

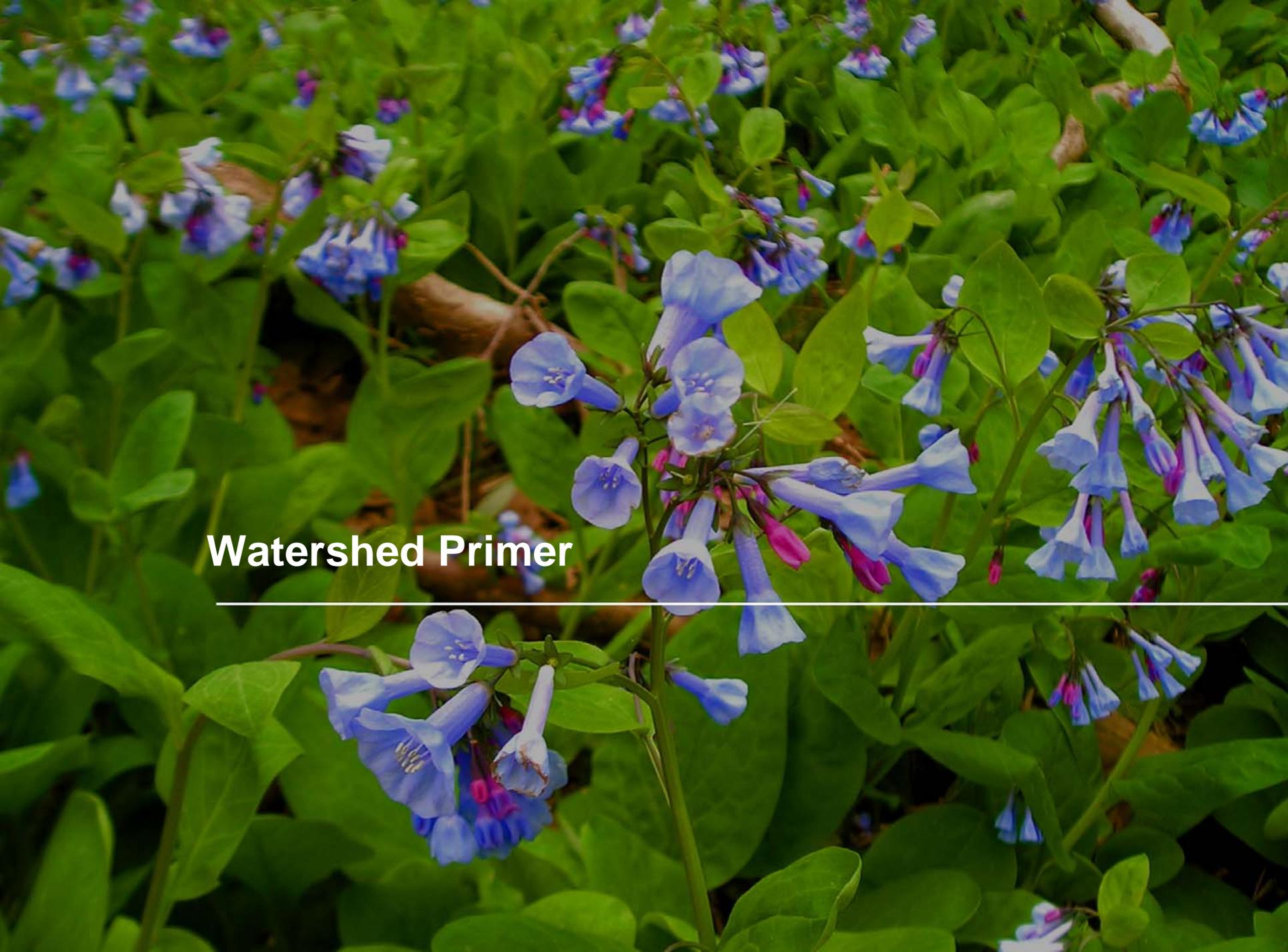
# Little Rocky Run Johnny Moore Creek Watershed Management Plan

Watershed Advisory Group #1  
December 1, 2008

**Fairfax County Department of Public Works  
and Environmental Services**

Presented by Watershed Planning & Assessment Branch,  
Stormwater Management

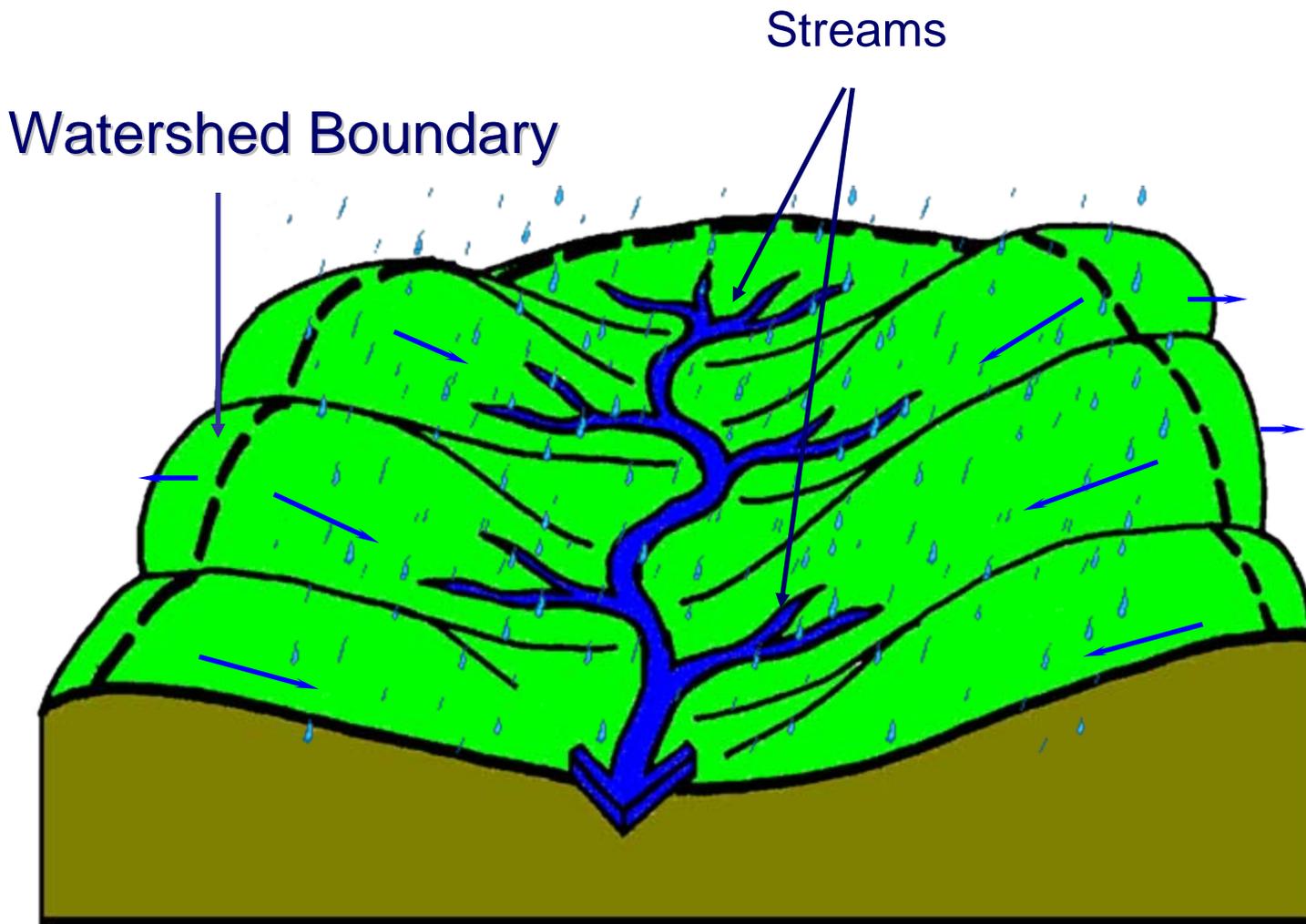


A close-up photograph of a dense field of blue and purple flowers, likely a species of primrose, with vibrant green foliage. The flowers are bell-shaped and clustered together. The background is filled with more of the same plants, creating a lush, textured appearance. The lighting is bright, highlighting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

**Watershed Primer**

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# What is a Watershed?



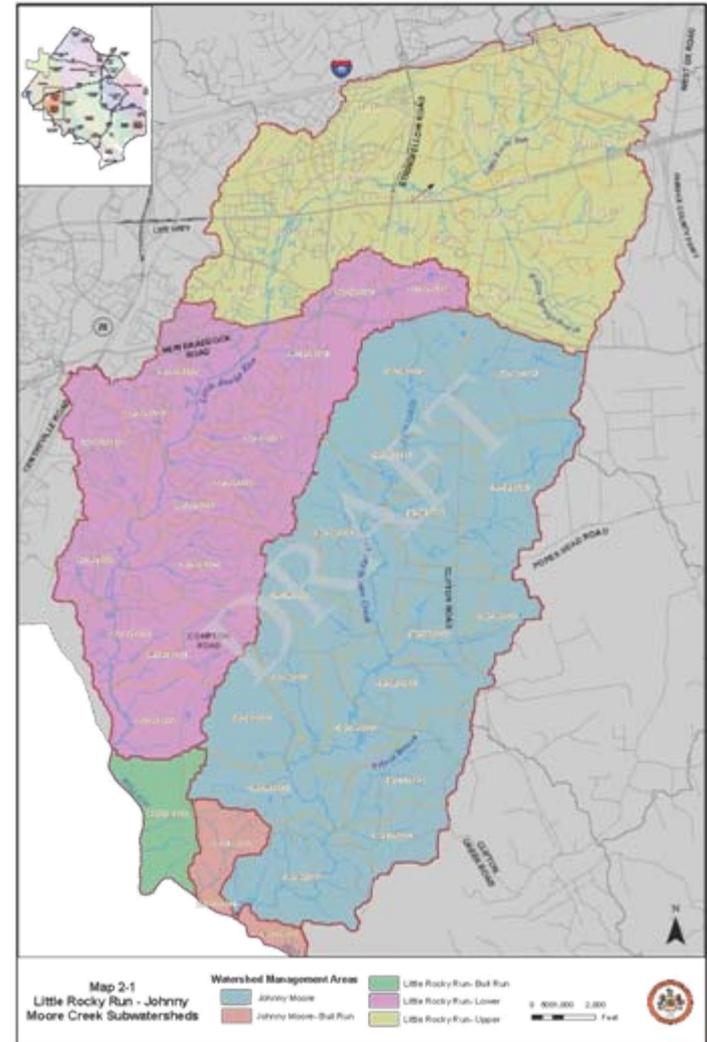
# Little Rocky Run and Johnny Moore Creek Watersheds

Little Rocky Run and Johnny Moore Creek are two of the county's 30 watersheds.

Total watershed area = 12.7 square miles

Little Rocky Run: 7.4 square miles

Johnny Moore Creek: 5.3 square miles



# The Watershed Planning Process

**Evaluate** data to determine the state of the watersheds

Identify **issues** that the plan will address

Establish a **vision** for the watershed and goals that improve, enhance and protect watersheds

Develop specific **actions** to achieve the goals

Create a framework and timeframe for **implementation**

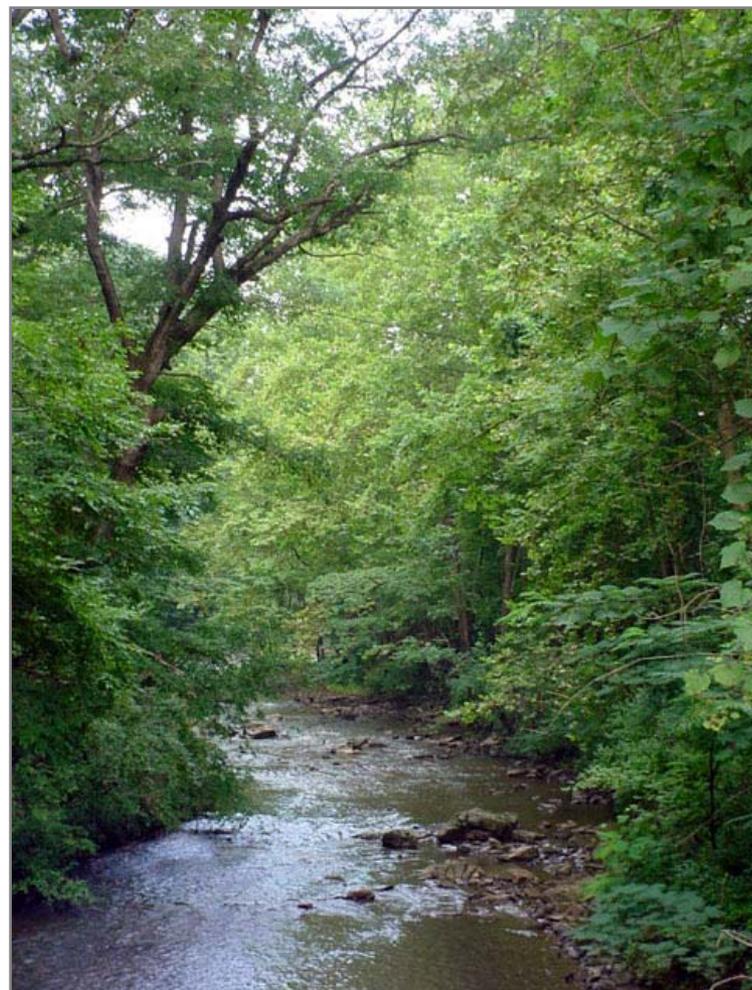
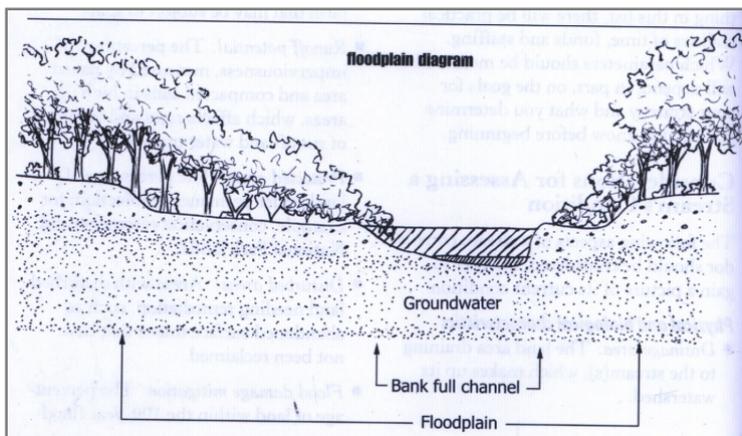
# Urban Ecology -- Healthy Streams

Native, woody vegetation, tree canopy to cool water

Stable vegetated banks, floodplains free of encroachment

Clear water, abundant and diverse, native flora and fauna

Lack of pollutants



# Typical Symptoms of Unhealthy Urban Streams

Severely eroding banks

Silt covers stream bottom

Unstable bars

Large debris flows and flood debris on banks

Lack of vegetation

Strange odors or colors

Lack of fish or invertebrates



Debris, litter & erosion



Streambank failure



Pavement in the floodplain area, equipment leaks oil & grease

# Indicators of Stream Health

**Benthic Macroinvertebrates:** Organisms that can be seen by the unaided eye and lacking a backbone that live on the stream bottom.

**Fish Community:** A healthy and diverse **fish community** is indicative of good stream health.

**Habitat:** Stream habitat is visually assessed and scored for 10 different features.

**Water Chemistry/Bacteria:** general water quality parameters and E.coli levels.



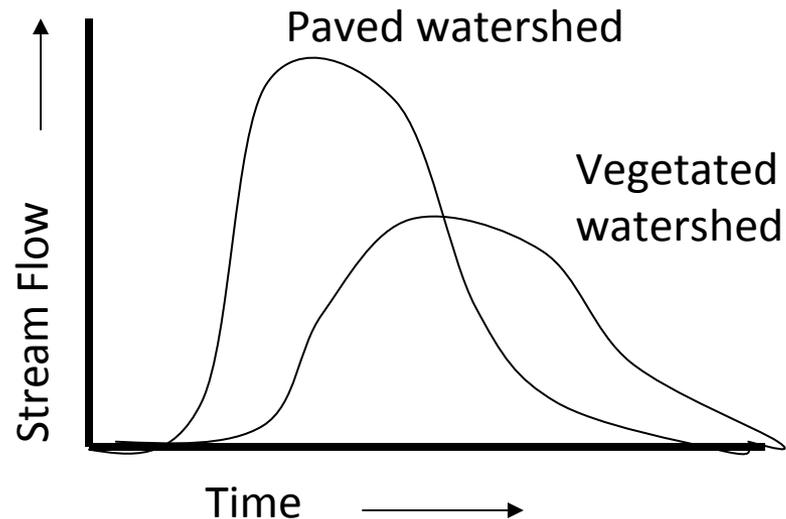
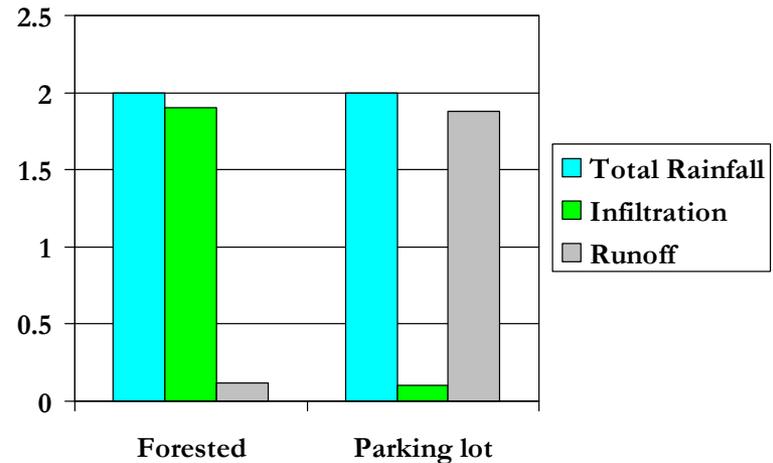
Stonefly



Aquatic worm

# Paved Areas Can Cause Extreme Flows

1. Impervious surfaces prevent rain infiltration, causing greater runoff volume and velocity.
2. Storm flows peak sooner in the stream at higher volumes.
3. Higher volumes and velocities of runoff lead to more flooding and damages – the firehose effect!



# Consequences of High Flows = Public Safety Concerns

High stormwater flow can lead to hazards, such as flooding.



# Stormwater Management



# Approaches to Stormwater Management



**Good** -- Detention Pond works in areas where you have room to maneuver.

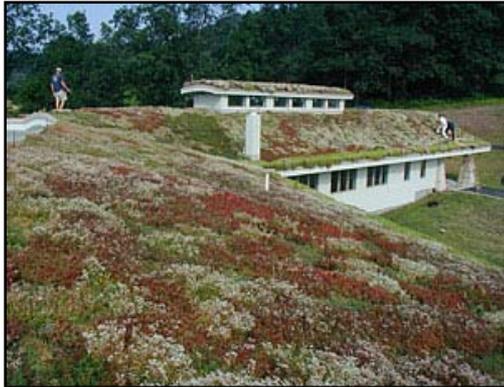


**Better** -- Improve pollution removal by adding wetland benches and plants to existing ponds.



**Best** -- Utilize smaller scale biofiltration throughout development.

# Urban Impacts = Need for Mitigation Using Low Impact Development



Green  
Rooftops



Filterra Box



Parking lot biofilter



Rain  
Barrel



Downspout filtration



Porous pavers

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

**Fairfax County Watershed Planning  
Purpose, History and Policy**

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# Why Develop Watershed Plans?

- Current Watershed Master Plan is over 25 years old
  - Conditions have changed – over 80% built-out
  - Need for identification of new capital projects
  - Need for identify opportunities for non-structural measures
- Community demands improved stream conditions – Quality of Life Issues
- Need for increased community collaboration and outreach
- Keep pace with changing Regulatory Requirements
  - Meeting the state's commitment of the Chesapeake Bay 2000 Agreement, 2/3 of watershed to have plans developed by 2010
  - NPDES/MS4 permit requirements
  - Development and implementation of TMDLs for impaired water bodies
- Identify needed Policy, ordinance and PFM requirement changes
  - Regional ponds versus onsite controls
  - Impacts of infill development

# Early History

- Comprehensive watershed master plans were completed in late 1970's
- These plans primarily addressed conditions at the time:
  - Flooding
  - Stream erosion
  - Predicted the impact of the 2000 built condition as Future Basin Plans

# Early History

- 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 – approximately 150 facilities were sited mainly in western parts of county
- Pro-Rata Share program adopted in 1991 – to provide funding for capital improvements for drainage problems on watershed basis. Regional ponds are included as projects funded by pro-rata.
- Specific type and number of projects determine the fee per impervious area in each watershed - fee updated every 6 months

# The Last Decade

- Chesapeake Bay Preservation Act was adopted in 1993:
  - led to county's Chesapeake Bay Preservation Ordinance featuring Resource Protection Areas (RPA)
  - PFM requirement for BMPs for all areas outside the Occoquan watershed to achieve 40% P removal for new developments, 10% for redevelopment
- Application and receipt of first VPDES/MS4 Permit in 1997
- Failed attempt to adopt a Stormwater Utility in 1998
- Implementation of a Stream Protection Strategy (SPS) started in 1998

# The Last Decade

- SPS Baseline Study completed in 2000, published January 2001 concluded that over 70% of streams were 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

# Watershed Planning Program Timeline

- Series of stakeholder meetings held between 2000-2001 to jump-start the development of watershed plans
- Options were decided on regarding the county-wide stream physical assessment (SPA) June 2001- CH2MHill was selected to conduct county-wide SPA
- Renewal of MS4 Permit in January 2002 - led to significant program increases including requirement to complete watershed plans
- 5 consultants selected for developing watershed plans between January – March 2002

# Watershed Planning Program Timeline

- CDM developed county-wide modeling standards in March 2002
- IEN/Woolpert developed guidelines for Public Involvement in 2003
- 1<sup>st</sup> Watershed plan commenced for Little Hunting Creek in March 2003
- 2<sup>nd</sup> watershed plan for Popes Head Creek commenced in July 2003 – 3 others followed
- 1<sup>st</sup> Amendments to RPAs adopted Nov. 2003
- 6<sup>th</sup> watershed plan for Middle Potomac Basins commenced in October 2004
- 1<sup>st</sup> watershed plan, Little Hunting Creek was adopted by Board Feb. 2005

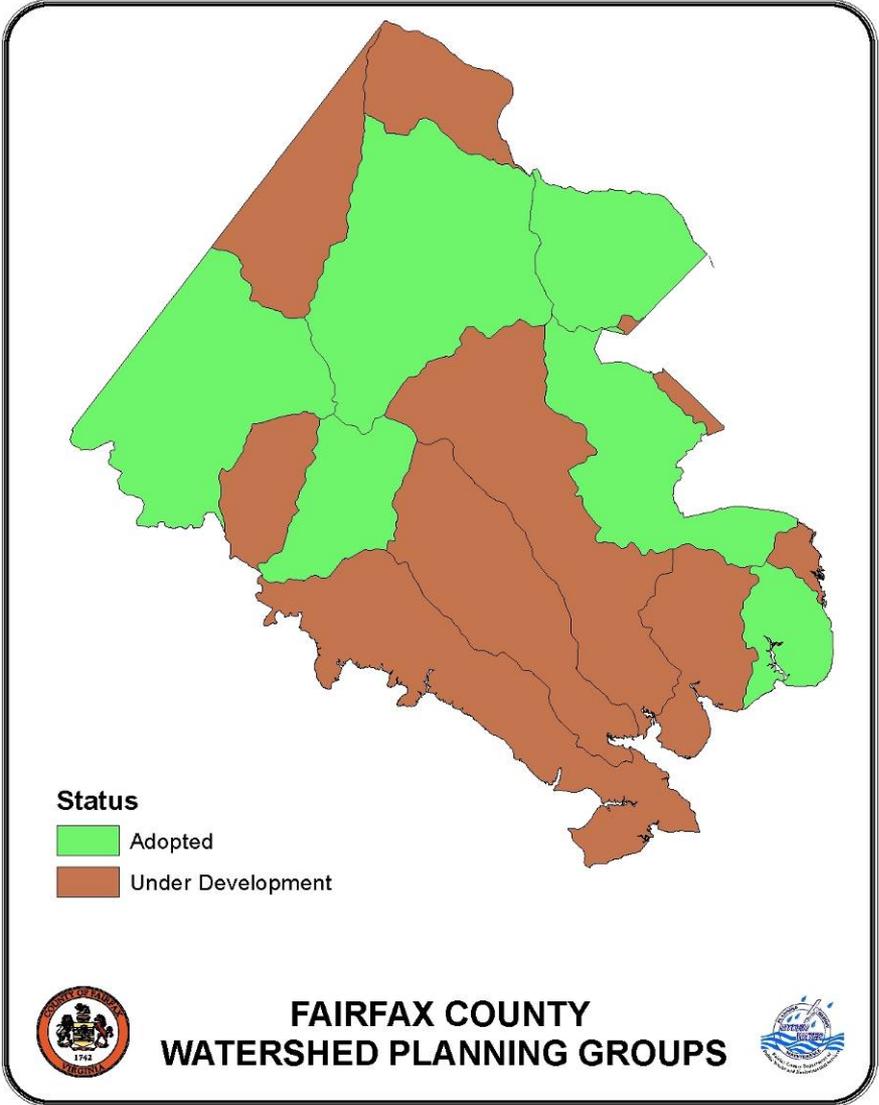
# Watershed Planning Program Timeline

- Stormwater Needs Assessment study and advisory committee activities were conducted between May 2004 – March 2005
- Watershed planning program evaluation by CBI completed in July 2005 – resulted in streamlining of PI process for future plans
- 2<sup>nd</sup> Amendments to RPAs adopted July 2005
- April 2005 Board adopted one-penny real estate tax revenue dedication for stormwater programs including implementation of watershed plan projects.

# Watershed Planning Program Timeline

- 2nd round consultants were selected in March 2006,
- 2<sup>nd</sup> round (7 plans/19watersheds) commenced with Tetra Tech overall watershed modeling work in Dec 2006
- 2<sup>nd</sup> round plans are being done concurrently rather than sequentially
- Middle Potomac plan adopted by Board May 2008
- To date, plans are completed for approximately 50% of county land area – 6 plans/11 watersheds

# Watershed Planning



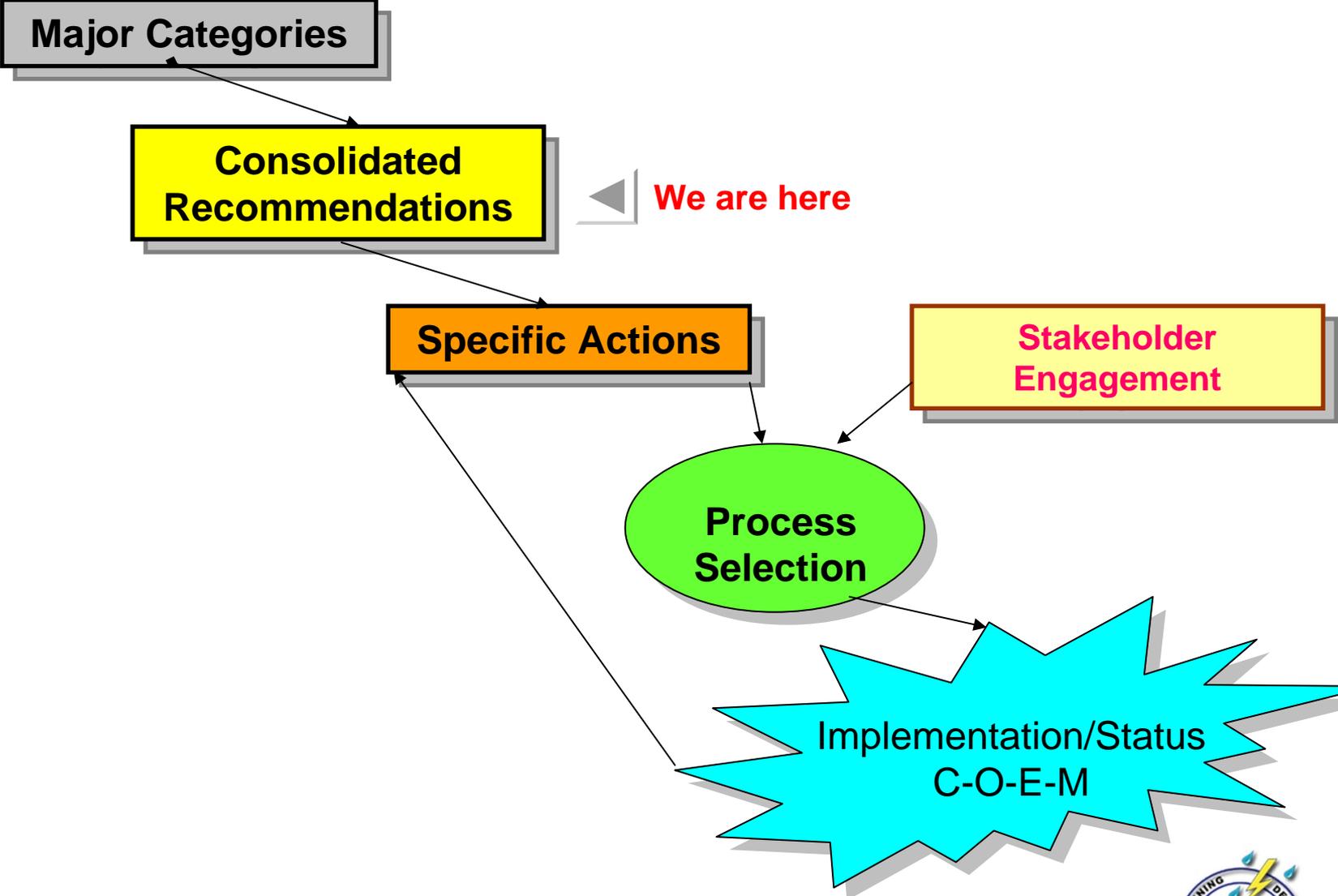
# Watershed Planning Program Timeline

- Watershed Consultants for 2<sup>nd</sup> 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
- Over 300 Policy Recommendations obtained from 1<sup>st</sup> round plans with county-wide implications loaded into database

# Policy Recommendations Process

- Major categories/themes from over 300 recommendations:
  - BMP/LIDs
  - Interagency Coordination
  - Enforcement & Inspections
  - Land-use Policies
  - Outreach & Education
  - Public Facilities Manual (PFM) Modifications
  - Watershed Improvements
  - Other

# Policy Recommendations Process



# Consolidated Recommendations

~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