

Acknowledgements

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Table of Contents

Volume I

Acknowledgements

Chapter 1

Introduction

1.1	Vision.....	1-1
1.2	Background	1-3
1.3	Purpose.....	1-4
1.4	Plan Implementation	1-4
1.5	Plan Organization	1-5

Chapter 2

Watershed Group Condition

2.1	General Watershed Group Information	2-1
2.2	History of the Watershed	2-2
2.3	Existing and Future Land Use	2-3
2.4	Watersheds	2-5
2.5	Summary of Existing Reports and Data.....	2-6
2.5.1	Environmental Baseline Report	2-6
2.5.2	Immediate Action Plan Report	2-6
2.5.3	Future Basin Plan Report.....	2-6
2.5.4	Fairfax County Master Plan Drainage Projects.....	2-7
2.5.5	Infill and Residential Development Study	2-7
2.5.6	Fairfax County Virginia Pollutant Discharge Elimination System Permit Data	2-7
2.5.7	Stream Water Quality Reporting	2-8
2.5.8	Virginia Natural Heritage Resource	2-10
2.5.9	Stream Protection Strategy.....	2-11
2.5.10	Stream Physical Assessment.....	2-12
2.5.11	Stormwater Management Facilities.....	2-20
2.5.12	Stormwater Infrastructure Maintenance.....	2-21
2.5.13	On-Site Wastewater Treatment.....	2-22
2.5.14	Flooding	2-22
2.6	Modeling Approach and Summary.....	2-23
2.7	Future Watershed Condition	2-28

Chapter 3

Watershed Plan Goals, Implementation and Monitoring

3.1	Watershed Plan Goals, Objectives and Actions.....	3-1
3.1.1	Goal A Objectives and Actions	3-4
3.1.1.1	Objective A1.....	3-4
3.1.1.2	Objective A2.....	3-11
3.1.1.3	Objective A3.....	3-12
3.1.2	Goal B Objectives and Actions	3-13
3.1.2.1	Objective B1.....	3-13
3.1.2.2	Objective B2.....	3-14
3.1.2.3	Objective B3.....	3-14
3.1.2.4	Objective B4.....	3-16
3.1.2.5	Objective B5.....	3-17
3.1.3	Goal C Objectives and Actions	3-18
3.1.3.1	Objective C1.....	3-18
3.1.3.2	Objective C2	3-20
3.1.3.3	Objective C3.....	3-22
3.2	Watershed Project Types	3-25
3.3	Benefits of Plan Actions	3-31
3.4	Implementation of Plan Actions	3-34
3.5	Monitoring of Plan Actions	3-39

Chapter 4

Bull Neck Run Watershed Management Plan Strategy

4.1	Watershed Condition	4-1
4.1.1	Watershed Characteristics	4-2
4.1.2	Existing and Future Land Use	4-2
4.1.3	Existing Stormwater Management.....	4-4
4.1.4	Stream Geomorphology	4-5
4.1.5	Stream Habitat and Water Quality	4-6
4.1.6	Problem Areas from the Public Forum	4-7
4.1.7	Modeling Results	4-8
4.1.7.1	Hydrology and Water Quality Modeling	4-9
4.1.7.2	Hydraulic Modeling	4-11
4.2	Management Plan Strategy.....	4-12
4.3	Benefits of Plan Actions.....	4-19
4.4	Implementation of Plan Actions	4-19

Chapter 5

Scotts Run Watershed Management Plan Strategy

5.1	Watershed Condition	5-1
5.1.1	Watershed Characteristics	5-2
5.1.2	Existing and Future Land Use	5-2
5.1.3	Existing Stormwater Management.....	5-5
5.1.4	Stream Geomorphology	5-7
5.1.5	Stream Habitat and Water Quality	5-8
5.1.6	Problem Areas from the Public Forum	5-10
5.1.7	Modeling Results	5-12
5.1.7.1	Hydrology and Water Quality Modeling	5-14
5.1.7.2	Hydraulic Modeling	5-15
5.2	Management Plan Strategy.....	5-18
5.3	Benefits of Plan Actions	5-33
5.4	Implementation of Plan Actions	5-34

Chapter 6

Dead Run Watershed Management Plan Strategy

6.1	Watershed Condition	6-1
6.1.1	Watershed Characteristics	6-1
6.1.2	Existing and Future Land Use	6-2
6.1.3	Existing Stormwater Management.....	6-4
6.1.4	Stream Geomorphology	6-6
6.1.5	Stream Habitat and Water Quality	6-6
6.1.6	Problem Areas from the Public Forum	6-8
6.1.7	Modeling Results	6-10
6.1.7.1	Hydrology and Water Quality Modeling	6-11
6.1.7.2	Hydraulic Modeling	6-13
6.2	Management Plan Strategy.....	6-14
6.3	Benefits of Plan Actions	6-26
6.4	Implementation of Plan Actions	6-26

Chapter 7

Turkey Run Watershed Management Plan Strategy

7.1	Watershed Condition	7-1
7.1.1	Watershed Characteristics	7-1
7.1.2	Existing and Future Land Use	7-2
7.1.3	Existing Stormwater Management.....	7-4
7.1.4	Stream Geomorphology	7-6

7.1.5	Stream Habitat and Water Quality	7-6
7.1.6	Problem Areas from the Public Forum	7-8
7.1.7	Modeling Results	7-8
7.1.7.1	Hydrology and Water Quality Modeling	7-9
7.1.7.2	Hydraulic Modeling	7-11
7.2	Management Plan Strategy	7-12
7.3	Benefits of Plan Actions.....	7-19
7.4	Implementation of Plan Actions	7-19

Chapter 8

Pimmit Run Watershed Management Plan Strategy

8.1	Watershed Condition	8-1
8.1.1	Watershed Characteristics	8-2
8.1.2	Existing and Future Land Use	8-2
8.1.3	Existing Stormwater Management.....	8-6
8.1.4	Stream Geomorphology	8-9
8.1.5	Stream Habitat and Water Quality	8-10
8.1.6	Problem Areas from the Public Forum	8-13
8.1.7	Modeling Results	8-21
8.1.7.1	Hydrology and Water Quality Modeling	8-23
8.1.7.2	Hydraulic Modeling	8-26
8.2	Management Plan Strategy.....	8-26
8.3	Benefits of Plan Actions.....	8-48
8.4	Implementation of Plan Actions	8-49

Chapter 9

Policy and Land Use Recommendations

9.1	Watershed Strategy	9-1
9.2	Goals, Objectives, and Actions	9-1

List of Tables

Table 2.1	Middle Potomac Watershed Group Imperviousness	2-3
Table 2.2	Existing and Future Land Use in the Middle Potomac Watershed Group ...	2-4
Table 2.3	Summary of Fecal Coliform Sampling in the Middle Potomac Watershed Group	2-9
Table 2.4	Virginia Natural Heritage Resources in the Middle Potomac Watershed Group	2-10
Table 2.5	Macroinvertebrate Assessment and Fish Species.....	2-11
Table 2.6	Description of Impacts	2-13
Table 2.7	Summary of CEM Types	2-16

Table 2.8	Summary of Overall Stream Habitat Quality	2-16
Table 2.9	Sedimentation Assessment	2-17
Table 2.10	Riparian Buffer Assessment	2-18
Table 2.11	Erosion Data	2-19
Table 2.12	Watershed Area Controlled by Stormwater Management Facilities	2-20
Table 2.13	Stormwater Management Facility Maintenance	2-21
Table 2.14	On-Site Wastewater Treatment	2-22
Table 2.15	Potential Flooding Locations	2-23
Table 2.16	Water Quality Pollutant Loading Rates	2-26
Table 3.1	Pollutant Loadings and Reductions	3-32
Table 4.1	Bull Neck Run Watershed Land Use	4-2
Table 4.2	Bull Neck Run Watershed Master Plan Drainage Projects	4-4
Table 4.3	Bull Neck Run Watershed Stormwater Management Facilities	4-5
Table 4.4	Problem Areas Identified During Public Forums	4-7
Table 4.5	Bull Neck Run Cumulative Peak Runoff Flows	4-10
Table 4.6	Bull Neck Run Pollutant Loads	4-10
Table 4.7	Benefits of Stormwater Management Facility and BMP Retrofits	4-13
Table 4.8	Benefits of New LID	4-13
Table 4.9	Summary of Bull Neck Run Priority Projects	4-20
Table 4.10	Summary of Bull Neck Run Non-Priority Projects	4-20
Table 5.1	Scotts Run Watershed Land Use	5-3
Table 5.2	Scotts Run Watershed Master Plan Drainage Projects	5-6
Table 5.3	Scotts Run Watershed Stormwater Management Facilities	5-7
Table 5.4	Problem Locations Identified During Public Forums	5-10
Table 5.5	Scotts Run Cumulative Peak Runoff Flows	5-14
Table 5.6	Scotts Run Pollutant Loads	5-16
Table 5.7	Benefits of Stormwater Management Facility and BMP Retrofits	5-22
Table 5.8	Benefits of New BMPs and LID Projects	5-25
Table 5.9	Benefits of Neighborhood Stormwater Improvement Areas.....	5-26
Table 5.10	Recommended Flood Protection Locations	5-27
Table 5.11	Summary of Scotts Run Priority Projects.....	5-35
Table 5.12	Summary of Scotts Run Non-Priority Projects	5-36
Table 6.1	Dead Run Watershed Land Use	6-2
Table 6.2	Dead Run Watershed Master Plan Drainage Projects	6-5
Table 6.3	Dead Run Watershed Stormwater Management Facilities	6-6
Table 6.4	Problem Areas Identified During Public Forums	6-8
Table 6.5	Dead Run Cumulative Peak Runoff Flows	6-12
Table 6.6	Dead Run Pollutant Loads	6-12
Table 6.7	Benefits of Stormwater Management Facility and BMP Retrofits	6-16
Table 6.8	Benefits of New BMPs and LID Projects	6-19
Table 6.9	Benefits of Neighborhood LID Stormwater Improvement Areas.....	6-20
Table 6.10	Recommended Flood Protection Locations	6-21
Table 6.11	Summary of Dead Run Priority Projects	6-27
Table 6.12	Summary of Dead Run Non-Priority Projects	6-28
Table 7.1	Turkey Run Watershed Land Use	7-2

Table 7.2	Turkey Run Watershed Master Plan Drainage Projects	7-5
Table 7.3	Turkey Run Watershed Stormwater Management Facilities	7-5
Table 7.4	Problem Areas Identified During Public Forums	7-8
Table 7.5	Turkey Run Cumulative Peak Runoff Flows	7-9
Table 7.6	Turkey Run Pollutant Loads	7-10
Table 7.7	Benefits of Stormwater Management Facility and BMP Retrofits	7-13
Table 7.8	Benefits of New LID Projects	7-14
Table 7.9	Summary of Turkey Run Priority Projects.....	7-20
Table 7.10	Summary of Turkey Run Non-Priority Projects.....	7-21
Table 8.1	Pimmit Run Watershed Land Use	8-3
Table 8.2	Pimmit Run Watershed Master Plan Drainage Projects	8-7
Table 8.3	Pimmit Run Watershed Stormwater Management Facilities	8-9
Table 8.4	Problem Locations Identified During Public Forums	8-13
Table 8.5	Pimmit Run Cumulative Peak Runoff Flows	8-23
Table 8.6	Pimmit Run Pollutant Loads	8-25
Table 8.7	Benefits of Stormwater Management Facility and BMP Retrofits	8-29
Table 8.8	Benefits of New BMPs and LID Projects	8-34
Table 8.9	Benefits of Neighborhood Stormwater Improvement Areas.....	8-37
Table 8.10	Recommended Flood Protection Locations	8-41
Table 8.11	Summary of Pimmit Run Priority Projects.....	8-50
Table 8.12	Summary of Pimmit Run Non-Priority Projects.....	8-52
Table 9.1	Watershed Information for Tysons Corner	9-8
Table 9.2	Parcel Area with Quantity and Quality Controls	9-8
Table 9.3	Subbasin Parcel Area with Stormwater Controls	9-10
Table 9.4	Tysons Corner Existing and Future Peak Flows	9-10

List of Figures

Figure 2.1	Middle Potomac Watersheds	2-1
Figure 2.2	Incised Channel Evolution Model	2-15
Figure 2.3	Modeled Portions of Streams in Middle Potomac Watersheds	2-24
Figure 3.1	Enhanced Dry Detention Basin.....	3-25
Figure 3.2	Wet Retention Pond	3-26
Figure 3.3	Enhanced Dry Detention Basin.....	3-27
Figure 3.4	Wet Retention Pond	3-27
Figure 3.5	Bioretention Basin	3-28
Figure 4.1	Bull Neck Run Future Total Phosphorus Loading	4-9
Figure 5.1	Scotts Run Future Total Phosphorus Loading	5-13
Figure 6.1	Dead Run Future Total Phosphorus Loading	6-11
Figure 7.1	Turkey Run Future Total Phosphorus Loading	7-9
Figure 8.1	Pimmit Run Future Total Phosphorus Loading	8-22
Figure 9.1	Difficult Run Watershed, Scotts Run Watershed, and Pimmit Run Watershed boundaries at Tysons Corner	9-6
Figure 9.2	Fairfax County draft development potential for Tysons Corner	9-7
Figure 9.3	Tysons Corner, Scotts Run Watershed and Pimmit Run Watershed Subbasins and Land Use Control Type	9-9

List of Maps

The maps are located at the end of the chapters.

- Map 2.1 Middle Potomac Watersheds Watershed Boundary
- Map 2.2 Middle Potomac Watersheds Current Land Use
- Map 2.3 Middle Potomac Watersheds Future Land Use
- Map 2.4 Middle Potomac Watersheds Subbasins
- Map 2.5 Middle Potomac Watersheds Peak Flow Model Results
- Map 2.6 Middle Potomac Watersheds Total Suspended Solids Range of Future Pollutant Loading
- Map 2.7 Middle Potomac Watersheds Total Phosphorus Range of Future Pollutant Loading
- Map 2.8 Middle Potomac Watersheds Total Nitrogen Range of Future Pollutant Loading
- Map 3.1 Peak Flow Model Results Future vs. Future Proposed
- Map 3.2 Future vs. Future Proposed Total Suspended Solids Percent Reduction
- Map 3.3 Future vs. Future Proposed Total Phosphorus Percent Reduction
- Map 3.4 Future vs. Future Proposed Total Nitrogen Percent Reduction
- Map 3.5 Cumulative Stream Flow Reduction
- Map 4.1 Bull Neck Run Watershed Characteristics and Storm Drain Infrastructure
- Map 4.2 Bull Neck Run Stream Geomorphology and Habitat Quality
- Map 4.3 Bull Neck Run Watershed Management Plan Recommendations
- Map 5.1 Upper Scotts Run Subwatershed Characteristics and Storm Drain Infrastructure
- Map 5.2 Lower Scotts Run Subwatershed Characteristics and Storm Drain Infrastructure
- Map 5.3 Upper Scotts Run Stream Geomorphology and Habitat Quality
- Map 5.4 Lower Scotts Run Stream Geomorphology and Habitat Quality
- Map 5.5 Upper Scotts Run Watershed Management Plan Recommendations
- Map 5.6 Lower Scotts Run Watershed Management Plan Recommendations
- Map 6.1 Dead Run Watershed Characteristics and Storm Drain Infrastructure
- Map 6.2 Dead Run Stream Geomorphology and Habitat Quality
- Map 6.3 Dead Run Final Draft Watershed Management Plan Recommendations
- Map 7.1 Turkey Run Watershed Characteristics and Storm Drain Infrastructure
- Map 7.2 Turkey Run Stream Geomorphology and Habitat Quality
- Map 7.3 Turkey Run Watershed Management Plan Recommendations
- Map 8.1 Upper Pimmit Run Subwatershed Characteristics and Storm Drain Infrastructure
- Map 8.2 Middle Pimmit Run Subwatershed Characteristics and Storm Drain Infrastructure
- Map 8.3 Little Pimmit Run and Lower Pimmit Run Subwatersheds Characteristics and Storm Drain Infrastructure
- Map 8.4 Upper Pimmit Run Stream Geomorphology and Habitat Quality
- Map 8.5 Middle Pimmit Run Stream Geomorphology and Habitat Quality
- Map 8.6 Little Pimmit Run and Lower Pimmit Run Stream Geomorphology and Habitat Quality
- Map 8.7 Upper Pimmit Run Watershed Management Plan Recommendations
- Map 8.8 Middle Pimmit Run Watershed Management Plan Recommendations
- Map 8.9 Little Pimmit Run and Lower Pimmit Run Watershed Management Plan Recommendations

Glossary

List of Acronyms and Abbreviations

References

Volume II

Appendix A

Project Fact Sheets

Appendix B

Stream Restoration Information

Appendix C

**Contact Sources for Native Plants for Conservation,
Restoration and Landscaping**

Appendix D

Watershed Modeling Process

Appendix E

Goals, Objectives, and Actions Reference List

Appendix F

List of Projects by Type

Prologue

The *Middle Potomac Watersheds Management Plan* presents a strategy for mitigating the impacts of development and improving or preserving the water resources and natural habitat in the Bull Neck Run, Scotts Run, Dead Run, Turkey Run, and Pimmit Run watersheds, collectively known as the Middle Potomac Watersheds. The plan has three goals: human protection, habitat protection, and stewardship. It outlines recommended structural and nonstructural actions in each of the five watersheds which will help achieve the plan goals.

The plan follows the same format as other watershed management plans adopted recently by Fairfax County, such as Difficult Run and Cameron Run. These watershed management plans are the first comprehensive plans for stormwater that the county has conducted since the 1970s. This is also the county's first attempt to examine water quality and stream management issues in addition to addressing flooding.

This is a watershed master plan, not a design plan, attempting to look at the big picture in the watersheds for the next 25 years. The objective is to assess the state of the watersheds by collecting a baseline data set and identifying and developing an inventory of existing problem areas. The plan also suggests potential solutions and policy changes and prioritizes a group of projects that will help improve the watersheds' conditions. The Middle Potomac Watersheds drain highly urbanized areas, making the restoration of streams to pre-development conditions virtually impossible. Furthermore, most of the watersheds have limited open space, so the type of projects that can be implemented in them is also limited. This plan will, however, help halt the degradation of the streams and loss of habitat and, with the implementation of the recommendations, the conditions of the streams will improve.

The plan is only the first step in the process of improving watershed conditions and is designed to be a living document that will be updated over the life of the plan. Stormwater management technologies are continually evolving, therefore implementation will occur on a five to ten year basis. This will allow time for monitoring and assessment of the effectiveness of selected technologies as well as allowing time to assess unanticipated changes to the watersheds that may affect planned projects.

Every year, projects from Fairfax County's adopted watershed management plans will be put into the Stormwater Management annual work plan. The work plan is developed to balance work done in each of the watersheds and districts, and to spread resources among infrastructure maintenance, dam safety, flooding issues, water quality, watershed restoration, and plan implementation. Projects in the plan will also be evaluated for their ability to meet other county initiatives, such as the Chesapeake 2000 agreement and the new Cool Counties initiative.

Executive Summary

The *Middle Potomac Watersheds Management Plan* presents a strategy for improving and preserving the water resources and natural habitat in the Bull Neck Run, Scotts Run, Dead Run, Turkey Run and Pimmit Run Watersheds, collectively known as the Middle Potomac Watersheds. The plan was initiated by Fairfax County as part of an initiative to create watershed management plans for all county watersheds with input from watershed residents and from a watershed advisory committee. Much of the watersheds were developed before stormwater controls were required, allowing runoff from impervious surfaces such as roofs, roadways and sidewalks to flow directly into the streams in large quantities, often causing downstream flooding and stream deterioration, including instream erosion. The condition of the watersheds has been damaged further by recent infill development and other sources of increased imperviousness, such as road widening projects. The actions outlined in the plan will begin to reduce the amount of runoff, improve water quality in the streams, restore stream habitat, and help the county meet its Chesapeake 2000 and Cool Counties goals. The Middle Potomac Watersheds drain highly urbanized areas, making the restoration of streams to pre-development conditions virtually impossible. This plan will, however, help halt the degradation of the streams and loss of habitat and, with the implementation of the recommendations, the conditions of the streams should improve.

The approach to developing the plan included the following actions:

- Analyzed information from stream assessments, previous watershed studies, watershed residents and current modeling to determine key watershed issues
- Worked with watershed stakeholders to identify goals, objectives, and actions to address the watershed issues
- Developed proposed improvements to the watershed, including costs and priorities

The plan lays out a sequence of projects to be implemented to improve stream conditions in the watersheds. Projects in the headwaters of the watersheds will be implemented first because their water quantity reductions will make downstream projects, such as stream restoration, more feasible. Projects that are easy to implement, such as obstruction removal and buffer restoration projects, will also be implemented first. Additional information such as subwatershed condition rankings, geographic location, parcel ownership, and existing water quantity or water quality controls were also considered in determining the appropriate sequencing of projects, as described in Section 3.4 in Chapter 3.

As the plan is implemented, it will need to be updated to address the dynamic nature of watershed conditions and land use. This will ensure that progress toward the plan goals and objectives is achieved. This plan is only the first step in the process and is designed to be a living document that will be updated as becomes necessary over the life of the plan. Stormwater management technologies are continually evolving, therefore implementation will occur on a five to ten year basis. This will allow time for monitoring and assessment of the effectiveness of selected technologies as well as allowing time to assess unanticipated changes to the watershed that may affect planned projects. The plan will not be able to solve all of the

problems in the watersheds, but will guide the county in the right direction.

Background

The Middle Potomac Watersheds cover an area of approximately 26 square miles located in the northeast portion of the county. Most of the Middle Potomac Watersheds are entirely within Fairfax County, but approximately 17 percent, or 2.1 square miles, of the Pimmit Run watershed is in Arlington County. The watershed group contains some of the most diverse watersheds in Fairfax County. Tysons Corner, one of the largest commercial centers on the East Coast, is located in the headwaters of Scotts Run and Pimmit Run Watersheds. McLean Community Business Center is located in the headwaters of Dead Run. Large natural areas including approximately 2,130 acres of park land (13 percent of the watershed land area) are located along the Potomac River and stream valleys. The *Middle Potomac Watersheds Management Plan* provides a strategy for mitigating the impacts of development, such as increased runoff, degraded water quality, and loss of stream habitat.

The history of the county's watershed management began in the 1940s with the conversion of agricultural land use to residential and commercial land uses. During this time, stormwater infrastructure was constructed to quickly carry runoff away from the developed areas to the creeks and streams that serve as the principal drainage system for the county. Starting in 1972, onsite Stormwater Management (SWM) facilities were required for new development to minimize the effects of increased runoff from development. As shown in Table 2.12 in Chapter 2, approximately 15 percent of the main watershed area is controlled by SWM facilities. In the early 1980s, water quality Best Management Practices (BMPs) were required for new development in the southern areas of the county that drained to the Occoquan drinking water reservoir. Stormwater BMPs were required for all new development in the county starting in July 1993. Because so much of the Middle Potomac Watersheds area was developed before stormwater controls were required, stormwater runoff has had considerable impacts on the streams in these watersheds.

In the late 1970s, the county developed master drainage plans for all of the watersheds in the county, including the Middle Potomac Watersheds. These plans identified projects to solve problems that included flooding, erosion, sedimentation, and other environmental impacts and issues projected through the year 2000. As proposed by residents, the county initiated a stream restoration and protection study and completed the *Fairfax County Stream Protection Strategy* (www.fairfax.va.us/gov/DPWES/environmental/SPS_Main.htm) in January 2001. This baseline study evaluated the condition of county streams and prioritized the watersheds for protection strategies. The stream protection program is ongoing, with continuous biological monitoring and assessment of stream condition. The residents of Fairfax County have also played an **important role in the management of the county's watersheds, and they** will continue to do so in the future.

Building on the recommendations from the *Stream Protection Strategy* baseline study, the county initiated a process to develop watershed management plans for all 30 watersheds in the county. The development of the watershed management plans builds on a detailed stream

physical assessment of over 800 miles of stream and includes community involvement; modeling of the runoff and stream flows; and the development of goals, objectives, and strategies for addressing watershed issues.

Purpose

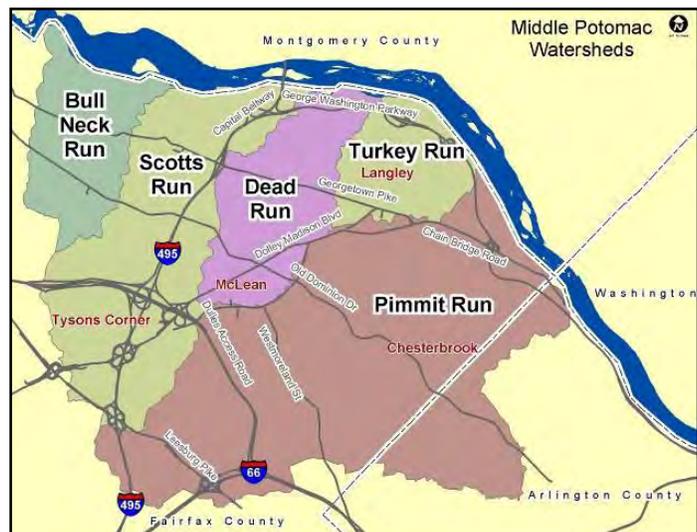
The primary reasons the *Middle Potomac Watersheds Management Plan* was developed can be summarized as follows:

1. **To restore and protect the county's streams, of which 80 percent are categorized as being in "fair" to "very poor" condition**
2. To help meet state and federal water quality standards by identifying strategies to prevent and remove pollution
3. **To support Virginia's commitment to the Chesapeake 2000 Agreement to clean up the Chesapeake Bay**
4. To replace the currently outdated watershed management plans and incorporate the use of new technologies
5. To take a comprehensive approach in addressing multiple regulations, commitments, and community needs

With input from the Middle Potomac Watersheds Steering Committee and other members of the community, this watershed management plan addresses these needs with a strategy for restoring and protecting the watersheds.

Existing Watershed Condition

For the purpose of this watershed plan, the Middle Potomac Watersheds were divided into nine subwatersheds: Bull Neck Run, Upper Scotts Run, Lower Scotts Run, Dead Run, Turkey Run, Upper Pimmit Run, Middle Pimmit Run, Lower Pimmit Run and Little Pimmit Run. These subwatersheds were further subdivided into 86 smaller basins, called subbasins, for further analysis. These subbasins are shown in Chapter 2 on Map 2.4.



The predominant existing land use in the Middle Potomac Watersheds is medium-density, single-family residential which covers approximately 26 percent of the area in the Middle Potomac Watersheds. The next most common land use in the watersheds is low-density residential, which comprises 17 percent of the overall land area. Currently 94 percent of the developable land within the five watersheds has been developed. The current impervious area in the watersheds is approximately 4,068 acres, or 24 percent of the total area, which includes the portions of the watersheds in Arlington

County.

The Virginia Department of Environmental Quality's (DEQ's) 2006 305(b)/303(d) Water Quality Assessment Integrated Report states that the recreation use goal for Pimmit Run is not supported due to exceedances of the fecal coliform bacteria water quality standard recorded at two DEQ water quality monitoring stations located on this stream. In addition to the bacterial impairment, **DEQ's 2006 Integrated Report** states that Pimmit Run is also impaired for fish consumption due to polychlorinated biphenyls (PCBs), chlordane, and heptachlor epoxide. The aquatic life use in Pimmit Run is fully supported with observed effects due to exceedances of the sediment screening value at the downstream portion of the stream. The 2004 DEQ Integrated Report listed Scotts Run as a Water of Concern based on citizen monitoring stations that revealed medium probability of adverse conditions for aquatic life.

The Fairfax County Health Department's *2002 Stream Water Quality Report* concluded that the overall water quality of the watersheds in the Middle Potomac Watershed Group is considered fair for fecal coliform and good for the other chemical and physical parameters that were sampled. The physical and chemical parameters that were measured included fecal coliform, dissolved oxygen, nitrate nitrogen, pH, phosphorous and heavy metals.

The *Fairfax County Stream Protection Strategy (SPS) Baseline Study* from January 2001 evaluated the quality of streams throughout the county. Pimmit Run and its tributaries, Scotts Run, and Dead Run received **"very poor" composite site condition ratings**, whereas Bull Neck Run and Turkey Run received **"excellent" ratings**. These ratings were based on a range of environmental parameters including an index of biotic integrity, stream physical assessment, habitat assessment, fish species richness, and percent imperviousness.

The county initiated a Stream Physical Assessment (SPA) for all of its watersheds in August 2002 to systematically characterize the existing conditions of stream corridors. This data has provided invaluable details of the conditions of streams as a "snap-shot" in time. However, it is recognized that conditions are changing and in some cases, may have changed significantly since the initial SPA was conducted. Due to the dynamic nature of streams as they adjust to the continual impact of development, it is believed that reassessment of physical conditions will be needed to determine the exact need before the implementation of any recommended projects.

The SPA included identification and characterization of the following: stream geomorphology, obstructions, stream habitat condition, pipe and ditch outfalls, riparian buffer condition, public utility lines, erosion locations, road and other crossings, head cuts, and dumpsites. The inventory items with a negative impact on the stream were assigned an impact score and the inventory items that did not impact the stream were not scored.

The scores assessed for the various physical parameters representing the stream habitat conditions were combined for each stream segment to obtain a total habitat score. The greatest percentage of the stream habitats in the watershed group were assessed as "fair." The summary of overall stream habitat quality for the Middle Potomac streams as a percentage

of the total length assessed is as follows:

Score	Percent of watershed group
"very poor"	0 percent
"poor"	10 percent
"fair"	40 percent
"good"	26 percent
"excellent"	24 percent

Future Watershed Condition

Future development in Fairfax County will present a number of challenges to restoring and protecting the Middle Potomac Watersheds due to the estimated increase in impervious area in the watersheds. Infill and redevelopment is expected to occur more frequently in the future in the Middle Potomac Watershed Group because the majority of the watershed area is already developed. It is anticipated that the percent imperviousness will increase in residential areas as additions are made to existing houses or existing houses are replaced with larger houses and existing vegetation is lost. Policy Action A1.8, explained in Chapter 9, will address this issue.

Virginia Department of Transportation (VDOT) projects will also have an impact on the imperviousness in the watersheds. VDOT has plans to improve interchanges and widen roadways, both of which could occur with minimal stormwater controls to diminish the effects of the increased imperviousness. The largest VDOT project in the watersheds is the construction of two new High Occupancy Toll (HOT) lanes along the Capital Beltway between Georgetown Pike and Springfield to be completed by 2010. Approximately half of this project goes through the Scotts Run and Pimmit Run Watersheds. HOT lanes are also being considered on other local highways, including Interstate 66, which goes through a small portion of the Pimmit Run Watershed. Policy Action A1.7 in Chapter 9 suggests an approach to manage this issue.

Another future development in the watersheds is the redevelopment of Tysons Corner in conjunction with the extension of Metro rail through the area. The Tysons Corner area will experience redevelopment as the Washington Metropolitan Area Transit Authority expands their rail lines and adds four rail stations to the area in the future. This redevelopment could further negatively impact Scotts Run unless a stormwater management strategy is implemented. The Tysons Corner Stormwater Strategy (Project SC9845), outlined in Chapter 9, recommends that Low Impact Development (LID) measures, new BMPs, BMP retrofits, and additional stormwater management requirements for developed properties without existing BMPs should be implemented to mitigate the effects of existing and future impervious areas. Fairfax County has initiated a Tysons Corner Transportation/Urban Design Study and appointed a Tysons Land Use Task Force to coordinate community participation and recommend changes to the 1994 Tysons Corner Comprehensive Plan. Coordination with the Tysons Land Use Task Force and the Department of Planning and Zoning will be essential in mitigating the impacts of the Tysons Corner redevelopment.

Changes in land use types will affect the imperviousness of the watersheds. The future watershed group imperviousness is predicted to increase to 27 percent. Mansionization will increase the imperviousness in the watersheds by an additional one percent, for a total imperviousness of 28 percent for the Middle Potomac Watershed Group.

The main issue with increased impervious area in the watersheds is the resulting increase in stormwater runoff volumes. Reducing the runoff delivered to the streams is a priority of the plan because it will reduce the amount of stream bank erosion, increasing the likelihood of success for stream restoration and other projects downstream. Runoff reduction will be accomplished through BMP retrofits, new BMPs, new LID projects, and Neighborhood Stormwater Improvement Areas.

The plan goals and actions as summarized in the next two sections offer ways to lessen the impact of the increased imperviousness from future development.

Plan Goals and Objectives

The goals for the *Middle Potomac Watersheds Management Plan* were derived from the issues identified by the community **and the project team based on their analysis of the watersheds'** condition. The objectives provide direction on how to achieve each of the goals, while the actions presented in Chapter 3 describe the strategy for accomplishing each objective. The actions and strategies were identified by the project team and the community and integrated comments from the steering committee and public workshop participants. The proposed strategies were then reviewed by the county to help clarify and refine the approach for implementation as part of the watershed plan review process.

Goal A: Reduce stormwater impacts to protect human health, safety, and property

Objective A1: Reduce stormwater volumes and velocities to minimize stream bank erosion.

Objective A2: Reduce stormwater flooding and the potential damage from stormwater flooding.

Objective A3: Reduce pollutants in stormwater runoff to protect human health.

Goal B: Protect and improve habitat and water quality to sustain native animals and plants

Objective B1: Reduce pollutants in stormwater runoff to protect fish and other aquatic life.

Objective B2: Increase the use of Low Impact Development for all development projects to reduce runoff and improve water quality.

Objective B3: Restore and protect vegetated stream buffers to filter pollutants from runoff, to provide erosion control, and to provide habitat for animals.

Objective B4: Protect and restore wetlands to provide habitat and improve water quality.

Objective B5: Restore natural stream channels, banks and beds to provide improved habitat.

Goal C: Provide for long term stewardship of the Middle Potomac Watersheds by building awareness of the importance of watershed protection and providing opportunities for enjoyment of streams.

Objective C1: Improve education and outreach.

Objective C2: Improve watershed access and stewardship.

Objective C3: Promote the implementation and maintenance of LID practices.

Recommended Structural and Non-structural Actions

The plan actions are summarized below for each watershed. Full lists of plan actions for each watershed are presented in Chapters 4 through 8. If more than one of each type of project is in the watershed then the number of projects that are recommended is shown beside the project type. Priority projects will be implemented within the first fifteen years of the plan in each watershed. Detailed costs and benefits were computed for these projects. The priority projects each have a Fact Sheet, presented in Appendix A, which summarizes key information about the projects. This is only preliminary information and is expected to change as projects enter the design phase of implementation. The summary tables at the ends of Chapters 4 through 8 also list the land owners for each project location. Coordination with the land owners will be essential to the successful implementation of the projects. Cost-sharing opportunities may be explored for projects where both the land owner and the county will benefit. Projects identified on VDOT property will be coordinated directly with VDOT to determine final schedule and cost sharing.

Bull Neck Run Plan Actions

Below are the structural and non-structural practices for Bull Neck Run. The total cost of the priority projects is \$1,420,000.

- Public Education Project
- Community Outreach Project
- LID Promotion Project
- Enforcement Enhancement Project
- Stream Assessment Project
- BMP Retrofit Project (2)
- Stream Restoration
- Buffer Restoration
- Infrastructure Improvement (2)
- Fecal Coliform Source Study
- New LID Project
- Dumpsite/Obstruction Removal (2)
- Wetland Assessment Project

Scotts Run Plan Actions

Below are the structural and non-structural practices for Scotts Run. The total cost of the priority projects is \$7,720,000.

- Public Education Project
- Community Outreach Project
- LID Promotion Project
- Enforcement Enhancement Project
- Stream Assessment Project
- BMP Retrofit Project (28)
- New BMP Project (10)
- Stream Restoration (6)
- Buffer Restoration
- Infrastructure Improvement (2)
- Flood Protection Project
- Fecal Coliform Source Study
- New LID Project (6)
- Neighborhood Stormwater Improvement Areas (2)
- Tysons Corner Stormwater Improvement Area
- Dumpsite/Obstruction Removal
- Wetland Assessment Project

Dead Run Plan Actions

Below are the structural and non-structural practices for Dead Run. The total cost of the priority projects is \$6,080,000.

- Public Education Project
- Community Outreach Project
- LID Promotion Project
- Enforcement Enhancement Project
- Stream Assessment Project
- BMP Retrofit Project (9)
- BMP Retrofit Project/New LID
- New BMP Project (4)
- Stream Restoration (3)
- Buffer Restoration (2)
- Infrastructure Improvement (3)
- Flood Protection Project
- Fecal Coliform Source Study
- New LID Project (6)
- Neighborhood Stormwater Improvement Areas (3)
- Dumpsite/Obstruction Removal
- Wetland Assessment Project

Turkey Run Plan Actions

Below are the structural and non-structural practices for Turkey Run. The total cost of the priority projects is \$3,710,000.

- Public Education Project
- Community Outreach Project
- LID Promotion Project
- Enforcement Enhancement Project
- Stream Assessment Project
- BMP Retrofit Project
- Stream Restoration (3)
- Buffer Restoration
- Infrastructure Improvement (2)
- Fecal Coliform Source Study
- New LID Project (3)
- Dumpsite/Obstruction Removal
- Land Conservation Coordination Project
- Wetland Assessment Project

Pimmit Run Plan Actions

Below are the structural and non-structural practices for Pimmit Run. The total cost of the priority projects is \$16,940,000.

- Public Education Project
- Community Outreach Project
- LID Promotion Project
- Enforcement Enhancement Project
- Stream Assessment Project
- BMP Retrofit Project (18)
- New BMP Project (3)
- Stream Restoration (5)
- Buffer Restoration (6)
- Floodplain Restoration (3)
- Infrastructure Improvement (11)
- Flood Protection Project
- Fecal Coliform Source Study
- New LID Project (31)
- Neighborhood Stormwater Improvement Areas (6)
- Dumpsite/Obstruction Removal (2)
- Wetland Assessment Project

Benefits of Structural and Non-structural Actions

Once completed, the priority projects, including BMP Retrofit, New BMP, New LID and Neighborhood Stormwater Improvement Areas, will remove an estimated 676 pounds per year of phosphorus, provide wetland habitat, and store a portion of the runoff from the one-year storm event to control the peak flows and help reduce erosion in the downstream channels.

Replacing or rehabilitating infrastructure in the Infrastructure Improvement Projects will help to alleviate flooding of houses, properties, and roadways. Stream and Buffer Restoration Projects will increase the amount of habitat and provide nutrient reduction for the streams. The Dumpsite/Obstruction Removal Projects will help to reduce the flooding of the streams and erosion of the stream banks.

Future development conditions without any alternatives (future) were compared to future development conditions with the proposed alternatives (proposed) to evaluate the effect of the proposed alternatives in the watersheds.

Table ES.1 shown on the next page presents the reductions in peak discharges and pollutant loadings in the nine Middle Potomac subwatersheds. As the table indicates, implementation of the proposed alternatives provides a reduction from the future to the proposed conditions in the ten-year peak flow as well as a reduction in pollutant loadings for total suspended solids (TSS), total phosphorus (TP), and total nitrogen (TN). These results are also shown on Maps 3.1 through 3.4.

Table ES.1 Pollutant Loadings and Reductions

Subwatershed	Drainage Area (ac)	Scenario	Runoff Volume (in/yr)	10-Year Peak Flow (cfs/ac)	TSS (lb/ac /yr)	TP (lb/ac /yr)	TN (lb/ac /yr)
Bull Neck Run	1,559	Existing	3.42	0.97	39.9	0.31	2.46
		Future	4.42	1.03	48.1	0.43	3.23
		Proposed	4.31	0.95	40.4	0.39	3.00
		% Load Reduction	-2%	-8%	-16%	-9%	-7%
Upper Scotts Run	1,982	Existing	11.18	1.56	213.3	0.88	8.12
		Future	12.16	1.60	231.4	0.95	8.95
		Proposed	12.01	1.39	160.2	0.82	8.05
		% Load Reduction	-1%	-13%	-31%	-14%	-10%
Lower Scotts Run	1,878	Existing	3.74	1.73	30.8	0.33	2.40
		Future	4.05	1.78	36.4	0.38	2.76
		Proposed	4.03	1.51	35.5	0.38	2.79
		% Load Reduction	0%	-15%	-2%	0%	1%
Dead Run	1,922	Existing	4.36	0.38	70.8	0.49	3.82
		Future	4.81	0.41	76.6	0.53	4.15
		Proposed	4.53	0.34	63.8	0.47	3.71
		% Load Reduction	-6%	-17%	-17%	-11%	-11%
Turkey Run	1,248	Existing	5.91	0.88	110.6	0.47	4.09
		Future	6.09	0.90	113.7	0.49	4.25
		Proposed	5.90	0.85	108.6	0.46	4.02
		% Load Reduction	-3%	-6%	-4%	-6%	-5%
Upper Pimmit Run	2,702	Existing	2.89	0.50	83.5	0.49	4.00
		Future	3.96	0.53	91.0	0.53	4.36
		Proposed	3.28	0.19	70.2	0.44	3.62
		% Load Reduction	-17%	-64%	-23%	-17%	-17%
Middle Pimmit Run	2,803	Existing	2.91	0.72	53.3	0.37	2.90
		Future	3.27	0.75	61.7	0.43	3.35
		Proposed	3.02	0.49	56.9	0.40	3.13
		% Load Reduction	-8%	-35%	-8%	-7%	-7%
Lower Pimmit Run	802	Existing	5.34	3.60	51.5	0.42	3.21
		Future	5.41	3.72	55.1	0.45	3.40
		Proposed	5.41	2.96	55.2	0.45	3.40
		% Load Reduction	0%	-20%	0%	0%	0%
Little Pimmit Run	1,776	Existing	7.19	0.45	60.8	0.44	3.40
		Future	7.41	0.46	63.2	0.46	3.56
		Proposed	7.28	0.45	60.9	0.45	3.48
		% Load Reduction	-2%	-2%	-4%	-2%	-2%
TOTAL	16,672	Existing	46.94	1.00	80.5	0.47	3.86
		Future	51.57	1.04	88.0	0.52	4.29
		Proposed	49.78	0.83	72.4	0.47	3.93
		% Load Reduction	-3%	-20%	-18%	-10%	-8%

The increased infiltration in the new BMP and LID projects reduces the peak flows, which also

reduces the amount of pollutants in the downstream subwatersheds. The cumulative stream flow reductions in the watersheds from the proposed alternatives are shown on Map 3.5.

Policy Recommendations

The strategies for achieving the vision of minimizing runoff, reducing pollution, and restoring the quality of Middle Potomac Watersheds include a wide range of recommendations. Not only are the capital improvement program projects described in Chapters 4 through 8 needed to meet the goals of the watershed management plan, but policy and land use changes are also vital in mitigating the effects of existing and future development in the watersheds. The policy actions described in Chapter 9 include actions that will reduce the impact of infill development, provide incentives for developers to use LID methods, implement a stormwater strategy for the Tysons Corner area, establish wildlife corridors, and increase citizen involvement in implementing LID methods. For more details, see the Policy Action Summary Sheet on pages 22 and 23 of this Executive Summary.

An example of a previous successful policy change is the newly adopted Low Impact Development (LID) amendment to the Fairfax County Public Facilities Manual (PFM) in March 2007. This policy added six LID methods to the list of acceptable stormwater management practices for development and provides design criteria for each. The six methods added were pervious pavement, bioretention filters and basins, vegetated swales, tree box filters, vegetated roofs, and reforestation.

Implementation Plan

The actions recommended in this plan will be implemented over the 25-year life of the *Middle Potomac Watersheds Management Plan*. This plan will serve as guidance for all county agencies and officials in determining how development and redevelopment will take place within the watersheds. The plan is the first step in the process and will be implemented as a living document. As such, the implementation schedule will be updated to reflect plan changes. The proposed policy actions were not prioritized because they will be evaluated in conjunction with the policy recommendations from the other county watershed management plans.

The proposed structural and non-structural projects were first prioritized using a weighted set of five prioritization categories. The actions in the plan were assigned an impact score from 1 to 5 for each of these prioritization categories, based on a set of evaluation criteria, with 5 as the best score and 1 as the worst score. Additional information considered when determining the scores included subbasin condition rankings, geographic location, parcel ownership, and existing water quantity or water quality controls. The prioritization categories are provided below.

1. Fairfax County Board of Supervisors-Adopted Stormwater Control Project Prioritization Categories
2. Direct Regulatory Contribution
3. Public Support
4. Effectiveness/Location
5. Ease of Implementation

The total score for each project was calculated by adding the corresponding weighted scores from each category. Based on the total scores, the projects were then ranked from the highest score (high priority) to the lowest score (low priority) within each watershed.

The 25 year implementation period for the Middle Potomac Watersheds Management Plan has been divided into five-year timeframes with the following designations:

Group A	0 to 5 years
Group B	5 to 10 years
Group C	10 to 15 years
Group D	15 to 20 years
Group E	20 to 25 years

The project prioritization is a tool to help in developing the implementation sequencing for the proposed watershed plan projects. The projects with the top prioritization rankings were typically assigned to Group A or Group B implementation timeframes. However, other factors were also considered when assigning the implementation timeframes such as promoting projects that have high visibility and low costs but that may not have received a high priority score.

The following provisions address the funding and implementation of projects, programs, and policy recommendations in the Middle Potomac Watersheds Management Plan:

- i. Projects and Programs (both structural and non-structural) as well as Policy items in this plan will first undergo appropriate review by county staff and the Board (please see iii below) prior to implementation. Board adoption of the watershed plan will not set into motion automatic implementation of projects, programs, initiatives or policy recommendations that have not first been subject to sufficient scrutiny to ensure that the projects that are funded give the county the greatest environmental benefit for the cost.
- ii. Road projects not related to protection of streambeds or banks or water quality will not be funded out of the stormwater and watershed budget.
- iii. The watershed plan provides a conceptual master-list of structural capital projects and a list of potential non-structural projects for the watersheds. Staff will, on a fiscal year basis, prepare and submit to the Board a detailed spending plan to include a description of proposed projects and an explanation of their ranking, based on yet to be established, specific criteria. Criteria used to assemble this list will include, but are not limited to, cost-effectiveness as compared to alternative projects, a clear public benefit, a need to protect public or private lands from erosion or flooding, a need to meet a specific watershed or water quality goal and implementable within same fiscal year that funding is provided. Staff also intends to track the progress of implementation and report back to the Board periodically.

- iv. Each project on the annual list of structural projects will be evaluated using basic value-engineering cost effectiveness principles before implementation and the consideration of alternative structural and non-structural means for accomplishing the purposes of the project will be considered before implementation. This process will ensure the **county's commitment to being a fiscally responsible public entity.**
- v. Obstruction removal projects on private lands will be evaluated on a case-by-case basis for referral to the Zoning Administrator and/or County Attorney for action as public nuisances; and otherwise to determine appropriate cost-sharing by any parties responsible for the obstructions.
- vi. Stream restoration projects on private lands will be evaluated to determine means for cost-sharing by land owners directly responsible for degradation due to their land uses.

Beginning in Fiscal Year 2006, the Board of Supervisors dedicated the approximate value of one penny from the **County's Real Estate** tax to support the growing needs and regulatory requirements in the stormwater program. This program consists of: Regulatory Compliance, Dam Safety, Infrastructure Reinvestment, Project Implementation and Watershed Planning.

Stormwater Management generates an annual work plan that prioritizes projects from all of the completed watershed management plans. The project prioritization within each plan is taken into consideration when selecting projects for the annual work plan. Cost and benefits, feasibility, and land ownership are also considered when selecting and prioritizing projects across all of the watersheds. For example, the 2008 fiscal year work plan included approximately ten million dollars for implementation of watershed plan projects. Projects were identified from each of the adopted six watershed plans and included in the annual work program. In addition to the projects identified specifically as Watershed Project Implementation, many of the other projects include the practices identified in the watershed plans. For example, many of the dam safety projects include retrofitting a standard dry pond to include BMPs such as additional storage, forebay and a wetlands feature.

The currently adopted five-year Capital Improvement Program (CIP) provides over \$22,000,000 per year for Stormwater Management and specifically identifies \$500,000 per year for each approved watershed management plan for project implementation. There is an additional \$3.5 million included for projects from watershed management plans that are still in progress. In addition to CIP funding, projects may be funded through the pro-rata program, or be constructed as part of a development project, or in conjunction with another county project.

Projects are evaluated on an annual basis as **part of the county's budget process and** development of the Stormwater Management annual work plan. As the next round of watershed management plans are completed and approved by the Board of Supervisors, the annual work plan will be developed to include the new projects that are identified in the respective watershed plans. The project selection processes described above, combined with the annual budgetary process, are the factors used in determining projects to implement.

Plan Total Cost

Costs were computed for the priority projects which will be implemented in the first 15 years of the plan. All project costs will be re-computed prior to implementation, during the design phase for each project. The total computed cost for priority projects is approximately 36 million dollars.

Bull Neck Run Watershed Summary Sheet

Overview

The Bull Neck Run Watershed has an area of approximately 1,559 acres as shown in the figure below. It is bounded to the west by Portland Place, Belleview Road, and the Madeira School; to the east by Meadow Green Lane, Dominion Reserve, and Canal Drive; to the south by Weller Avenue and Lewinsville Road; and to the north by the Potomac River.



The headwaters of Bull Neck Run begin at the Spring Hill District Park, which is located near the intersection of Spring Hill Road and Lewinsville Road. The stream then passes through Bull Neck Stream Valley Park and continues until it discharges to the Potomac River.

Aerial Photograph of Bull Neck Run

Some facts about Bull Neck Run include the following:

- Flows from south to north
- Stream length is approximately 2.5 miles
- One major unnamed tributary contributes significant stream flow

Characteristics



Fallen trees and debris are causing a severe impact to Bull Neck Run just north of Georgetown Pike

The current impervious area in this watershed is eight percent of the total area. When watershed imperviousness reaches ten percent, stream quality begins to decline with poor water quality, alteration of the stream channel, and degraded plant and animal habitat becoming apparent.

The current land use in the watershed is:

- Predominantly low-density residential
- Open space downstream of Old Dominion Drive and estate residential adjacent to Spring Hill Road.
- Low-density residential along the upper portions of the

watershed.

- 147 acres, or nine percent of the watershed is comprised of open space, parks, and recreational areas including Greenway Heights Park, Bull Neck Stream Valley Park, and Spring Hill District Park.

For the future land use condition, open space may be replaced by estate and low-density residential development and the future imperviousness may increase to 12 percent.

The overall condition of the watershed is summarized as follows.

Bull Neck Run Watershed Condition Summary

- Current imperviousness is eight percent with the majority being low-density residential land use
- Future imperviousness is 12 percent
- 13 crossings have “minor to moderate” impacts
- Majority of the habitat quality is “fair” with inadequate buffers
- Actively widening stream
- “Moderate to severe” erosion at three locations
- Three obstruction locations block the stream
- One trash dumpsite

Upstream segments of the channel have been lined with concrete or large stones. The stream has “minor to moderate” erosion due to pipe crossings. Approximately 271 acres, or 17percent of the watershed drains to stormwater management facilities.

Stream Quality



Severe erosion downstream of the Alvord Street crossing

- The Fairfax County Stream Protection Strategy Baseline Study from January 2001 evaluated the quality of streams throughout the county and the county evaluated the physical condition of Bull Neck Run in January 2003. The stream quality for Bull Neck Run can be summarized as follows:
- “Excellent” composite site condition rating based on biological integrity, stream physical assessment, habitat assessment, fish species richness, and percent imperviousness

Bull Neck Run Watershed Summary Sheet

- Majority of the stream buffer consists of lawns
- 15 percent to 30 percent of the bank area has erosion
- 44 percent of Bull Neck Run exhibits “good” habitat quality and 31 percent of the stream exhibits “excellent” habitat quality

Problem locations were provided by the public at the Community Watershed Forum held on April 16, 2005, and also by the Middle Potomac Watersheds Steering Committee. They identified problem areas in Bull Neck Run such as:

- Inadequate pipe infrastructure.
- Trail erosion from overuse.
- Pollution from parking lots.

Issues/Solutions

The goals for the Middle Potomac Watersheds Management Plan were derived from the issues identified by the community and the project team based on their analysis of the watersheds’ condition.

While the overall health of the Bull Neck Run Watershed is good, some projects will be needed, as well as continued monitoring of the watershed, to maintain the water quality and manage stormwater runoff volumes as the watershed becomes more developed.

Solutions recommended for the Bull Neck Run Watershed in the *Final Draft Middle Potomac Watersheds Management Plan* include structural and non-structural practices. The proposed projects have been prioritized and will be implemented over 25 years. The following projects are proposed to be implemented in the next five years. Specific details on the projects that follow can be found in Chapter 4 and Appendix A.

Coordination with the land owners will be essential to the successful implementation of the plan actions. Cost-sharing opportunities may be explored for projects where both the land owner and the county will benefit.

1. Removal of channel obstructions that block stream flow and clean up of dumpsites (Dumpsite/Obstruction Removal Projects BN9901 and BN9918).
2. Restoration of vegetated stream buffers to mitigate stream bank erosion (Buffer Restoration Project BN9302).
3. Installation of low impact development techniques such as manufactured tree-box filters, bioretention areas, and bio-swales to reduce stormwater runoff volumes and improve water quality (New LID Project BN9811).
4. Retrofit of existing stormwater management facilities to provide better stormwater quantity control and water quality treatment (BMP Retrofit Project BN9105).
5. Education and outreach initiatives that will be implemented for the entire 25-year period. These

projects are designed to involve the stakeholders in improving the watershed (Public Education Project BN9913, Community Outreach Project BN9914, LID Promotion Project BN9915, Enforcement Enhancement Project BN9916 and Stream Assessment Project BN9921).

The county (encompassing all county government entities) and other stakeholders of the Middle Potomac Watersheds are committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem. This commitment emphasizes the importance of protecting the county’s valuable natural resources, including surface waters, and supports the sustainability and improvement of the environment, which has a direct impact on the quality of life of the county’s residents.



Middle Potomac Watersheds steering committee meeting

Scotts Run Watershed Summary Sheet

Overview

The Scotts Run Watershed has an approximate area of 3,860 acres as shown in the figure below. It is bounded to the west by Tysons Corner Shopping Center, Spring Hill Road and Canal Drive; to the east by Magarity Road, Balls Hill Road and portions of I-495; to the south by Leesburg Pike; and to the north by the Potomac River.



The headwaters of Scotts Run begin at a stormdrain system outfall located on the east side of I-495, just southeast of Tysons Corner Shopping Center. Scotts Run then flows in a northerly direction through Scotts Run Nature Preserve before it discharges to the Potomac River.

Aerial photograph of the Scotts Run Watershed

Some facts about Scotts Run include the following:

- Flows from south to north
- Length is approximately 4.5 miles
- Watershed is divided into two subwatersheds, Upper Scotts Run and Lower Scotts Run
- Several major unnamed tributaries contribute significant stream flow; Bradley Branch is the only named tributary



Falls at the downstream end of Scotts Run

Characteristics

The current impervious area in this watershed is 30 percent of the total area. When watershed imperviousness reaches ten percent, stream quality begins to decline with poor water quality, alteration of the stream channel, and degraded plant and animal habitat becoming apparent.

The current land use in the watershed is:

- Predominantly road right of ways.

- Commercial land, such as Tysons Corner, located to the southwest and low-density residential and forested land in the northern portions of the watershed.
- 554 acres, or 14 percent of the watershed is comprised of open space, parks, and recreational areas including McLean Hamlet Park, Scotts Run Stream Valley Park, Westgate Park, Timberly Park, and Scotts Run Nature Preserve.

For the future land use conditions, estate residential land use may be replaced by low-density residential development and the future imperviousness may increase to 33 percent.

The overall condition of the watershed is summarized as follows.

Scotts Run Watershed Condition Summary

- Current imperviousness is 30 percent with the majority being low-density residential land use
- Future imperviousness is 33 percent
- 33 of 34 crossings have “minor to moderate” impacts
- Habitat quality is “fair” with inadequate buffers
- Actively widening stream
- “Minor to moderate” erosion at 12 locations
- Five obstruction locations block the stream

The stream has “minor to moderate” erosion due to discharge from the stormdrain pipes. Approximately 743 acres in the watershed drain to stormwater management facilities.

Stream Quality

The Fairfax County Stream Protection Strategy Baseline Study from January 2001 evaluated the quality of streams throughout the county and the county evaluated the physical condition of Scotts Run in January 2003.



Severe erosion was observed at Scotts Run north of Old Dominion Drive

The stream quality for Scotts Run can be summarized as follows:

- “Very poor” composite site condition rating based on biological integrity, stream physical assessment, habitat assessment, fish species richness, and percent imperviousness
- Majority of the stream buffer is inadequate and

Scotts Run Watershed Summary Sheet

- consists of lawns
- 15 percent to 30 percent of the bank area in Upper Scotts Run has erosion
- 40 percent to 50 percent of the bank area in Lower Scotts Run has erosion
- 57 percent of Upper Scotts Run exhibits “fair” habitat quality and 43 percent exhibits “poor” habitat quality
- 31 percent of Lower Scotts Run exhibits “excellent” habitat quality, 28 percent exhibits “good” habitat quality and 41 percent exhibits “fair”

Problem locations were provided by the public at the Community Watershed Forum held on April 16, 2005, and also by the Middle Potomac Watersheds Steering Committee. They identified problem areas in Scotts Run such as:

- Erosion of the stream banks.
- Obstructions in the stream channel.
- Pollution from parking lots.
- Development causing increased runoff.

Issues/Solutions

The goals for the Middle Potomac Watersheds Management Plan were derived from the issues identified by the community and the project team based on their analysis of the watersheds’ condition.

The Upper Scotts Run Watershed, which includes the Tysons Corner area, is highly urbanized, with 64 percent commercial, industrial, and road right of way land use. More development is expected as the Washington Metropolitan Area Transit Authority expands their rail lines and adds four rail stations to the area in the future. This development will be addressed by the Tysons Corner Stormwater Strategy, SC9845, discussed in more detail as Policy Action B2.5 in Chapter 9.

In contrast to the urbanization in Upper Scotts Run, Lower Scotts Run is has only 15 percent commercial, industrial, and road right of way land use. There is much more residential land use in Lower Scotts Run, as well as the 380 acre Scotts Run Nature Preserve. However, the large amount of impervious area in Upper Scotts Run impacts Lower Scotts Run through increased stormwater runoff volumes and poor water quality. One of the main problems in Lower Scotts Run is flooding, particularly in the Swinks Mill area.

Solutions recommended for the Scotts Run Watershed in the *Final Draft Middle Potomac Watersheds Management Plan* include structural and non-structural practices. The proposed projects have been prioritized and will be implemented over 25 years. The following projects are proposed to be implemented in the next five years. Specific details on the projects that follow can be found in Chapter 5 and Appendix A.

Coordination with the land owners will be essential to the successful implementation of the plan actions. Cost-

sharing opportunities may be explored for projects where both the land owner and the county will benefit.

1. Removal of channel obstructions that block stream flow and clean up of dumpsites (Dumpsite/Obstruction Removal Project SC9903).
2. Restoration of vegetated stream buffers to mitigate stream bank erosion (Buffer Restoration Project SC9352).
3. A Neighborhood Stormwater Improvement Area for a neighborhood with no stormwater controls to reduce flooding and increase water quality. (Neighborhood Stormwater Improvement Area SC9819).
4. Retrofit of existing stormwater management facilities to provide better stormwater quantity control and water quality treatment (BMP Retrofit Projects SC9114, SC9117, SC9126, SC9141 and SC9147).



Wet pond example

5. Construction of new stormwater management facilities such as wet ponds or dry detention basins (New BMP Projects SC9128, SC9132, SC9137, SC9142, SC9157, SC9158 and SC9167).
6. Education and outreach initiatives that will be implemented for the entire 25-year period. These projects are designed to involve the stakeholders in improving the watershed (Public Education Project SC9976, Community Outreach Project SC9977, LID Promotion Project SC9978, Enforcement Enhancement Project SC9979 and Stream Assessment Project SC9982).

The county is committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem.

Dead Run Watershed Summary Sheet

Overview

The Dead Run Watershed has an approximate area of 1,922 acres and is shown in the figure below. It is bounded to the west by Balls Hill Road and I-495; to the east by Old Chain Bridge Road and Ridge Drive; to the south by Chain Bridge Road; and to the north by the Potomac River.



Aerial photograph of the Dead Run Watershed

The headwaters of Dead Run begin near Pathfinder Lane and the stream continues through the McLean Central Park, which is located near the intersection of Old Dominion Drive and Dolley Madison Boulevard. The stream then passes through the Dead Run Stream Valley Park and continues until it discharges to the Potomac River.

Some facts about Dead Run include the following:

- Flows from south to north
- Length is approximately three miles
- Several major unnamed tributaries contribute significant stream flow
- Watershed land elevations range from 260 to 270 feet in the southern part to elevations of 55 to 85 feet in the northern part



Concrete lined portion of Dead Run

Characteristics

The current impervious area in this watershed is 25 percent of the total area. When watershed imperviousness reaches ten percent, stream quality begins to decline with poor water quality, alteration of the stream channel, and degraded plant and animal habitat becoming apparent.

The current land use in the watershed is:

- Predominantly medium-density residential.
- Low-density residential and low-intensity commercial throughout the lower portions of the

watershed.

- 265 acres, or 14 percent of the watershed is comprised of open space, parks, and recreational areas including Langley Oaks Park, Churchill Road Park, Dead Run Stream Valley Park, and McLean Central Park.

For the future land use condition, estate residential land use may be replaced by low-density residential development and the future imperviousness may increase to 29 percent.

The overall condition of the watershed is summarized as follows.

Dead Run Watershed Condition Summary

- Current imperviousness is 25 percent with the majority being medium-density residential land use
- Future imperviousness is 29 percent
- 24 stream crossings have “minor to moderate” impacts
- Habitat quality is “fair” with inadequate buffers
- Actively widening stream
- “Moderate to severe” erosion at three locations
- Two obstruction locations block the stream
- One trash dumpsite

The stream has “minor to moderate” erosion due to pipe crossings. Approximately 294 acres in the watershed drain to stormwater management facilities.

Stream Quality

The Fairfax County Stream Protection Strategy Baseline Study from January 2001 evaluated the quality of streams throughout the county and the county evaluated the physical condition of Dead Run in January 2003.



Eroded stream banks at a tributary to Dead Run near Churchill Road

The stream quality for Dead Run can be summarized as follows:

- “Very poor” composite site condition rating based on biological integrity, stream physical

Dead Run Watershed Summary Sheet

assessment, habitat assessment, fish species richness, and percent imperviousness

- Majority of the stream buffer is inadequate and consists mainly of lawns
- 30 percent to 50 percent of the bank area has erosion
- 61 percent of Dead Run exhibits “fair” habitat quality and 20 percent exhibits “good” habitat quality

Problem locations were provided by the public at the Community Watershed Forum held on April 16, 2005, and also by the Middle Potomac Watersheds Steering Committee. They identified problem areas in Dead Run such as:

- Frequent flooding of residential properties.
- Inadequate pipe infrastructure.
- Trail erosion from overuse.
- Pollution from parking lots.
- Non-functioning stormdrains.
- Increasing impervious area from excessive build-out of residential lots.
- Poor stream buffers.



Backyard flooding near Kyleakin Court

Issues/Solutions

The goals for the Middle Potomac Watersheds Management Plan were derived from the issues identified by the community and the project team based on their analysis of the watersheds' condition.

The Dead Run Watershed is mainly residential. The main issues in the watershed are increasing imperviousness from mansionization and flooding of homes and properties. Mansionization will increase the overall imperviousness in the watershed by one percent, which will in turn increase the stormwater runoff volumes and cause increased stream erosion.

Solutions recommended for the Dead Run Watershed in the *Final Draft Middle Potomac Watersheds Management Plan* include structural and non-structural practices. The proposed projects have been prioritized and will be implemented over 25 years. The following projects are proposed to be implemented in the next five years. Specific details on the projects that follow can be found in Chapter

6 and Appendix A.

Coordination with the land owners will be essential to the successful implementation of the plan actions. Cost-sharing opportunities may be explored for projects where both the land owner and the county will benefit.

1. Removal of channel obstructions that block stream flow and clean up of dumpsites (Dumpsite/Obstruction Removal Project DE9901).
2. Restoration of streams and vegetated stream buffers to mitigate stream bank erosion and improve stream habitat. (Stream Restoration Project DE9226, Buffer Restoration Projects DE9303 and DE9310).
3. A Neighborhood Stormwater Improvement Area for a neighborhood with no stormwater controls to reduce flooding and increase water quality. (Neighborhood Stormwater Improvement Area DE9836).
4. Retrofit of existing stormwater management facilities to provide better stormwater quantity control and water quality treatment (BMP Retrofit Projects DE9106, DE9120, DE9122 and DE9130).
5. Construction of new stormwater management facilities such as wet ponds or dry detention basins (New BMP Projects DE9112 and DE9129).
6. Education and outreach initiatives that will be implemented for the entire 25-year period. These projects are designed to involve the stakeholders in improving the watershed (Public Education Project DE9939, Community Outreach Project DE9940, LID Promotion Project DE9941, Enforcement Enhancement Project DE9942 and Stream Assessment Project DE9947).

The county is committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem.

Turkey Run Watershed Summary Sheet

Overview

The Turkey Run Watershed has an approximate area of 1,248 acres as shown in the figure below. It is bounded to the west by Ridge Drive and Langley Oaks Park; to the east by Savile Lane; to the south by Georgetown Pike; and to the north by the Potomac River.



The headwaters of Turkey Run begin at a natural springs located south of Georgetown Pike. Turkey Run flows under Georgetown Pike, then flows in a northerly direction until it discharges to the Potomac River.

Aerial photograph of Turkey Run Watershed

- Flows from south to north
- Length is approximately 1.7 miles
- One unnamed tributary contributes significant stream flow
- Watershed land elevations range from 210 to 230 feet in the southern part to elevations of 55 to 75 feet in the northern part

Some facts about Turkey Run include the following:

the east.

- 461 acres, or 37 percent of the watershed is comprised of open space, parks, and recreational areas including Langley Oaks Park, Langley Fork Park, Clemyjontri Park, Turkey Run Recreation Area, and Claude Moore Colonial Farm.

For the future land use condition, estate residential land use may be replaced by low-density residential development and the future imperviousness may increase to 16 percent.

The overall condition of the watershed is summarized as follows.

Turkey Run Watershed Condition Summary

- Current imperviousness is 15 percent with the majority being low-intensity commercial land use
- Future imperviousness is 16 percent
- Seven crossings have "minor to moderate" impacts
- Habitat quality is "excellent"
- Several locations have inadequate buffers
- Actively widening stream
- "Moderate to severe" erosion at two locations
- Two obstruction locations block the stream

At one outfall pipe location there is "minor to moderate" erosion of the channel due to the discharge from the pipe. Approximately 61 acres in the watershed drain to one stormwater management facility.

Characteristics



Fallen trees and debris are causing a severe impact to the stream east of Turkey Run Road

The current impervious area in this watershed is 15 percent of the total area. When watershed imperviousness reaches ten percent, stream quality begins to decline with poor water quality, alteration of the stream channel, and degraded plant and animal habitat becoming apparent.

The current land use in the watershed is:

- Predominantly low-intensity commercial.
- Low-density residential and forested lands that are located in the upper portions of the watershed.
- The Central Intelligence Agency (CIA) and the Federal Highway Administration that are located to

Stream Quality



Poor buffer area southwest of Kedleston Court

The Fairfax County Stream Protection Strategy Baseline Study from January 2001 evaluated the quality of streams throughout the county and the county evaluated the physical condition of Turkey Run in January 2003.

The stream quality for Turkey Run can be summarized as follows:

- "Excellent" composite site condition rating based on biological integrity, stream physical assessment, habitat assessment, fish species richness, and percent imperviousness
- Majority of the stream buffer consists of grass

Turkey Run Watershed Summary Sheet

- 15 percent to 30 percent of the bank area has erosion
- 60 percent of Turkey Run exhibits “excellent” habitat quality and 30 percent exhibits “fair” habitat quality

Problem locations were provided by the public at the Community Watershed Forum held on April 16, 2005, and also by the Middle Potomac Watersheds Steering Committee. They identified problem areas in Turkey Run such as:

- Inadequate pipe infrastructure.
- Pollution from a parking lot.

Issues/Solutions

The goals for the Middle Potomac Watersheds Management Plan were derived from the issues identified by the community and the project team based on their analysis of the watersheds’ condition.

The main issue in Turkey Run is the lack of Stormwater Management ponds and Best Management Practices which can reduce downstream stormwater runoff volumes and increase water quality.

While the overall health of the Turkey Run Watershed is good, some projects will be needed, as well as continued monitoring of the watershed, to maintain the water quality and manage stormwater runoff volumes as the watershed becomes more developed.

Solutions recommended for the Turkey Run Watershed in the *Final Draft Middle Potomac Watersheds Management Plan* include structural and non-structural practices. The proposed projects have been prioritized and will be implemented over 25 years. The following projects are proposed to be implemented in the next five years. Specific details on the projects that follow can be found in Chapter 7 and Appendix A.

Coordination with the land owners will be essential to the successful implementation of the plan actions. Cost-sharing opportunities may be explored for projects where both the land owner and the county will benefit.

1. Removal of channel obstructions that block stream flow and clean up of dumpsites (Dumpsite/Obstruction Removal Project TR9902).
2. Restoration of streams to mitigate stream bank erosion and improve stream habitat (Stream Restoration Project TR9201).
3. Installation of low impact development techniques such as manufactured tree-box filters, bioretention

areas and bioswales to reduce stormwater runoff volumes and improve water quality (New LID Project TR9807).



Bioretention area example

4. Retrofit of existing stormwater management facilities to provide better stormwater quantity control and water quality treatment (BMP Retrofit Project TR9104).
5. Education and outreach initiatives to involve the stakeholders in improving the watershed (Public Education Project TR9914, Community Outreach Project TR9918, LID Promotion Project TR9919, Enforcement Enhancement Project TR9920 and Stream Assessment Project TR9922).

The county is committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem.

Pimmit Run Watershed Summary Sheet

Overview

The Pimmit Run Watershed has an area of approximately 8,083 acres that includes 1,356 acres of Arlington County, as shown in the figure below. It is bounded to the west by Interstate 495; to the north by Chain Bridge Road and Dolley Madison Boulevard; to the northeast by the Potomac River; to the east by Glebe Road in Arlington County; and to the south by Lee Highway and Interstate 66. The watershed is divided into four smaller subwatersheds consisting of Upper Pimmit Run, Middle Pimmit Run, Little Pimmit Run and Lower Pimmit Run.



Aerial photograph of the Pimmit Run Watershed

The headwaters of Pimmit Run begin west of Interstate 495 along Gallows Road and drain into a pond just west of the interstate near Madron Lane and Executive Court. The stream discharges into the Potomac River in Arlington County.

Some facts about Pimmit Run include the following:

- Flows from west to east
- Length is approximately 13.1 miles
- 6 major tributaries contribute significant stream flow
- Watershed land elevations range from 350 to 400 feet in the southern part to elevations of 30 to 100 feet in the northern part



The McLean Little League ball fields after flooding

Characteristics

The current impervious area in this watershed is 27 percent of the total area. When watershed imperviousness reaches ten percent, stream quality begins to decline with poor water quality, alteration of the stream channel, and degraded plant and animal habitat becoming apparent.

The current land use in the watershed is:

- Predominantly medium-density residential.
- Commercial in the southwest.
- Low-density residential and forested land located east of the George Washington Memorial Parkway.
- 502 acres, or six percent of the watershed is comprised of open space, parks, and recreational areas.

For the future land use condition, estate residential land use may be replaced by low-density residential development and the future imperviousness may increase to 30 percent.

The overall condition of the watershed is summarized as follows.

Pimmit Run Watershed Condition Summary

- Current imperviousness is 27 percent with the majority being medium-density residential land use
- Future imperviousness is 30 percent
- Three stream crossings had “moderate to severe” impacts
- 11 utility locations have “minor to moderate” impacts
- Habitat quality is “fair” with inadequate buffers
- Actively widening stream
- “Moderate to extreme” erosion at 28 locations
- Eight obstruction locations block the stream
- Two trash dumpsites

The stream has “minor to moderate” erosion due to pipe crossings. Approximately 609 acres in the watershed drain to stormwater management facilities.

Stream Quality



View of utility poles located in Pimmit Run

Fairfax County Stream Protection Strategy Baseline Study from January 2001 evaluated the quality of streams throughout the county and the county evaluated the physical condition of Pimmit Run in January 2003.

The stream quality for Pimmit Run can be summarized as follows:

- Impaired stream quality due to fecal coliform bacteria
- “Very poor” composite site condition rating based on

Pimmit Run Watershed Summary Sheet

biological integrity, stream physical assessment, habitat assessment, fish species richness, and percent imperviousness

- Majority of the stream buffer is inadequate and consists mainly of scattered shrubs, grasses and forbs
- 30 percent of the bank area has erosion
- 39 percent of Pimmit Run exhibits “fair” habitat quality and 44 percent exhibits “good” habitat quality

Problem locations were provided by the public at the Community Watershed Forum held on April 16, 2005, and also by the Middle Potomac Watersheds Steering Committee. They identified problem areas in Pimmit Run such as:

- Frequent flooding of residential properties.
- Inadequate pipe infrastructure.
- Low water quality.
- Pipes exposed due to erosion.
- Non-functioning stormdrains.
- Concrete channelization.
- Increasing impervious surfaces due to excessive residential build-out.
- Culverts blocked by fallen debris.
- Separation of floodplains from the stream due to streambed erosion.

Issues/Solutions

The goals for the Middle Potomac Watersheds Management Plan were derived from the issues identified by the community and the project team based on their analysis of the watersheds’ condition.

Pimmit Run is primarily residential, with over 60 percent of the watershed estate residential, low density residential, medium density residential, or high density residential land use. In Upper Pimmit Run, many of the streams have been channeled, or paved with concrete,



Backyard flooding near Chesterfield Avenue caused by increased runoff from impervious areas

decreasing infiltration along the stream and also decreasing water quality. Many of the issues in the watershed are related to erosion and flooding.

Solutions recommended for the Pimmit Run Watershed in the *Final Draft Middle Potomac Watersheds Management Plan* include structural and non-structural practices. The proposed projects have been prioritized and will be implemented over 25 years. The following projects are proposed to be implemented in the next five years. Specific details on the projects that follow can be found in Chapter 8 and Appendix A.

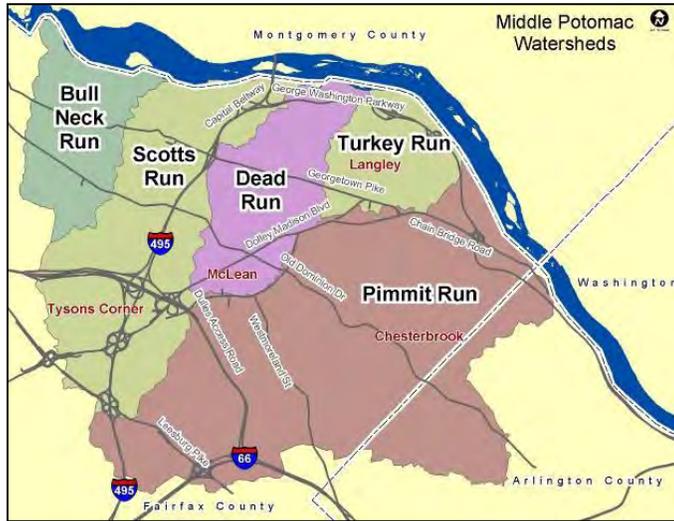
Coordination with the land owners will be essential to the successful implementation of the plan actions. Cost-sharing opportunities may be explored for projects where both the land owner and the county will benefit.

1. Removal of channel obstructions that block stream flow and clean up of dumpsites (Dumpsite/Obstruction Removal Projects PM9902 and PM9937).
2. Restoration of vegetated stream buffers to mitigate stream bank erosion (Buffer Restoration Projects PM9301, PM9311, PM9328 and PM9379).
3. Installation of low impact development techniques such as manufactured tree-box filters, bioretention areas, and bio-swales to reduce stormwater runoff volumes and improve water quality (New LID Projects PM9822, PM9824, PM9829, PM9830, PM9831, PM9843, PM9850, PM9852, PM9856, PM9859 and PM9874).
4. A Neighborhood Stormwater Improvement Area for a neighborhood with no stormwater controls to reduce flooding and increase water quality. (Neighborhood Stormwater Improvement Area PM9819).
5. Retrofit of existing stormwater management facilities to provide better stormwater quantity control and water quality treatment (BMP Retrofit Projects PM9136, PM9148, PM9149, PM9154, PM9160 and PM9161).
6. Construction of new stormwater management facilities such as wet ponds or dry detention basins (New BMP Projects PM9144 and PM9155).
7. Education and outreach initiatives that will be implemented for the entire 25-year period. These projects are designed to involve the stakeholders in improving the watershed (Public Education Project PM9984, Community Outreach Project PM9985, LID Promotion Project PM9986, Enforcement Enhancement Project PM9987 and Stream Assessment Project PM9997).

The county is committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem.

Overview

Along with capital improvement projects, policy and land use changes are vital in mitigating the effects of existing and future development in the Middle Potomac Watersheds. The policy and land use recommendations proposed by the Middle Potomac Steering Committee include proposals that would typically involve amendments to the county code and other supporting documents such as the Public Facilities Manual (PFM).



Map of Middle Potomac Watersheds

These recommendations will need to be further evaluated by the county in light of their countywide implications.

The current planned approach for processing the policy recommendations from the Middle Potomac Watersheds Management Plan is to integrate these recommendations with similar recommendations in the other county watershed management plans that were recently completed. Specific ordinance amendments would then be drafted in light of other county initiatives and address the common ground that can be established between the various policy recommendations.

Reduction in Roadway Runoff

With roadways accounting for a significant amount of the impervious surface in Fairfax County, one recommended policy action is to encourage transportation authorities to further control runoff from both new and existing roadway pavement. Specific actions for transportation authorities include:

- Applying the same stringent stormwater controls for commercial and residential development to transportation projects.
- Reducing imperviousness along the project corridor by providing more efficient access to entrances, removing old pavement, and reducing overall pavement footprints.

Increased Use of LID

Another policy action is to increase the use of Low Impact Development (LID) for all new and existing development in order to reduce runoff and improve water quality. Methods to accomplish this include:

- Establishing design assistance, outreach programs, and educational programs for individual landowners, design professionals, developers, and technical review staff to install LID.
- Add incentives to use LID by arranging for a technical, pre-review process to ensure that proposed plans are workable and potentially acceptable to the county.
- Provide flexibility to county staff to administratively approve deviations of the minimum yard requirements in return for the use of contiguous areas needed for LID.

Policy Actions for Middle Potomac Watersheds

- Require reduced runoff from new and existing roadways
- Provide incentives for use of LID and require developers to use LID to the 'maximum extent practicable'
- Implement proposed Tysons Corner Stormwater Strategy to mitigate effects of development
- Protect stream buffers and wetlands
- Implement an LID awareness program

Other recommended Policy Actions that will serve to protect and improve habitat and water quality to sustain native species include:

- Providing a list of desirable LID projects so that developers considering the use of proffers can easily find where projects are needed.
- Continue to evaluate LID practices for application to private sector development projects to the maximum extent practicable.
- Requiring all public facilities to use LID to the 'maximum extent practicable'.

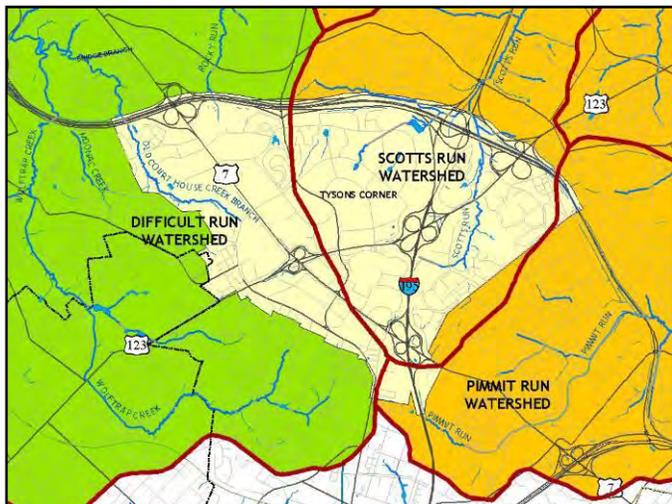
Tysons Corner Stormwater Strategy

Implementation of the Tysons Corner Stormwater Strategy Project SC9845 in conjunction with new metrorail stations is recommended.

Portions of Tysons Corner will be redeveloped as the Metro rail expands to the area. LID measures, new Best Management Practices (BMPs), BMP retrofits, and additional stormwater management requirements for developed properties without existing BMPs should be implemented to mitigate the effects of both new development and the existing impervious areas. Fairfax County has initiated a Tysons Corner Transportation/Urban Design Study and appointed a Tysons Land Use Task Force to coordinate community participation and

Policy Action Summary Sheet

recommend changes to the 1994 Tysons Corner Comprehensive Plan. Additional information on the Tysons Corner Study is available at www.fairfaxcounty.gov/dpz/tysonscorner/.



Map of Tysons Corner Watersheds

- An inspection and maintenance program will help keep the LID sites functioning properly and therefore maintain and improve water quality.
- LID signs will increase public awareness of LID measures and should help to prevent inadvertent damage to LID sites.
- This action would help to increase the installation of LID methods by individual property owners.

The county is committed to protecting the streams in the watersheds from future degradation and promoting watershed-wide management actions that work to restore the streams and other watershed areas to an environmentally healthy ecosystem.

Protect Stream Buffers and Wetlands

Another goal through policy action is to restore and protect vegetated stream buffers and wetlands in order to filter pollutants from runoff, provide erosion control, improve water quality, and provide habitat for animals. A means to accomplish this is through the following:

- The county should utilize environmentally-sensitive trail design in the vegetated buffers to reduce stormwater impacts where possible.
- The county should work to encourage mitigation for wetland losses resulting from development to be mitigated within the same hydrologic area (same local watershed). In addition, the county's PFM should be changed to allow for alternate but friendlier trail and bridge designs that still meet ADA requirements where possible

Establish an LID Awareness Program

The county should promote the implementation and maintenance of LID practices through an LID Awareness Program. This can be accomplished through the following:

- Creating a program that certifies citizens to inspect rain gardens and other LID measures.
- Recommending that HOAs should post signs identifying locations of LID measures in order to prevent inadvertent damage. A universal common symbol should be developed and posted near LID measures.
- If and when a stormwater utility is established, providing opportunities for landowners to lower their utility fees by installing LID measures on their properties.

Benefits of these actions include: