



Northeast Creek and Crooked Creek Watershed Improvement Plan

Public Works Department
Stormwater Services Division

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Public Workshop – October 23, 2012

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Meeting Agenda

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- Water Quality Goals
- Riparian Area Management Plan
- Critical Area Protection Plan
- Watershed Evaluations
- Preliminary Recommendations
- Next Steps

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Water Quality Goals

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Northeast and Crooked Creeks

Both watersheds are regulated by the Jordan Lake Nutrient Management Strategy (“Jordan Rules”)



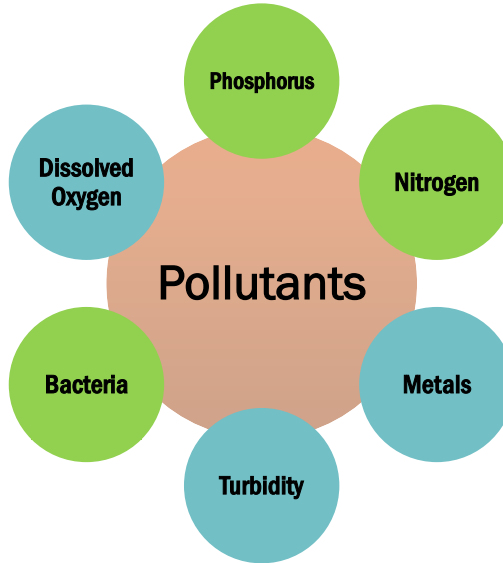


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Local Water Quality Issues



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Pollutant Reduction Goals

Total Nitrogen:

- 35% reduction FROM 2001 annual load
- Based on Jordan Lake Nutrient Management Strategy



Total Phosphorus:

- 5% reduction FROM 2001 annual load
- Based on Jordan Lake Nutrient Management Strategy



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Pollutant Reduction Goals

Sediment:

- 1,600 lbs/ac/yr
- Based on protection of aquatic species from monitoring in the Piedmont region of Georgia



Fecal Coliform:

- 4.1 cfu*10⁹/ac/yr
- Based on water quality standard of 200/100ml & average annual creek flow

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Pollutant Reduction Goals

Copper:

- 0.03 lb/ac/yr
- Based on “Action Level” in North Carolina and average annual creek flow



Zinc:

- 0.22 lb/ac/yr
- Based on “Action Level” in North Carolina and average annual creek flow

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Riparian Area Management Plan

Goals of the Riparian Area Management Plan:

- Develop improved maintenance procedures for City-owned land along creeks that protects and improves water quality:
 - Utility easements
 - Parks
 - Greenway Trails
- Serve as a guide for city-wide procedures, not tied to specific watershed
- Comply with buffer rules for the Neuse and Jordan Lake watersheds



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Riparian Area Management Plan

Goals of the Riparian Area Management Plan:

- Riparian Area Management Plan was developed as part of the Ellerbe Creek WIP
- Modified and updated for the Third Fork Creek and Northeast/Crooked Creek WIPs
- Stormwater Services partners with Parks and Recreation Department:
 - “Let It Grow” Fact Sheet
 - “Let It Grow” video
 - Public Outreach

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Riparian Area Management Plan

Public Outreach:

- Let It Grow Fact Sheet
- "No Mow" video

Let It Grow
Giving Nature a Hand with No Mow

Stream Buffers

The City of Durham joins other leading municipalities across the nation in recognizing the benefits of stream buffers. Stream buffers, the vegetated areas along streams, provide multiple advantages for the health of streams and water quality. They serve as a natural water filter.

WATER QUALITY BENEFITS

- Reduce sediment and debris and increase streamflow
- Stabilize stream banks and reduce stream bank erosion
- Filter out pollutants and improve water quality
- Reduce stream temperature and improve habitat for aquatic life

ECOLOGICAL BENEFITS

- Create a riparian habitat for native vegetation
- Increase biodiversity by providing food and shelter for native stream organisms
- Provide shade and cooler water temperatures for fish and aquatic insects

SUCCESSIONAL BENEFITS

- Allow plants to obtain high quality nutrients and water naturally
- Encourage stream bank vegetation succession
- Allow riparian areas to develop naturally over time

COST SAVINGS BENEFITS

- Decrease stream bank erosion and stream flow
- Reduce debris and organic matter
- Reduce peak storm water runoff
- Reduce risk of high-velocity flows of the stream bank

F.A.Q. Frequently Asked Questions

• What are the No Mow signs meant to do?
The signs are meant to inform the public about the riparian area management plan. The City requires property owners to maintain riparian areas in order to protect the health of the stream. The signs are meant to inform the public about the riparian area management plan and to encourage the public to support the plan.

• Can I still use the No Mow areas?
The No Mow areas are not meant to be used as a playground or for other recreational activities. The signs are meant to inform the public about the riparian area management plan and to encourage the public to support the plan.

• Will other areas of the park continue to be mowed?
The riparian area management plan only applies to the riparian area. Other areas of the park will continue to be mowed.

• How will the No Mow areas be managed over time?
The riparian area management plan includes a maintenance schedule. The City will maintain the riparian area management plan and will encourage the public to support the plan.

More information

For more information, visit the City of Durham website at www.durhamnc.gov or call the City of Durham at 919.560.4326.



Critical Area Protection Plan

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Critical Area Protection Plan

Goals of the Critical Area Protection Plan:

- Protect and preserve high-quality streams and their riparian buffers
- Create a continuous forested riparian corridor along Northeast and Crooked Creeks
- Expand existing natural areas (e.g., open spaces, parks, and greenways)

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Critical Area Protection Plan

Recommendations:

- Protect high-quality riparian buffers in 107 areas
- Protect and preserve 17 “Urban Gems”
- Acquire sites of 15 high-priority new Stormwater Control Measures



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Watershed Evaluations

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Existing Conditions

- Takes into account all existing development
- All 60 existing Stormwater Control Measures that are providing water quality benefits are included:
 - 15 - Dry Ponds
 - 35 - Wet Ponds
 - 3 - Constructed Wetlands
 - 1 - Bioretention
 - 6 - Sand Filters



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Existing Conditions

Pollutant Reduction Provided by Existing BMPs under Future Land Use Conditions

Summary Points	Pollutant Yield					
	Nitrogen (lbs/ac/yr)	Phosphorus (lbs/ac/yr)	Sediment (lbs/ac/yr)	Fecal Coliform (cfu x 10 ⁹ /ac/yr)	Copper (lbs/ac/yr)	Zinc (lbs/ac/yr)
Northeast Creek near Scott King Rd.	19.6	1.12	1,250	5.1	0.09	0.56
Water Quality Goals	12.3	1.1	1,600	4.1	0.03	0.22
Crooked Creek at Scott King Rd.	13.2	0.51	1,360	6.8	0.06	0.38
Water Quality Goals	7.9	0.46	1,600	4.1	0.03	0.22

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Watershed Evaluations

Evaluate the water quality benefits of various measures or programs:

- Add Retrofit Stormwater Control Measures (SCMs) to existing developed areas
- Retrofit existing SCMs
- Stream Restoration Projects
- The Stormwater Ordinance (Stormwater Performance Standards for Development)
- New SCMs for all City-owned property and right-of-ways
- New SCMs for targeted commercial and industrial land uses
- Sanitary Sewer Collection System Upgrades (e.g., reduce SSOs, leaks, spills)

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Watershed Evaluations

- A “Watershed Scenario” consists of a one or more of these water quality improvement measures or programs
- The annual reduction in pollutant load was estimated for each scenario
- Results are compared to the water quality goals to gauge effectiveness



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Recommended Plan

Combination of several water quality improvement measures:

- Retrofit existing Stormwater Control Measures
- Implement Retrofit Stormwater Control Measures to existing developed areas
- Implement stream restoration projects
- Stormwater Performance Standards for Development Ordinance
- Target SCM Retrofits for Commercial and Industrial Property (typically >3 ac parcels)
- Sewer system upgrades to reduce SSOs, leaks, and spills from the sewer collection system by 90%



Recommended Plan

Pollutant Reduction Provided by the Recommended Plan						
Summary Points	Pollutant Yield					
	Nitrogen (lbs/ac/yr)	Phosphorus (lbs/ac/yr)	Sediment (lbs/ac/yr)	Fecal Coliform (cfu x 10 ⁹ /ac/yr)	Copper (lbs/ac/yr)	Zinc (lbs/ac/yr)
Northeast Creek near Scott King Rd.	13.0 *(34%)	0.54 (52%)	810 (35%)	3.70 (27%)	0.06 (33%)	0.35 (39%)
Water Quality Goals	12.3	1.1	1,600	4.1	0.03	0.22
Crooked Creek at Scott King Rd.	11.2 (15%)	0.44 (14%)	1,140 (16%)	4.26 (37%)	0.05 (17%)	0.33 (13%)
Water Quality Goals	7.9	0.46	1,600	4.1	0.03	0.22

* Parenthesis reflect percent reduction from Existing Conditions Scenario





Next Steps

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Next Steps

- Obtain feedback from public and key stakeholders on recommended plan within 2 weeks
- Revise Draft Watershed Improvement Plan based on comments received by City staff and public

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