Eno River Watershed Improvement Plan

July 31, 2018
Sandi Wilbur, PE, City of Durham
Sujit Ekka, PE, PH, AECOM
Presentation Agenda

• Introductions and Project Background

• Update on Eno River Watershed Improvement Plan
  – Prioritizing Projects in the Watershed
  – Watershed Management Scenario Analysis

• Activities:
  – Kids station
  – Fill out the Survey
  – Visit Informational Posters
Durham’s Nutrient Sensitive Waters

- Regulatory Framework
  - Neuse River: Nitrogen reduced by 30%
  - Falls Lake: Nitrogen reduced by 40%, Phosphorus reduced by 77%
Streams with Impaired Water Quality

- Ellerbe Creek
- Third Fork Creek
- Northeast & Crooked Creek
- Little Lick Creek
- Eno River (Orange County)

Next:
- Sandy/New Hope
Eno River Watershed
151 square miles
Eno River Watershed Plan Goals

• Evaluate water quality and watershed health
• Identify “hotspot” areas
• Evaluate the benefits of:
  − Stormwater Control Measures (SCMs)
  − stream restoration opportunities
• Meet Federal and State water quality regulations
Recap: Stormwater Control Measures and Stream Inventory

**Assess**
- current SCM and stream conditions

**Identify**
- water quality issues

**Find**
- stream restoration opportunities

**Find**
- SCM opportunities (new & existing)
Recap: Watershed Modeling

- Stream flow, nutrients and sediment simulated
- 2008-2016 simulation period
- Evaluate water quality benefits associated with various SCM scenarios
Second Public Meeting: Survey Results

Importance of criteria used to rank watershed improvement projects

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Very Important</th>
<th>Moderately Important</th>
<th>Slightly Important</th>
<th>Not Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Quality Benefits</td>
<td>95%</td>
<td>5%</td>
<td></td>
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</tr>
<tr>
<td>Habitat and Biological Integrity</td>
<td>92%</td>
<td>8%</td>
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<tr>
<td>Stream Bank Protection</td>
<td>75%</td>
<td>20%</td>
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<tr>
<td>Community Enhancement</td>
<td>40%</td>
<td>49%</td>
<td>10%</td>
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<tr>
<td>Implementation Issues</td>
<td>19%</td>
<td>56%</td>
<td>21%</td>
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<tr>
<td>Public Safety and Public Property</td>
<td>29%</td>
<td>46%</td>
<td>21%</td>
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</table>

The Community is most concerned about:

- Trash & Plastic (10)
- Construction Sediment (5)
- Sewer Overflows (4)
- Swimming Safety (3)
- Industrial Pollution (3)
Project Evaluation and Prioritization Criteria

- Water quality treatment
- Implementation Issues
- Community Enhancement
- Habitat and Biological Integrity
- Stream Bank Protection
- Public safety and Property
SCM Project Prioritization Results

- 38 retrofits to existing SCMs
- 24 new SCMs
- Estimated cost-$29m
Stream Project Prioritization Results

- 10 restorations
- 22 stream enhancements
- 3 bank stabilization
- 30 stream preservation
- Estimated cost - $28.4 million
- Overall most benefit
Scenarios

Baseline condition (existing land use + existing SCMs)

Future Land Use +

Existing Stormwater Control Measures

Stormwater Control Measure Projects

Stream Projects

Land Conservation

Green Infrastructure

Section 8.3: Stormwater Control Measures

Stormwater Requirements for New Construction
Scenario Analysis Results (Within City limits)

Percent Change in Annual Load from Existing Condition

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Future Land Use (FLU)</th>
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- **Baseline:**
  - Total Nitrogen: 21%
  - Total Phosphorus: 9%
  - Total Suspended Solids:

- **Future Land Use (FLU):**
  - Total Suspended Solids: 30%

Legend:
- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids
Scenario Analysis Results
(Within City limits)

Percent Change in Annual Load from Existing Condition

Future Land Use (FLU)
- Total Nitrogen: 21%
- Total Phosphorus: 9%

New Construction Stormwater Requirements (NCSR)
- Total Nitrogen: 30%
- Total Phosphorus: 13%
- Total Suspended Solids: 28%
Scenario Analysis Results (Within City limits)

Percent Change in Annual Load from Existing Condition

New Construction Stormwater Requirements (NCSR) + FLU

- Total Nitrogen: 13%
- Total Phosphorus: 1%
- Total Suspended Solids: 28%

Stormwater Control Measure Projects

- Total Nitrogen: 10%
- Total Phosphorus: 2%
- Total Suspended Solids: 24%
Scenario Analysis Results
(Within City limits)

Percent Change in Annual Load from Existing Condition

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Nitrogen</th>
<th>Total Phosphorus</th>
<th>Total Suspended Solids</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Construction Stormwater</td>
<td>13%</td>
<td>1%</td>
<td>28%</td>
</tr>
<tr>
<td>Requirements (NCSR) + FLU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stream Projects</td>
<td>6%</td>
<td>17%</td>
<td>NA</td>
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</table>
Scenario Analysis Results (Within City limits)

Percent Change in Annual Load from Existing Condition

<table>
<thead>
<tr>
<th>New Construction Stormwater Requirements (NCSR)</th>
<th>Green Infrastructure and Low Impact Development</th>
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<tr>
<td>+ FLU</td>
<td></td>
</tr>
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<td>13%</td>
<td>28%</td>
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<td>1%</td>
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<td>10%</td>
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<td>2%</td>
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<tr>
<td>25%</td>
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- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids

Legend:
- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids
Scenario Analysis Results (Within City limits)

Percent Change in Annual Load from Existing Condition

- New Construction
- Stormwater Requirements (NCSR) + FLU
- Land Conservation

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<td></td>
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<tr>
<td>Land Conservation</td>
<td>12%</td>
<td></td>
<td>0% NA</td>
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- Total Nitrogen
- Total Phosphorus
- Total Suspended Solids

Legend:
- Blue
- Orange
- Green
## Scenario Analysis Results
(Within City limits)

### Percent Change in Annual Load from Existing Condition

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<th>Stormwater Control Measure Projects</th>
<th>Stream Projects</th>
<th>Green Infrastructure and Low Impact Development</th>
<th>Land Conservation</th>
<th>COMBINED PRACTICES*</th>
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<tr>
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<td>0%</td>
<td>NA</td>
<td>19%</td>
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<tr>
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<td>15%</td>
<td>22%</td>
<td>19%</td>
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*Includes SCM projects, stream restoration, GI-LID, and land conservation for total nitrogen and total phosphorus.
Recommendations from Watershed Improvement Plan

• Implement high-priority projects (SCM and Streams)
• Preserve high-quality streams and stream buffer areas (land conservation)
• Implement green infrastructure practices (high infiltration areas)
• Maintain current programs and practices
Next Steps

• Draft Watershed Improvement Plan

• Final Watershed Improvement Plan

• Implement projects and track progress

Eno Watershed webpage on City of Durham Site

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