

Clean-up Plan for Roanoke River Watershed

Business

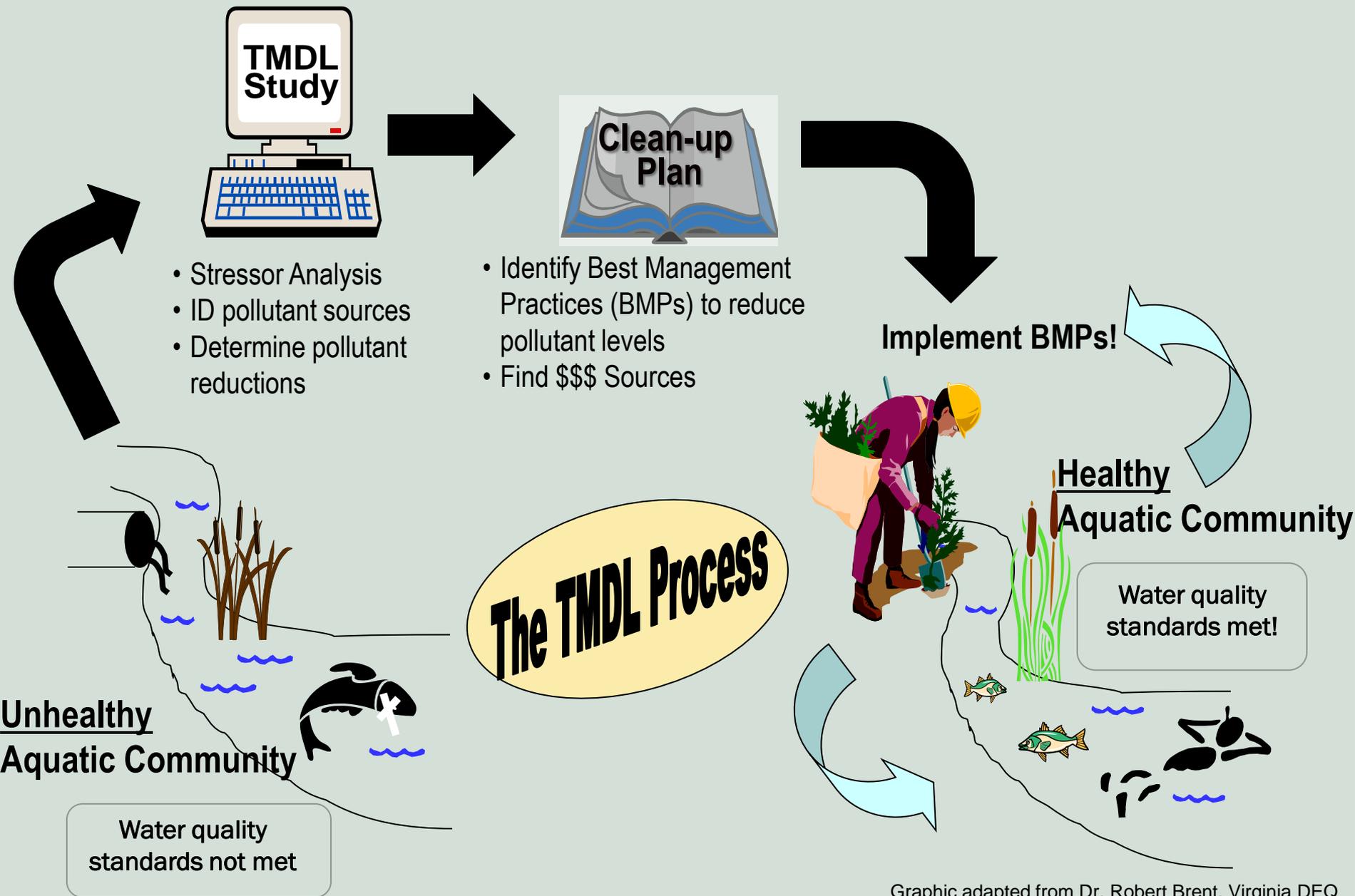
Working Group Meeting

February 27, 2014



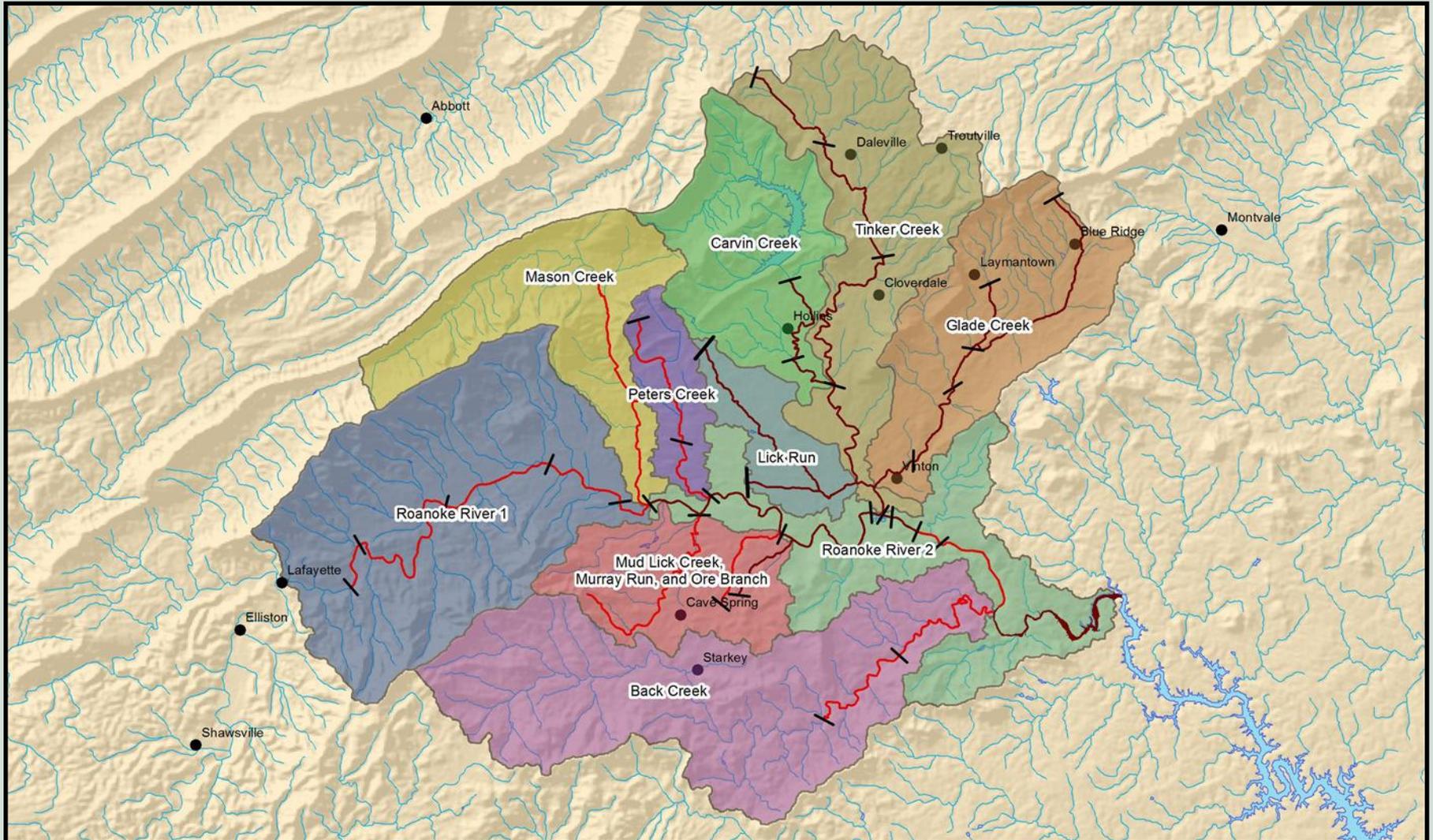
Presentation Overview

- Timeline/Introduction
- Watershed Overview
- TMDL Overview
- Implementation Plan Approach
- Implementation Actions
- Units and Costs
- Funding

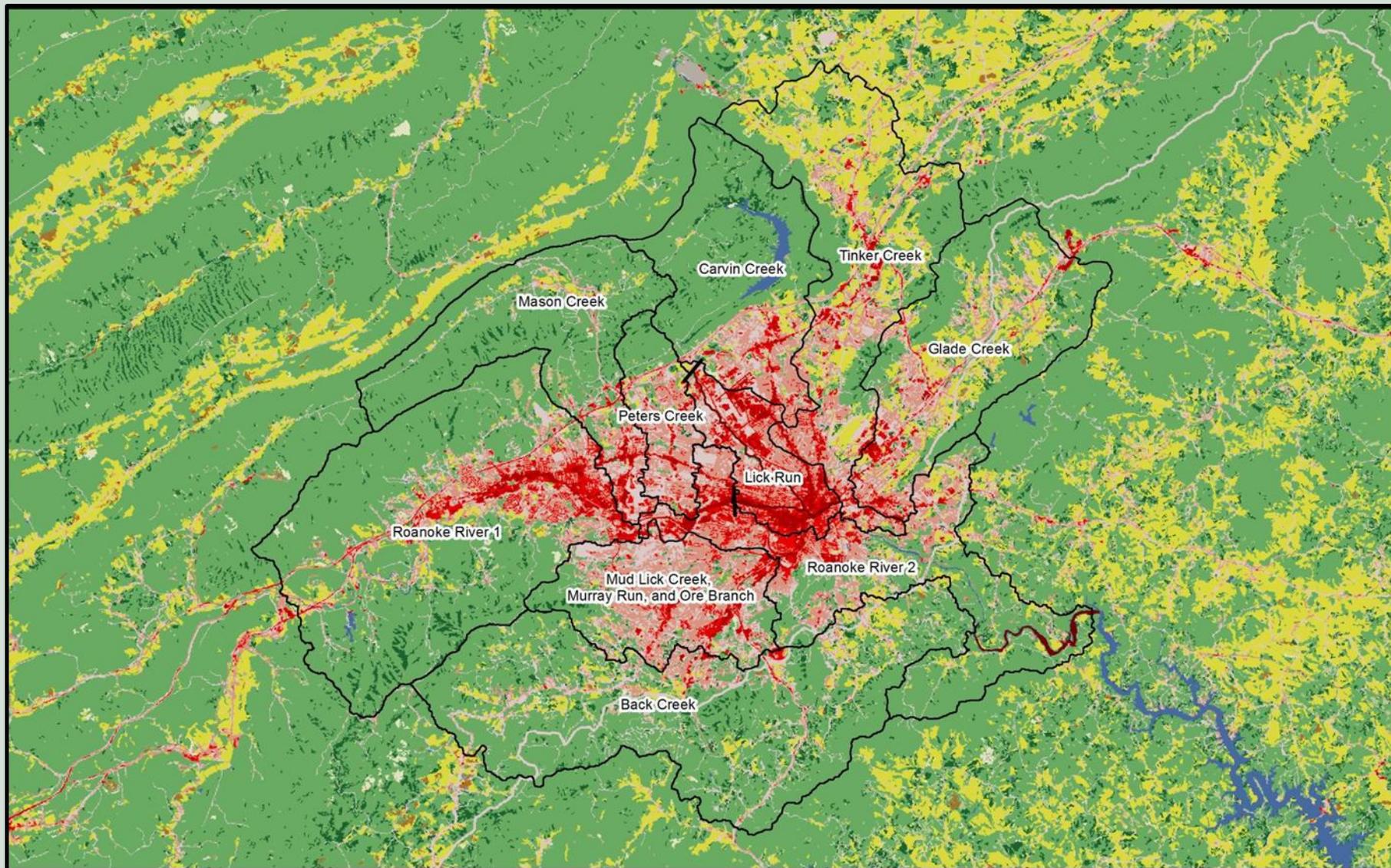


Graphic adapted from Dr. Robert Brent, Virginia DEQ

Overview of the Watershed



NLCD 2006 Landuse



Landuse

Landuse Percentages by Subwatershed

Source	Carvin Creek	Glade Creek	Lick Run	Tinker Creek	Back Creek	Mason Creek	Mud Lick Creek, Murray Run, and Ore Branch	Peters Creek	Roanoke River 1	Roanoke River 2
Developed	23.27%	33.67%	97.43%	35.83%	18.36%	19.99%	73.63%	65.96%	13.59%	26.35%
Cropland	0.00%	0.32%	0.00%	0.11%	0.17%	0.05%	0.03%	0.00%	0.02%	0.001%
Pasture/Hay	2.98%	19.01%	0.89%	28.20%	7.54%	2.77%	1.41%	3.12%	0.87%	0.45%
Forest	69.56%	46.85%	1.65%	35.43%	73.28%	76.47%	24.64%	30.69%	84.64%	72.75%
Water/Wetlands	3.95%	0.10%	0.02%	0.20%	0.05%	0.02%	0.03%	0.00%	0.17%	0.39%
Other*	0.25%	0.05%	0.01%	0.23%	0.59%	0.70%	0.26%	0.23%	0.71%	0.06%

*Includes Barren Land, Grassland/Herbaceous, Scrub/Shrub

Roanoke River Watershed Allocations

TMDL Bacteria Reductions by Source

Source	Back Creek	Carvin Creek	Glade Creek	Lick Run	Mason Creek	Mud Lick Creek, Murray Run, and Ore Branch	Peters Creek	Roanoke River 1	Roanoke River 2	Tinker Creek
Developed	98.9%	90.2%	96.3%	98.5%	98.9%	99.6%	98.9%	96.5%	98.2%	98.6%
Cropland	98.9%	0.0%	96.3%	0.0%	98.9%	99.6%	0.0%	96.5%	98.2%	99.8%
Pasture/Hay	98.9%	90.2%	96.3%	91.0%	98.9%	99.6%	98.9%	96.5%	98.2%	99.8%
Forest	98.9%	85.2%	91.5%	0.0%	98.9%	99.6%	98.9%	96.5%	98.2%	95.0%
Water/Wetlands	0.0%	85.2%	91.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	95.0%
Other	98.9%	90.2%	96.3%	0.0%	98.9%	99.6%	98.9%	96.5%	98.2%	98.0%
Livestock Direct	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Wildlife Direct	64.5%	75.0%	70.0%	0.0%	65.1%	87.9%	53.7%	67.1%	66.0%	0.0%
Straight Pipes and Sewer Overflows	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Roanoke River TMDL Sediment Reductions

Landuse Category		Percent Reduction
Land Sources	Developed	75%
	Cropland	75%
	Pasture/Hay	75%
	Forest	75%
	Water/Wetlands	0%
	Other	75%
Instream Erosion	-	75%

Adaptive Implementation Approach

Overarching Project Goal is to Design a Clean-up Plan including:

- Appropriate types and numbers of Best Management Practices designed to meet sediment and bacteria reduction goals called for in the Roanoke River watershed TMDL Reports
- Measurable Goals and Milestones for achieving water quality goals
- List and description of potential funding sources
- **Meeting Goals:** Discuss revised estimates of Best Management Practices by subwatershed that will result in reductions of urban bacteria and sediment loads.

Implementation Actions (Indirect Measures)

- Indirect measures refers to outreach, educational programs, and signage.
- Indirect measures intend to change behaviors and attitudes of watershed citizenry through outreach and education. Several examples of indirect measures to be considered in this plan include:
 - Pet Waste Education Campaign
 - Targeting of Educational Materials to Vet Offices and Kennels
 - Pet Waste Signage

Clean-up Plan Actions

- Refers to actions and installations that target pollutants at their source, and is a very cost-effective measure of reducing bacteria/sediment in stormwater
- The following are examples of preventative Best Management Practices (BMPs) being considered in the subwatersheds:
 - Proper Pet Waste disposal
 - Pet Waste Stations
 - Pet Waste Digesters

Clean-up Plan Actions

- Actions and installations that intercept pollutants before they reach our waterways
- The following are examples of Best Management Practices (BMPs) being considered in the subwatersheds:
 - Existing Stormwater BMP Retrofits
 - Low Impact Development Stormwater BMPs

Urban BMPs

Stormwater Retrofits

- Infiltration Basin/Trench Retrofit
- Constructed Wetland Retrofit



New Stormwater BMPs

- Bioretention
- Rain Garden
- Infiltration Basin/Trench
- Manufactured BMP
- Constructed Wetland



Urban BMPs

New Stormwater BMPs (continued)

- Riparian Buffer (Forested)
- Riparian Buffer (Grass/Shrub)
- Street Sweeping
- Vegetated Swale

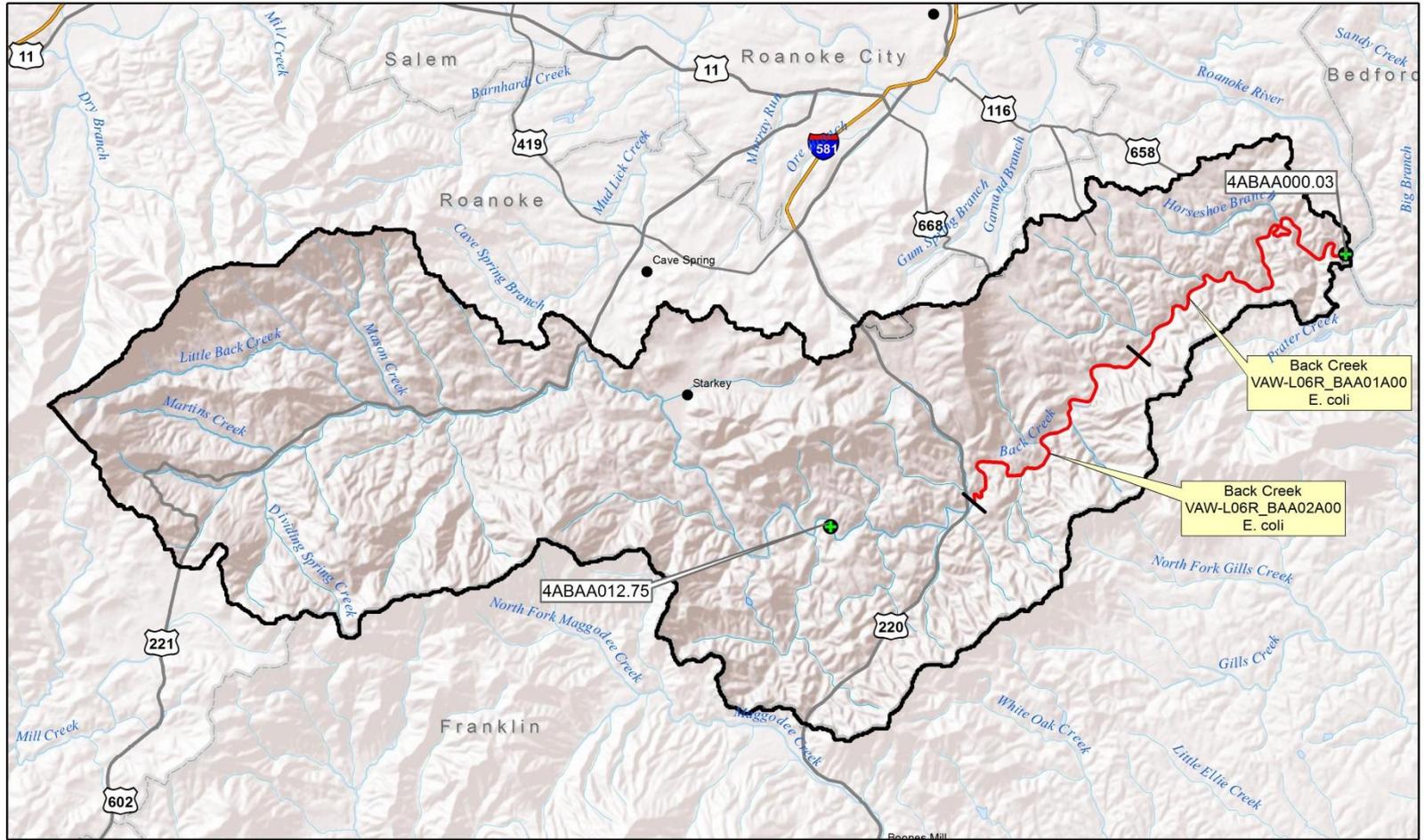


Urban BMPs

Detention Pond Retrofits				
Urban BMPs	Detention Pond Efficiency		Retrofitted Efficiency	
	Sediment Removal Efficiency	Bacteria Removal Efficiency	Sediment Removal Efficiency	Bacteria Removal Efficiency
Infiltration Basin/Trench	50%	30%	75%	90%
Constructed Wetland			50%	80%

Stormwater BMPs		
Urban BMPs	Sediment Removal Efficiency	Bacteria Removal Efficiency
Bioretention	70%	90%
Raingarden	70%	70%
Infiltration Basin/Trench	75%	90%
Manufactured BMP	80%	80%
Constructed Wetland	50%	80%
Riparian Buffer (Forested)	70%	57%
Riparian Buffer (Grass/Shrub)	50%	50%

Back Creek Subwatershed



Back Creek Subwatershed

Urban BMPs	Units	Area Treated (acres)	Unit	Cost/unit	Total Cost
Detention Pond Retrofits					
Infiltration Basin/Trench	37	1160	acre-treated	\$6,000	\$6,960,378
Constructed Wetland	17	545	acre-treated	\$2,900	\$1,581,488
Stormwater BMPs					
Bioretention	131	1,301	acre-treated	\$10,000	\$13,005,647
Raingarden	131	131	acre-treated	\$5,000	\$655,000
Infiltration Basin/Trench	131	130	acre-treated	\$6,000	\$782,581
Manufactured BMP	131	158	acre-treated	\$20,000	\$3,163,925
Constructed Wetland	131	3,755	acre-treated	\$2,900	\$10,889,910
Riparian Buffer (Forested)	N/A	12	acre-treated	\$3,500	\$40,289
Riparian Buffer (Grass/Shrub)	N/A	12	acre-treated	\$360	\$4,144

Additional Implementation Measures/BMPs for Consideration

- Street Sweeping Expansion
- Swales
- Green Roofs
- Enhanced Erosion and Sediment Control
- Pervious Pavement
- “Adopt-an-Inlet” Program
- Education on LID techniques and Proper Grease Disposal

Funding Sources

- USDA Programs – Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), Environmental Quality Incentives Program (EQIP)
- EPA Section 319 Funds
- Water Quality Improvement Fund
- State Revolving Loan Funds
- State Cost-Share Program
- State Tax Credits
- VA Small Business Environmental Assistance Fund Load Program
- Community Development Block Grant Program
- Southeast Rural Community Assistance Program (SER-CAP)
- Wetland Reserve Program (WRP)

Project Timeline

April 10, 2013

Kick-Off Meeting:
Introduce local agencies, government and NGOs
Implementation Process

June 20th

AG, Resid., Business Working Group Meetings:
Discuss potential best management practices and Outreach activities

November

21st Steering Committee Meeting
Prioritize Best Management Practices, discuss funding sources & timeline

Public Meeting:
Present Draft Clean up Plan to Citizens of the watersheds!

APRIL/MAY

JUNE

JULY/AUG.

FALL/WINTER 2013

JAN./FEB. 2014

SPRING 2014

June 11th

Open House:
Introduce Clean up Plan to the Community,
Working Group Sign up

August 27th

Government Working Group Meeting:
Discuss potential best management practices and Outreach activities

February

Working Group Meetings:
Discuss implementation scenarios, cost, funding

Steering Committee Meeting (& additional WG Mtgs as needed):
Address any additional challenges, monitoring plan, etc.

Public Comment period ends 30 days after Final Public Meeting.

NEXT STEP:
Finalize Clean up Plan, begin implementing Best Management Practices! Kick off N. and S. Forks Roanoke Clean up Plan...

TMDL Contacts



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Reports/presentations available at:

<http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLImplementation/TMDLImplementationProgress.aspx>

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