



Stormwater Management Systems in the Parkers Creek Watershed

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Outline

Background

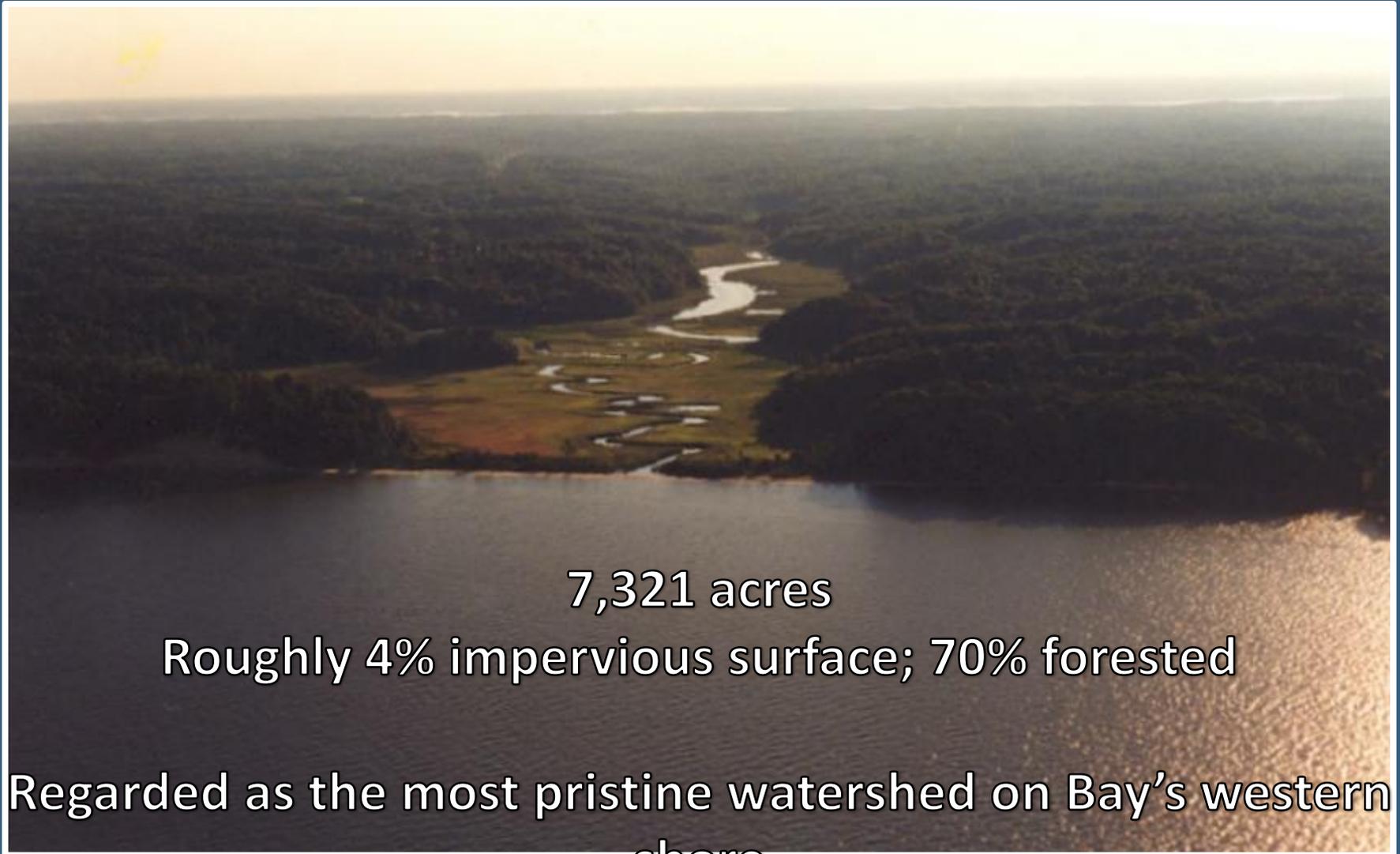
Impervious Surface and Stormwater

Current Stormwater Management Systems

Results from MN Project

Thoughts and Questions

Parkers Creek Watershed



7,321 acres

Roughly 4% impervious surface; 70% forested

Regarded as the most pristine watershed on Bay's western
shore



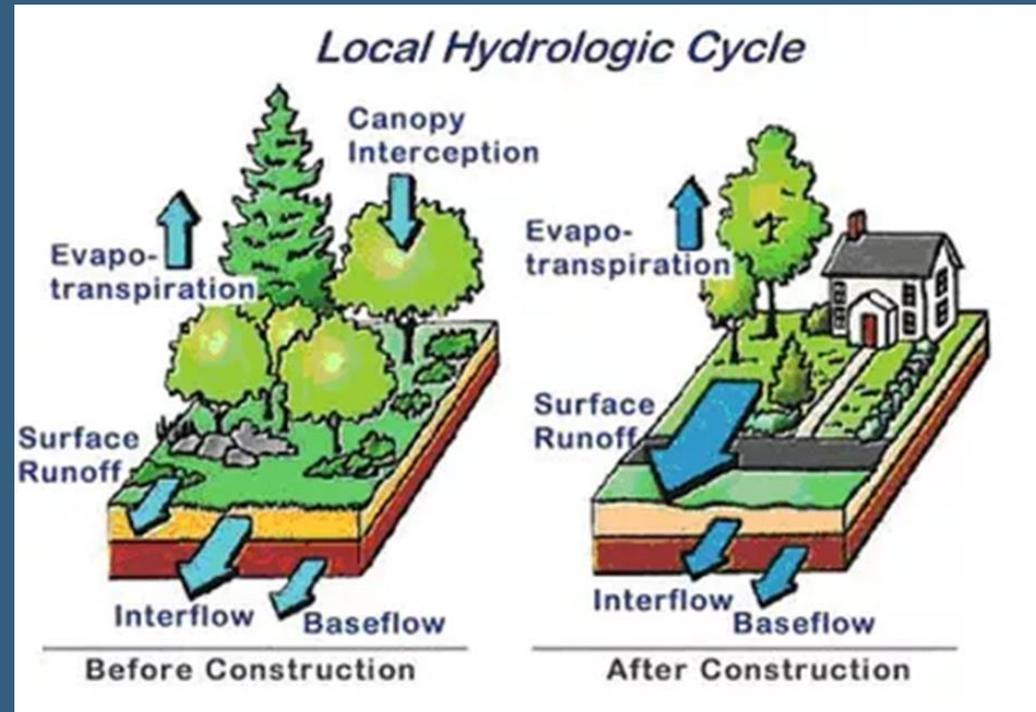
ACLT Science Committee &
Maryland Master Naturalist

The Problem



The Problem

- Impervious surfaces add new dynamic to hydrologic cycle
- Surface runoff increased, base/interflows decreased, vegetative interception decreased



Effects of Impervious Surfaces



Increased flooding events



Stream bank erosion



On-site erosion



Lowered water table=drought



Increased water temperature

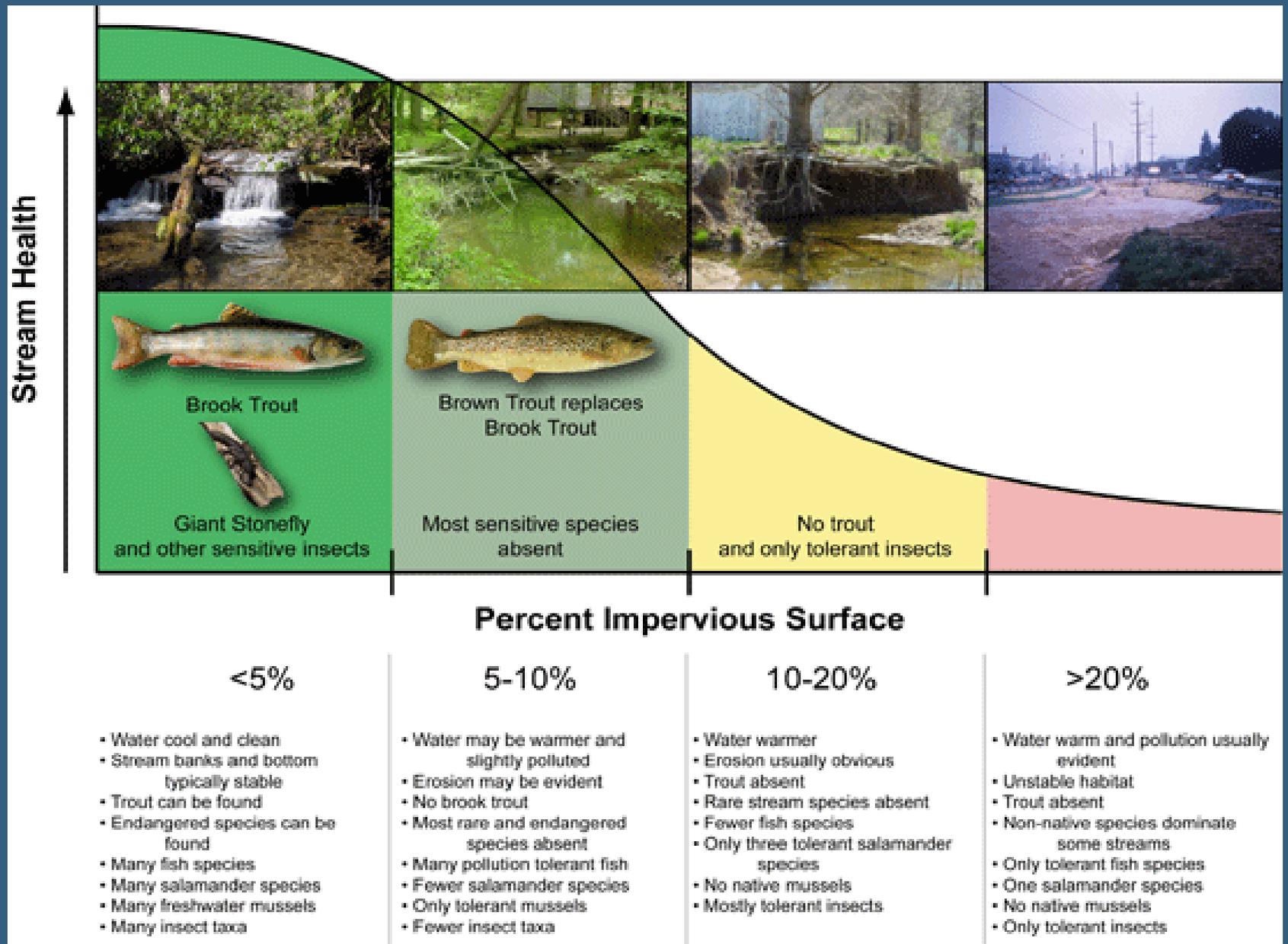


Toxin/Sediment influx

Pollutants

Common Stormwater Pollutants and Their Sources

	Vehicle Exhaust	Power Plants	Tire and Vehicle Parts Wear	Vehicle oil, Grease, and Fuel	Road Surfaces and De-icing Salts	Household, Lawn, and Garden Chemicals
Lead	X	X	X	X		X
Zinc			X	X	X	X
Arsenic		X				
Copper			X	X		
Cadmium		X	X			X
Chromium		X	X			
Nickel		X	X	X	X	
Manganese		X	X			
Mercury	X	X				X
Iron			X			
Cyanide						X
Nitrogen and Phosphorus	X	X				X



Storm water Management Systems

Curb and Gutter: Basic approach but sends runoff and pollutants directly into streams

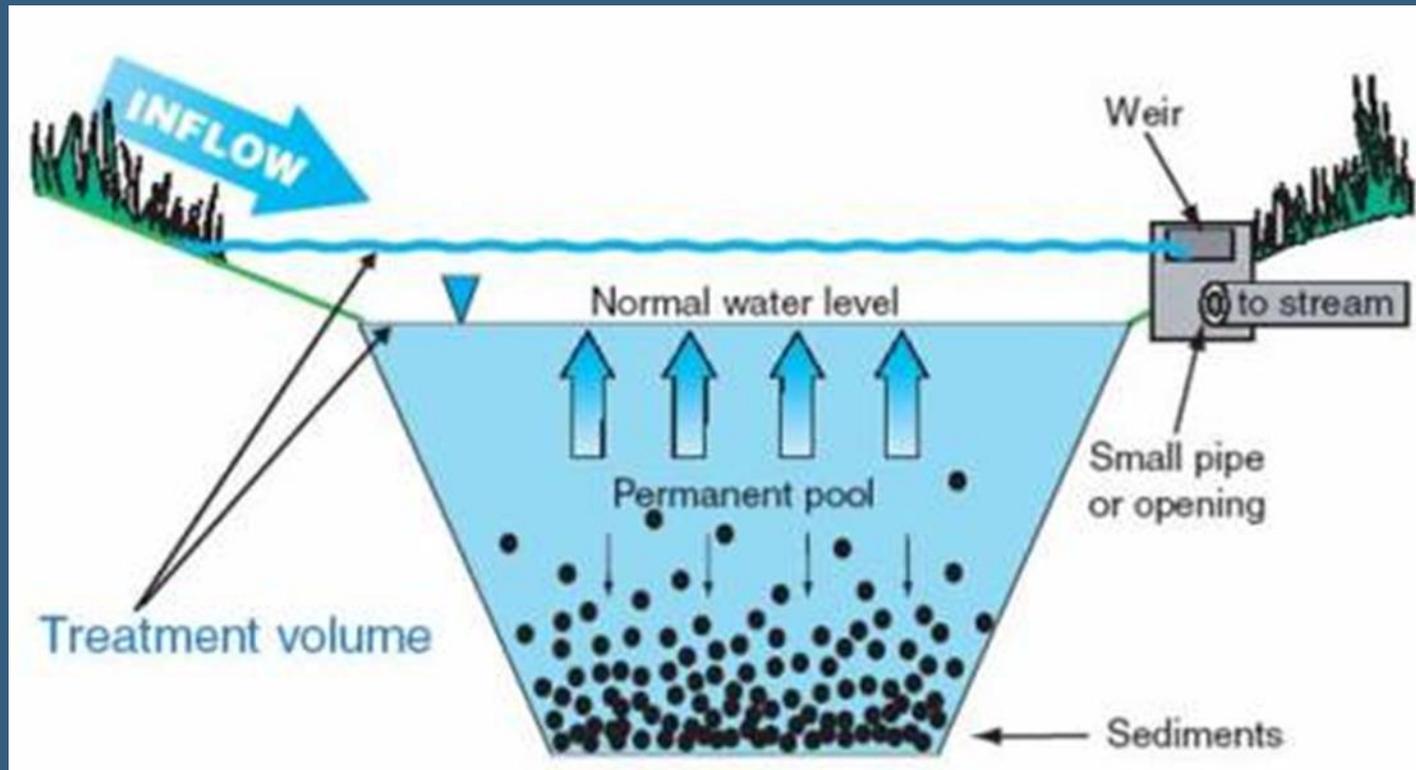


Stormwater Management Systems

Detention or Dry Ponds, Retention or Wet Ponds, and Constructed Wetlands: Designed to slow runoff and settle out pollutants. High degree of maintenance



Retention Pond Infographic



Stormwater Management Systems

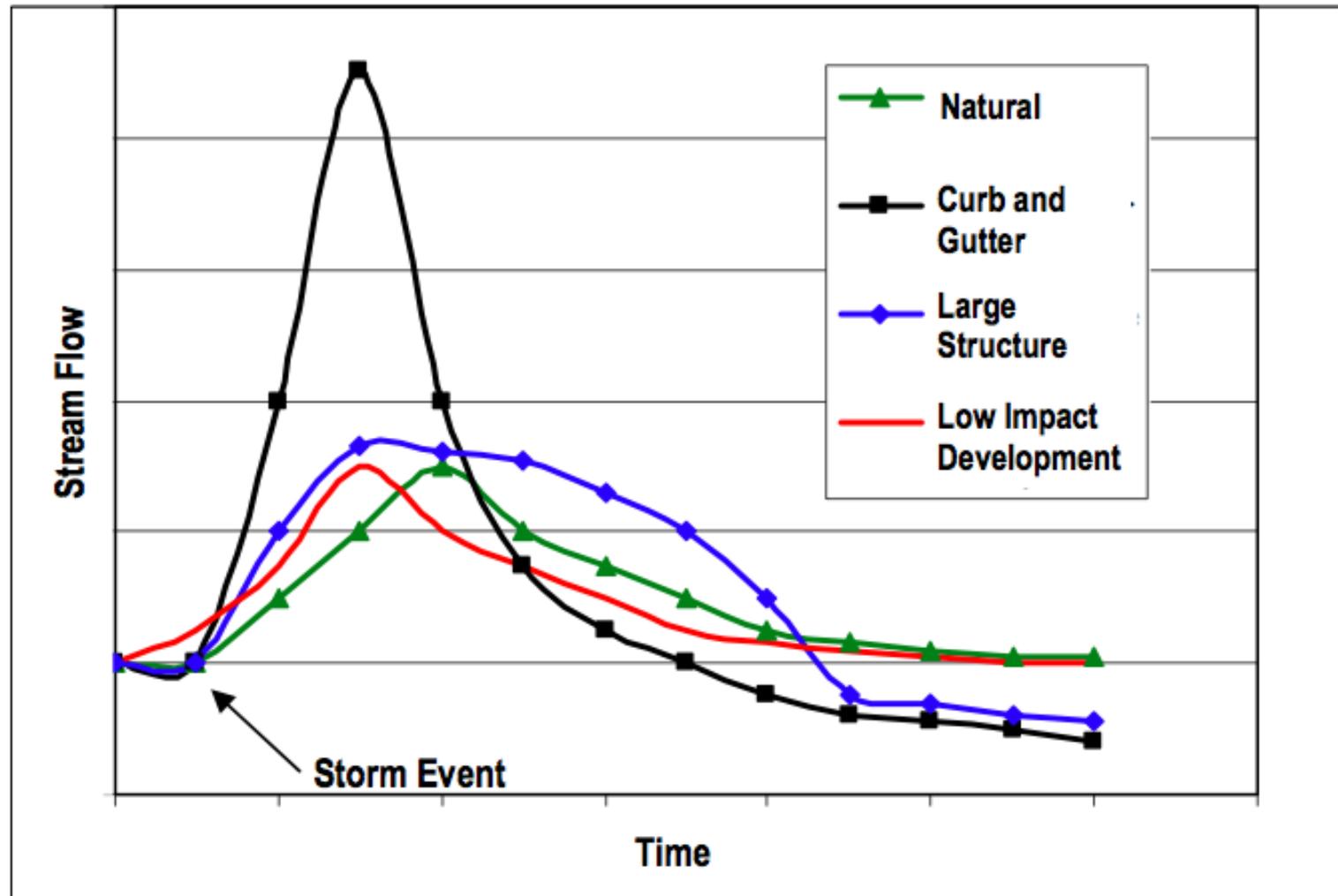


Low Impact Development:

- Cluster housing
- Landscaped cul-de-sacs
- Shallow front yards
- Less sidewalks
- Reduced parking areas
- Narrower streets
- Runoff channeled into holding devices (cisterns), vegetated buffers, grass channels, green roofs, and bioretention ponds.



Comparative Performance of Stormwater BMPs

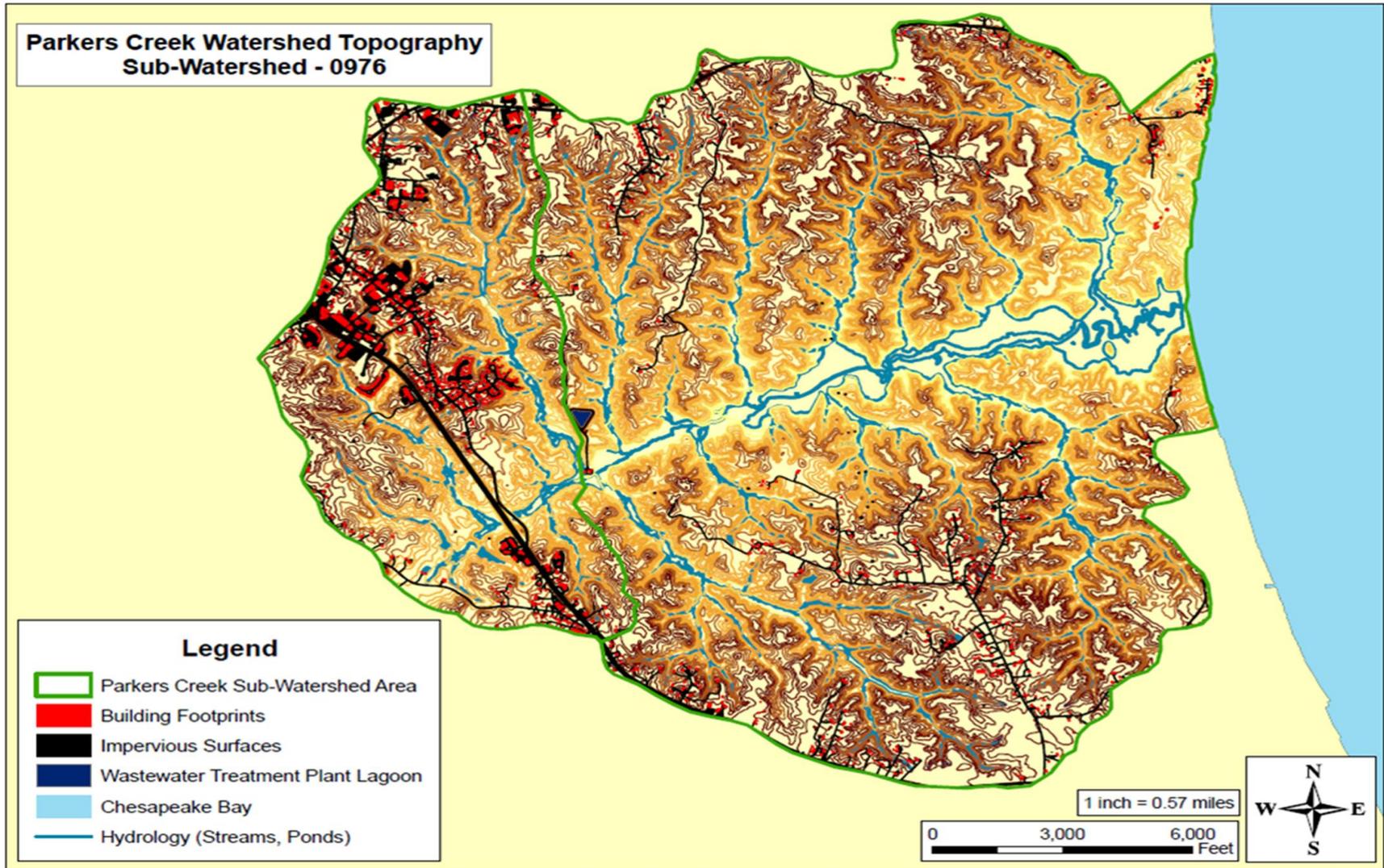


Adapted from *Maryland Stormwater Design Manual*, Maryland Dept. of the Environment

Regulations

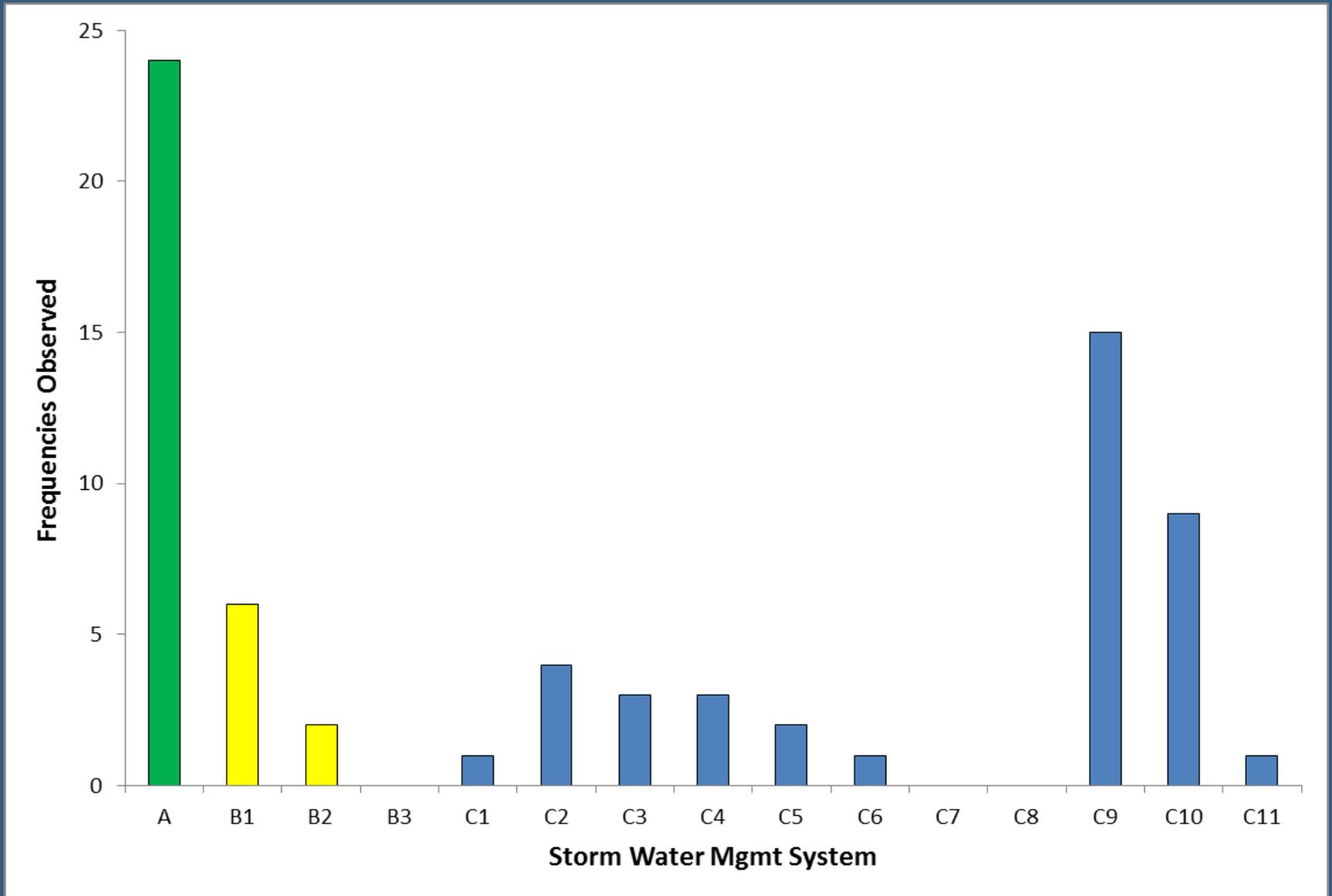
- **Mandatory stormwater management plans**
 - Sediment and Erosion Control
 - State and Fed. Stormwater Management Guidelines
- **Incentives and Grants**
 - Low Impact Development Credit
 - Natural Area Conservation Credit
 - Envr Sensitive Development Credit
 - MD Stormwater Pollution Control Cost-Share Grant Program

What did we find in the Parkers Creek Watershed?

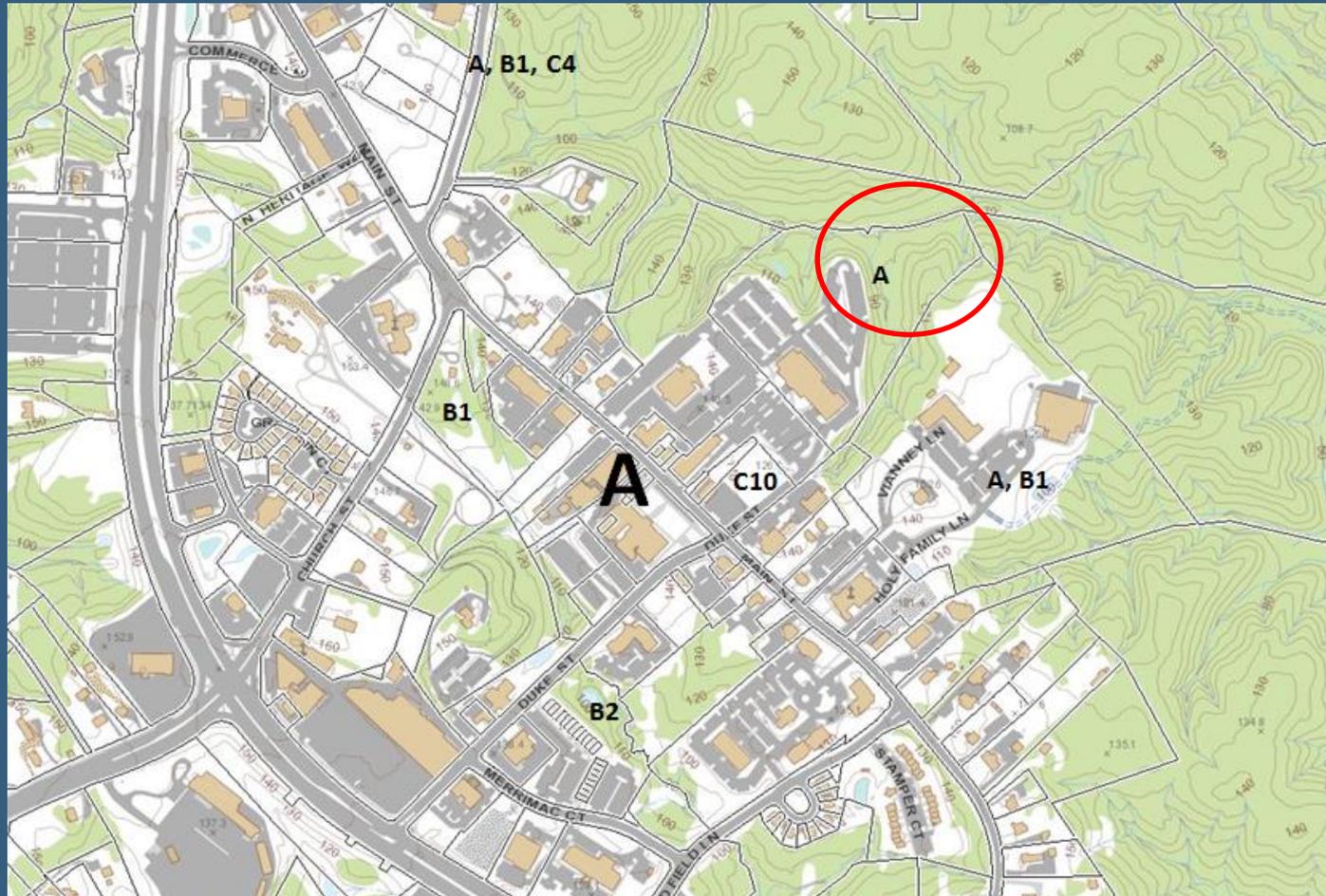


Types of Water Management Systems:	Code Key
Curb and Gutter Systems	A
Large Stormwater Structures:	
Stormwater Ponds - Dry or Detention Pond	B1
Stormwater Ponds - Wet or Retention Pond	B2
Stormwater Ponds - Constructed Wetland	B3
Low Impact Development:	
Cluster Zones	C1
Cul-de-sac reduction	C2
Shallow Front Setbacks	C3
Less or no sidewalks	C4
Reduced Parking area	C5
Narrower Streets	C6
Alternate roof runoff systems - rainbarrels, cisterns	C7
Infiltration systems to reduce runoff	C8
Natural area buffers	C9
Grass channels	C10
Green Roofs	C11

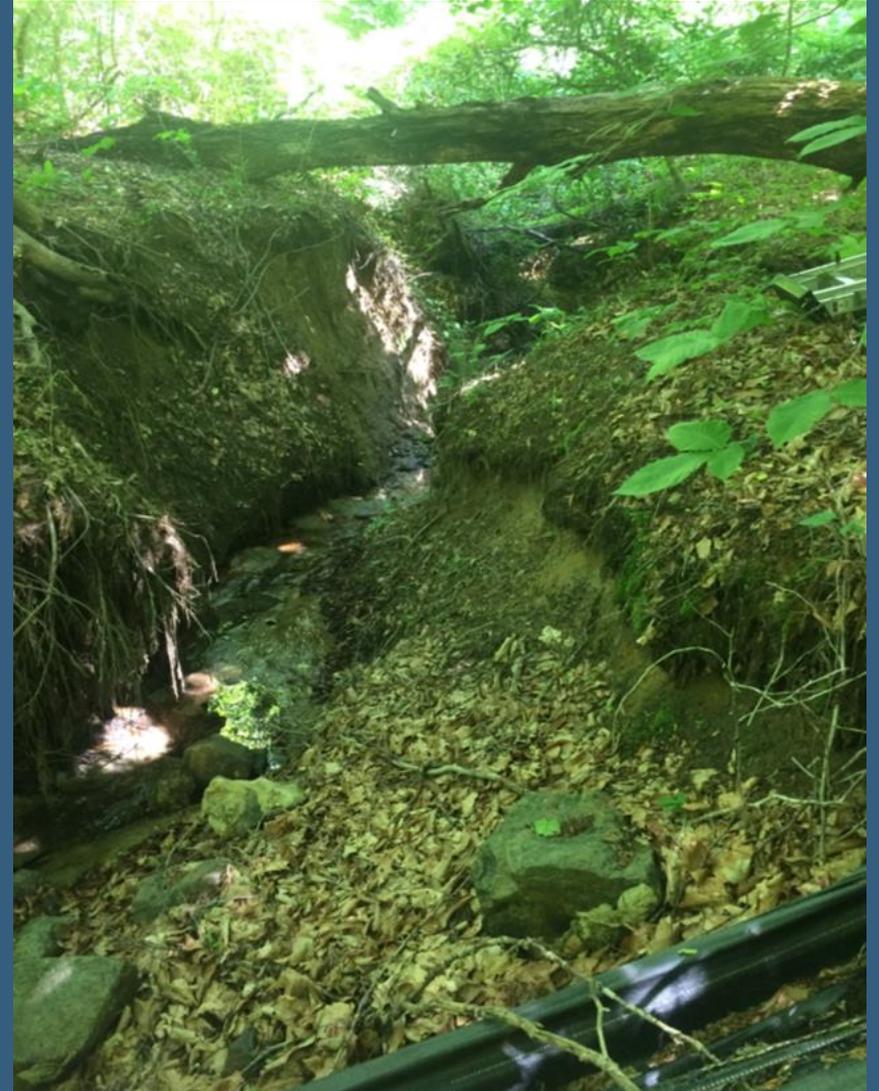
Stormwater Management Types Found in Parkers Creek Watershed May-June 2017



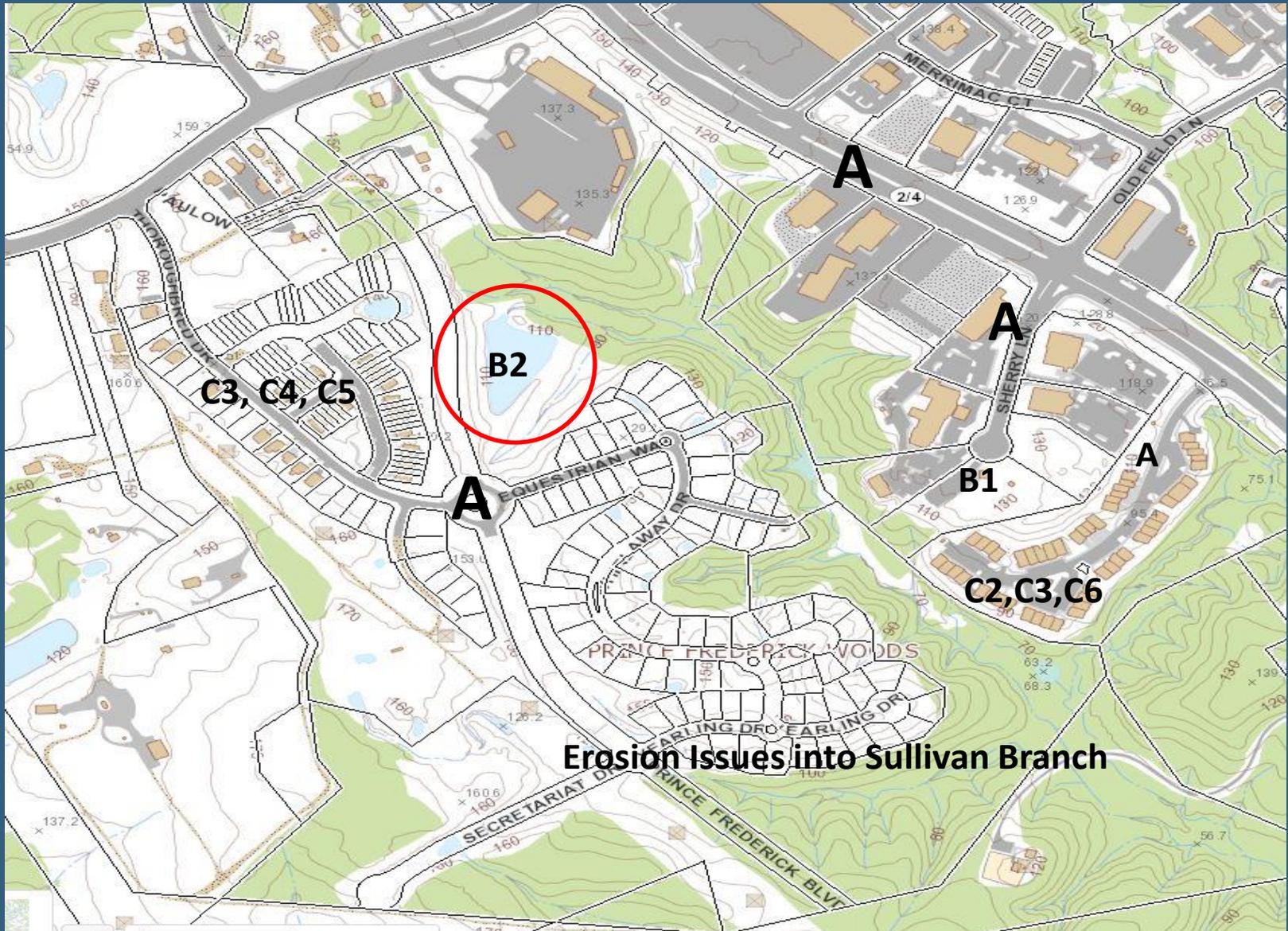
Main St, Prince Frederick



Stream System Erosion near Main St.



Prince Frederick Crossing Subdivision



Erosion Issues into Sullivan Branch

Prince Frederick Crossing Retention Pond



Sullivan Branch



*Prince Frederick Crossing
Subdivision abuts Sullivan
Branch

CBI = 1.3
VERY POOR

*Rated worst stream in Calvert Co.
by MBSS in 2014

Thoughts

Most systems antiquated; new developments show progress

- * Developers are integral to the equation
- * Retrofitting necessary

Adverse effects on local stream systems evident

Continue education and advocating

Questions?

