

Nichol Run and Pond Branch Watershed Management Plan

Watershed Advisory Group #1
March 17, 2009

**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 arranged in clusters. The background is filled with more of the same plants, creating a lush, textured appearance.

Group Expectations

Juliana Birkhoff, CBI

Group Expectations

- Comments are offered as individuals and are exploratory.
- Meeting notes will not attribute comments to specific individuals.
- Show your respect for group members by listening and taking everyone's ideas seriously.
- Expect, respect, and accept different interests, perspectives, and opinions.
- Participate actively-share all relevant information, ideas, and concerns.
- Keep the discussion focused on the task or issue at hand. You can help keep the discussion focused by only one person talking at a time, and avoiding side conversations and interruptions.
- Be fully present, turn off or put on vibrate your cell phones, Blackberries, and WiFi, and do not multi-task.

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 Program Background, Purpose & Policy Recommendation Process

Fred Rose

Why Develop Watershed Plans?

- Current Watershed Master Plan is over 25 years old
- Community demands improved stream conditions – Quality of Life Issues
- Need for increased community collaboration and outreach
- Keep pace with changing Regulatory Requirements
- Identify needed Policy, ordinance and PFM requirement changes

Early History

- Comprehensive watershed master plans were completed in late 1970's
- The Occoquan “down-zoned” case in 1982 - resulted in preservation of low density development (1 dwelling per 5 acres) for significant areas in the Occoquan watershed within the county
- Best Management Practices (BMPs) were adopted in PFM for Occoquan area – 50% removal of phosphorus (P) required
- The Regional Pond Plan was developed and approved by the Board 1989

The Last Decade

- Chesapeake Bay Preservation Act was adopted in 1993:
 - led to establishment of Resource Protection Areas (RPA)
 - BMPs required for all areas outside the Occoquan watershed to achieve 40% P removal for new developments, 10% for redevelopment
 - RPAs were updated in 2004-5 using new perennial stream designations
- Application and receipt of first VPDES/MS4 Permit in 1997
- SPS Baseline Study published January 2001 concluded that over 70% of streams are degraded, some key recommendations were:
 - Develop more detailed watershed plans for protection and restoration of streams
 - Continue annual monitoring to determine trends
 - Support ongoing federal, state and other county environmental initiatives
 - Establish working partnerships with residents to support environmental stewardship efforts

Recent History of Watershed Planning

- Renewal of MS4 Permit in January 2002 - led to significant increases in program requirements including need to develop watershed plans
- A county-wide stream physical assessment (SPA) conducted in 2002-3 – involved over 800 miles of streams
- 1st Watershed plan commenced for Little Hunting Creek in March 2003, adopted by Board in 2005

Recent History of Watershed Planning

- Other watershed plans were initiated between 2003-4:
 - Popes Head Creek
 - Cameron Run
 - Cub Run/Bull Run
 - Difficult Run
 - Middle Potomac Basins
- Watershed planning program evaluation conducted in July 2005 – resulted in streamlining of PI process for future plans



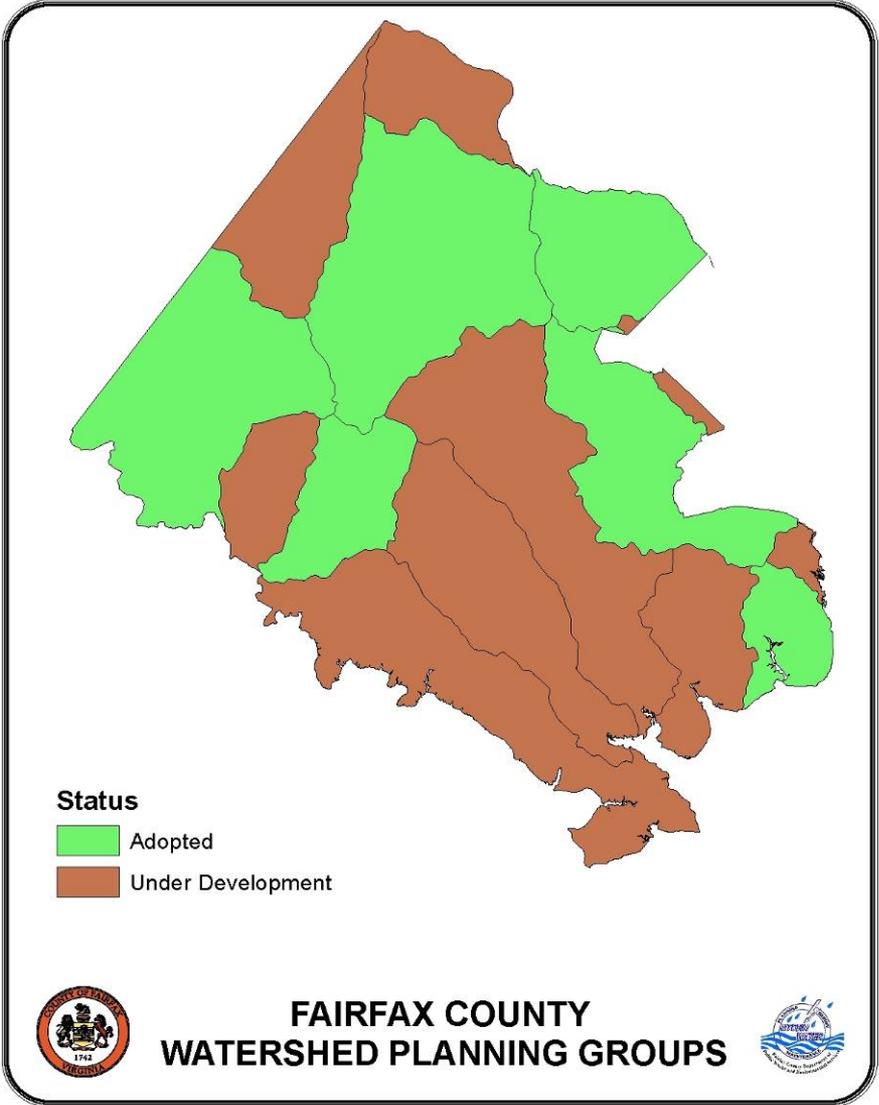
Recent History of Watershed Planning

- Stormwater Needs Assessment study and advisory committee activities were conducted between May 2004 – March 2005
- Board adopted one-penny real estate tax revenue dedication for funding stormwater programs including implementation of watershed plan projects since April 2005 – averaged \$20M/year
- Middle Potomac plan adopted by Board May 2008 – last of 1st round plans

2nd Round Watershed Plans

- 2nd round (7 plans/19watersheds) commenced with Tetra Tech overall watershed modeling and other support work in Dec 2006
- 2nd round plans are being done concurrently rather than sequentially – big difference from 1st round
- To date, plans are completed for approximately 50% of county land area – 6 plans/11 watersheds

Watershed Planning



2nd Round Watershed Plans

- Watershed Consultants for 2nd round have completed existing condition watershed characterization leading to workbooks and the Issues Scoping Forums
- Development underway of a Watershed Data Management System to house data from all plans
- A county-wide prioritization system being developed to aid implementation through annual budget process

Policy Recommendations Process

~300 policy recommendations were taken from the six completed watershed management plans and broken into eight categories.

BMP/LIDs	Interagency Coordination	Enforcement and Inspection	Land-Use Policies
Outreach and Education	PFM Modifications	Watershed Improvements	Other

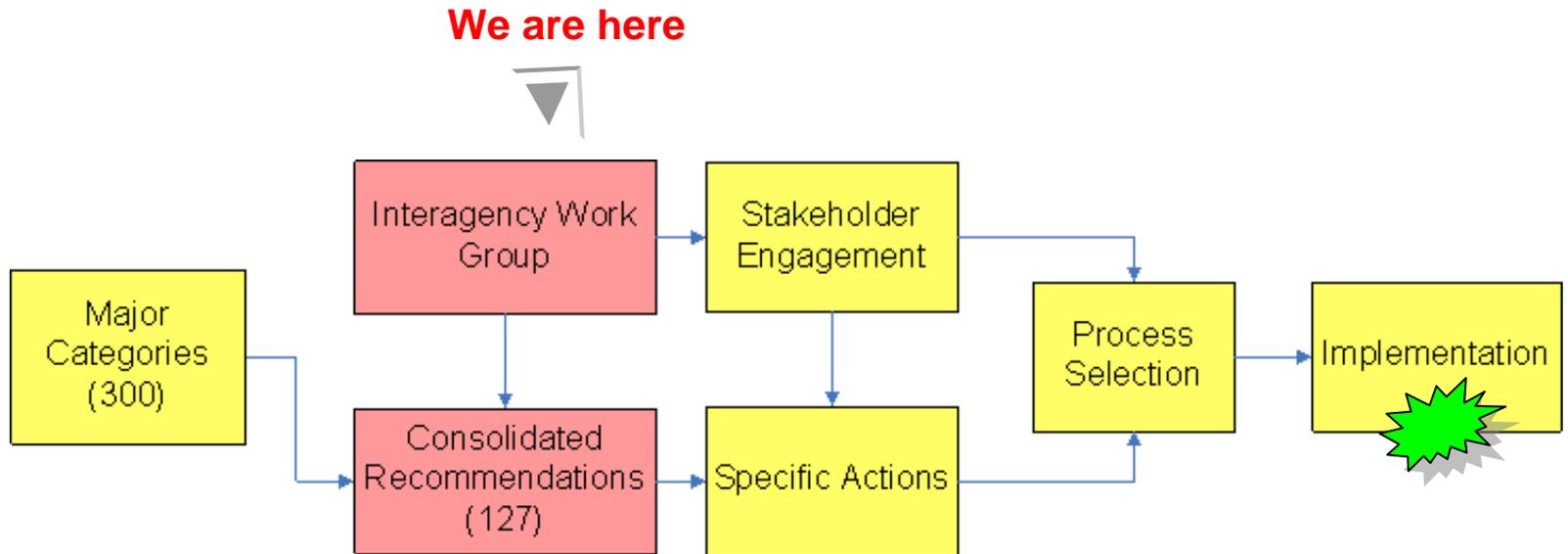
The recommendation list from each category were further consolidated into general themes

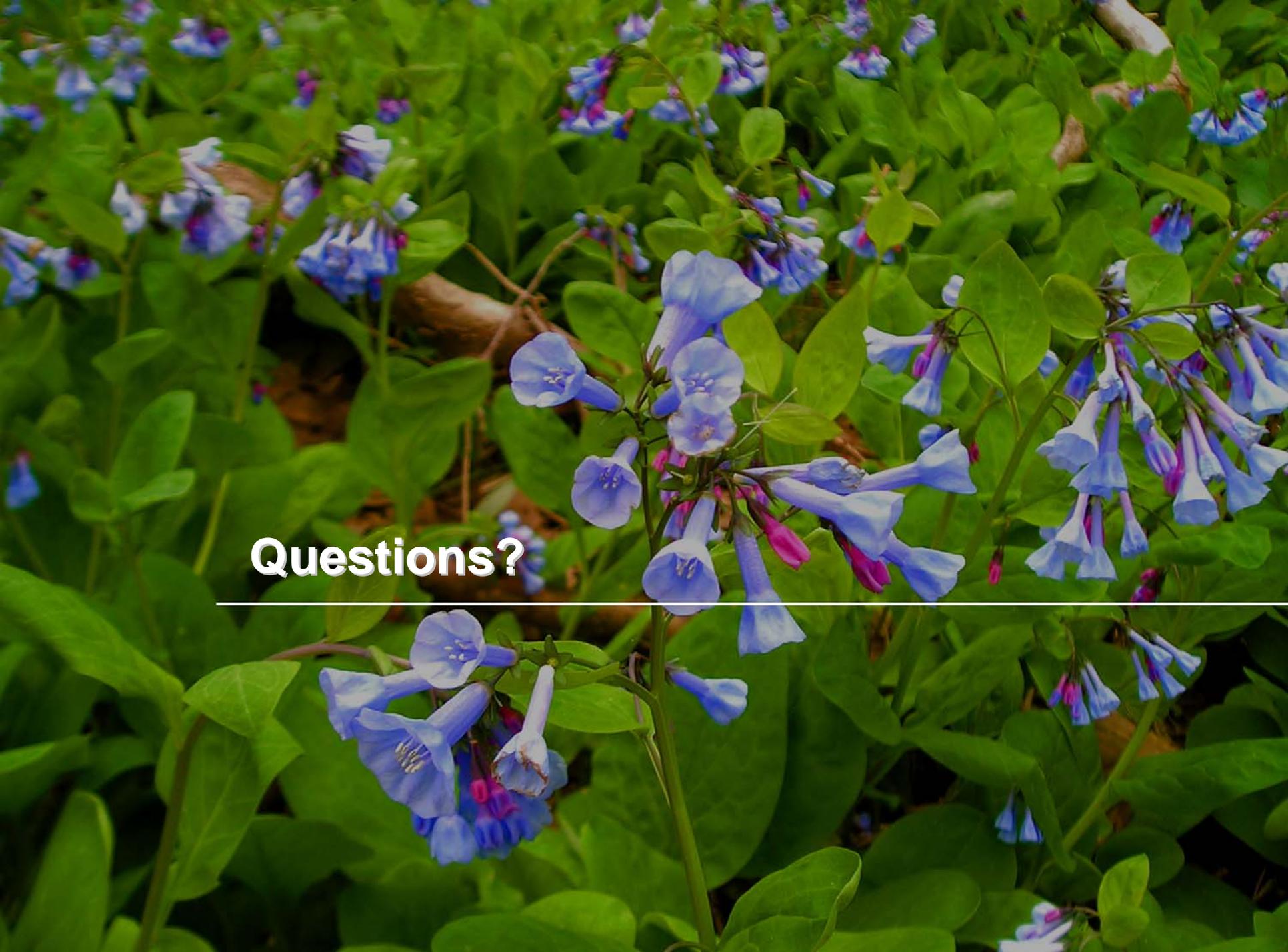
Consolidated Recommendations Example

Originally 28 BMP/LID recommendations – consolidated into 8

Recommendation	Action	Process	Status
Study BMP effectiveness	Implemented	NA	Monitor
Require developers to use LID to max extent possible	TBD	TBD	Ongoing
Require public facilities to use LID to max extent possible	TBD	TBD	Ongoing
Install BMPs to reduce the amount of N and P in facilities that do not have WQ controls	TBD	TBD	Ongoing
Allow LID on private lots	TBD	TBD	Ongoing
Update LID list in PFM	TBD	TBD	Ongoing
Standardize STW credits for innovative design	TBD	TBD	Ongoing
Retrofit existing STW facilities	Implemented	NA	Monitor

Policy Recommendations Process



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. The lighting is bright, highlighting the colors of the flowers and leaves.

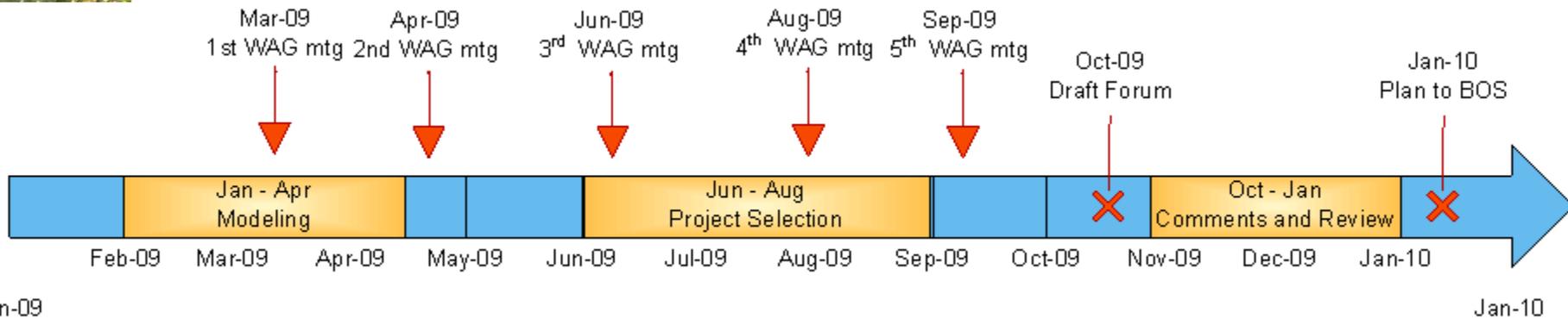
Questions?

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 plants, creating a rich, textured green backdrop.

Timeline for the Nichol Run and Pond Branch Watershed Management Plan

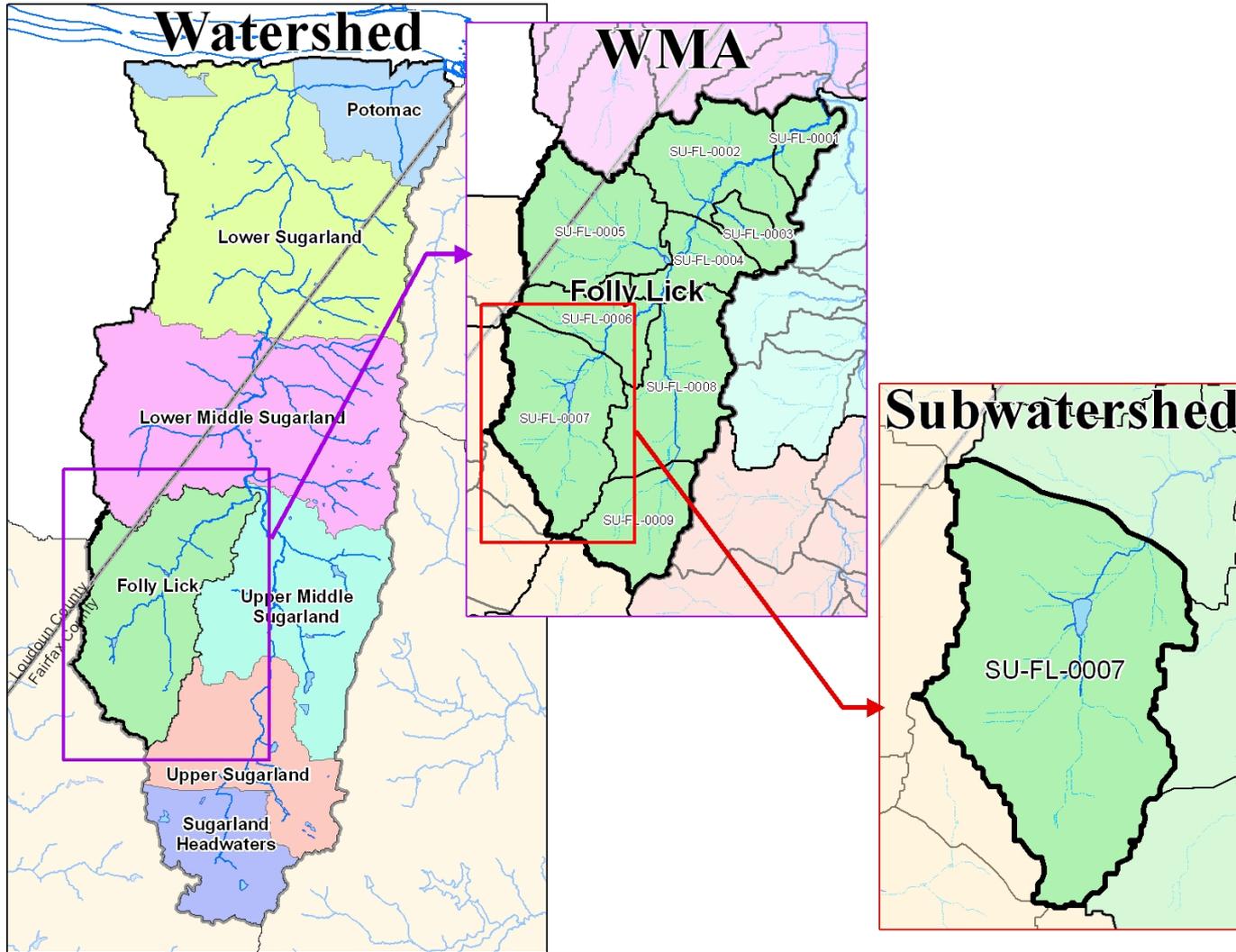
Joe Sanchirico, Fairfax County

General Timeline



1. WAG #1: Orientation to process
2. WAG #2: Review Project Types and Restoration Strategies
3. WAG #3: Prioritize & Evaluate Proposed Projects
4. WAG #4: Prioritize & Evaluate Proposed Projects (cont'd)
5. WAG #5: Review Draft Plan & Comment
6. Draft Plan Public Forum/ Public Comment period (30 days)
7. Finalize Plan and Submit to BOS for Adoption

Watershed Planning Study Units



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.

WAG Participation Guidelines

Juliana Birkhoff, CBI

Watershed Advisory Group Participation Guidelines

- **Substantive**
 - Goal is to develop recommendations for the County on watershed issues, problems, and preferred options to address restoration and preservation
- **Organizational**
 - WAG includes representatives from homeowners associations, environmental, recreation, civic, educational, other county and state organizations
 - Public welcome to observe
 - WAG responsible for representing constituency and outreach
 - Expect process to last ~10 months
 - County will consider all comments- but may not end up in plan

Watershed Advisory Group Participation Guidelines

- **Procedural**
 - Consensus seeking decision making
 - Facilitated discussions with flip chart or note taking by team to document
 - One person per organization, others may act as alternates
 - 4-6 meetings, please attend all
 - Meeting summaries will be shared and posted on web site, updated watershed documents
 - Draft Plan will be presented at the Draft Plan Forum for review
- **Behavioral**
 - Basic good meeting participation
- **County will publicize meetings and progress**

A close-up photograph of a dense field of blue and purple flowers, likely a species of 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.

Watershed Workbook

Erika Tokarz, F.X. Browne, Inc



Nichol Run and Pond Branch Watershed Workbook



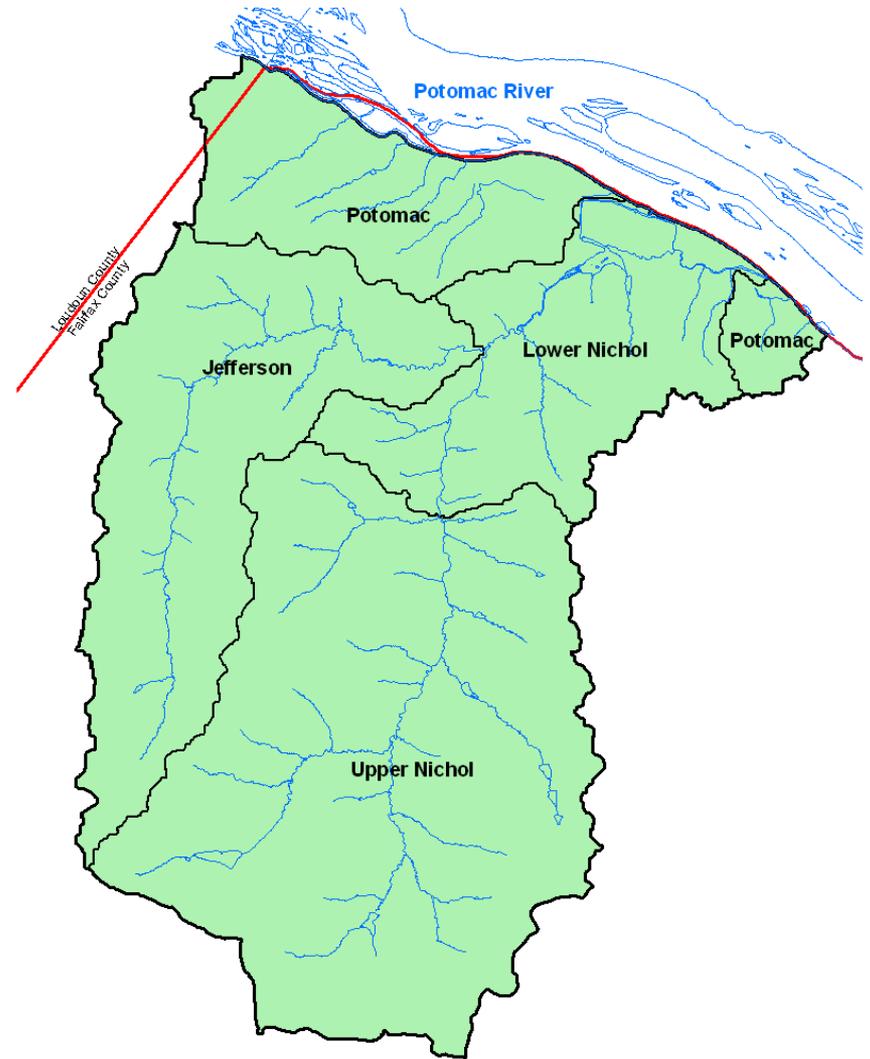
FAIRFAX COUNTY STORMWATER MANAGEMENT





Nichol Run Watershed

- 8.2 square miles, 0.04 square miles in Loudoun County
- 31.8 miles of perennial streams
- Comprised of four WMAs:
 - Jefferson
 - Lower Nichol
 - Potomac
 - Upper Nichol





Pond Branch Watershed



- 8.5 square miles
- 23.8 miles of perennial streams
- Comprised of four WMAs:
 - Clark Branch
 - Mine Run
 - Pond Branch
 - Potomac

Watershed Workbook Structure

- Chapter 1 – Introduction
- Chapter 2 – Watershed Study Methodology
- Chapter 3 – Sugarland Run Watershed
- Chapter 4 – Horsepen Creek Watershed
- Chapter 5 – Glossary of Terms
- *Future Addition – Restoration Strategies*



Chapter 1 – Introduction

- Background, Goals & Objectives
- Watershed Workbook Organization
- Watershed History and Condition
 - General Watershed Characteristics
 - Watershed History and Population Growth
 - Existing and Future Land Use
 - Aquatic Environment
 - Terrestrial Environment
 - Resource Protection Areas
 - Stormwater Management

Chapter 2 – Watershed Study Methodology

- Watershed Management Areas and Subwatersheds
- Existing and Future Land Use
- Field Reconnaissance and Stream Physical Assessment
- Watershed Characterization
- Modeling
- Subwatershed Ranking

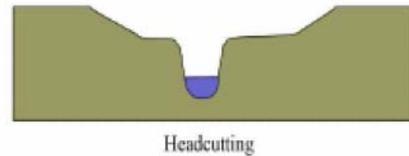
Stream Physical Assessment

Channel Evolution Model

Stage 1 –
Stable



Stage 2 –
Incision



Stage 3 –
Widening



Stage 4 –
Stabilizing



Stage 5 -
Stable



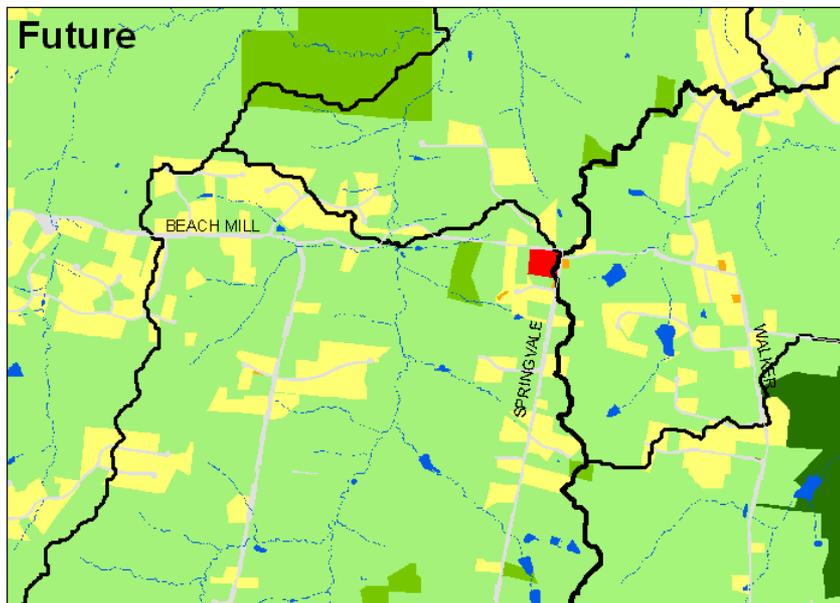
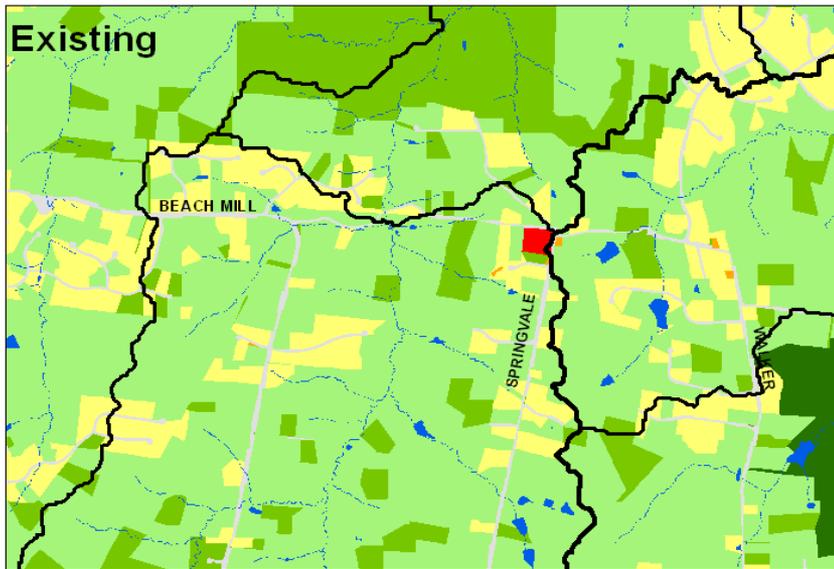
- Supplement 2005 Study
- Habitat conditions
- Impacts to stream from infrastructure & problem areas
- General stream characteristics
- Geomorphic classification
 - Nichol Run – Stage 3 & 4
 - Pond Branch – Stage 3



Chapters 3 & 4

Nichol Run and Pond Branch

- Initial assessment of existing conditions
 - Land Use
 - Stormwater Infrastructure
 - Stormwater Management
 - Stream Conditions
 - Field Reconnaissance
 - Stormwater Modeling
 - Subwatershed Ranking
- Results depicted at WMA scale



Land Use

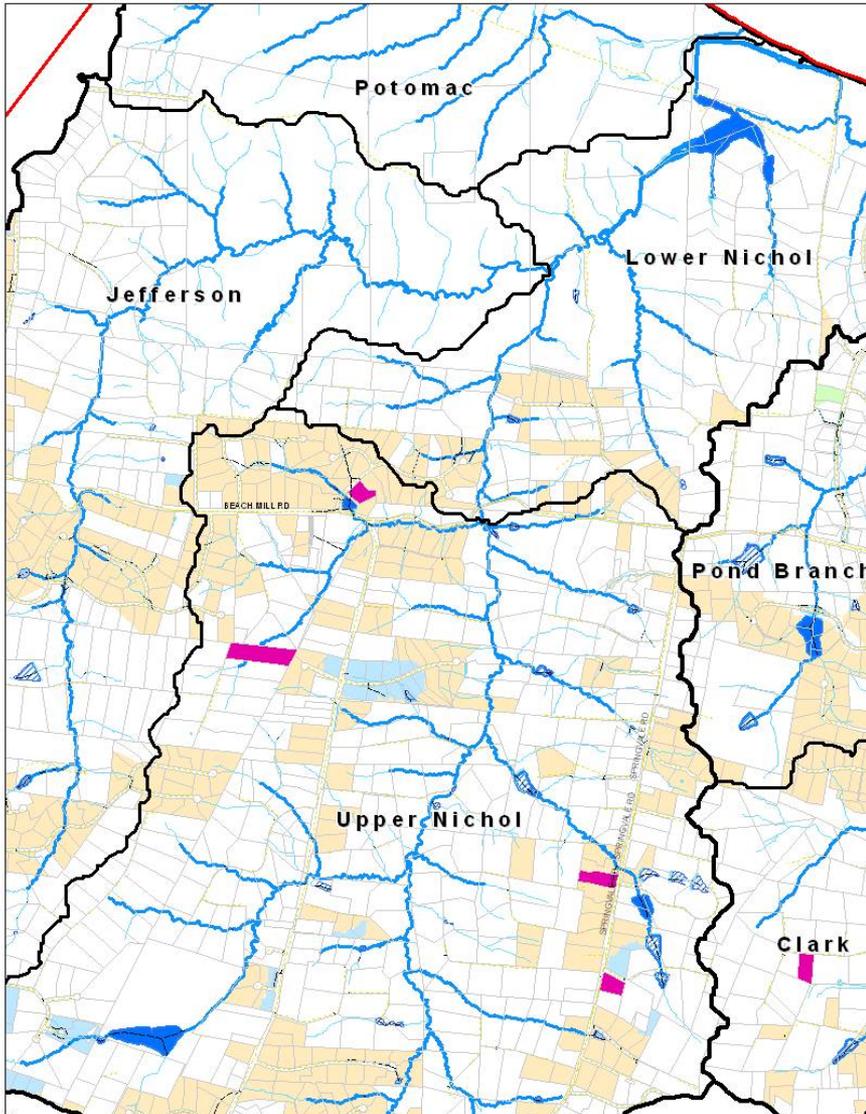
- One of the leading causes of stream degradation, including water quality impairments and habitat decline.
- Future based on County's 25-year Comprehensive Plan

	Open Space		Institutional
	Golf Course		Low Intensity Commercial
	Estate Residential		High Intensity Commercial
	Low Density Residential		Industrial
	Medium Density Residential		Transportation
	High Density Residential		Water



Stormwater Infrastructure

- Regional Ponds
- Stormwater facilities
- Stormwater drainage pipes/channels
- Stormwater Management
 - Detention Only
 - Quality/Quantity
 - Quality Only

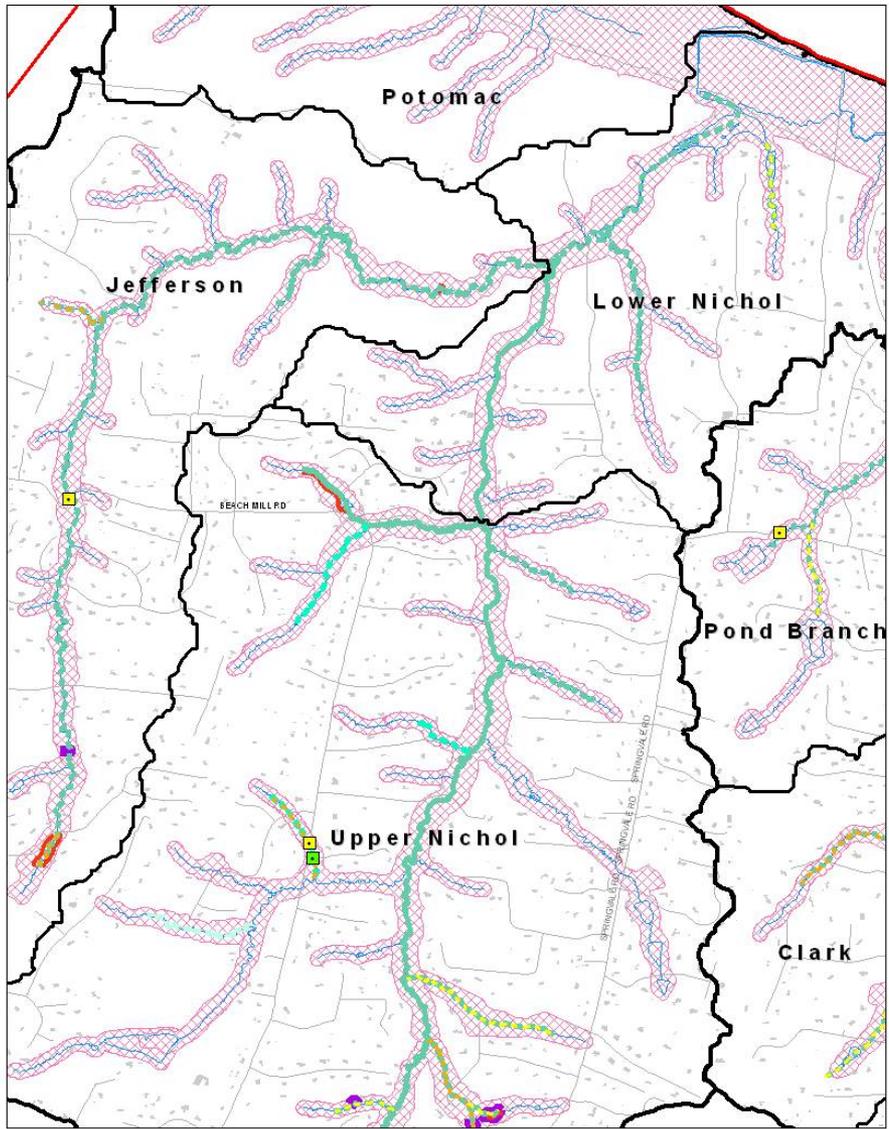


- | | |
|---------------------------------|------------------------|
| ■ ■ ■ 303d Impaired Waters | Stormwater Facilities |
| ~ Perennial Streams | ● Wet Pond |
| ~ Non-Perennial Drainage | ○ Dry Pond |
| - - - Stormwater Infrastructure | ▨ All Other Facilities |
| ■ Drainage Complaints | Stormwater Controls |
| ● Regional Ponds | ■ Detention Only |
| ● Completed | ■ Quality & Quantity |
| ● Active | ■ Quality Only |
| ● Incomplete | |





Stream Conditions

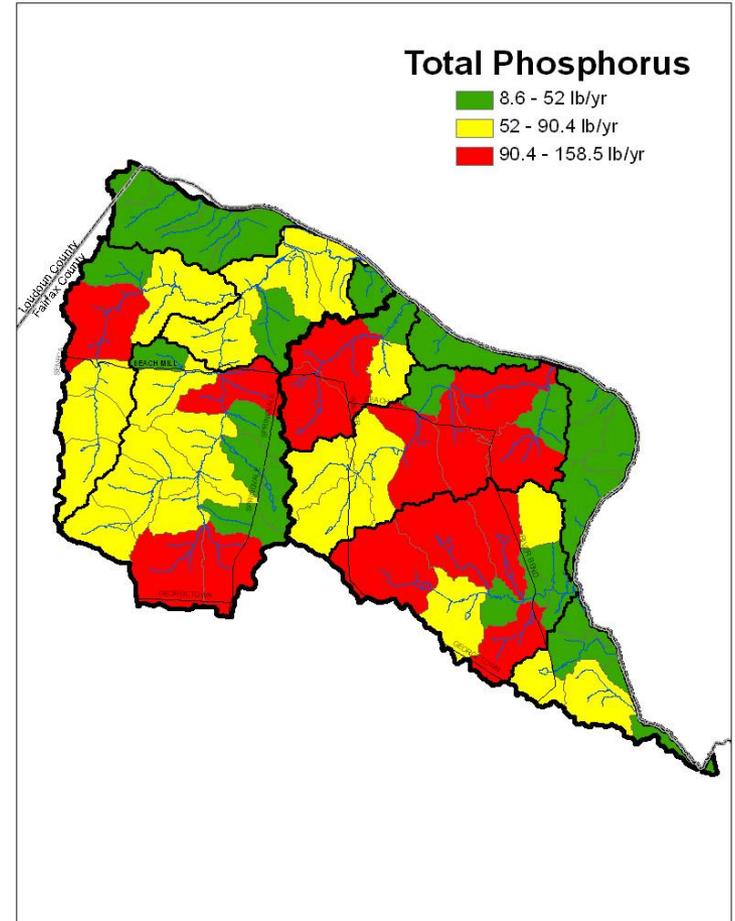
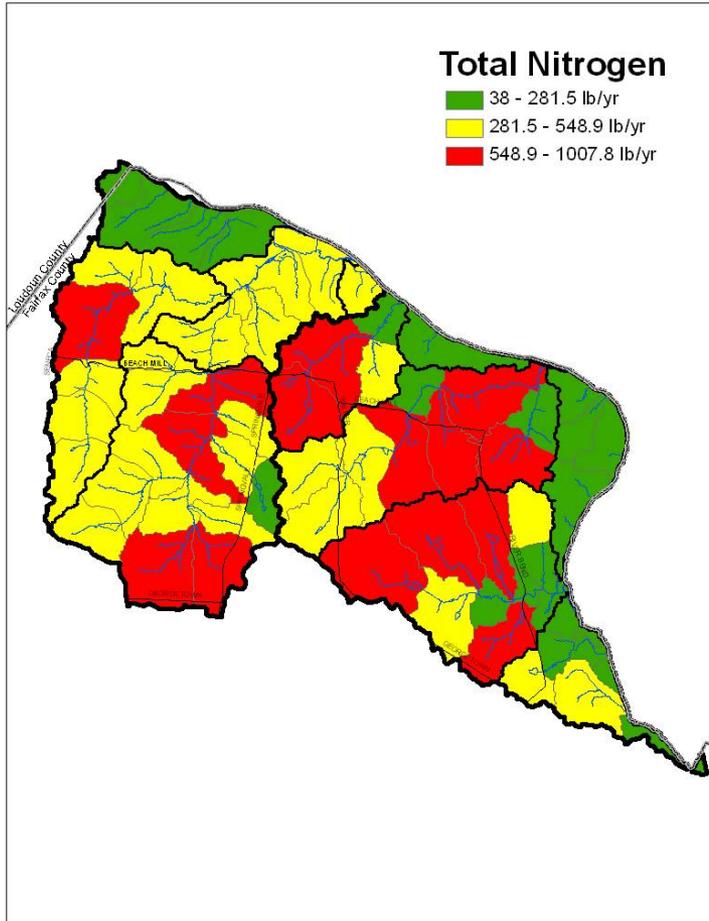


- Head Cuts
- Erosion
- Obstructions
- Stream Crossings
- Pipes
- Dump Sites
- Ditches
- Habitat Scores
- Channel Evolution Models
- Deficient Buffers
- Resource Protection Areas

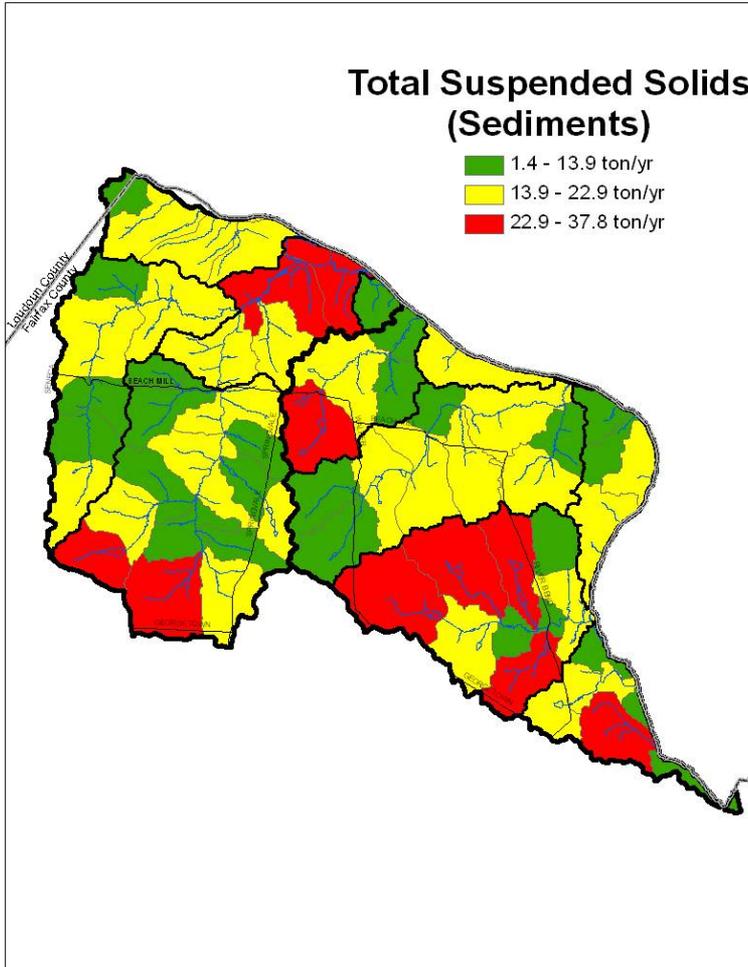
Head Cut Height	Obstruction Impact	Pipe Impact
● 0.5 - 1ft	⊕ Minor to Moderate	● Minor to Moderate
● 1 - 2ft	⊕ Moderate to Severe	● Moderate to Severe
● > 3ft	⊕ Severe to Extreme	● Severe to Extreme
Utility Impact	Crossing Impact	Channel Evolution Model
◆ Minor to Moderate	■ Minor to Moderate	▨ CEM Type 2 - Incision
◆ Moderate to Severe	■ Moderate to Severe	▨ CEM Type 3 - Widening
◆ Severe to Extreme	■ Severe to Extreme	▨ CEM Type 4 - Stabilizing
Dump Site Impact	Ditch Impact	▨ Poor to Very Poor Habitat
● Minor to Moderate	◆ Minor to Moderate	▨ Fair Habitat
● Moderate to Severe	◆ Moderate to Severe	▨ Deficient Buffer
● Severe to Extreme	◆ Severe to Extreme	▨ Severe to Extreme Erosion
		▨ Resource Protection Areas



Nutrients from Stormwater Runoff



Sediment from Stormwater Runoff



Floodplain Modeling





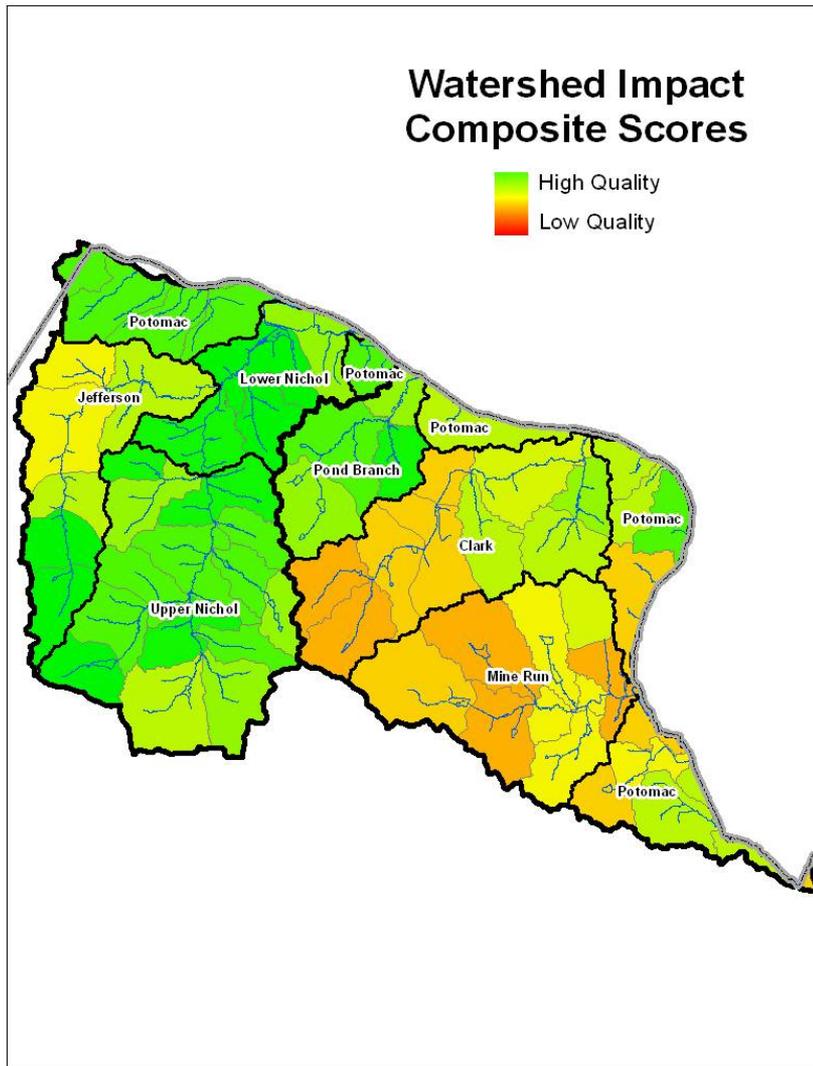
Subwatershed Ranking

- Provides a systematic means of compiling available water quality and natural resources information.
- Tool for planners and managers to prioritize subwatersheds
- Methods are consistent throughout the latest set of Watershed Management Plans, so ranking is comparable between watersheds.

Subwatershed Ranking Indicators

- Watershed Impact Indicators
- Source Indicator
- Programmatic Indicators

Watershed Impact Indicators: *Watershed condition*



- 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



Subwatershed Ranking

Fairfax County Goals

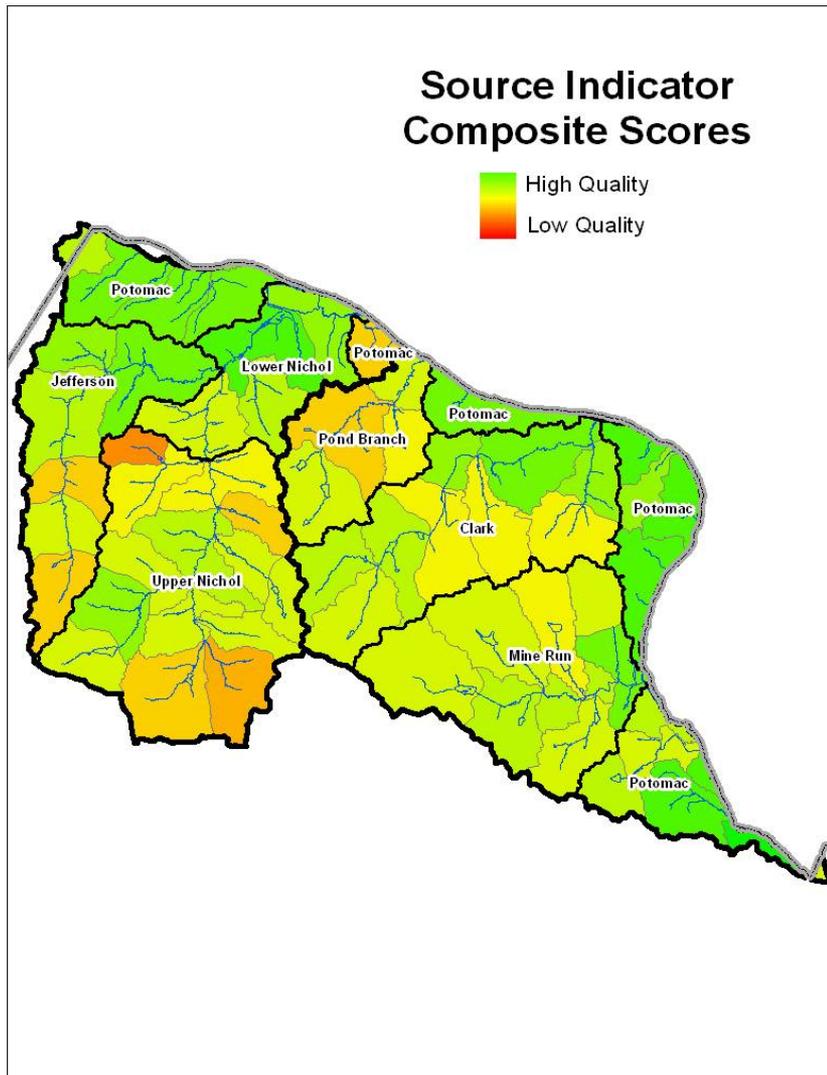
1. Improve and maintain watershed functions in Fairfax County, including water quality, habitat, and hydrology.
2. Protect human health, safety, and property by reducing stormwater impacts.
3. Involve stakeholders in the protection, maintenance and restoration of county watersheds.

Fairfax County Objectives

1. Hydrology
2. Habitat
3. Stream Water Quality
4. Drinking Water Quality
5. Stewardship



Source Indicators: *Sources of watershed stressors*



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

Programmatic Indicators

- Existing stormwater management facilities
- A tool to evaluate watershed management needs
- Will be used during *Candidate Project Identification*



Status

- **Where we are in the process**
 - Initial Evaluation of Existing Conditions
 - Preliminary Modeling & Subwatershed Ranking
 - Introductory & Issues Scoping Forum, Jan. 22, 2009

- **Next Steps**
 - Public Involvement/WAG
 - Comprehensive Evaluation of Existing Conditions, Public Input, and Future Build-out Scenarios
 - Develop and Prioritize Restoration and Preservation Strategies

Identified Problems

- **Stream Protection Strategy Study Baseline Study, 2001**
 - Macro-invertebrate (Benthic) Scores were high:
 - Ranged from Excellent to Poor in Nichol Run,
 - Good in Pond Branch
 - Overall site conditions were also high:
 - Good in Nichol Run
 - Good to Excellent in Pond Branch
- **Stream Physical Assessment, 2005**
 - Habitat Assessment: Nichol Run
 - 9% poor, 10% fair, 57% good, and 24% excellent
 - Habitat Assessment: Pond Branch
 - 7% very poor, 23% poor, 47% fair, and 23% good
 - The assessment shows that stream bank stability and deficient buffers are a concern on many of the stream reaches

Nichol Run – Identified Problems



Issues Identified within Fairfax County during the Scoping Forum on January 22, 2009

Some Issues Include:

- Stream channel erosion
- Damaged stormwater facilities

Pond Branch – Identified Problems



Issues Identified within Fairfax County during the Scoping Forum on January 22, 2009

Some Issues Include:

- Stream channel erosion
- Trash/dump sites
- Insufficient stormwater controls
- Flooding
- Damaged stormwater facilities

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.

Project Examples

Erika Tokarz, F.X. Browne, Inc



Types of Candidate Projects

Structural

- Regional Pond Alternatives
- Catchment Improvements
- Stream Restoration
- Road Crossing Improvements
- Low Impact Development

Non-structural Measures

- Stream Restoration
- Preservation
- Education and Outreach

Regional Pond Alternatives

Projects to retrofit areas lacking stormwater management

- Conversion of existing quantity controls to water quality BMPs
- New structures including ponds, wetlands, culvert retrofits, and outfall treatments



Catchment Improvement

Projects to retrofit areas to reduce stormwater impacts

- Conversion of existing quantity controls to water quality BMPs
- New structures including ponds, wetlands, culvert retrofits, and outfall treatments



Stream Restoration - Structural

In-stream projects, including channel stabilization
and channel restoration



Road Crossing Improvements



Projects designed to reduce the frequency of flooding of culverts and bridges

- Raising the roadbed
- Rebuilding culvert
- Replacing damaged culverts
- Rebuilding bridges to carry larger flows

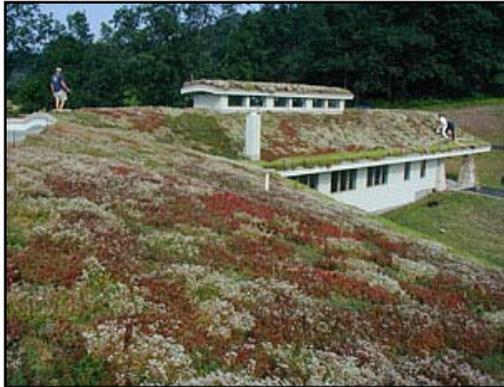
Low Impact Development



An innovative approach to land development and stormwater management

- Protect and improve water quality, watershed hydrology, and fish and wildlife
- Reduce infrastructure costs
- Make communities more attractive
- Meet new regulations

Examples of Low Impact Development



Green
Rooftops



Filtrerra Box



Parking lot biofilter



Rain
Barrel



Downspout filtration



Porous pavers

Non-structural Measures

Pollution prevention and programs to reduce pollutants from non-stormwater discharges



- Cluster developments
- Minimize total disturbed areas
- Minimize soil compaction
- Re-vegetate/forest disturbed areas
- Reduce impervious cover
- Rooftop disconnection
- Disconnection from storm sewers

Stream Restoration – Non-Structural

Riparian buffer restorations



Preservation

- Areas of high quality habitat or land cover that should be preserved
- Protect sensitive and special value features
- Protect, conserve, and enhance riparian areas
- Protect/utilize natural flow pathways in stormwater planning and design



Education and Outreach

- Increase public awareness of watershed conditions
- Encourage public involvement
- Educate public on how they can help to improve watershed conditions



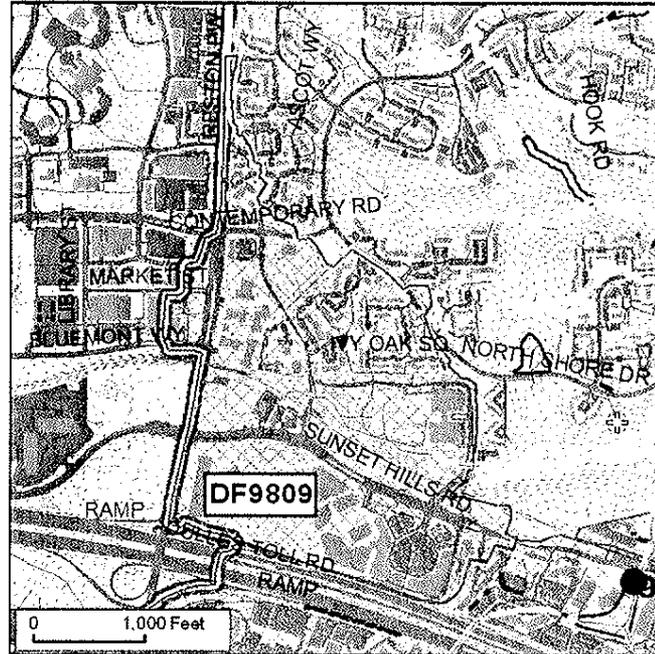
Example of Project Concept Plan

Project Number: DF91135
Catchment Code: DFDG9901
Candidate Site: C135

Project Type: Pond Retrofit
Project Size: +/- 3.5 acres

Project Location: This project is located upstream of Reston Parkway.

Project Description: This project would consist of retrofitting the existing pond located between Water Pointe Lane and the Reston Parkway. It will not only increase the storage, but it will also increase the amount of treatment on the stream.

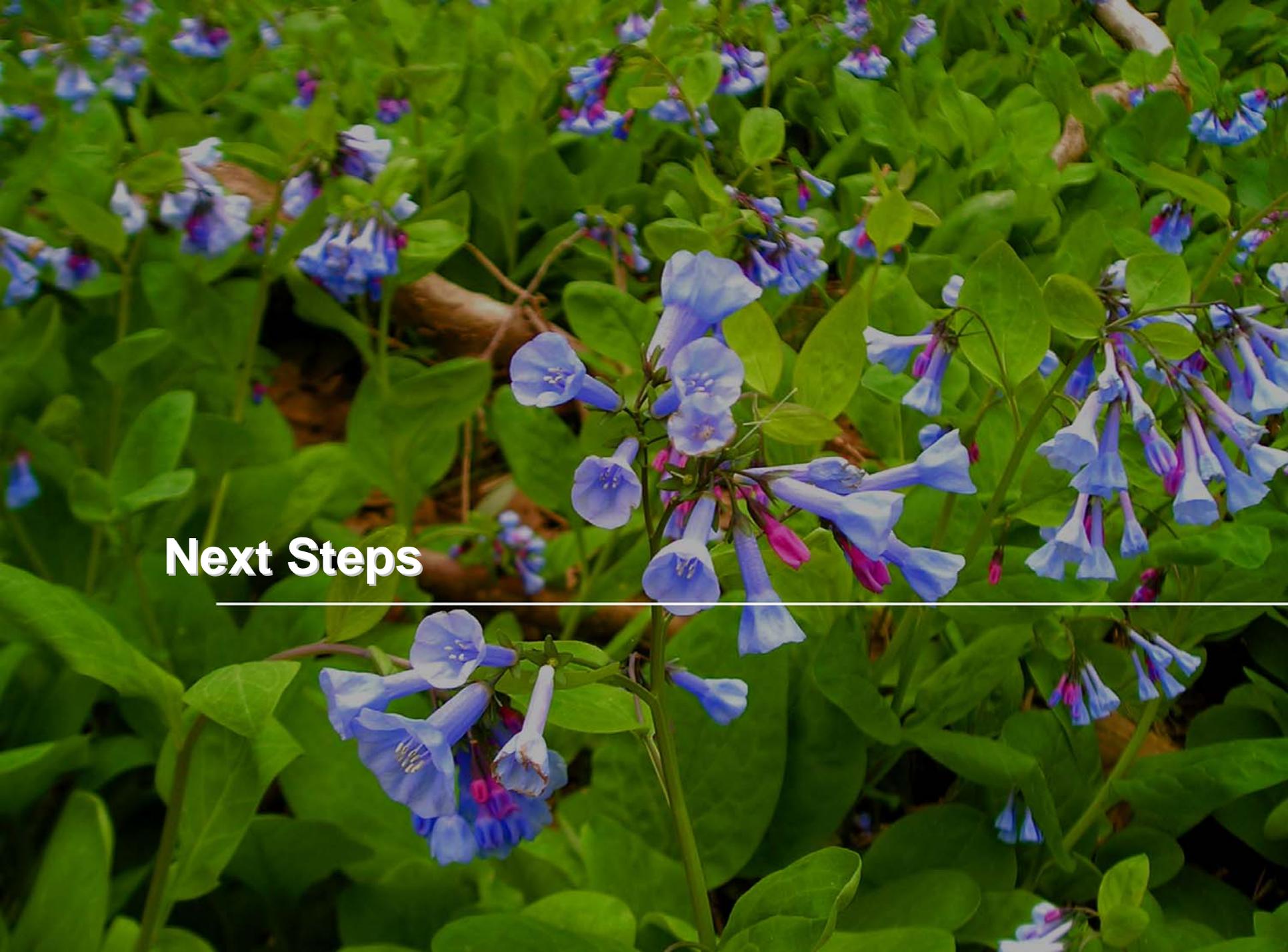


Potential Project Benefits:

Peak Flow	This project could result in a significant reduction to the peak discharge.
Water Quality	Reduction of pollutants can be expected through the vegetative plantings and the settling of pollutants.

Potential Project Constraints:

Environmental	No environmental constraints are anticipated.
Property Ownership	This project appears to be on public property.
Facility Access	Access to this area is very good by way of public roads.
Design / Construction	No design or construction problems are anticipated for this project.

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 clustered together. The background is filled with more of the same plants, creating a lush, textured appearance. The lighting is bright, highlighting the colors of the flowers and leaves.

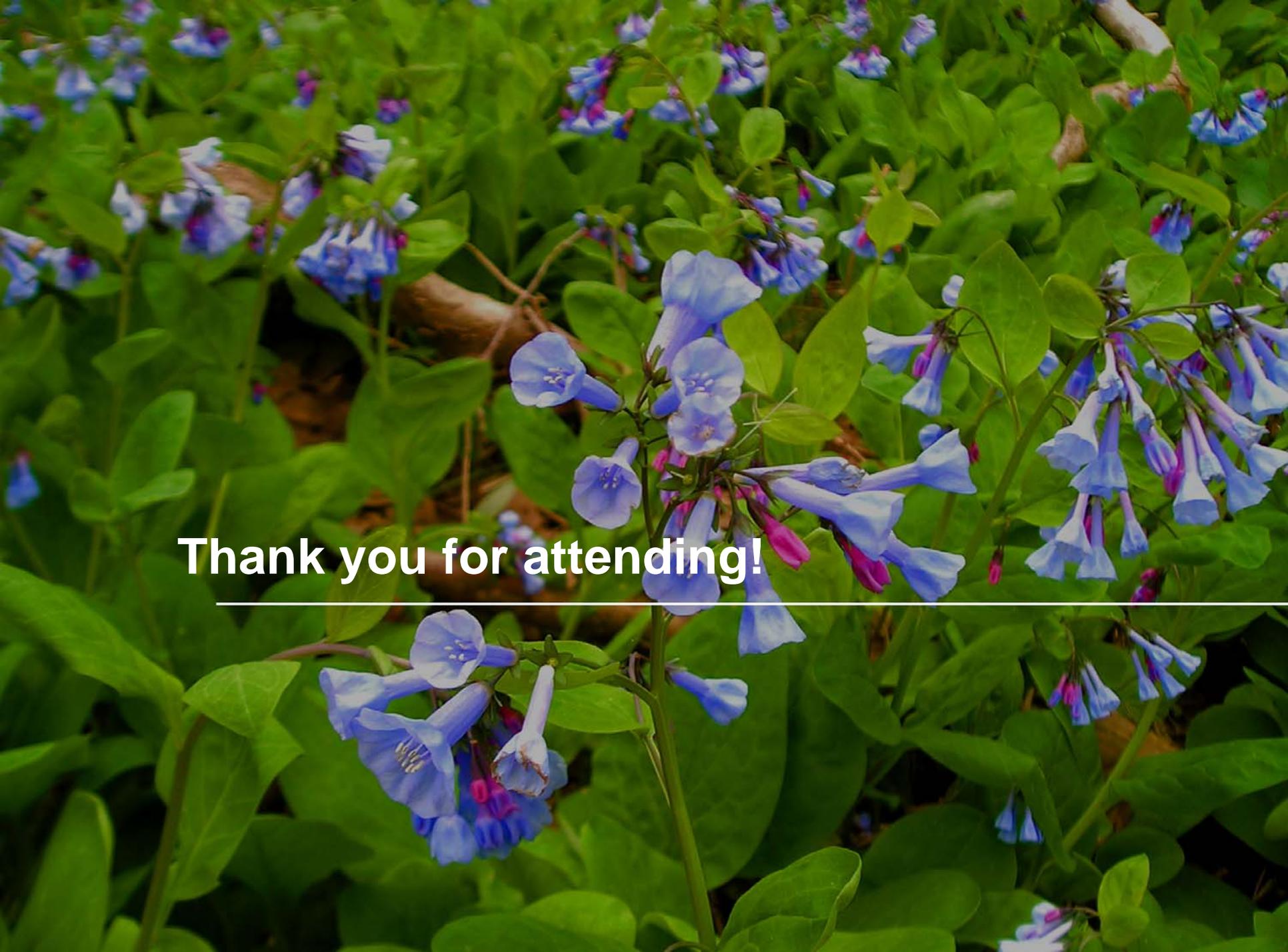
Next Steps

Next Steps

- F.X. Browne, Inc. will review any new watershed issues raised
- F.X. Browne, Inc. will develop restoration strategies based on their watershed characterization process
- F.X. Browne, Inc. will develop engineering solutions to the identified problems and create a management plan
- Next meeting in early spring 2009 to review restoration strategies

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.

Questions?

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.

Thank you for attending!
