershed Restoration Action Strategy
Urban Wetlands Program, Bennett Creek Watershed Pilot	Completed Oct. 2007	71,103.85	47,402.57	1) Developed a wetland monitoring assessment and inventory protocol. 2) Created and implemented a GIS tracking system. 3) Initiated an education and outreach program.
Urban Wetlands Program, Bennett Creek Watershed Pilot	In progress, scheduled end is Nov. 2009	*176,500 + ***46,864	117,667 + 32,243	1) Conducted assessments and baseline monitoring. 2) Identified and prioritized wetland restoration projects for implementation. 3) Initiating restoration project implementation for about 4 projects.
Bennett Creek Watershed Urban BMP Demonstration Project	In progress, scheduled end is June 2010	*234,545	156,363	1) Select restoration project sites involving stakeholders. 2) Perform additional wetland assessment and monitoring. 3) Establish riparian buffer on 12 acres of urban land treating about 36 acres to reduce pollutant loads by about 46 tons of sediment, 1435 pounds of nitrogen and 887 pounds of phosphorus. 4) Establish nonstructural urban BMP projects treating 30 acres of urban land to reduce pollutant loads by about 65 tons of sediment, 3,427 pounds of nitrogen, and 720 pounds of phosphorus.
Overall		527,013	393,676	Pollutant load reduction projected: 4862 lb/yr nitrogen; 1607 lb/yr phosphorus; 111 ton/yr sediment.

* Grant \$ is the grant allocation, not actual grant reimbursement. (This affects associated Match \$).

** Local out-of-pocket expense.

*** Additional grant \$ requested to perform additional work.

Corsica River Watershed

The Corsica River watershed continues to be a Maryland focus area since its 2005 beginning. Partners in this effort include the Maryland Departments of the Environment, Natural Resources and Agriculture, the Town of Centreville and Queen Anne's County. Project goals include:

- Reducing sediment and nutrient pollution to implement TMDLs, which will lead to removal of the Corsica River from Maryland's 303(d) list of impaired waters.
- Implementing projects that reduce sediment and nutrient pollutant loads
- Conducting outreach and education aimed at directly involving local residents,
- Increasing the capacity of local governments to protect water quality.

During calendar year 2008 five projects received 319(h) Grant funds. A summary of grant funding for these projects is presented in Table 6. The progress reported by these projects is summarized in the following pages:

- Corsica River Watershed Restoration Project Agriculture Project Capacity Development Demonstration: This Maryland Dept. of Agriculture project supported a conservation planner position in the Queen Anne's Soil Conservation District, outreach and education/outreach targeting the agricultural community to promote cover crops and other BMPs including horse pasture management. Project accomplishments reported for the most recent report are summarized below (FFY07 project final report):
 - Three conservation plans completed for 200.6 acres.
 - Nine BMPs were applied totaling 755 tons/year in sediment reduction, 10.03 lbs/year of phosphorus reduction, and 285.96 lbs/year of nitrogen reduction into the Corsica River and its tributaries. The BMPs applied were, five grade stabilization structures, one grassed waterway of 0.1 acres, one diversion of 110 linear feet, one stream crossing, and one stream fencing of 5,000 linear feet.
- Corsica River Watershed Implementation Monitoring: This Maryland Dept. of the Environment project monitors effectiveness of retrofitting conventional on-site domestic septic systems (OSDS) with nitrogen control technology and of implementing urban stormwater management BMPs. According to the project report for FFY07:
 - OSDS monitoring wells installed at several residential sites and control sites yielded samples of pre-implementation conditions.
 - Automated samplers in two storm drains draining Route 213 in Centreville for first flush and a timed composite samples as summarized in Table 7.

Table 6
Corsica River Watershed
Summary of 319(h) Grant-Funded Projects (Feb. 2009)

319(h) Grant Funding

Project Year	Centreville	DNR	MDA	MDE	MDE	QA Co.	TOTAL
				Corsica	Targeted*		
1	232,666.15	199,766.06	145,554.24	77,225	161,373		816,583.95
2	300,500	184,140	14,272.71	30,415	165,590	124,281.44	819,198.65
3	300,500	130,300	22,187.16	79,650	185,702		718,338.66
4			50,780	72,411	158,068	50,000	331,259.00
Total Grant	833,666.15	514,206.06	232,794.11	259,701.00	670,731.50	174,281.44	2,685,380.26

Key:

Uncolored box, with two decimal places = actual expenditure for completed project

Yellow box, with whole number = grant allocation

Grey box = no grant amount

* Estimated 50% of total project budget is expended for Corsica work.

NonFederal Match

Project Year	Centreville	DNR	MDA	MDE	MDE	QA Co.	TOTAL
				Corsica	Targeted*		
1	155,110.77	133,177.37	97,036.16	51,483	107,582		544,389.30
2	200,333	122,760	9,515.14	20,277	110,393	82,854.29	546,132.43
3	200,333	86,867	14,791.44	53,100	123,801		478,892.44
4			33,853	48,274	105,379	33,333	220,839.33
Total Match	555,777.43	342,804.04	155,196.07	173,134.00	447,154.33	116,187.63	1,790,253.51

Total Project	1,389,443.58	857,010.10	387,990.18	432,835.00	1,117,885.83	290,469.07	4,475,633.77
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Table 7 Corsica River Watershed Urban Stormwater Constituent Ranges Before Retrofit Implementation		
Parameter	Storm Flow	Criteria (COMAR)
Total nitrogen	up to 14.6 mg/L	N/A
Total phosphorus	up to 2.2 mg/L	N/A
Cadmium	up to 20.0 ug/L	2 ug/L (acute)
Copper	up to 100 ug/L	13 ug/L (acute)
Lead	up to 160 ug/L	65 ug/L (acute)
Zinc	up to 300 ug/L	120 ug/L (acute)
Oil and grease	up to 5.2 mg/L	5 mg/L
TPH	up to 5.0 mg/L	5 mg/L

- Corsica River Restoration Project: monitoring 1) water quality results of implementing cover crops and stormwater BMPs and 2) living resources: This Maryland Dept. of Natural Resources project is a comprehensive monitoring project to gauge early implementation progress in the Corsica River Watershed Restoration Project and to provide feedback necessary to enhance the success of future watershed restoration projects. The most recent project reports included the following:
 - Cover crop implementation results based on samples from 42 fields found an average nitrate-N concentration of 18.2 mg/l ranging from 6.8 to 57 mg/l. Results from several sampling years for corn fields show that cover crops substantially reduced nitrate leaching compared to fallow fields. (January 2008 report).
 - Fish sampling in 2006-2007 in the three major Corsica River tributaries found that yellow and white perch eggs/larva tended to be present in Old Mill Branch and Three Bridges Branch, but tended to be absent in Gravel Run. Results from fish sampling conducted in the open tidal Corsica River 2003-2007 were reported but no trend was identified. (November 2007 report)
 - Water quality sampling in the Corsica River 2003-2007 suggests a trend toward an increasing number of violations of the 5.0 mg/l dissolved oxygen standard. (November 2007 report)

- Corsica River Watershed Restoration Project Town of Centreville Demonstration Project: This project focuses on local government capacity building by funding: 1) A watershed manager and associated program costs to accelerate local government institution changes, public outreach/education, and implementation of urban BMPs in this watershed, and 2) Project design/construction for urban stormwater retrofit/management. 2008 accomplishments for this project are listed below.

The Centreville Town Council made several institutional changes in 2008:

- Created an Environmental Advisory Council (EAC) composed of residents and environmental professionals including the Town’s Watershed Manager. This body advises the Town on environmentally sensitive issues and has the responsibility of reviewing and updating Centreville’s ordinances.
- Adopted an ordinance for maintenance of tree canopy, which is identified by the Maryland Forest Service as one the of the most progressive tree canopy ordinances in the State of Maryland.

- Adopted an ordinance for control of pet waste.
- Drafted an ordinance that would affect Environmentally Sensitive Areas.

Centreville stormwater treatment/retrofit implementation progress reported for 2008 included three projects:

- Gravel Run Wooded Wetland project design was completed and permits were received. Construction slated in Spring 2009. When complete the project will treat stormwater from 17 acres including a portion of Maryland Rt. 213.
- Coastal Plain Outfall / Banjo Lane project design was completed, permits were received and the bid process for construction was initiated. Construction is slated in Spring 2009. When complete the project treat stormwater from about 10 acres including a steep slope.
- Centreville Police Station bio-retention project design and permits/approvals process is underway.

Centreville Outreach/Education progress in 2008 included:

- Use of the Corsica River watershed logo and associated public awareness campaign continued throughout 2008.
- In May 2008, the Town hired a consultant to implement the outreach campaign. Accomplishments include updating the Corsica River watershed website, creation of a TV ad and presentations for use at meetings/events, and conducted interviews with local radio stations and newspapers. (see www.corsicariver.org)
- Corsica River Awareness Day was held September 20, 2008.
- To gauge success of the education and outreach campaign, a survey was conducted in December 2008 of citizen awareness and understanding of local nonpoint issues and the program to address them. The majority of respondents were aware of the campaign and were interested in Corsica River water quality. Less than half were willing to say which problems were most important but the most frequently mentioned issues were overdevelopment and agricultural runoff.

D. Implementation Tracking for Nonpoint Source Management

Two projects supported by Federal 319(h) Grant funds include responsibilities to collect and integrate information on implementation projects that protect or restore water bodies affected by nonpoint source pollution.

On urban lands in Maryland, hundreds of stormwater management projects are constructed each year. These urban lands include residential, commercial, industrial and institution properties. In order to track stormwater management implementation progress, 23 Counties, Baltimore City and dozens of municipalities that each collect and maintain data for their jurisdiction using various methods designed to meet local needs. In cooperation with these jurisdictions, MDE's Urban Stormwater Management Practices Database project collects this information and integrates it into a single system that supports statewide progress tracking.

On non-urban lands in Maryland, thousands of best management practices are implemented each year. These nonpoint source control practices include animal waster management, cover crops, forest management practices, stream buffers and restoration, wetland restoration, and others.

Implementing and tracking these projects and involves many different entities such as Soil Conservation Districts, State and local agencies.

Coordination and integration of these divergent data from urban and non-urban is performed by MDE's Analyzing and Tracking Nonpoint Source Data project. This ongoing project has successfully coordinated the consolidation of nonpoint source Best Management Practices for use in the Chesapeake Bay Watershed Model.

The most current cumulative progress tracking data through 2007 is presented in Appendix B.

E. Watershed Planning

Protecting and restoring water quality depends on effective planning to be successful. To meet these needs, Maryland State agencies, counties, municipalities, watershed organizations and other groups conduct planning at a watershed scale. The form and focus of these watershed plans are as diverse as groups that produce them.

Some of these watershed-based plans are produced, in part to meet requirements under the Federal Clean Water Act including the 319(h) Grant. In particular, watershed plans must be accepted by EPA based on EPA guidance for components of a watershed-based plan (A-I Criteria) in order to expend funds for implementation from the "Incremental" portion of the 319(h) Grant.

Prior to 2008, EPA had accepted one watershed plan in Maryland:

Corsica River Watershed Restoration Action Strategy, Final Report September 2004
<http://www.dnr.state.md.us/watersheds/surf/proj/wras.html>

During 2008, EPA accepted four watershed plans that were submitted by Maryland jurisdictions:

Lower Jones Falls Watershed Small Watershed Action Plan, Baltimore County, October 15, 2008.

Lower Monocacy River Watershed Restoration Action Strategy (WRAS) Supplement: EPA A-I Requirements, Frederick County Maryland, July 2008, Version 1.0
http://www.watershed-alliance.com/mcwa_pubs.html

Spring Branch Subwatershed – Small Watershed Action Plan (Addendum to the Water Quality Management Plan for Loch Raven Watershed), Baltimore County, March 17, 2008.

Upper Back River Small Watershed Action Plan, Volume 1 and 2, Baltimore County, November 2008.

Watershed planning and implementation activities involving MDE's 319(h) NPS Program are summarized in Table 8.

**Table 8
Watershed Planning Activities For NPS Management And Implementation Status*
Maryland 319(h) NPS Program
March 2009**

Watershed	County	Lead	Watershed Plan	Implementation
Aaron Run	Garrett	MDE	Completed 2005	In progress 2008 to 12/31/2010 (FFY05, 06, 07 319(h) Grant funding)
Bennett Creek	Frederick	Co.	Accepted by EPA (Lower Monocacy plan, did not use federal funding)	In progress (FFY07 & FFY08 319(h) Grant funding)
Casselman River	Garrett	MDE	Drafting in progress (319(h) Grant funded)	Proposed (FFY09 319(h) starting 7/1/09)
Corsica River	Centreville, Queen Anne's Co.	Town & Co	Accepted by EPA	In progress (2005 to ?) (319: FFY05 to FFY09)
Hall Creek	Calvert	Co.	Proposed planning project (requested 319(h) funds)	To be determined during the planning process.
Lower Jones Falls	Baltimore Co.	Co.	Accepted by EPA (plan production did not use federal funding)	Implementation projects are eligible for 319(h) implementation funding.
Sligo Creek	Prince George's	Co.	In EPA review (319(h) Grant funded)	Implementation scheduled in FFY08 319(h) project for 2009-2010.
Spring Branch	Baltimore Co.	Co.	Accepted by EPA (Spring Br. supplement to Loch Raven plan, plan production did not use federal funding)	Implementation complete (Construction was partially 319(h) Grant funded.)
Upper Back River	Baltimore Co.	Co.	Accepted by EPA (plan production do not use federal funding)	Redhouse Run stream restoration project (Proposed for FFY07 319 funds)
Upper Choptank River	Caroline	Co.	Proposed planning project (requested 319(h) funds)	To be determined during the planning process.

* Watershed plans and implementation of those plans that are identified in the table are limited to projects that involve MDE's 319(h) NPS Program.

V. Areas of Concern/Recommendations/Future Actions

Key challenges addressed by the NPS Program in collaboration with other state efforts include:

Urban/Suburban Nonpoint Source Pollution is increasing: Maryland has seen tremendous population growth over the last 20 years and the trend is projected to continue. An accompanying trend is a decrease in the number of people per household. These trends contribute to increasing development acreage, increasing impervious area as a percentage of the landscape and increasing urban nonpoint source pollutant loads in affected watersheds. During 2008, the Maryland Department of the Environment (MDE) continued to promote new and innovative practices to control stormwater through environmentally sensitive design techniques described in the “2000 Maryland Stormwater Management Manual.” Also during 2008, MDE’s Stormwater Management Program was drafting a new manual with updated information, guidelines and requirements. MDE is committed to maintaining a state-of-the-art approach to stormwater management and can contribute to control and reduction of the negative affects of urban stormwater runoff.

Resource Constraints/Measurable Environmental Results: As federal and state budgets grow tighter, there is a push for all programs to demonstrate their effectiveness at producing results. The national Nonpoint Source Program is under pressure to demonstrate program effectiveness through measurable environmental results. Over the past few years, the Maryland NPS Program has focused on a watershed approach to help local government effectively leverage their resources to meet environmental goals and objectives. In the future, the NPS Program will selectively target program resources to aid efforts aimed at removing waters from the impaired waters list.

Maryland priorities include:

Reducing nutrient and sediment pollution: Nutrient and sediment pollution are the main reason our waterways remain impaired. These pollutants are the foremost threats to the state’s living resources. Although significant progress has been made in reducing nutrient and sediment pollution, significant progress still needs to be made to meet Chesapeake Bay 2000 agreement and Coastal Bays management plan nutrient reduction goals.

Improvement of Impaired Waters: Removal of impaired waters from the 303(d) list, either entirely or partially, is a priority. As part of the EPA Strategic goals there is a call for improvement in a state’s living resources. As part of this goal, targeting watersheds that can either be removed or partially removed is a priority. Efforts to strategically target these watersheds in cooperation were underway in 2008 and will continue to be developed.

Appendix A
General Approach and Schedule to Implement Applicable Management Measures
Page 1 Of 2

Category / Priority		Implementation Timeline (Years)		
		1998-2002	2003-2007	2009-2012
Agriculture	Statewide	Farmers using commercial fertilizers must have n & P based plans by 2002	Soil Conservation Water Quality Plans (SCWQP) on 50% of all farms by 2003	
		Farmers using animal manure or sludge must have n & P based plans by 2002	SCWQP implemented on 25% of all farms by 2003	
			Farmers using animal manure or sludge must have N&P based plans by July 1, 2004	
	Watershed Focus	Tributary Strategies	Agricultural Priority Watersheds**	
		Agricultural Priority Watersheds**		
Forestry	Statewide	Riparian Forest Buffer (RFB) goal of 43 mi/yr	RFB goal of 43 mi/yr	600 miles of RFB created by 2010
	Watershed Focus	Coastal Bays		
		Special Streams Project		
		Monocacy		
		Anacostia		
		Susquehanna		
		Town Creek		
		Rock & Carroll Creek		
Urban runoff: developing and developed areas	Statewide			
	Watershed Focus	Washington - Baltimore Metro Area, Roland Run, Redhouse Run, Severn River SWM plan		
		Anacostia Watershed		

Appendix A
General Approach and Schedule to Implement Applicable Management Measures
Page 2 Of 2

Category / Priority		Implementation Timeline (Years)		
		1998-2002	2003-2007	2009-2012
Marinas and Recreational Boating	Statewide	96 Certified Clean Marinas by 2002	125 Certified Clean Marinas by 2004	270 Certified Clean Marinas by 2010
				Marine Sewage Pumpout Program goal of 460 facilities by 2010
	Watershed Focus	Chesapeake Bay		
		Coastal Bays		
		Deep Creek Lake		
Channelization and Channel Modification, dams, and shoreline erosion	Statewide			
	Watershed Focus	Chesapeake Bay Shoreline		
		CWAP Priority Watersheds		
		Anacostia Northwest Branch		
		Anacostia Town Park Stream		
Wetlands	Statewide	3000 acres by 2002	10,500 acres by 2007	15,000 acres by 2010
	Watershed Focus	CWAP Priority Watersheds		
		Coastal Bays		

From "Maryland Nonpoint Source Management Plan December 1999"

Appendix B

2007 BMP Implementation Progress in Maryland

From MDE's Analyzing and Tracking Nonpoint Source Data Project, FFY08 319(h) Grant

Type Of Practice	Choptank River	Lower Eastern Shore	Lower Western Shore	Lower Potomac River	Middle Potomac River	Non Bay Water-sheds	Patapsco / Back River	Patuxent River	Upper Eastern Shore	Upper Western Shore	Upper Potomac River	Statewide Total	Nitrogen Reduction Approx. (lb/yr)	Phos. Reduction Approx. (lb/yr)
Animal Waste Mgmt Systems-Livestock	52	31	4	20	13	0	53	52	145	113	677	1,160	1,396,408	158,116
Animal Waste Mgmt Systems-Poultry	178	907	0	0	0	0	0	0	94	3	12	1,194	268,303	30,380
Cover Crops	32,802	48,475	619	6,149	2,131	0	2,152	5,522	42,007	12,884	26,625	179,366	323,624	14,790
Dry Detention Ponds & Hydro Structures	732	1,405	1,791	655	15,336	719	12,787	3,203	2,346	13,160	14,131	66,266	24,196	2,995
Dry Extended Detention Ponds	219	114	3,065	884	9,893	142	8,689	5,128	377	6,513	8,597	43,621	95,566	9,857
Erosion and Sediment Control	54	1,136	4,321	410	11,740	0	5,893	8,457	184	3,477	2,491	38,163	91,970	8,624
Filtering Practices	49	148	364	78	1,232	35	2,699	614	116	1,457	321	7,114	20,780	1,929
Forest Conservation	1,455	3,314	3,207	12,561	10,853	0	5,194	21,123	8,473	11,719	4,258	82,156	N/A	N/A
Forest Harvesting Practices	3,039	17,349	469	5,341	307	0	747	1,897	2,503	2,414	6,180	40,245	27,548	359
Grassed Buffers	15,234	14,927	23	1,016	69	0	465	570	9,573	298	2,555	44,730	437,878	51,815
Infiltration Practices	206	307	2,533	94	1,722	171	18,487	2,821	159	1,423	2,884	30,808	112,492	9,747
Nutrient Mgmt Plan Implementation	158,878	213,445	12,961	47,056	39,134	0	68,476	51,140	257,362	99,776	262,237	1,210,466	1,377,870	242,688
Retirement Of Highly Erodible Lands	362	481	71	1,222	2,063	0	1,179	718	3,661	994	6,082	16,833	N/A	N/A
Riparian Forest Buffers on Ag Lands	1,145	7,382	51	679	452	0	814	690	1,833	1,300	5,539	19,885	230,881	28,351
Riparian Forest Buffers on Urban Lands	3	0	47	26	55	0	63	73	34	11	33	346	408	1,183
Runoff Control	8	9	5	23	3	0	49	164	48	304	300	913	667	41
Septic Connections to Sewers	510	796	332	720	0	0	977	220	4,561	570	2,054	10,740	78,432	N/A
Septic Denitrification	49	64	219	24	11	0	121	157	40	8	18	711	2,598	N/A
Soil Conservation Water Quality Plans	95,949	100,910	2,491	21,049	25,523	0	11,723	39,751	140,408	66,393	138,754	642,951	731,870	128,906
Stream Protection w/Fencing	0	30	77	243	207	0	309	489	64	616	2,317	4,352	59,446	5,817
Stream Protection w/o Fencing	0	41	646	204	250	0	6,175	6,966	255	13,273	3,980	31,790	217,119	21,245
Stream Restoration	655	3,703	5,652	1,509	39,271	0	21,110	12,025	5,057	36,905	21,102	146,989	669,269	1,146
Tree Planting on Agricultural Lands	1,207	2,009	91	48	97	0	255	260	1,804	1,039	2,880	9,691	112,516	13,816
Wet Ponds	623	5,125	3,580	1,045	20,404	920	9,061	7,982	2,803	4,690	7,429	63,662	139,473	14,386
Wetland Restoration on Ag Lands	1,604	2,755	5	169	35	0	105	91	2,124	190	195	7,272	84,436	10,368

Footnotes

1. For each type of practice in the table, data represents cumulative totals through 2007.
2. Nutrient load reduction estimates for each type of practice represent the affect of each BMP acting independently.
The nutrient load reduction estimates do not account for the potential aggregate affect of multiple BMPs interacting together.
For example, an agricultural field may have both cover crops and grassed buffers.

Appendix C
Cooperating Agencies and Contacts
Page 1 of 1

Maryland Nonpoint Source Program List of Agency Cooperators		
State Lead Agency	Maryland Department of Environment Science Services 1800 Washington Blvd. Baltimore MD 21230 410-537-3902	Jim George – Director, Water Quality Protection and Restoration Program Ken Shanks- §319(h) Grant Manager Joe Woodfield- §319(h) Natural Resources Planner
State	Maryland Department of Natural Resources Watershed Services 580 Taylor Ave. E-2 Annapolis MD 21401 410-260-8710	Matt Fleming – Chesapeake & Coastal Programs John McCoy – Ecosystem Restoration Services Catherine Shanks – Community & Local Government Services
State	Maryland Department of Agriculture 50 Harry S. Truman Parkway Annapolis MD 21401	John Rhoderick- Office of Resource Conservation
State	Maryland Department Of Planning 301 W. Preston Street Suite 1101 Baltimore MD 21201-2305	Joe Tassone- Landuse Planning and Analysis
Federal	EPA Region III Nonpoint Source Program Water Protection Division Mail Code 3WP10 1650 Arch Street Philadelphia PA 19103-2029	Fred Suffian, Team Leader David Greaves, Maryland Project Officer