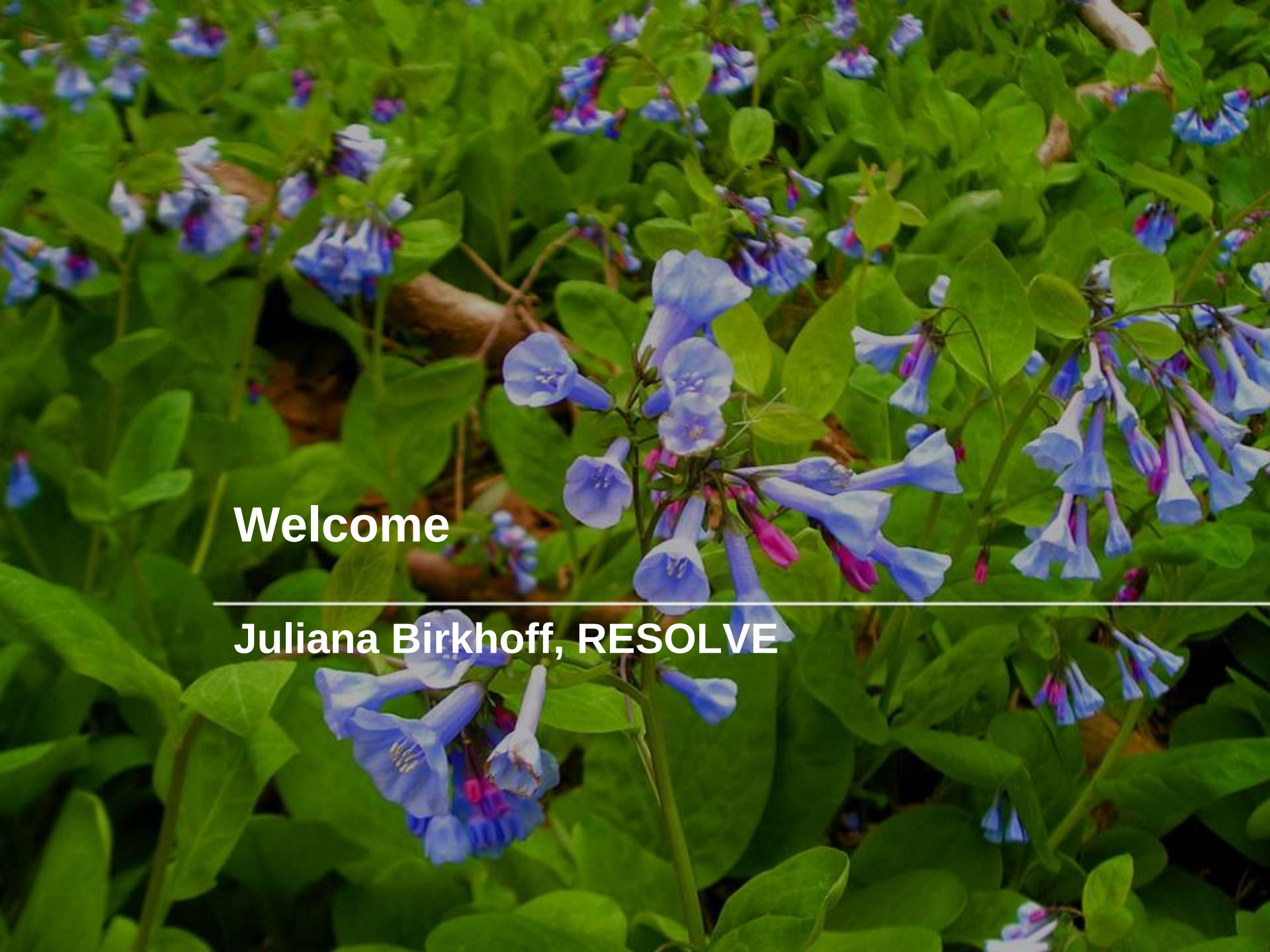
Accotink Creek Watershed Management Plan

Watershed Advisory Group Meeting #4

April 13, 2010

Fairfax County Department of Public Works and Environmental Services

Presented by Watershed Planning & Assessment Branch, Stormwater Management

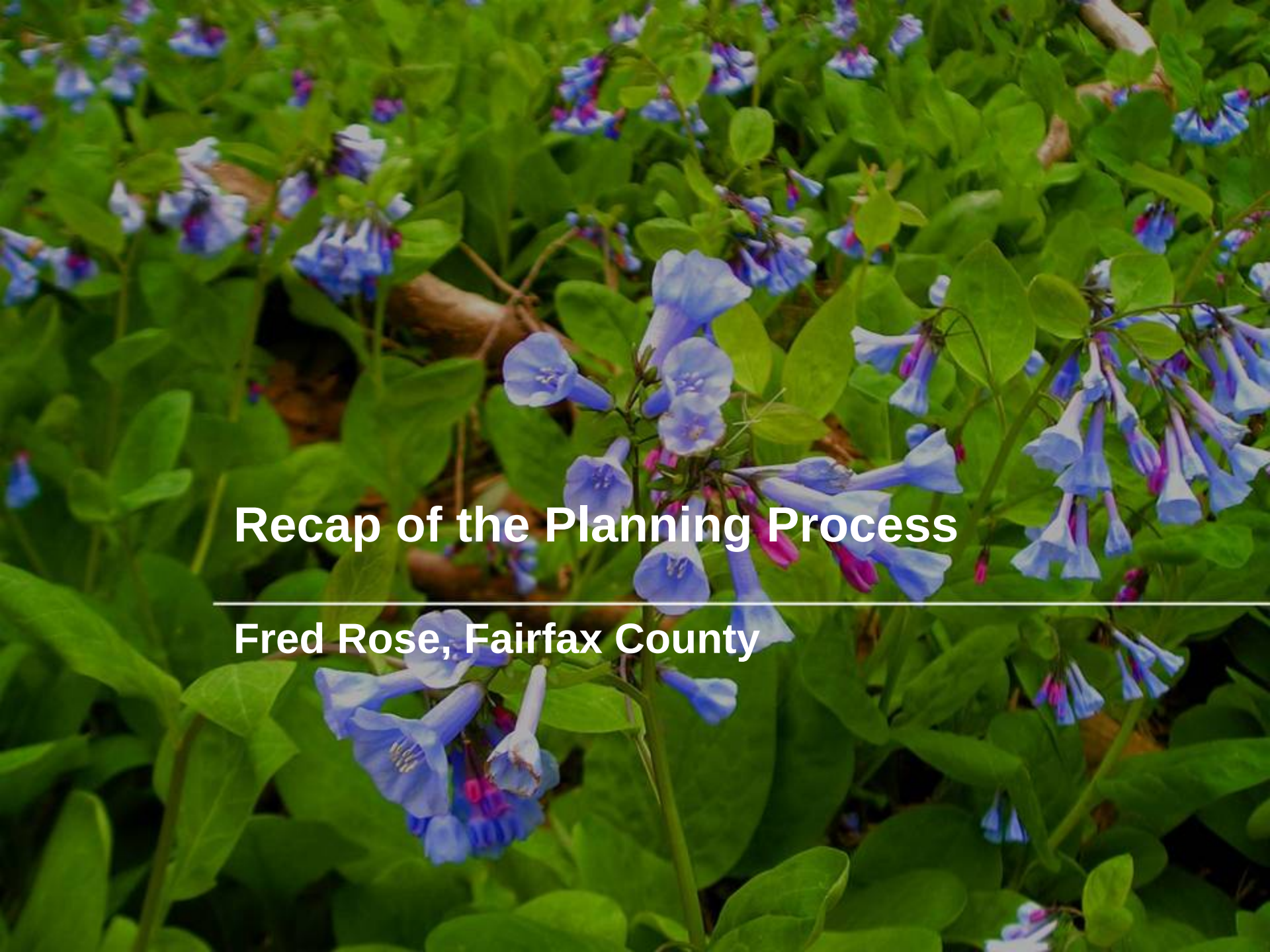


Welcome

Juliana Birkhoff, RESOLVE

Today's Meeting Goals

- Recap planning process between WAG #3 and WAG #4
- Review the process to prioritize projects
- Review potential structural and non-structural projects
- Map breakout sessions to provide feedback
  - Northern WMAs
  - Southern WMAs



Recap of the Planning Process

Fred Rose, Fairfax County

Prioritization Procedure

Bill Frost, KCI

Starting Point, End of WAG #3

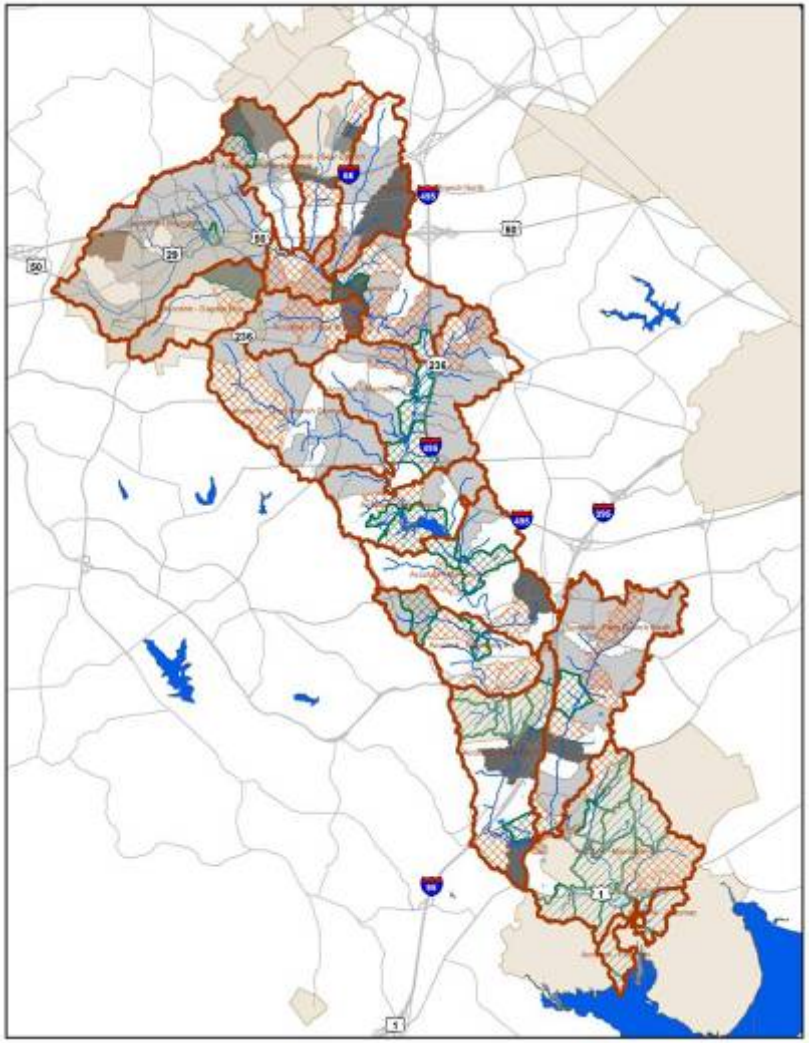
- Identified problems in each subwatershed based on indicators. Four indicator groups were used:
  - Stormwater Runoff Impacts - stream degradation
  - Flooding Hazards - flooding
  - Habitat Health - terrestrial and riparian habitat
  - Drinking Water Quality - runoff water quality

- Project site ID through desk and field investigation
  - Stream Restoration - Stream assessment photos and data
  - Flooding - Results of watershed modeling
  - Habitat - Analysis of maps and aerial photos
  - Water Quality - Results of watershed modeling

WAG Input

- Focus on preserving pristine areas first. Once degraded, it is nearly impossible to restore them. Follow with improvements to highly impaired areas, then to those in between.
- Identify locations which are only slightly impaired, which could be restored to expand the population reservoir.
- Identify highly impaired watersheds where only one factor (indicator) is causing the poor ranking and address the single cause.

All Areas



Map showing all areas for potential retrofits or preservation

Strategy	Source Indicators (Selection)	Rationale
1	Urban Land Cover (<50%)	50% Urban Land is approximately 20% of the subwatersheds. Includes all subwatersheds <10% total imperviousness.
2	Total Impervious Area (TIA) Percentage from 10% to 25%	TIA values meet the definition of Impacted areas (some degradation, can be mitigated)
3	Composite Score <83	Rank value selects worst 40% of subwatersheds
4	Any indicator worse than the 80th percentile value	Ensures serious impairments are reviewed regardless of overall subwatershed priority

Watershed Restoration Approach

Investigation

(~510 Sites)

Identify types of retrofits which Fairfax County can implement in the watershed

Desktop analysis to identify potential sites for each type

Field reconnaissance to assess constraints and feasibility

→

Evaluation

256 Sites

Combine smaller sites into single projects

Eliminate projects with duplicate benefits

Evaluate potential retrofits based on ranking procedure

→

Concept Design

131 10-Year Sites

Obtain WAG input on priority sites

Field visit to collect concept-level design information

Estimate pollutant load and runoff reduction benefits

April - July

Completed **Completed**

Prioritization Procedure

- Purpose
  - Identify ~130 most effective projects
- Process
  - Quantifiable
  - Use indicators and water quality modeling
  - Based on ranking of subwatershed containing the project
- Steps

1. Determine effect of each project on watershed **impact and source indicators** by subwatershed
   1. Define predictive indicators for each type of project
   2. Perform water quality modeling for pollutant load indicators
   3. Use Best Professional Judgment to determine changes in other indicators
   4. Calculate overall scores for each project
2. Determine project score for **location** within priority subwatersheds
3. Determine project score for **sequencing** in upstream-downstream order
4. Determine project score for **implementability**

Impact Indicators

	New / Retrofit SWM Pond	Stream Restoration	Area Wide Improvement	Culvert Retrofit	New / Retrofit BMP/ LID	Flood Protection / Mitigation	Outfall Improvement	Buffer Restoration	Predictive Indicator
Benthic Communities	--	--	--	--	--	--	--	--	--
Fish Communities	--	--	--	--	--	--	--	--	--
Aquatic Habitat	--	E	--	E	--	--	--	E	
Channel Morphology (ICEM)	E	E	--	--	--	E	--	--	Yes
Instream Sediment	E	E	--	--	--	--	--	E	--
Hydrology	F	F	F	F	F	F	--	--	Yes
Number of Road Hazards	--	--	--	F	--	F	--	--	Yes
Magnitude of Road Hazards	--	--	--	F	--	F	--	--	Yes
Residential Building Hazards	--	--	--	F	--	F	--	--	Yes
Non-Residential Bldg Hazards	--	--	--	F	--	F	--	--	Yes
Flood Complaints	--	--	--	--	--	--	--	--	--
RPA Riparian Habitat	--	E	E	--	F	--	--	E	Yes
Headwater Riparian Habitat	--	E	E	--	F	--	--	E	Yes
Wetland Habitat	--	E	E	--	F	--	--	E	Yes
Terrestrial Forested Habitat	--	--	E	--	F	--	--	--	Yes
E. coli Concentration	--	--	--	--	--	--	--	--	--
TSS Concentration	P	P	P	P	P	--	--	--	Yes
TN Concentration	P		P	P	P	--	--	--	Yes
TP Concentration	P	P	P	P	P	--	--	--	Yes

E Existing Condition. Projects in subwatersheds in poor condition scored higher.
F Future without Projects. Projects in subwatersheds with high percent change for the worse scored higher
P Future with Projects. Projects that made the best improvement scored higher

Source Indicators

	New / Retrofit SWM Pond	Stream Restoration	Area Wide Improvement	Culvert Retrofit	New / Retrofit BMP/ LID	Flood Protection / Mitigation	Outfall Improvement	Buffer Restoration	Predictive Indicator
Channelized / piped streams	E	P	--	P	--	P	--	--	--
DCIA	P	--	P	--	P	P	--	--	Yes
TIA	--	--	P	--	P	P	--	--	Yes
Stormwater Outfalls	E	E	E	--	E	E	--	--	--
Sanitary Sewer Crossings	--	--	--	--	--	--	--	--	--
Streambank Buffer Deficiency		E	--	--	--	--	--	E	--
TSS Concentration	P	P	P	P	P	--	--	--	Yes
TN Concentration	P		P	P	P	--	--	--	Yes
TP Concentration	P	P	P	P	P	--	--	--	Yes

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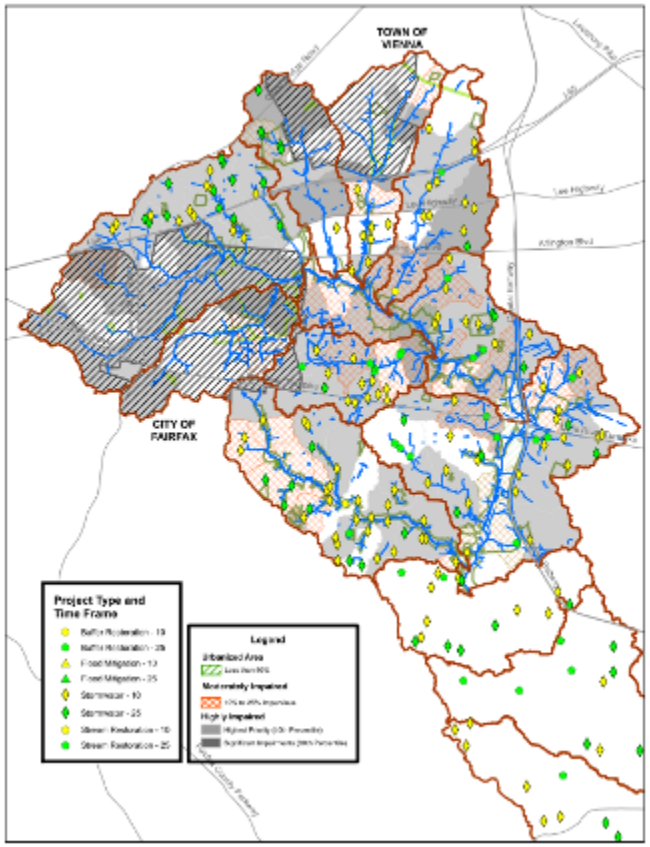
Location within Priority Subwatersheds

Projects were scored based on the priority ranking of the subwatershed in which they were located.



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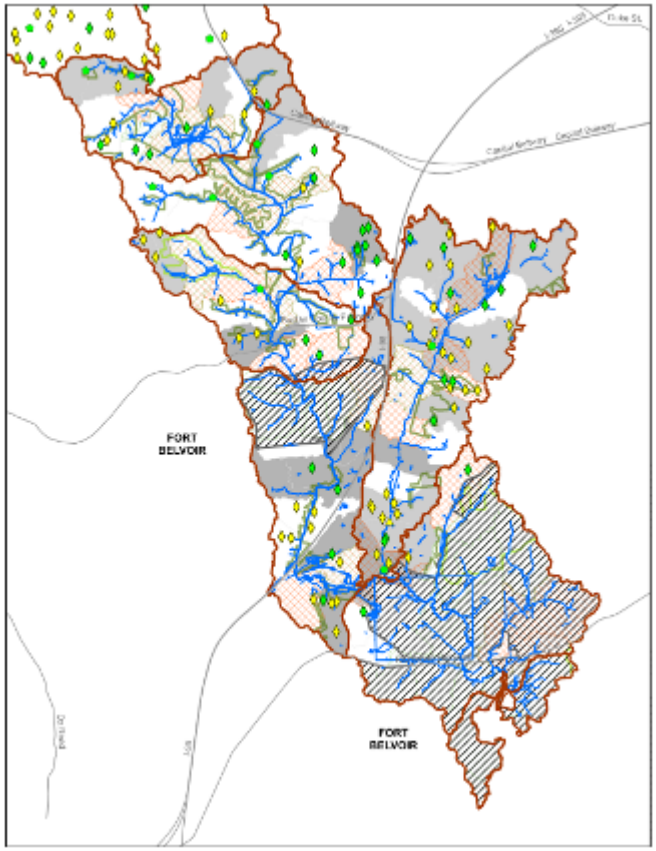

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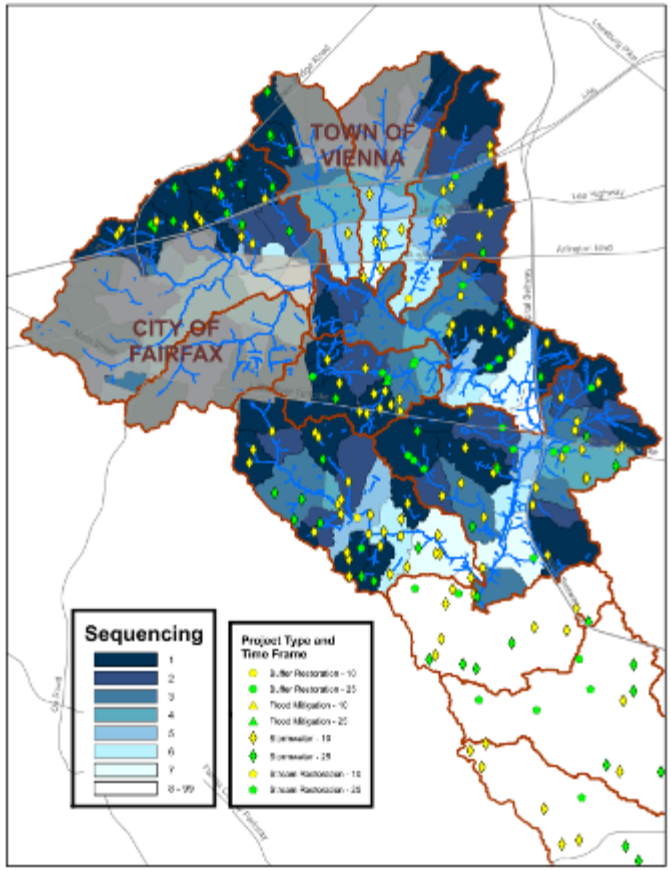
Sequencing

Projects were scored based on their subwatershed location in each WMA, based on stream order, which is a measure of the location upstream or downstream.



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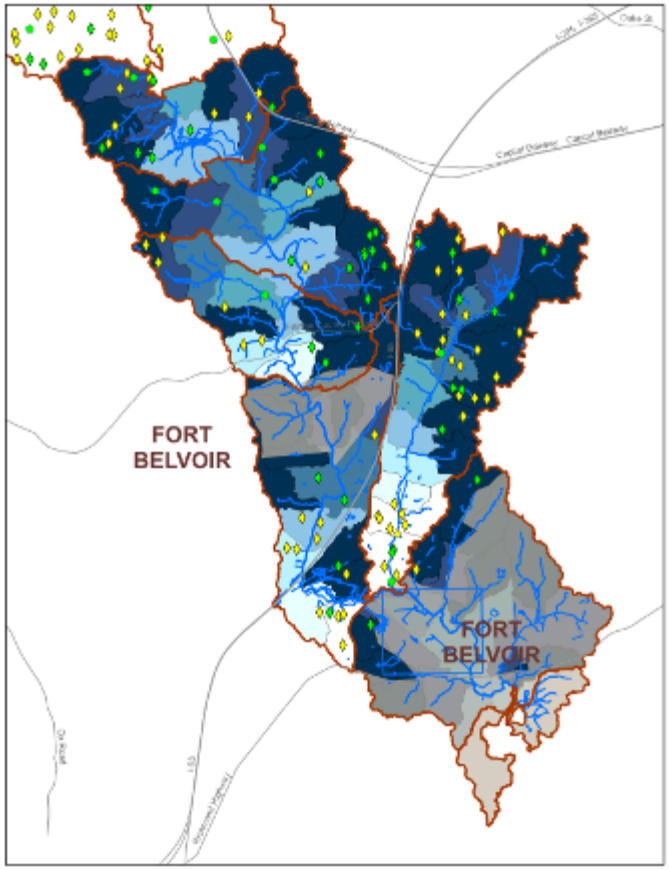

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Implementability

- Two qualitative metrics were used to identify which projects would be easier to implement
  - Whether or not they were on County-owned or maintained property
  - Whether or not upstream quantity controls were required for them to be successfully implemented
  - Scores were assigned manually:

No Upstream Quantity Control Required	County-Owned or Maintained Property	Score
Yes	Yes	5
Yes	No	3
No	Yes or No	1

Score Calculation

- Weighted Average of Five Factors
  - Effect on Impact Indicators 30%
  - Effect on Source Indicators 30%
  - Location within Priority Subwatersheds 10%
  - Sequencing 20%
  - Implementability 10%
- Adjustments (Best Professional Judgment)
  - **Channel Morphology (ICEM)** ICEM was forecast directly for stream restoration projects by assuming the reach moves from current conditions to Type 5: Recovered.
  - **Number of Road Hazards** Road Hazards were forecast with the BPJ assumption that flood mitigation projects will eliminate the hazard.
  - **Residential and Non-Residential Building Hazards**. These were forecast with the BPJ assumption that flood mitigation projects will eliminate the hazard.
  - **Channelized / piped streams** Forecasting was done by estimating the amount of stream channel restored.
  - **Streambank Buffer Deficiency** Forecasts were made with the assumption that all of the buffer within the restored reach would become forested.

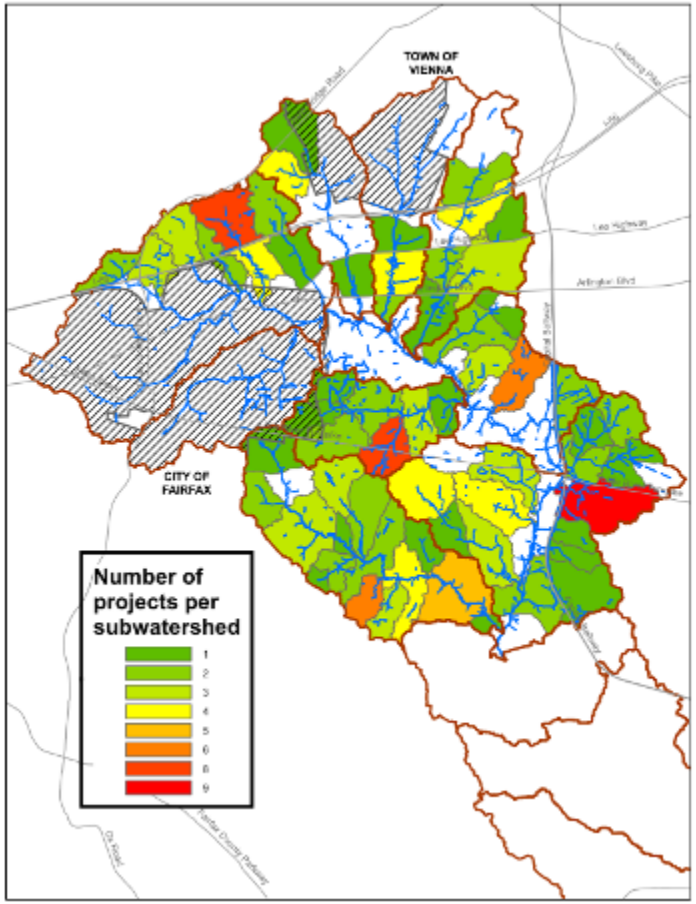
Results

- 256 feasible candidate projects, consolidated into 224
- Based on planning-level cost estimate to group projects with a minimum cost of $80,000

Code	Project Type	Potential Projects	10-Year Projects
1	New Stormwater Pond	15	10
1	Retrofit Stormwater Pond	89	52
2	Stream Restoration	24	1
3	Area wide Improvement	17	17
4	Culvert Retrofit	9	8
5	New BMP/LID	59	39
5	Retrofit BMP/LID	3	2
6	Flood Mitigation	2	1
7	Outfall Improvement	0	0
8	Buffer Restoration	6	1
	Total	224	131

Results

Number of projects per Subwatershed (10 and 25-yr)



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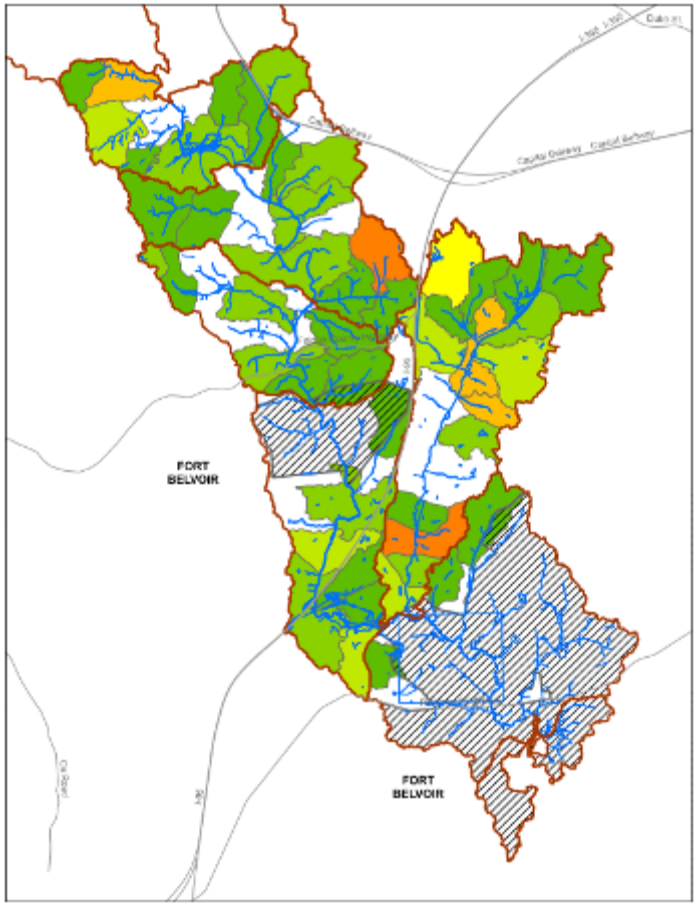

SOUTH

Non-Structural Projects

Greg Hoffman, CWP

Impairments and Project Types (Source of project in parentheses)

- Stormwater Runoff Impacts
  - Dumpsite / Obstruction Removal (Stream assessment data)
    - Dumpsite cleanup, obstruction removal
- Flooding Hazards
  - Studies, Surveys, and Assessments (Modeling results)
    - Additional modeling, additional monitoring
- Habitat Health
  - Land Conservation (Map analysis)
  - Buffer Restoration (Stream assessment, map analysis)
- Water Quality
  - Impervious Disconnection (NSA)
    - Rain barrels, downspout disconnection
  - Outreach / Education (NSA)
    - Storm drain stenciling, lawn care practices, tree planting
  - Inspection / Enforcement (HSI)
    - Dumpster management, outdoor material storage, fuel spill prevention
  - Street Sweeping / Litter Removal (NSA)
    - Street sweeping, litter/trash removal

Results

- 545 potential sites, not yet grouped or prioritized

Project Type	Main-stem 1	Main-stem 2	Main-stem 3	Main-stem 4	Main-stem 5	Main-stem 6	Main-stem 7	Main-stem 8
Dumpsite / Obstruction Removal	2	24	38	10	-	-	4	-
Studies and Assessments	-	-	3	1	2	1	2	-
Land Conservation (Parcels)	17	14	25	3	17	21	23	18
Buffer Restoration	-	2	-	-	-	-	-	-
Impervious Disconnection	-	1	4	-	2	1	3	4
Outreach / Education	1	3	18	2	13	-	3	11
Inspection / Enforcement	1	-	-	2	5	2	10	7
Street Sweeping / Litter Removal	-	-	1	-	-	-	1	1
Total	21	44	89	18	39	25	46	41

Project Type	Bear Branch	Crook Branch	Daniels Run	Hunters Branch	Long Branch Central	Long Branch North	Long Branch South	TOTAL
Dumpsite / Obstruction Removal	10	6	2	1	6	15	3	121
Studies and Assessments	-	1	-	-	2	-	1	13
Land Conservation (Parcels)	9	12	9	16	30	31	-	245
Buffer Restoration	-	2	-	-	-	1	2	7
Impervious Disconnection	-	-	-	-	-	-	3	18
Outreach / Education	2	4	-	-	22	4	4	87
Inspection / Enforcement	-	-	-	-	2	7	9	45
Street Sweeping / Litter Removal	-	-	-	-	4	-	2	9
Total	21	25	11	17	66	58	24	545

Breakout Discussion

Breakout Discussion

- Comments on:
  - Individual projects
  - Project selection and priorities
  - Suggestions for areas that have been missed

Next Steps

- Review WAG comments
- Develop concept plans
- Develop Draft Plan
  - Project team will provide format for comments
- Draft plan forum