

# The Countywide Coordinated Implementation Strategy for Montgomery County



# Must Address Urban Water Quality Impacts

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Untreated oily runoff from a parking lot



Threats to infrastructure



Illegal dumping

# Too much flow and too many pollutants

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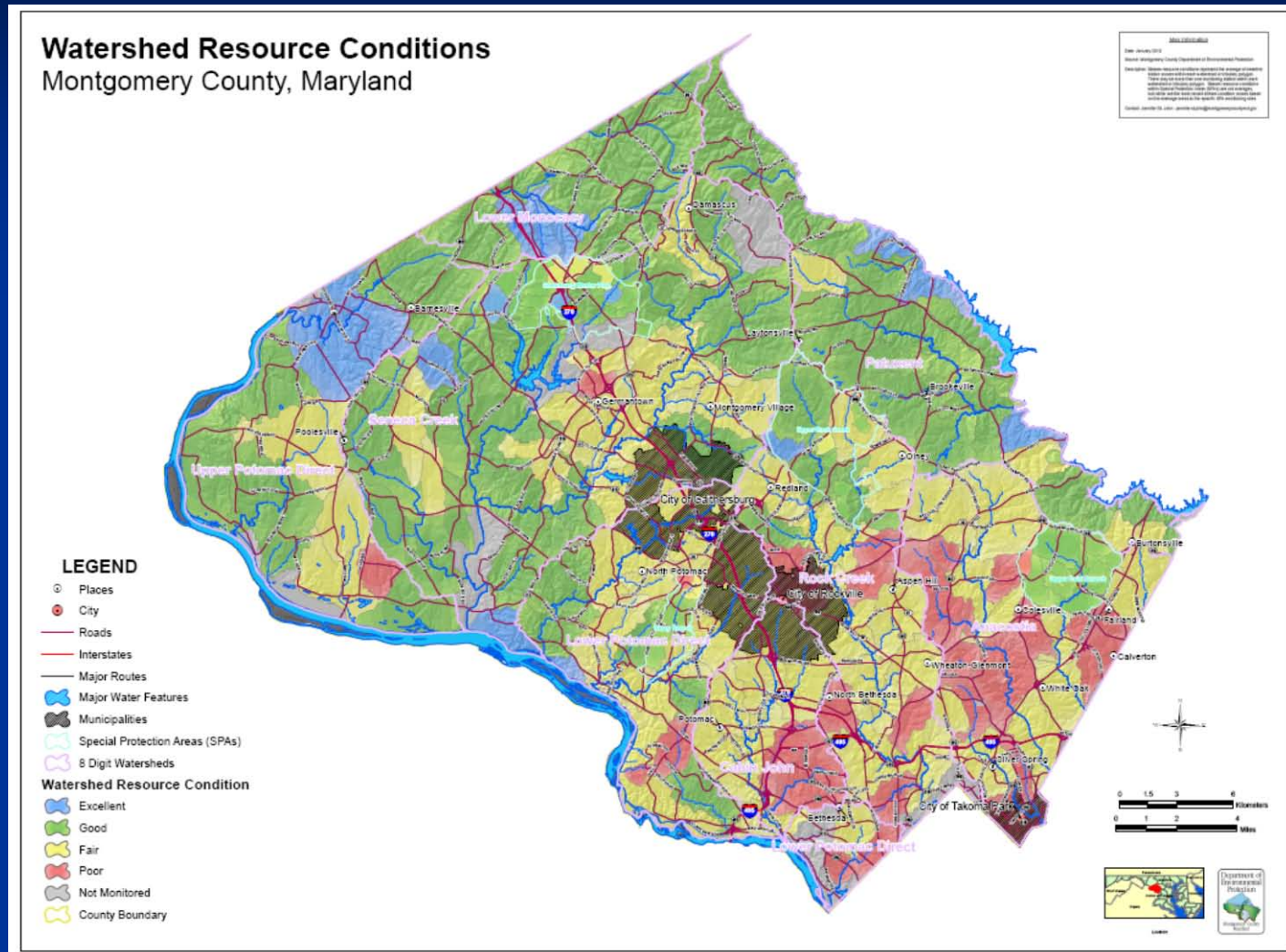




# Too much trash in our streams



# Goal: Protect and Restore



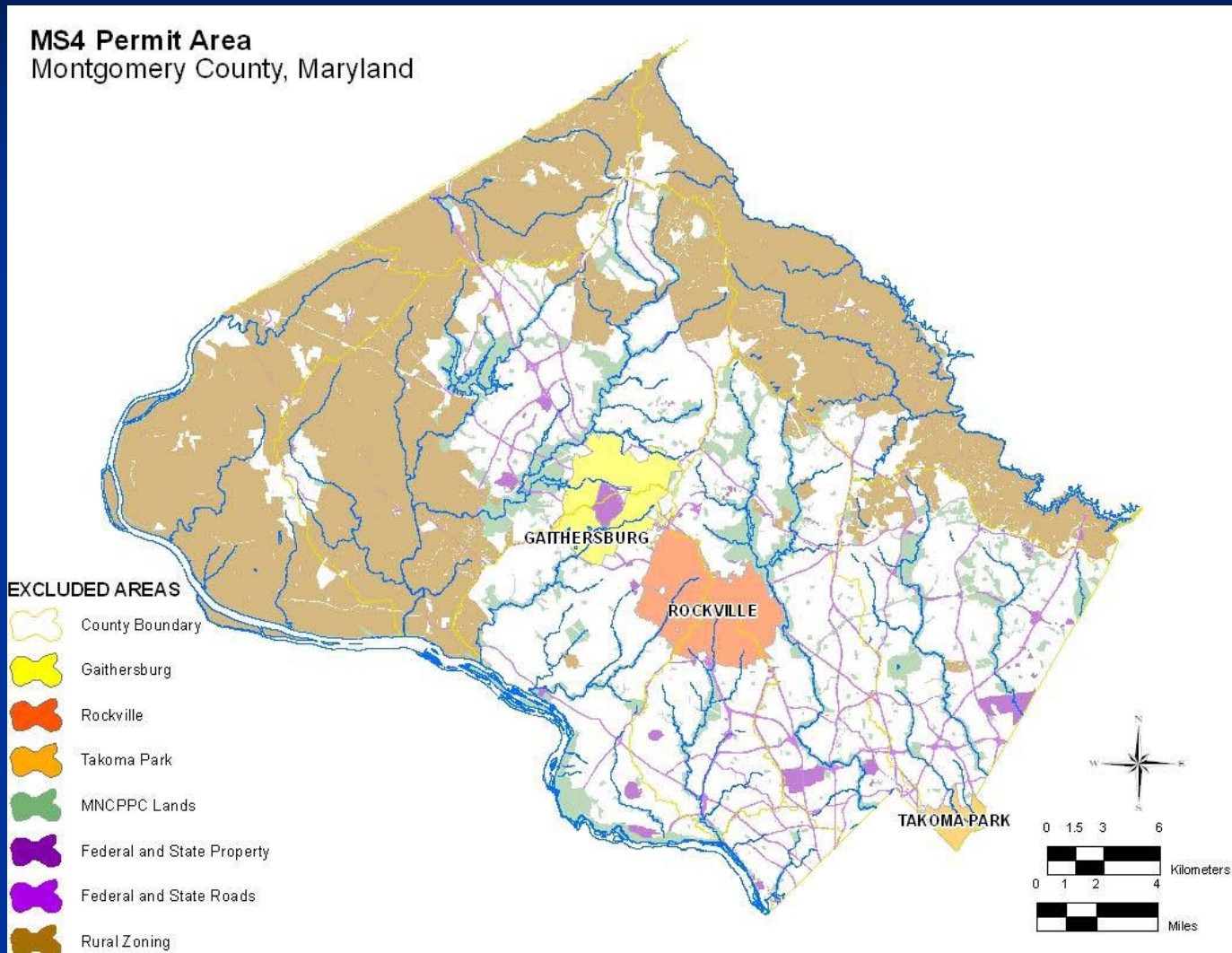
March 18, 2011

# ~~Goal: Meet Permit Requirements~~

- Add stormwater management to an additional **20% of impervious area** currently not treated to the maximum extent practicable (MEP)
- Meet wasteload allocations (WLAs) to Achieve Total Maximum Daily Loads (TMDLs)
  - **TMDLs set pollutant reduction goals**
- Meet commitments in Trash Free Potomac Treaty
- Use Environmental Site Design (ESD) to the MEP
- Assure public input and stewardship opportunities

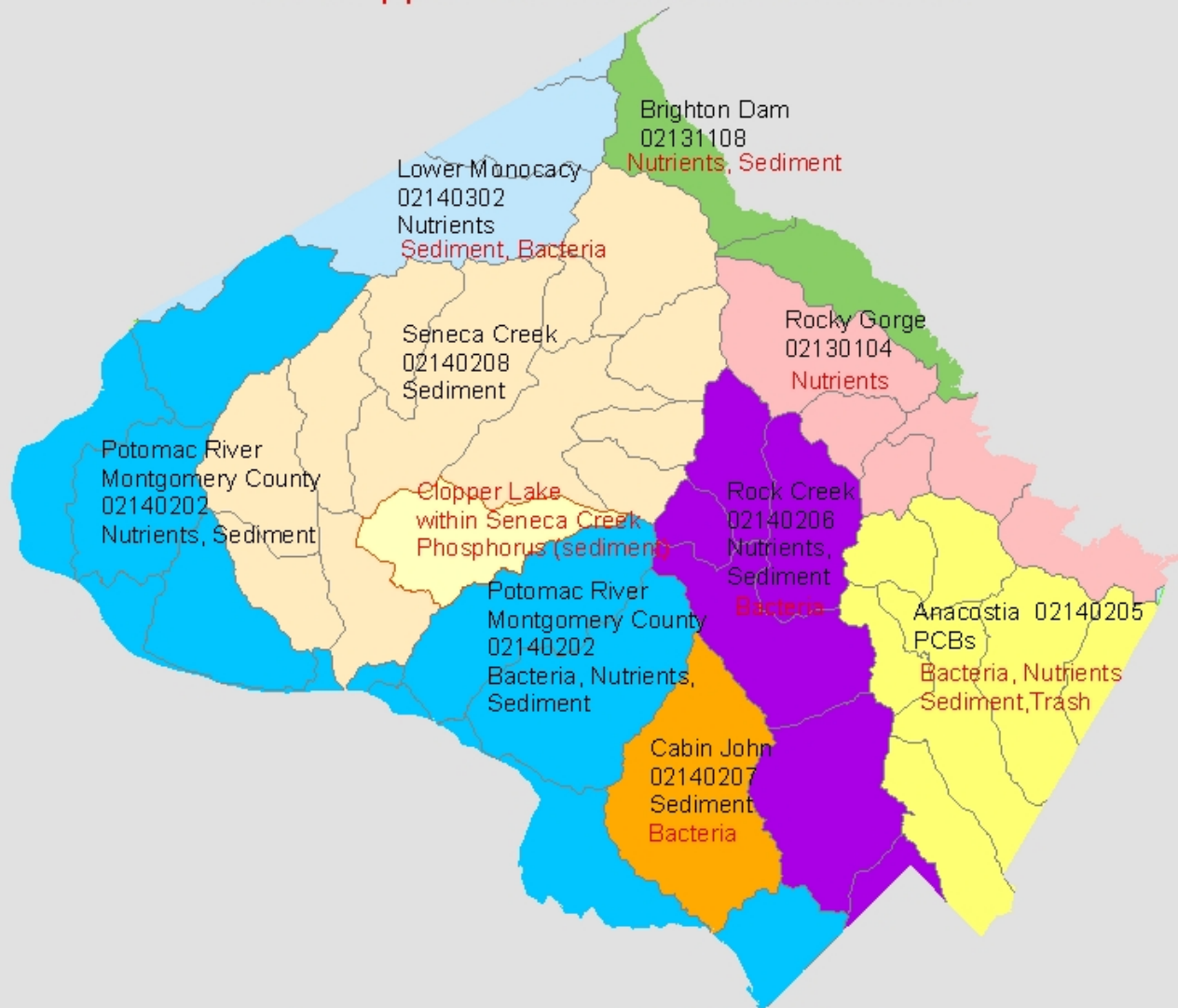


# MS4 Permit Area



# County Watersheds on Maryland's Impaired List January 2011

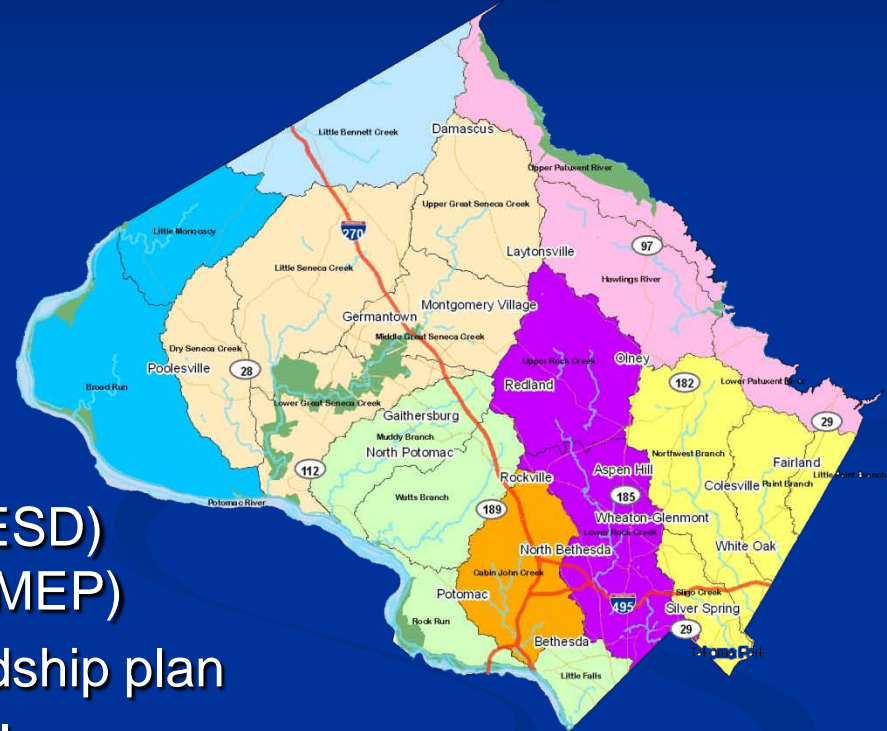
EPA approved TMDLs shown in red





# Coordinated Countywide Implementation Strategy

- Based on Eight Watershed Groups
  - **separate implementation plans**
- Meet MS4 permit restoration goal
- Reduce pollutant loads for TMDLs
- Make progress for Trash Treaty
- Assure Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP)
- Develop public outreach and stewardship plan
- Consultant Team led by Biohabitats, Inc.



# Analytical Approach

## Watershed Treatment Model



### Land Use

- EMC (Urban)
- Unit Load (Non-urban)



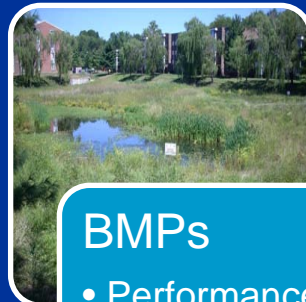
### Soils & Rainfall

- Annual Runoff Volume



### Pollutant Load

- Before
- treatment



### BMPs

- Performance Code
- Removal Efficiency



### Discount Factors

- BMP specific
- Treatability Factor



### Pollutant Reduction

- Applied to baseline load

Land Conversion									
Function/Impervious	Area (Acres)	Impervious	SW	SD	ESD	FC	Soak	Permeable	Permeable
Land Use/Storm Area (Impervious)	Area (Acres)	Area (Acres)	SW	SD	ESD	FC	Soak	Permeable	Permeable
Residential Single-Family	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential Medium-Density	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential High-Density	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Public Works	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Stormwater Receptors									
Receptor	Area (Acres)	Impervious	SW	SD	ESD	FC	Soak	Permeable	Permeable
Receptor 1	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Receptor 2	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Receptor 3	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Receptor 4	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Receptor 5	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Option 1: Summarize BMPs									
BMP Type	Total Area (Acres)	Impervious Area (Acres)	SW	SD	ESD	FC	Soak	Permeable	Permeable
Green Roof	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stormwater Pond	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Permeable Pavement	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Analytical Approach

- Baseline conditions
  - Impervious cover
  - Existing BMPs

- Calibration to WLAs for TMDLs (where applicable)
- Trash for Potomac tributaries

Watershed/Subwatershed	Pollutants	Impervious Cover	Trash
Patuxent	TMDL	20% Countywide Goal	
Anacostia			TMDL
Rock Creek			Trash-Free Potomac
Great Seneca			
Cabin John Creek			
Lower Monocacy			
Muddy Branch/ Watts Branch			
Dry and Little Seneca			
Lower Potomac Direct			
Upper Potomac Direct			



# Analytical Approach

- Iterative Process
- Implementation Plans

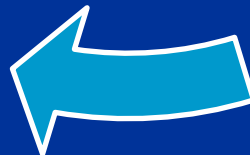


Restoration Potential

**Major driver:**  
**20% impervious**

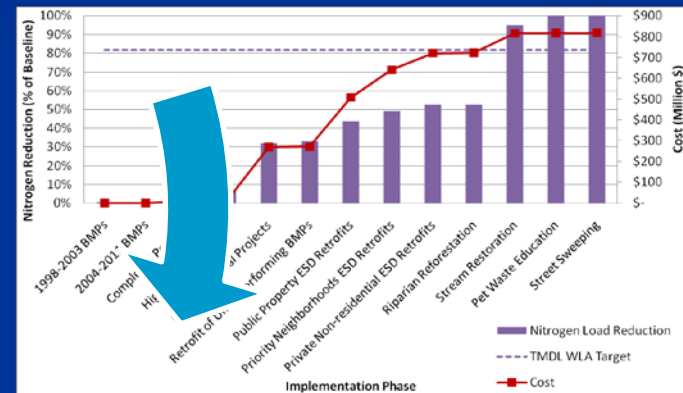
Countywide Watersheds						
Summary of Implementation Plan schedule with expected MS4 permit area WLA compliance endpoints						
	2015	2016	2025	2030	Permit/ TMDL Targets 2017	Permit/ TMDL Targets 2020
Impervious Area Treated (acres)	4,302	6,014		11,154	6,008	7,723
% of Impervious Area Treated by ESD	18%	34%	0%	63%		
Impervious Area Treatment Cost (Million \$)	305	622	687	1,884		
% of Cost for ESD	53%	66%	10%	80%		
Nitrogen (% Reduction)	18%	25%	6%	51%	9%	20%
Phosphorus (% Reduction)	17%	23%	4%	46%	12%	34%
Sediment (% Reduction)	23%	34%	3%	62%	20%	37%
Bacteria (% Reduction)	11%	15%	3%	30%		
Trash (% Reduction)	18%	26%	1%	42%		

Stakeholder input and Bay restoration



Countywide Strategy

**Consider WLAs, ESD, and costs**



# Countywide Strategy – Schedule and Drivers

**Table 4.1 Compliance Targets for Countywide Coordinated Implementation Strategy**

Target Date	Compliance Target	Metric
2015	Meeting 20% impervious cover treatment requirement within the MS4 Permit cycle	~4,300 acres of Impervious Cover
2017	Meet the interim dates and targets for the Chesapeake Bay TMDL, which include specific regulated urban area reductions by 2017 for nutrients and sediment (based on Maryland Department of the Environment’s Watershed Implementation Plan)	9%, 12%, and 20% respectively for TN, TP, and TSS reductions from baseline conditions
2020	Meet the full compliance and targets for the Chesapeake Bay TMDL, which include specific regulated urban area reduction by 2020 for nutrients and sediment (based on Maryland Department of the Environment’s Watershed Implementation Plan)	18%, 34%, and 37% respectively for TN, TP, and TSS reductions from baseline conditions
	Meet additional impervious cover treatment targets associated with next MS4 Permit cycle (assumes another 20% target)	~3,400 acres of Impervious Cover = 20% of impervious remaining after 2015
2025	Meet additional impervious cover treatment targets associated with next MS4 Permit cycle (assumes another 20% target)	~2,750 acres of Impervious Cover = 20% of impervious remaining after 2020
2030	Out year compliance with other watershed TMDLs	100% compliance with MS4 Permit Area WLAs

# Countywide Strategy:

## *Implementation and Pollutant Reductions*

### Countywide Watersheds

Summary of Implementation Plan schedule with expected MS4 permit area WLA compliance endpoints

	2015	2017	2020	2025	2030	Permit/ TMDL Targets 2017	Permit/ TMDL Targets 2020
Impervious Area Treated (acres)	4,302	6,014	7,722	10,518	11,154	6,008	7,723
% of Impervious Area Treated by ESD	18%	34%	47%	60%	63%		
Impervious Area Treatment Cost (Million \$)	305	622	987	1,687	1,884		
% of Cost for ESD	53%	66%	70%	80%	80%		
Nitrogen (% Reduction)	18%	25%	36%	46%	51%	9%	20%
Phosphorus (% Reduction)	17%	23%	34%	44%	46%	12%	34%
Sediment (% Reduction)	23%	34%	54%	60%	62%	20%	37%
Bacteria (% Reduction)	11%	15%	20%	28%	30%		
Trash (% Reduction)	18%	26%	33%	41%	42%		

*Assumptions:*

1. Does not include repeated Outreach and Education costs beyond FY2015
2. Does not include an inflation multiplier



# Questions?



Sculpin



Stonefly