

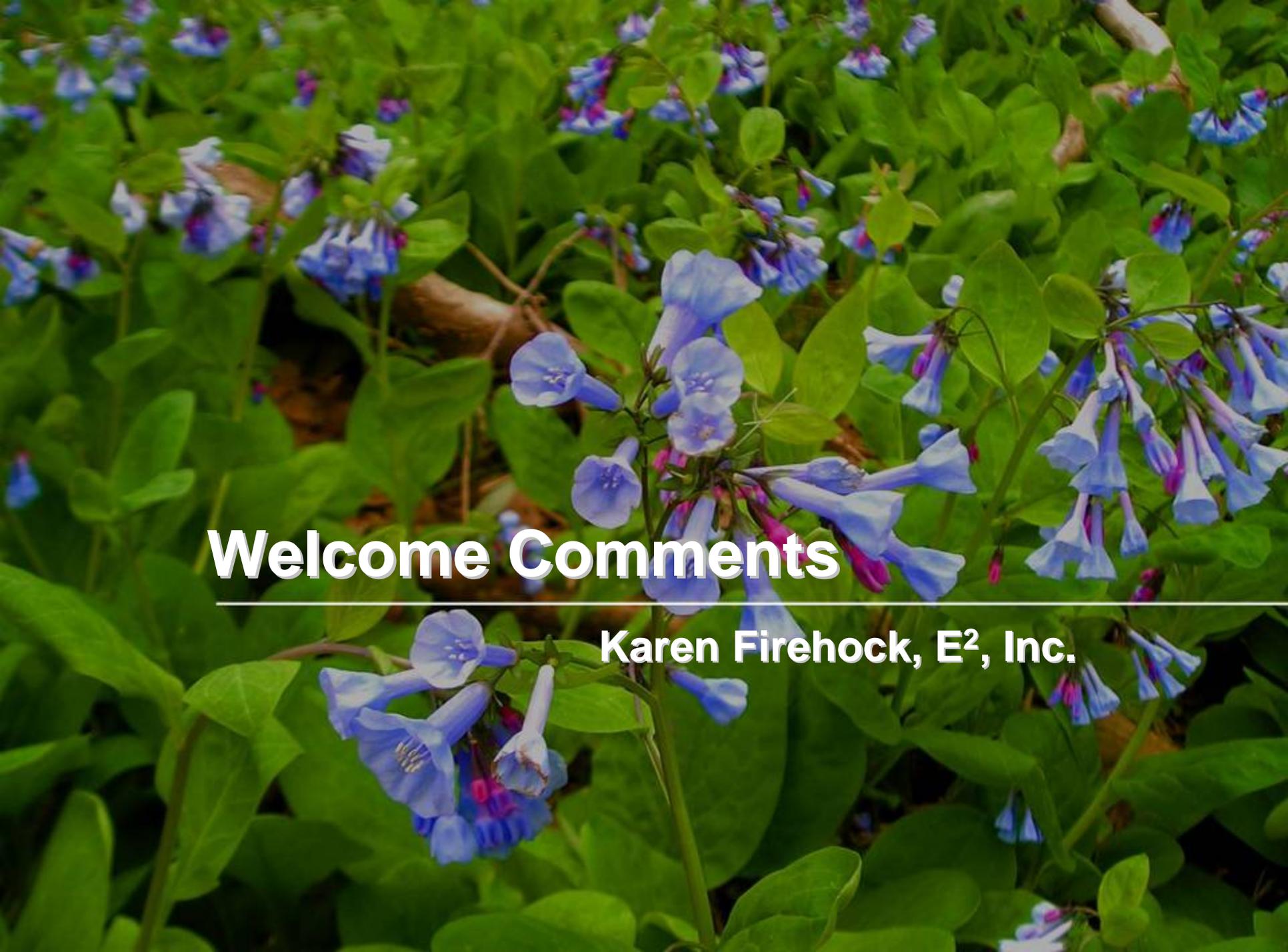
# Little Rocky Run - Johnny Moore Creek Watershed Management Plan

Draft Plan Forum  
September 16, 2010

Fairfax County Department of Public Works  
and Environmental Services

Presented by Watershed Planning & Assessment Branch,  
Stormwater Management



A close-up photograph of a dense field of blue and purple flowers, likely Salpiglossis, with vibrant green foliage. The flowers are bell-shaped and hang from thin stems. The background is filled with more of the same plants, creating a lush, textured appearance.

**Welcome Comments**

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**Karen Firehock, E<sup>2</sup>, Inc.**

# Agenda

- Welcome
- Watershed Planning in Fairfax County
- Address by District Supervisor
- Watershed Primer
- Watershed Management Plan Overview
- Plan Comment Period and Timeline
- Breakout Sessions
- Adjourn

A close-up photograph of a dense field of blue and purple flowers, likely Virginia Bluebells, with vibrant green foliage. The flowers are in various stages of bloom, some fully open and others as buds. The background is a soft-focus expanse of similar flowers and leaves.

# **Watershed Planning in Fairfax County**

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**Fred Rose, Fairfax County**

A close-up photograph of a dense field of blue and purple flowers, likely Virginia Bluebells, with vibrant green foliage. The flowers are in various stages of bloom, some fully open and others as buds. The background is a soft-focus expanse of similar flowers and leaves.

# **Welcome Addresses**

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**Supervisors Frey and Herrity**

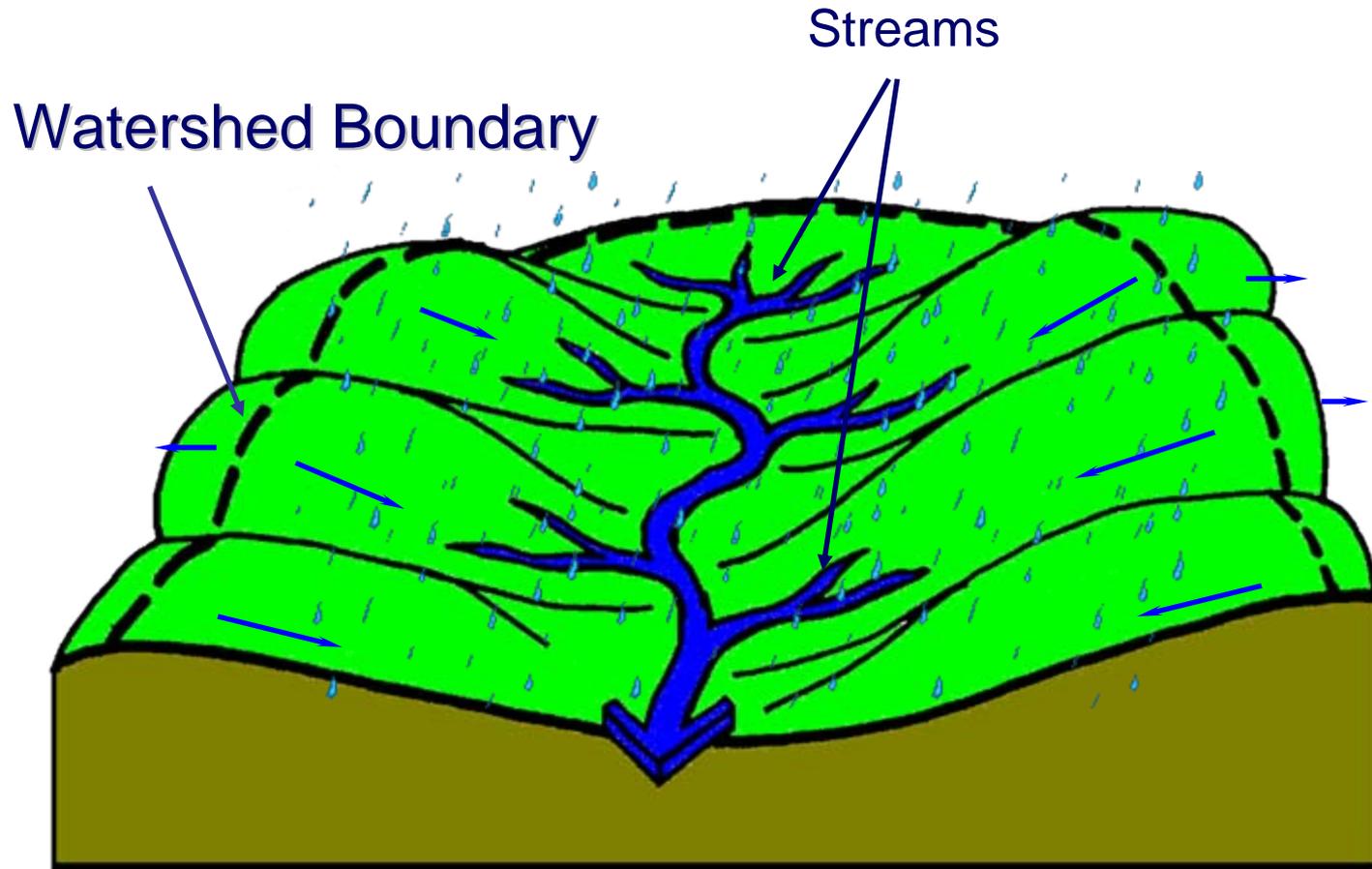
A close-up photograph of a dense field of blue and purple flowers, likely a species of primula, with vibrant green foliage. The flowers are bell-shaped and clustered together. The background is filled with more of the same plants, creating a lush, textured appearance.

# **Watershed Primer**

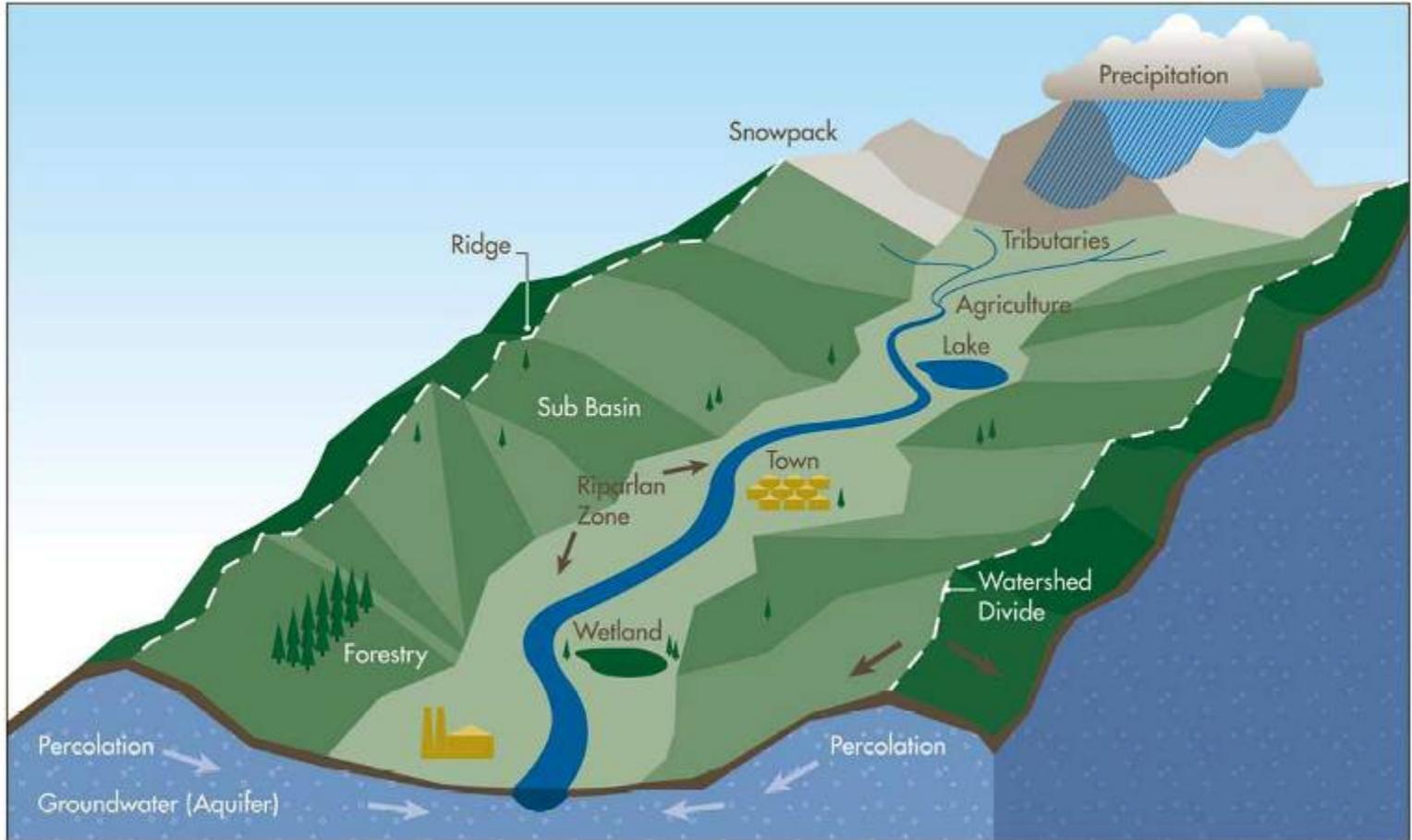
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**Eric Forbes, Fairfax County**

# What is a Watershed?

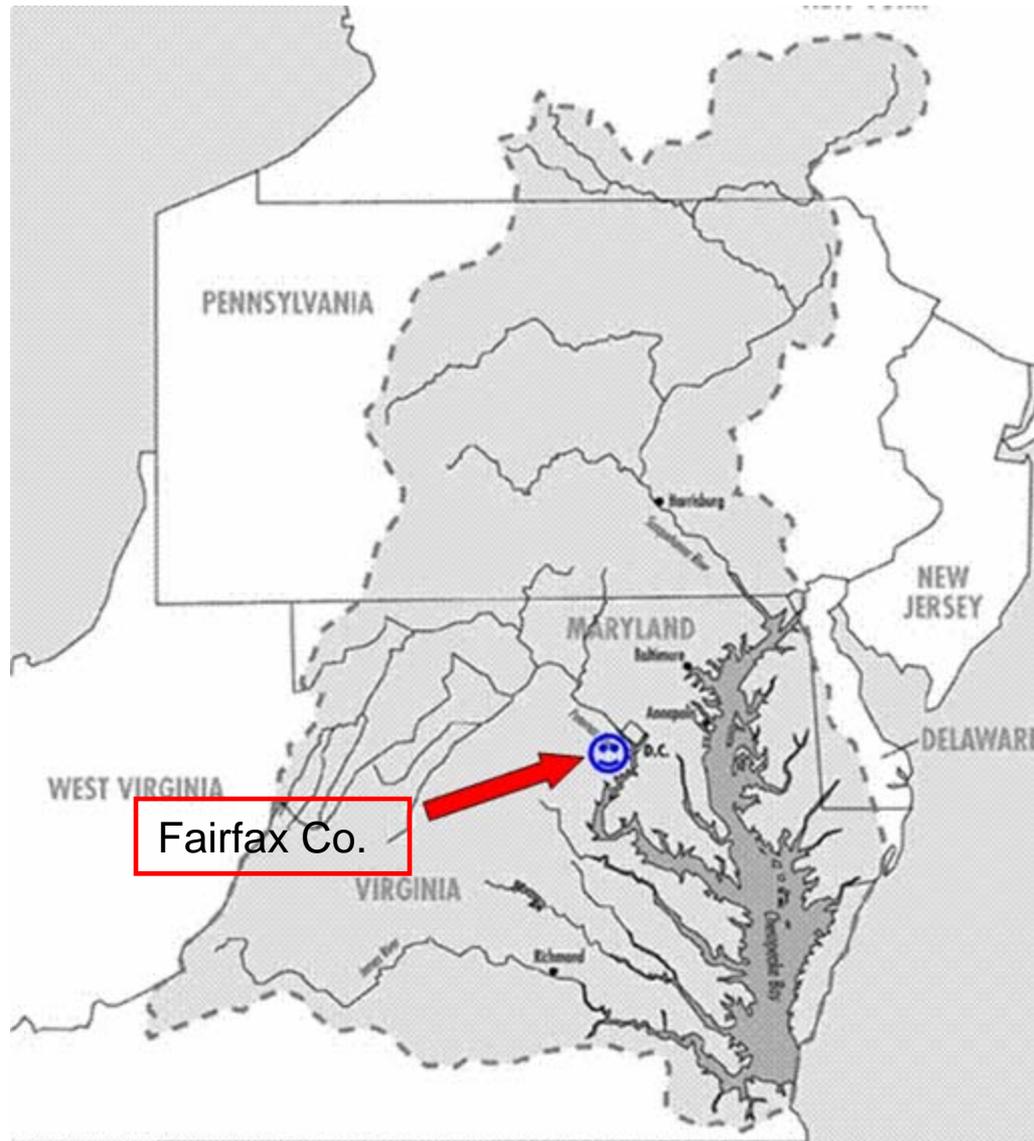


# What is a Watershed?



<http://www.epa.gov/owow/watershed/whatis.html>

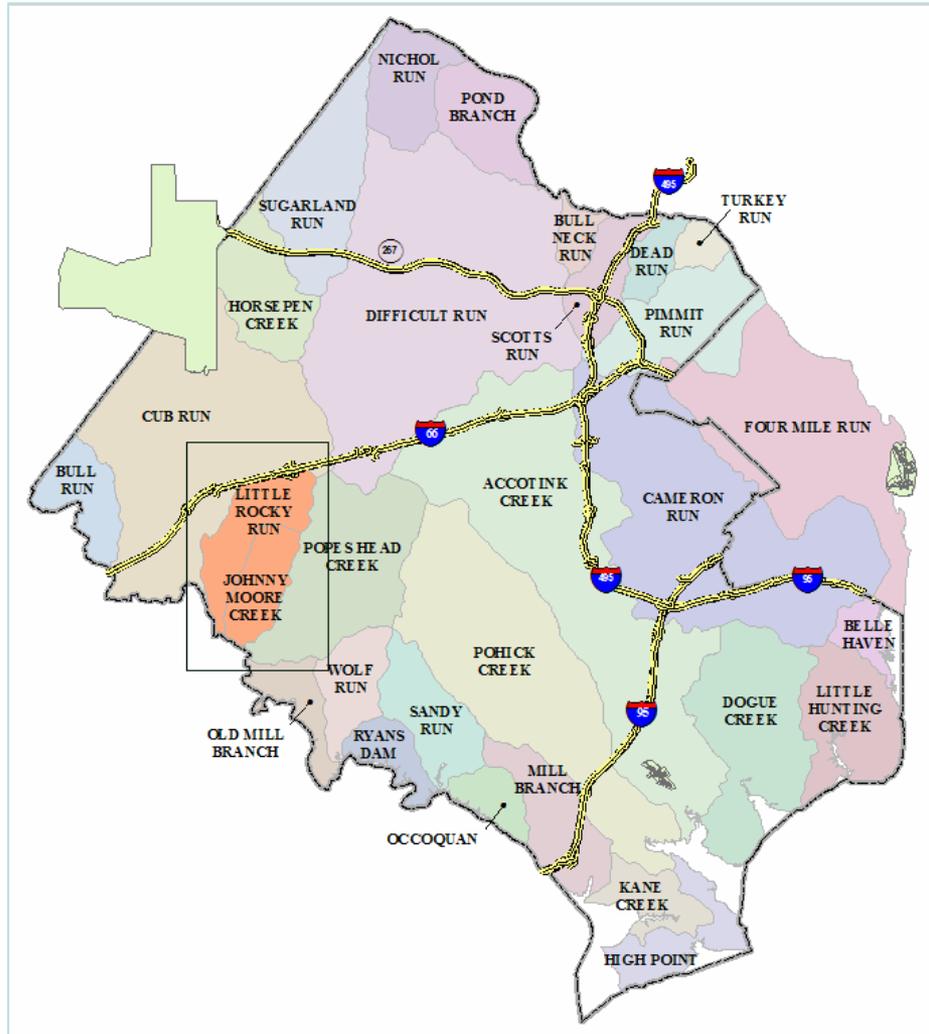
# Chesapeake Bay Watershed



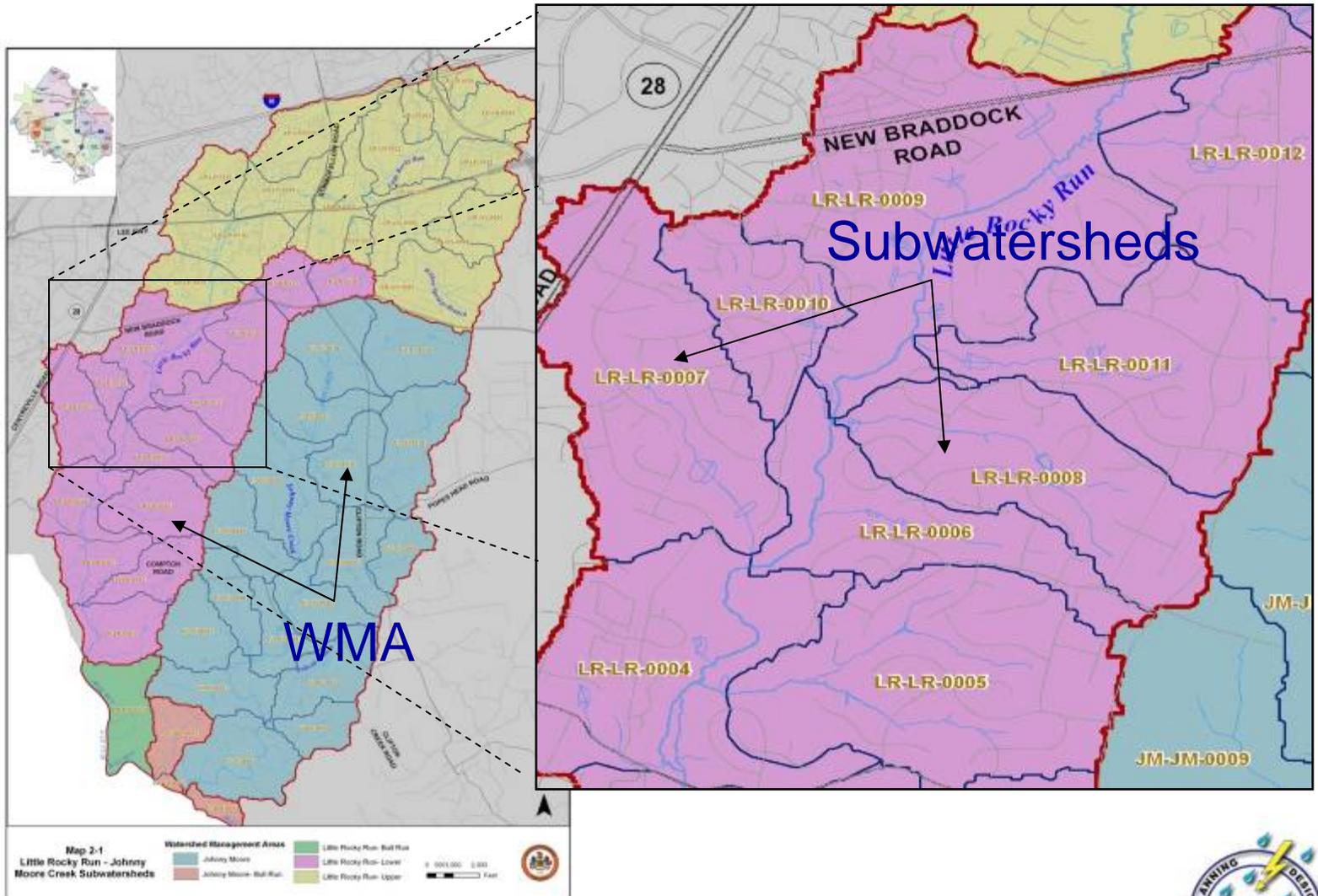
FAIRFAX COUNTY STORMWATER MANAGEMENT



# Fairfax County Watersheds



# Watershed Planning Study Units



# Stormwater Management

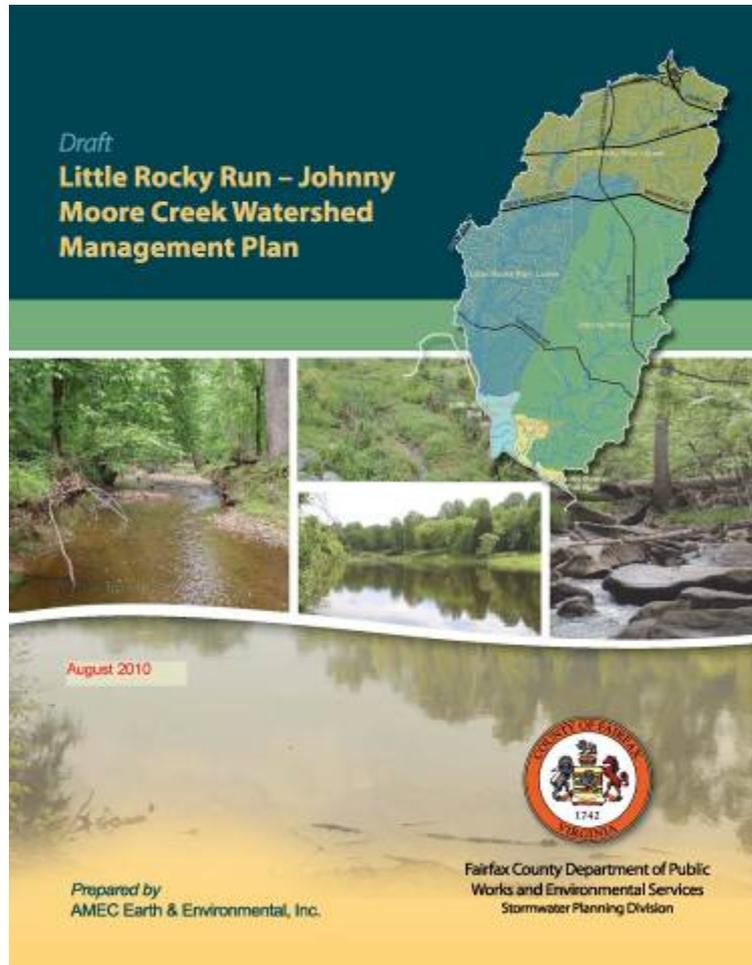
The process of controlling **stormwater runoff** that drains from rooftops, driveways, roads and other hard surfaces that do not allow water to permeate into the ground.



# Stormwater Management



# What Is a Watershed Management Plan?



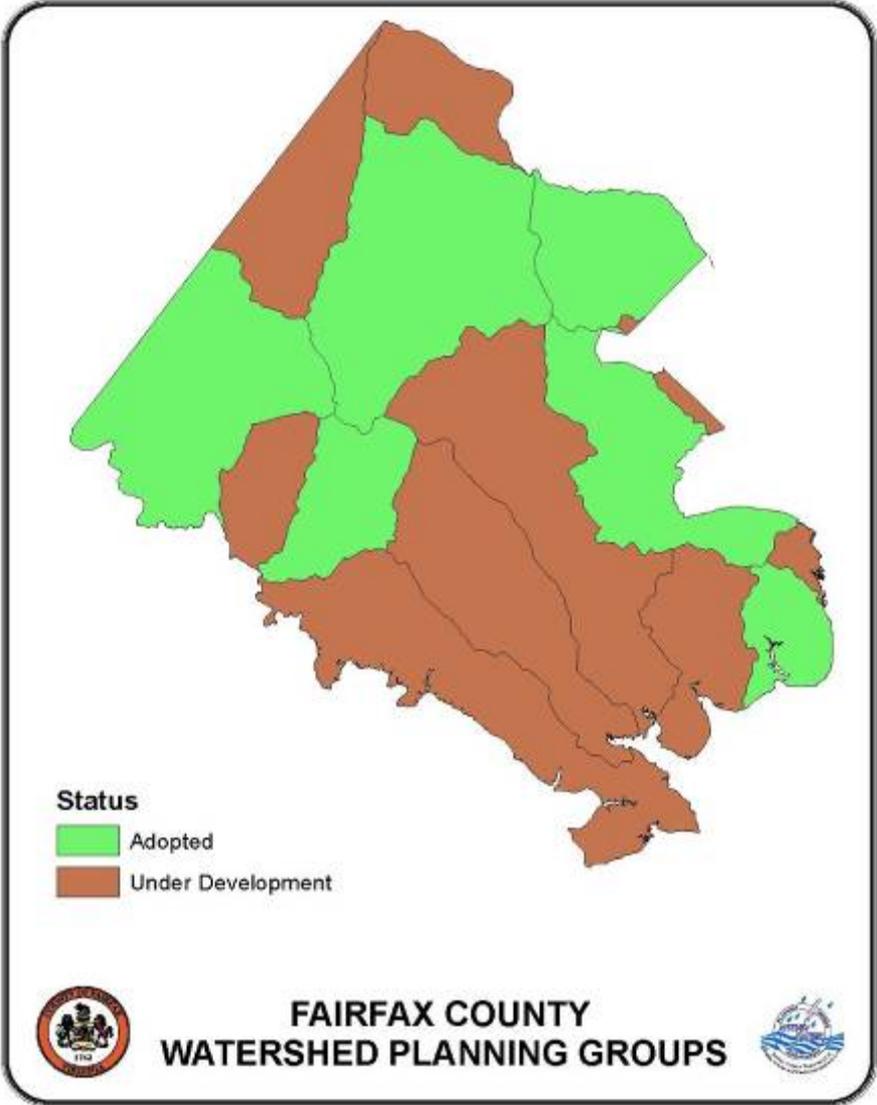
- A Watershed Management Plan is a tool to identify and address the issues affecting our environment.
- The plan contains a 25-year list of proposed projects to protect and restore our streams and other water resources.

# Why Create Watershed Plans?

Healthy watersheds, healthier communities



# Watershed Planning





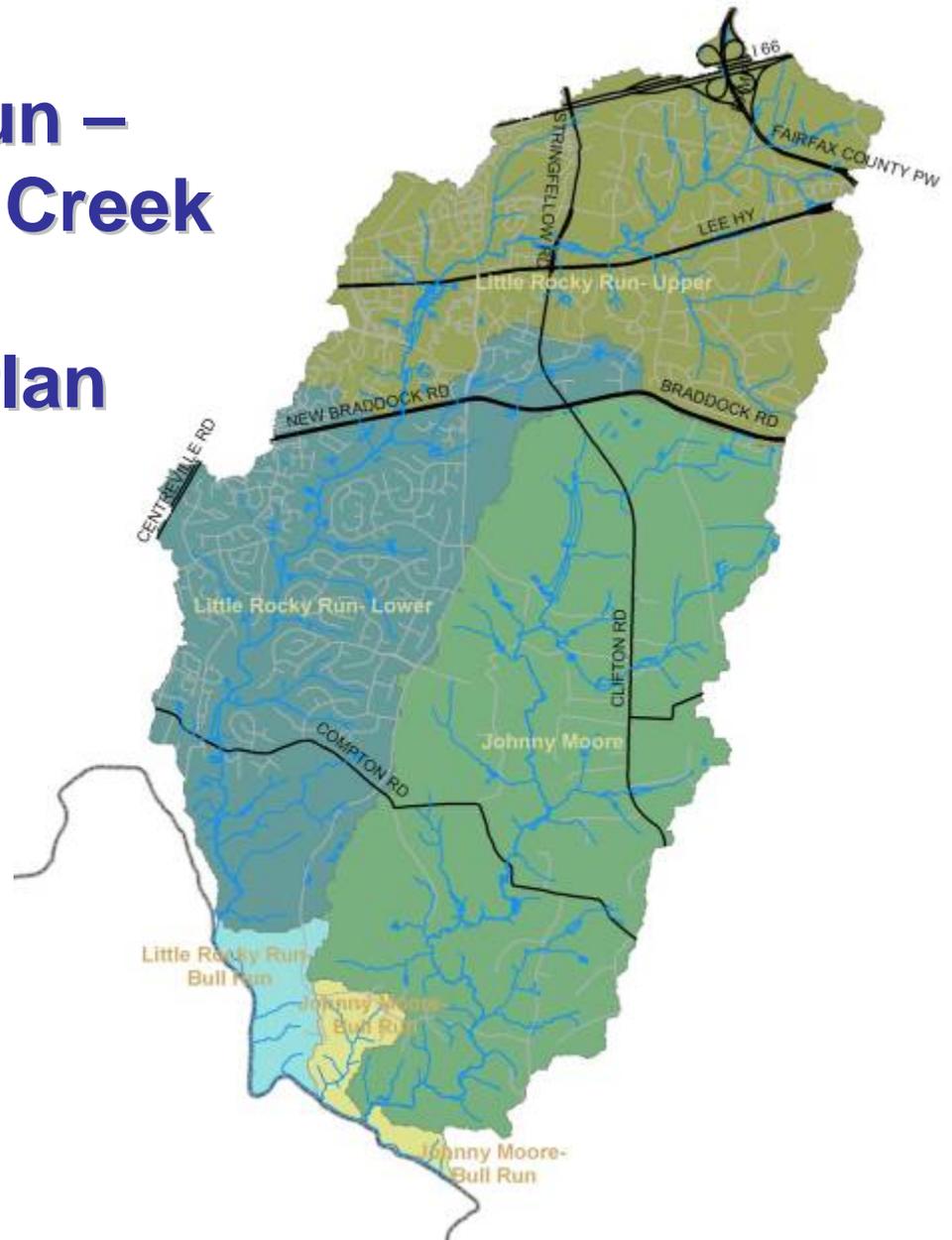
**The Little Rocky Run – Johnny Moore  
Creek Watershed Management Plan**

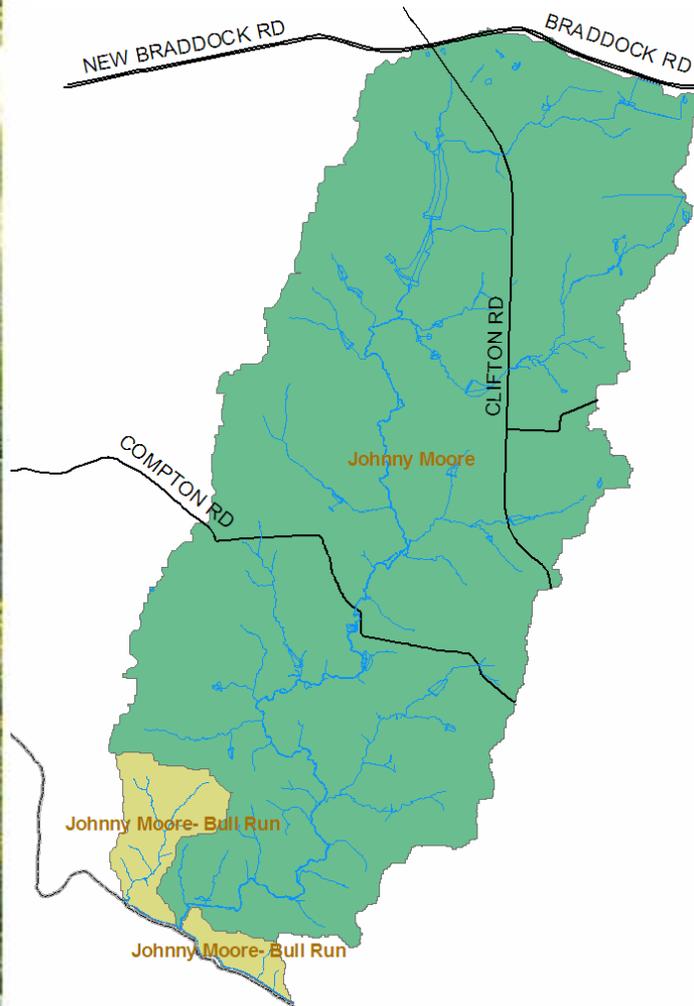
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**Lynne Mowery, AMEC**



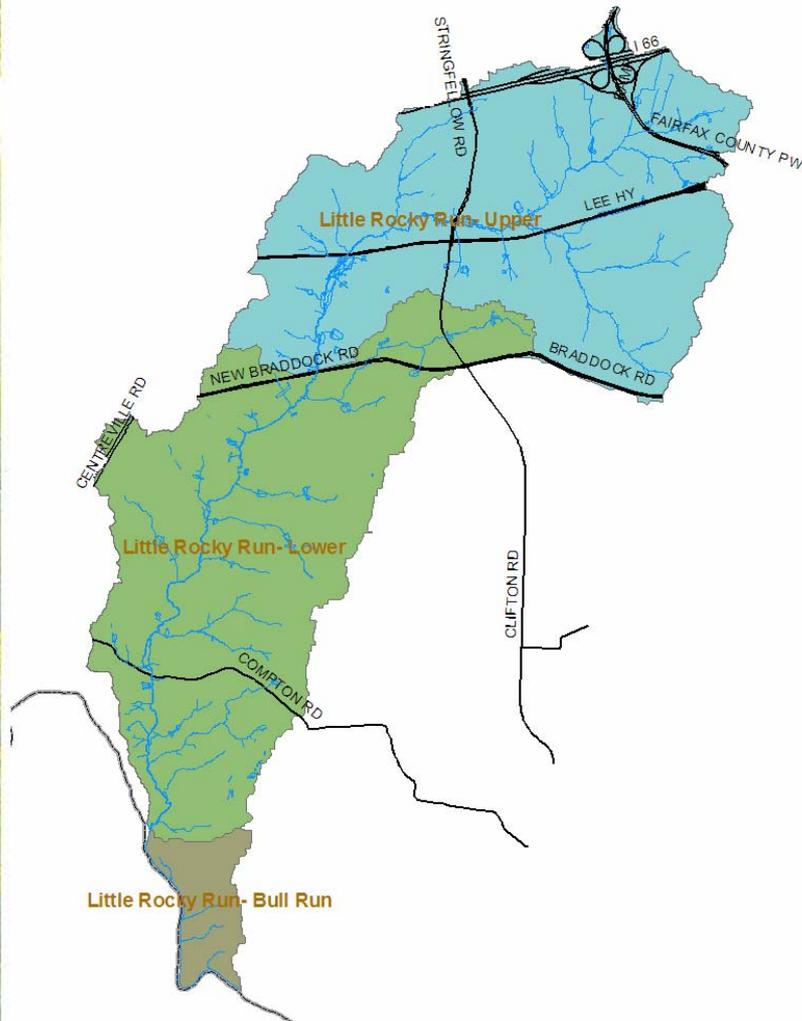
# Little Rocky Run – Johnny Moore Creek Watershed Management Plan





# Johnny Moore Creek Watershed

- 5.3 square miles
- 11.7 miles of streams assessed in Stream Physical Assessment
- Comprised of two WMAs:
  - Johnny Moore
  - Johnny Moore – Bull Run
- Johnny Moore – Bull Run WMA is undeveloped and no projects were recommended in plan



# Little Rocky Run Watershed

- 7.2 square miles
- 13.2 miles of streams assessed in Stream Physical Assessment
- Comprised of three WMAs:
  - Little Rocky Run - Upper
  - Little Rocky Run - Lower
  - Little Rocky Run – Bull Run
- Johnny Moore – Bull Run WMA is undeveloped and no projects were recommended in plan

# Organization of Watershed Management Plan

## Executive Summary

1. Introduction
2. Watershed Planning Process
3. Summary of Watershed Conditions
4. Summary of Watershed Restoration Strategies
  - Describes Strategies and Project Types
5. WMA Area Restoration Strategies
  - Identifies Projects in each WMA
6. Benefits of Plan Implementation
  - Modeling Results and Project Cost/Benefit Analysis
7. Glossary and Acronyms

## Appendices

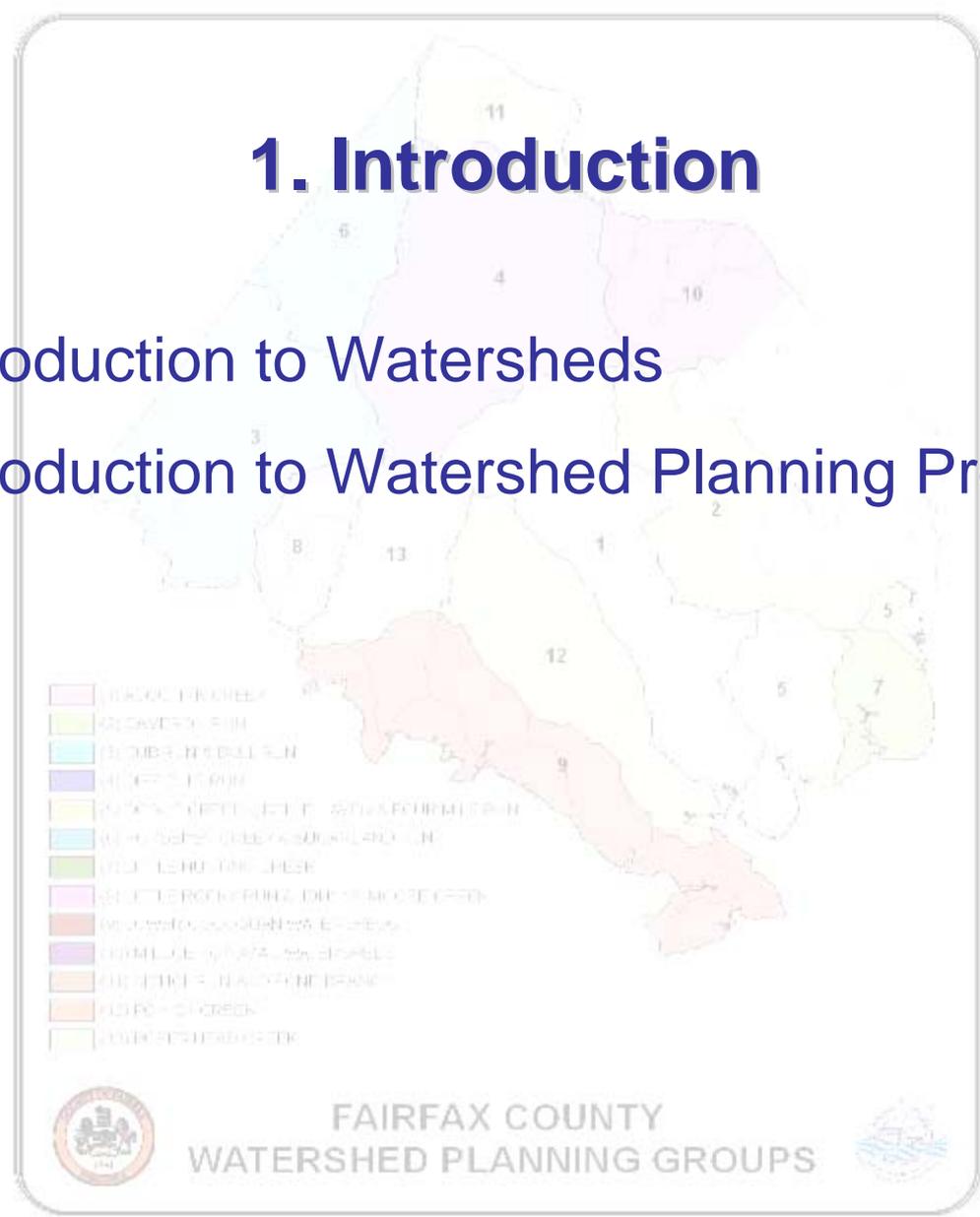
# Executive Summary

- Overview of Plan
- Master Project List
  - 10-year Implementation Plan
  - 25-year Implementation Plan
  - Non-Structural Projects



# 1. Introduction

- Introduction to Watersheds
- Introduction to Watershed Planning Process



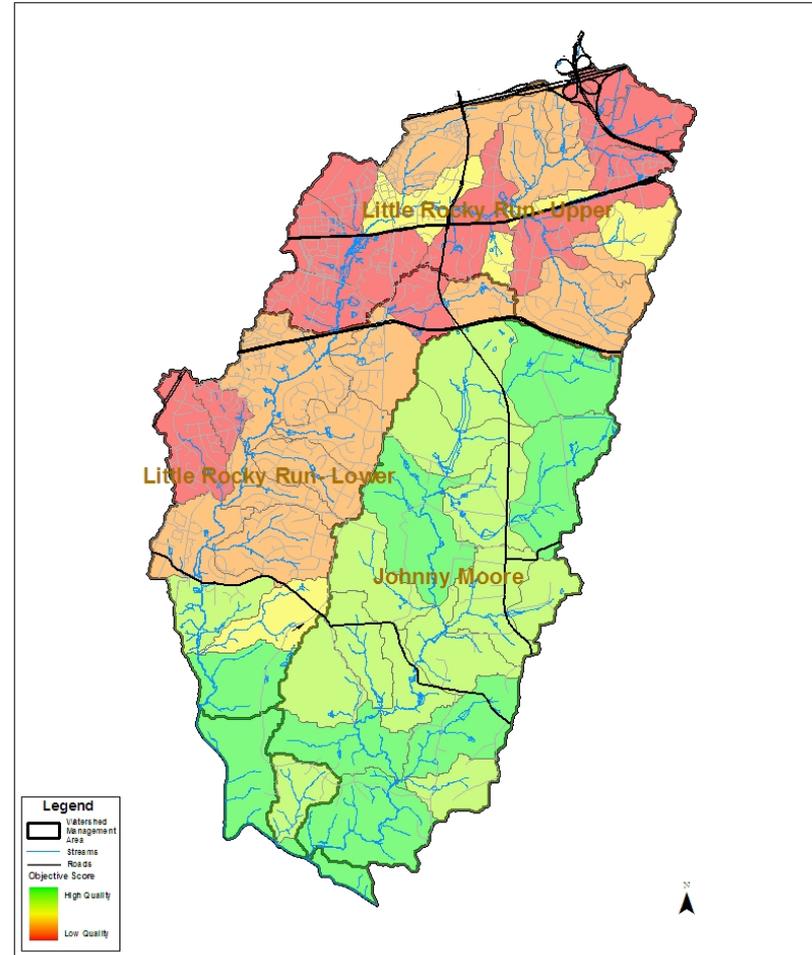
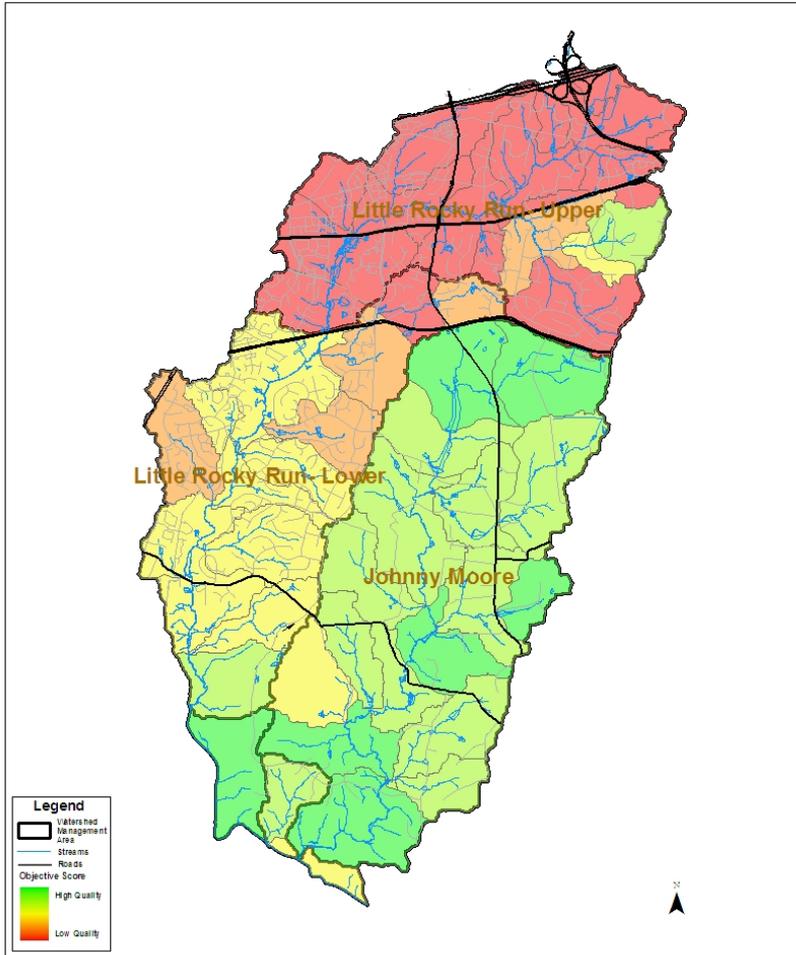
## 2. Watershed Planning Process

- Watershed Goals and Objectives
- Subwatershed Ranking
- Stormwater Modeling
  - Pollution Model (STEPL)
  - Hydrologic Model (SWMM)
  - Hydraulic Model (HEC-RAS)
- Public Involvement Plan

# Subwatershed Ranking

- Systematic means of compiling available water quality and natural resources information
- Consistent methodology throughout latest set of Watershed Management Plans
- Allows for analysis of future conditions using “predictive” indicators

# Subwatershed Ranking



# Stormwater Modeling

- **Pollution Model**
  - Spreadsheet Tool for Estimating Pollutant Loads (STEPL)
  - Models Total Nitrogen, Phosphorus, and Sediment
- **Hydrologic Model**
  - Storm Water Management Model (SWMM)
  - Models Stormwater Flows
- **Hydraulic Model**
  - Hydrologic Engineering Centers River Analysis System (HEC-RAS)
  - Models Floodplain

# Public Involvement Plan

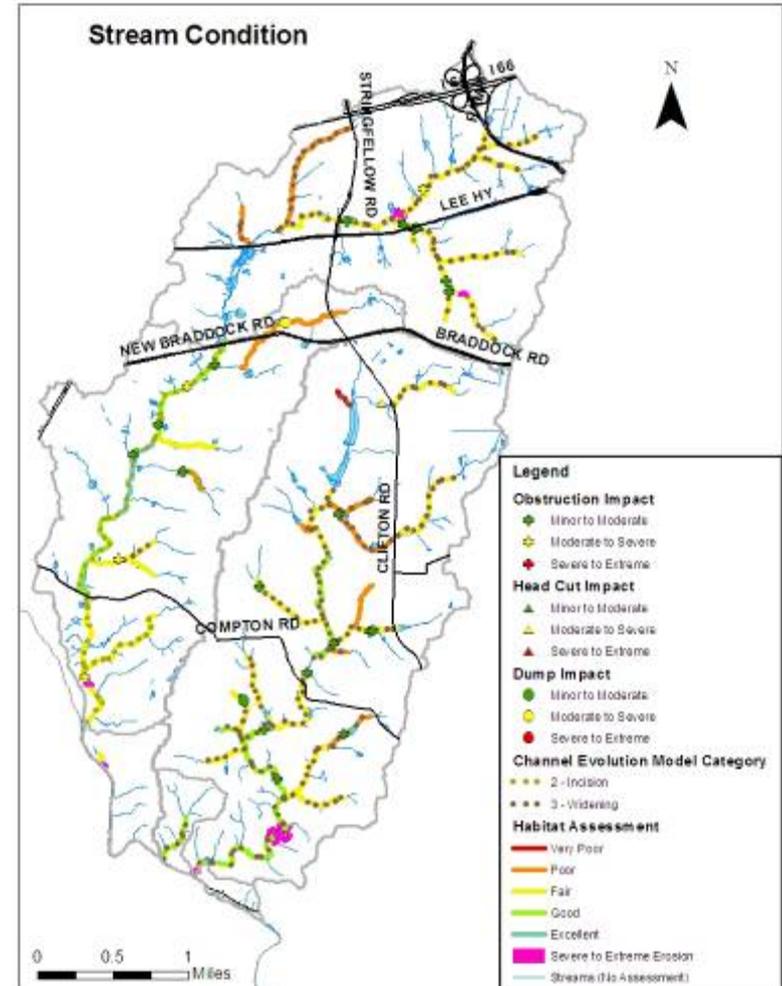
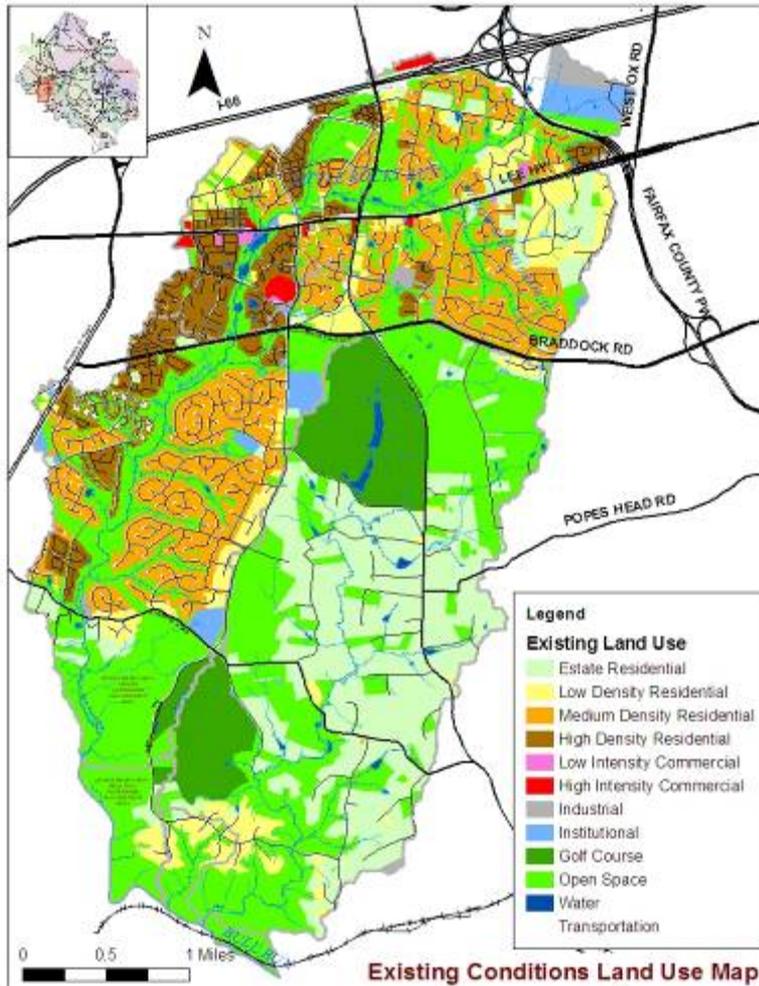
- **Introductory and Issues Scoping Forum**
  - Increase community awareness and understanding of stormwater management
  - Incorporate community ideas into the scope of the watershed plans
- **Watershed Advisory Group**
  - Provide meaningful participation options for a diversity of stakeholders
  - Several meetings throughout the plan development in order to provide guidance and comments at critical junctures of the process
- **Draft Plan Forum**

# 3. Summary of Watershed Conditions

- Summary of Existing Watershed Conditions
  - General WMA information
  - Land use
  - Modeling Results
  - Other Studies and Field Reconnaissance
  - Overall Condition based on Subwatershed Ranking
- WMAs Organized in Alphabetical Order



# Watershed Characterization



## 4. Summary of Watershed Restoration Strategies

- Restoration Strategies – relationship to goals & objectives
- Project Type Descriptions
  - Each Major Project Type
  - Description, Diagrams, and Photos
- Project Selection and Prioritization
- Project List

# Restoration Strategies

- **Stream/Buffer Restoration**
  - Improve stream stability
  - Improve habitat
- **Pond Retrofits**
  - Watersheds covered by many existing ponds
  - Retrofit to add water quality enhancements
  - Increase storage capacity to reduce runoff downstream
- **New SWM Facilities**
  - Use Low Impact Development (LID) or other stormwater management strategies in areas without water quality controls or to enhance water quality
- **Flooding Mitigation**
  - Strategies to reduce structure and/or road flooding

# Stormwater Pond Retrofit

## Benefits

- Reduces stormwater velocity
- Improves nutrient removal



***Before***



***After***

# Stream Restoration

- Benefits
  - Reduced erosion
  - Improved nutrient removal
  - Restore riparian habitat

***Before***



***After***

# LID Bioretention/Bioswale



## Benefits

- Reduce directly connected impervious areas
- Improve nutrient removal



# Non-Structural Project Evaluation

- Evaluated after structural projects to better determine areas in need of additional non-structural alternatives
- Some projects/project groups are WMA – wide
- Evaluation based on:
  - Existing need for additional stormwater management with no/few opportunities for structural projects
  - Areas with deficient riparian buffer
  - Areas for targeted education based on WAG comments

# Non-Structural Projects

- Dump Site Cleanup
- Stream Cleanups
- Targeted education at commercial and high intensity residential sites

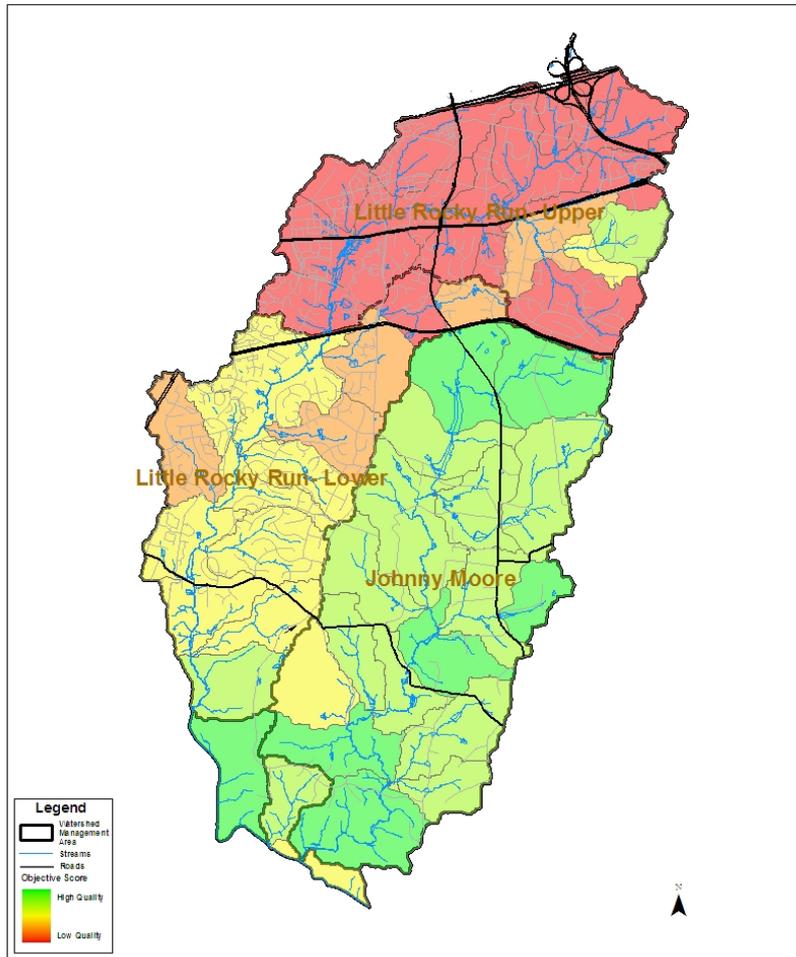


Buffer Restoration

# Project Prioritization Process

- Effect on Watershed Impact Indicators
- Effect on Source Indicators
- Location within Priority Subwatersheds
- Sequencing
- Implementability

# Watershed Impact Indicators: *Watershed condition*



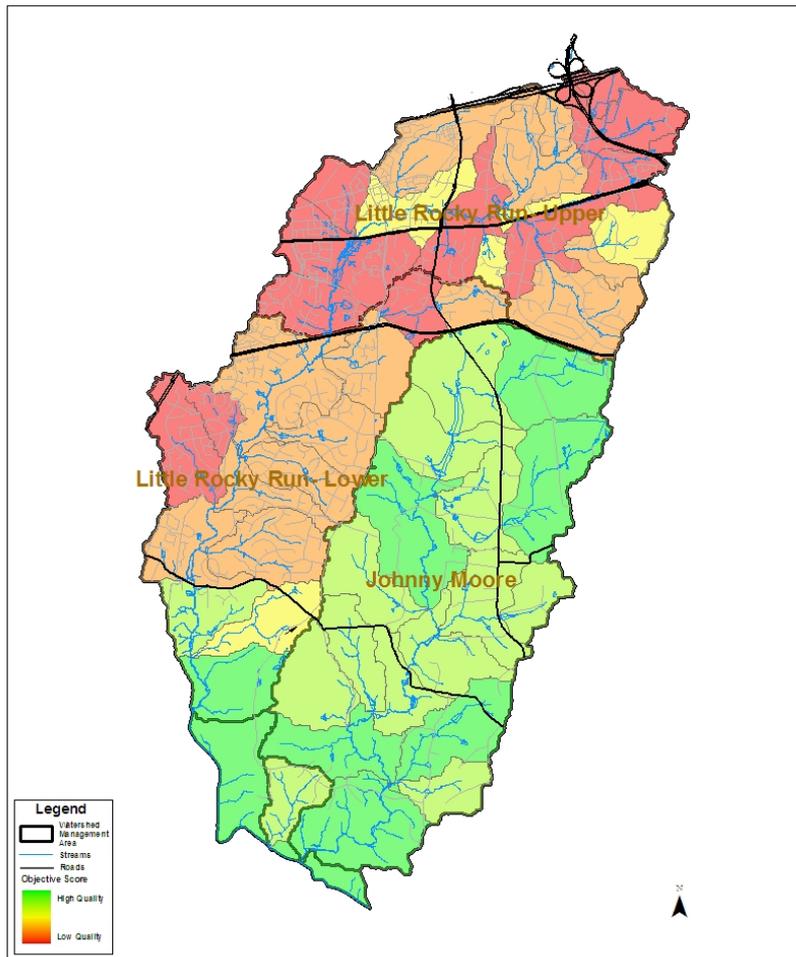
Watershed Quality Composite Score  
Little Rocky Run - Johnny Moore Creek  
Watersheds

0 0.5 1 Miles



- Benthic Communities
- Fish Communities
- Aquatic Habitat
- Channel Morphology
- Instream Sediment
- Building Hazards (floodplain)
- Flood Complaints
- Riparian Habitat
- Wetland Habitat
- Forested Habitat
- *E. coli* Concentration
- Sediment & Nutrient Runoff

## Source Indicators: *Sources of watershed stressors*



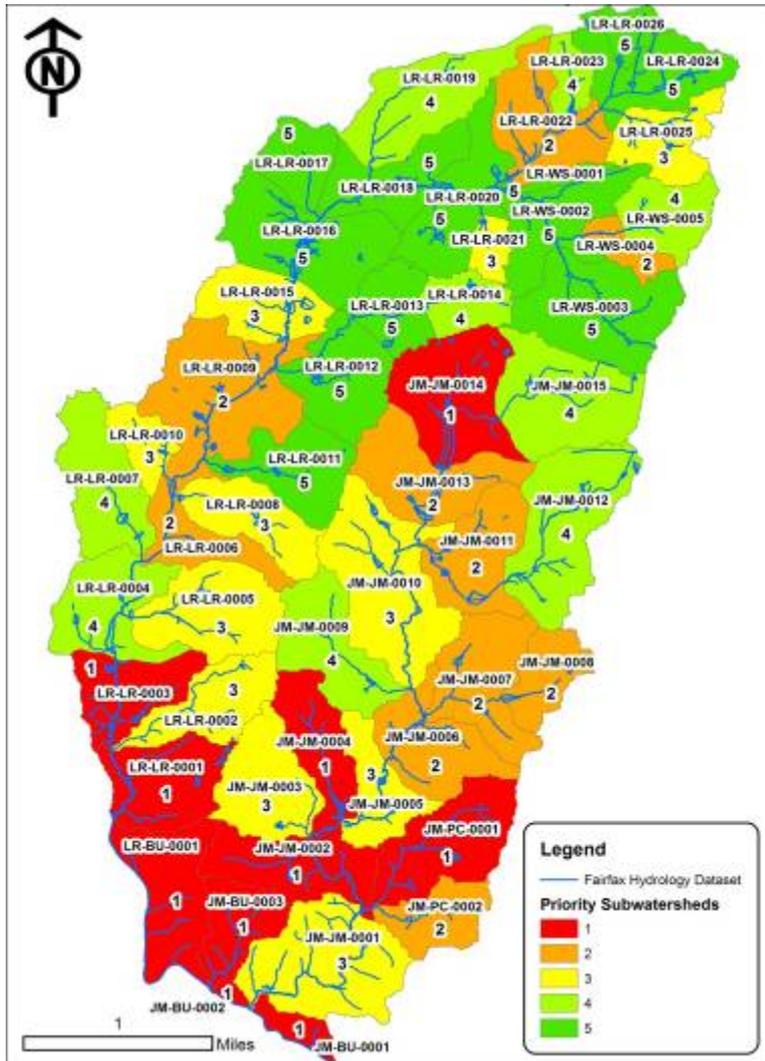
Source Composite Score  
Little Rocky Run - Johnny Moore Creek  
Watersheds

0 0.5 1 Miles



- Channelized Streams
- Impervious Area
- Stormwater Outfalls
- Onsite Sewage Disposal
- Streambank Buffer Deficiency
- Sediment & Nutrient Runoff
- Percent Urban Landcover
- Industrial Discharges

# Location within Priority Subwatersheds

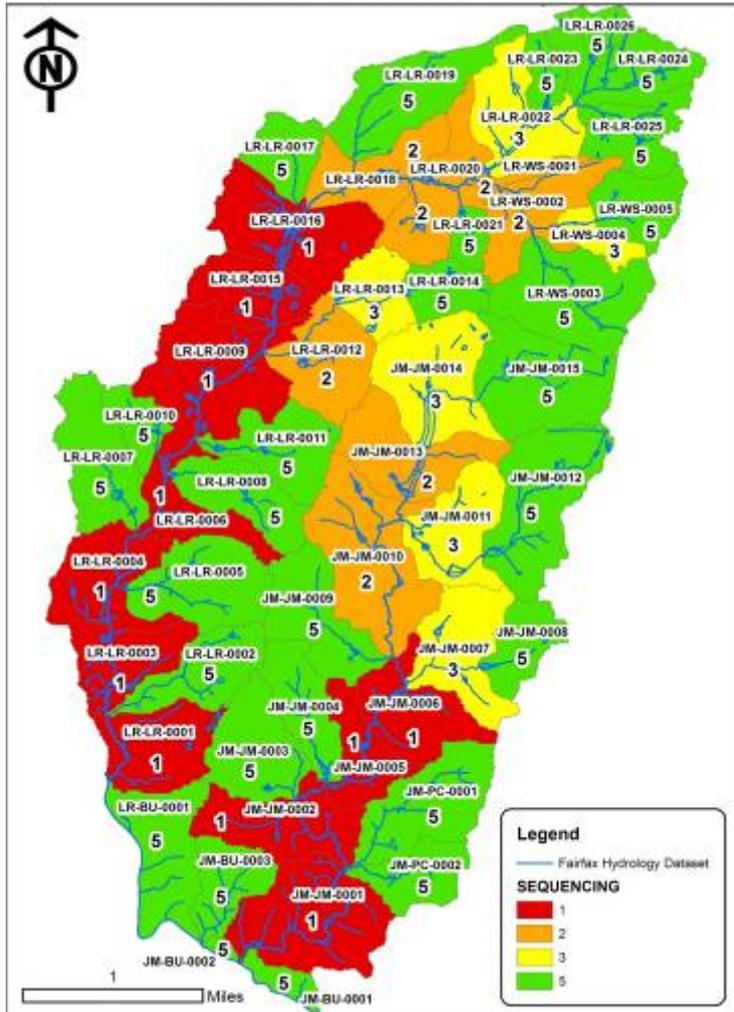


Projects in poor quality subwatersheds may have the potential to provide a greater impact than projects located within a high quality subwatershed.



# Sequencing

SEQUENCING (20%)



Projects in headwater areas should be completed first and considered higher priority.

# Implementability

- High Implementability (5 points)
  - Tree buffer restoration
  - Debris/trash removal
  - SWM retrofits in County maintained facilities where no additional land rights are required
  - Stream restorations that do not require upstream runoff quantity reductions and are proposed on sites with significant land owner support
  - LID retrofits at schools and other County facilities
  - Other priority projects that have significant land owner support
- Moderate Implementability (3 points)
  - Other pond and LID retrofits and other stream restorations that do not require upstream runoff quantity reductions
- Low Implementability (1 point)
  - Projects that do not fit into the above categories and are likely to be less feasible than the majority of recommended projects

# 10 and 25-Year Implementation Plans

- 10-Year Implementation Plan
  - 40 best ranked projects in Little Rocky Run and Johnny Moore Creek
- 25-Year Implementation Plan
  - Next 36 projects in numerical order
- Projects ranked lowest were dropped from plan
- WAG input was important in refining final 10 and 25-year implementation plans.

## 5. WMA Area Restoration Strategies

- WMAs Organized in Alphabetical Order
- Each WMA Section Contains
  - Key WMA Conditions
  - Description of 10-year Structural Projects and Non-Structural Projects
  - Table Containing all Projects within WMA
  - Map Showing Types and Locations of all Projects
- Fact Sheets for all 10-year Projects
  - Organized in the same order as the WMA sections

# Project Fact Sheets

- All projects in 10-year Implementation Plan
- Contains overview of project, benefits and considerations
- Regional pond alternatives are a larger suite of projects
  - Additional sub-project description, map and costs for each subproject greater than \$80,000
- Fact sheets are grouped by WMA and organized alphabetically



**Project # & Type** →

Little Rocky Run Watershed  
Little Rocky Run – Lower Watershed Management Area  
**LR9100 Stormwater Pond Retrofit**

← **Watershed & WMA**

**Location Map** →



Address	13943 Stonefield Dr
Location	Subdivision
Landowner	Little Rocky Run Homeowner's Association
PIN	0654 02 H1
Control Type	Water quality control
Drainage Area	75 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

← **Project Info:**  
Location  
Land Owner  
Control Type  
Drainage Area  
Receiving Waters

**Project Description** →

**Description:** Project LR9100 involves the retrofit of an existing pond to include wetland plantings and alter the existing pond geometry to extend the flow path. The project will also include removal of existing trickle ditches and the addition of micropools.



← **Detailed Project Area Map**

**Map Legend** →

Property Lines	Remove Trickle	Micropools	Wetland Plantings	Grading
----------------	----------------	------------	-------------------	---------

Project Area Map  
Little Rocky Run/Johnny Moore Creek Watershed Management Plan





**Project Benefits**  
Qualitative &  
Quantitative  
(Modeling)

**Project Benefits:** An estimated 5.5 lbs/yr of phosphorus will be removed. Nutrient uptake, gravitational settling and sediment trapping improved along with pond aesthetics. Wetland plantings can replicate ecosystems for a variety of wildlife (insects, birds, amphibians, etc.)

**Project Design Considerations:** Permitting and access issues are minimal for this existing facility. Stream/Buffer Restoration LR0200 is downstream of this project, but because only quality measures have been proposed, sequencing is not critical. This project can be considered independent from other proposed sites.

**Project Design Considerations**  
-Project  
Coordination &  
Sequencing  
-Permitting &  
Easements  
-Construction  
Issues & Tree  
Impacts

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road		SY	\$25.00	\$0.00
Access Road Gate		EA	\$2,500.00	\$0.00
Clear and Grub	0.05	AC	\$8,500.00	\$425.00
Structural BMP and Incidentals		LS	\$10,000 - \$20,000	\$0.00
New Storm Pipe		LF	\$100 - \$300	\$0.00
Grading and Excavation	883	CY	\$35.00	\$32,655.00
Embankment		CY	\$50.00	\$0.00
Organic Compost Soil Amendment	233	CY	\$40.00	\$9,320.00
Remove Trickle Ditch	25	SY	\$10.71	\$267.75
<b>Base Construction Cost</b>				<b>\$42,667.75</b>
Mobilization (5%)				\$2,133.39
Plantings (5%)				\$2,133.39
Ancillary Items (5%)				\$2,133.39
Erosion & Sediment Control (10%)				\$4,266.78
<b>Subtotal 1</b>				<b>\$53,334.69</b>
Contingency (25%)				\$13,333.67
<b>Subtotal 2</b>				<b>\$66,668.36</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$30,000.76
<b>Total</b>				<b>\$96,669.12</b>
<b>Estimated Project Cost</b>				<b>\$100,000.00</b>

**Detailed  
Project Costs**

**Total Project Cost**  
*Rounded up to nearest  
\$10,000*

Little Rocky Run/Johnny Moore Creek Watershed Management Plan



## 6. Benefits of Plan Implementation

- Analysis of Stormwater Modeling Results
- Overall Costs and Benefits of Plan Implementation
- Cost Benefit Analysis

# Plan Benefits

Watershed	Area (ac)	Scenario	Runoff Volume (in/yr) <sup>1</sup>		Peak Flow (cfs/ac) <sup>1</sup>		TSS (t/ac/yr) <sup>2</sup>	TN (lb/ac/yr) <sup>2</sup>	TP (lb/ac/yr) <sup>2</sup>
			2 Year	10 Year	2 Year	10 Year			
Little Rocky Run	4353.1	Existing Condition	1.43	3.22	0.15	0.43	0.21	10.28	1.36
		Future Without Projects	1.45	3.25	0.16	0.43	0.22	10.36	1.38
		Future With Projects	1.42	3.21	0.15	0.42	0.17	9.45	1.25
		Reduction (10-year Plan)	0.04	0.05	0.01	0.01	0.02	0.76	0.10
		Reduction (25-year Plan)	0.04	0.05	0.01	0.01	0.05	0.91	0.13
Johnny Moore Creek	3212.9	Existing Condition	1.25	3.05	0.16	0.45	0.12	1.81	0.32
		Future Without Projects	1.28	3.08	0.17	0.47	0.12	2.21	0.36
		Future With Projects	1.17	2.93	0.15	0.44	0.08	2.13	0.33
		Reduction (10-year Plan)	0.11	0.15	0.02	0.03	0.04	0.08	0.03
		Reduction (25-year Plan)	0.11	0.15	0.02	0.03	0.04	0.08	0.03

<sup>1</sup> Flow is cumulative, <sup>2</sup> Loads are representative of individual land area contributions



# Appendices

- Appendix A: Watershed Workbook
  - Watershed Study Methodology
  - Detailed Characterization of Existing Watershed Conditions
  - Draft Document
- Appendix B: Technical Documents
  - Subwatershed Strategies
  - Prioritization
  - Modeling
- Appendix C: Public Involvement
  - Summaries of Initial Forum and WAG Meetings

A close-up photograph of a dense field of blue and purple flowers, likely Salpiglossis, with vibrant green foliage. The flowers are bell-shaped and hang from thin stems. The background is filled with more of the same plants, creating a lush, textured appearance.

# **Comment Period and Timeline**

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# How to Provide Comments

- Tonight – in breakout groups
- Online Comment Form  
[http://www.fairfaxcounty.gov/dpwes/watersheds/johnnymoorecreek\\_docs.htm](http://www.fairfaxcounty.gov/dpwes/watersheds/johnnymoorecreek_docs.htm)
- E-mail – [watersheds@fairfaxcounty.gov](mailto:watersheds@fairfaxcounty.gov)
- Phone - 703-324-5500, TTY 711
- Fax - 703-802-5955
- Mail - Stormwater Planning Division  
12000 Government Center Parkway,  
Suite 449  
Fairfax, VA 22035

# Timeline

- 30 Day Review and Comment period (ends 10/16/10)
  - General public, county agencies, external organizations
- Evaluate and Incorporate Comments into Plan
- Finalize Plan
- Present to the County's Board of Supervisors
- Submit for Adoption (early 2011)

A close-up photograph of a dense field of blue and purple flowers, likely Salpiglossis, with vibrant green foliage. The flowers are bell-shaped and hang from thin stems. The background is filled with more of the same plants, creating a lush, textured appearance.

# Break Out Session

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# Policy and Action Recommendations

- The first six plans had >300 policy and action recommendations
- The full list can be found at: [www.fairfaxcounty.gov/dpwes/watersheds/wspolicyrec.htm](http://www.fairfaxcounty.gov/dpwes/watersheds/wspolicyrec.htm)
- Round 2 plans do not have any p/a recommendations
- P/A recommendations are being dealt with concurrently to completing final WMPs

Recommendations may be divided into eight categories:

1. BMP/LID
2. Coordination
3. Enforcement and Inspections
4. Land-Use Policies
5. Outreach and Education
6. PFM
7. Watershed Improvements
8. Other