



# **DURHAM COUNTY NC**

## Nutrient Management Strategies

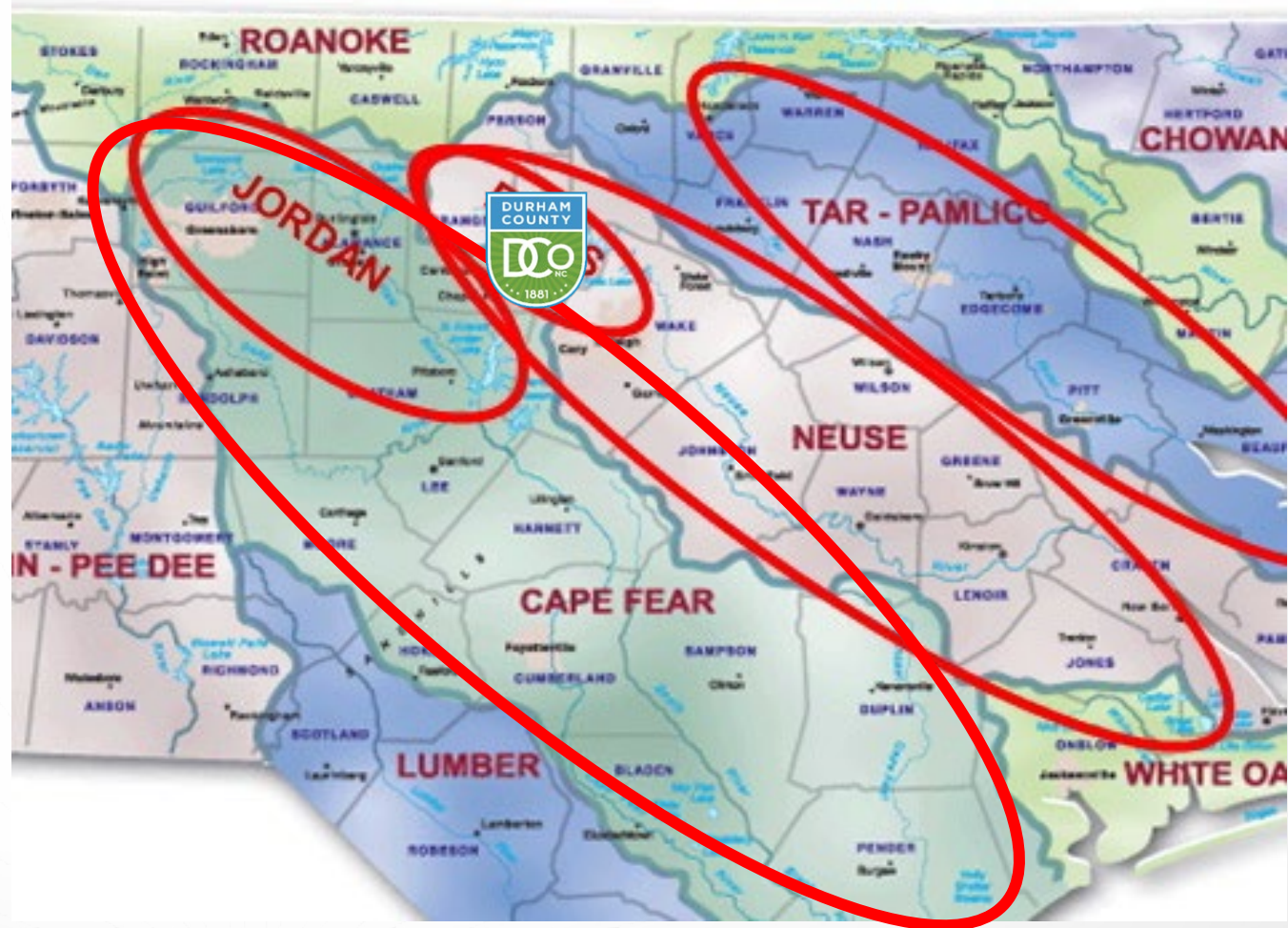
# Today's Presentation

- Background
- Stormwater Concerns
- Utility Development
- Alternative Compliance
- Nutrient Management Study
- Project Identification
- Next Steps



# Location, Location, Location

- Durham County is split between two major river basins
- **Cape Fear River Basin** (Southern Durham County)
- **Neuse River Basin** (Northern and Southeastern Durham County)



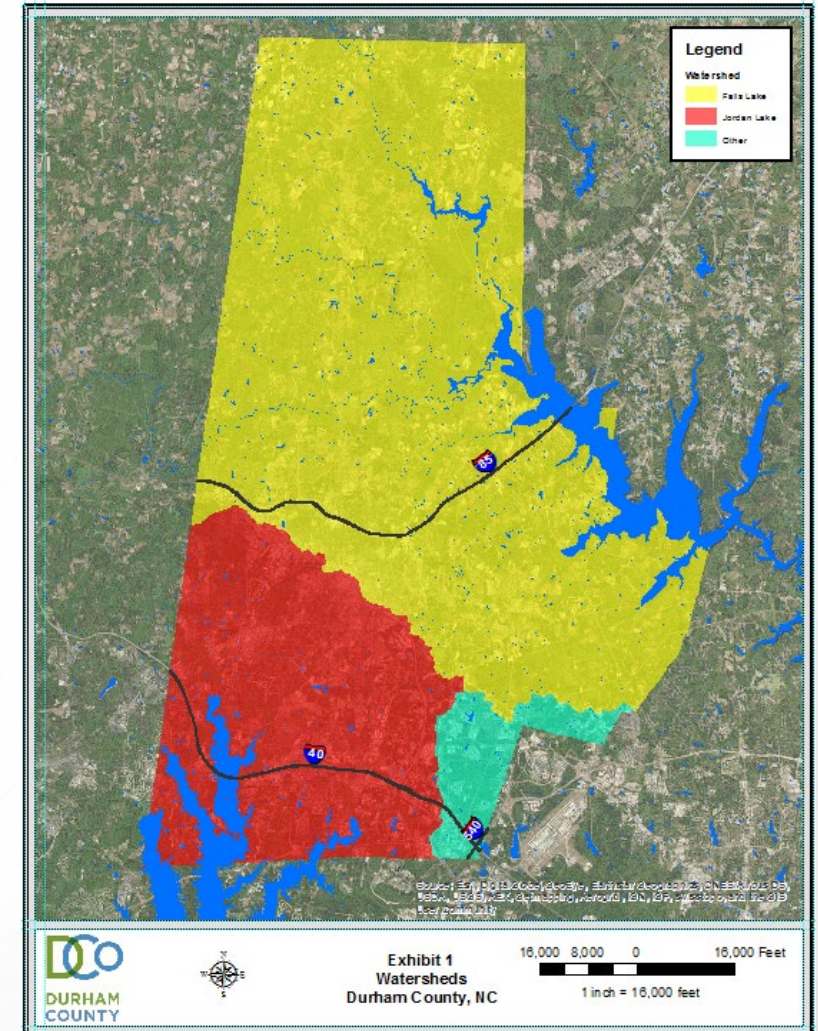
# Pollutants in North Carolina Waterbodies

- North Carolina Department of Environmental Quality (NCDEQ) water quality modeling
- Determination that Jordan Lake and Falls Lake have excessive levels of Nitrogen and/or Phosphorous
- Delegated them to be “Nutrient Sensitive Waters” (NSW)



# Nutrient Sensitive Water and Special Watershed Programs

- Nutrient Sensitive Water Management Strategies are adopted legislation
- Local municipalities and counties are required by law to comply with the nitrogen and/or phosphorous reductions required by the State
- Durham County must comply with three separate rules:
  - ★ Neuse River Basin Nutrient Strategy
  - ★ Falls Lake Nutrient Management Rules
  - ★ Jordan Lake Nutrient Management Rules





# What does Durham County have to do?

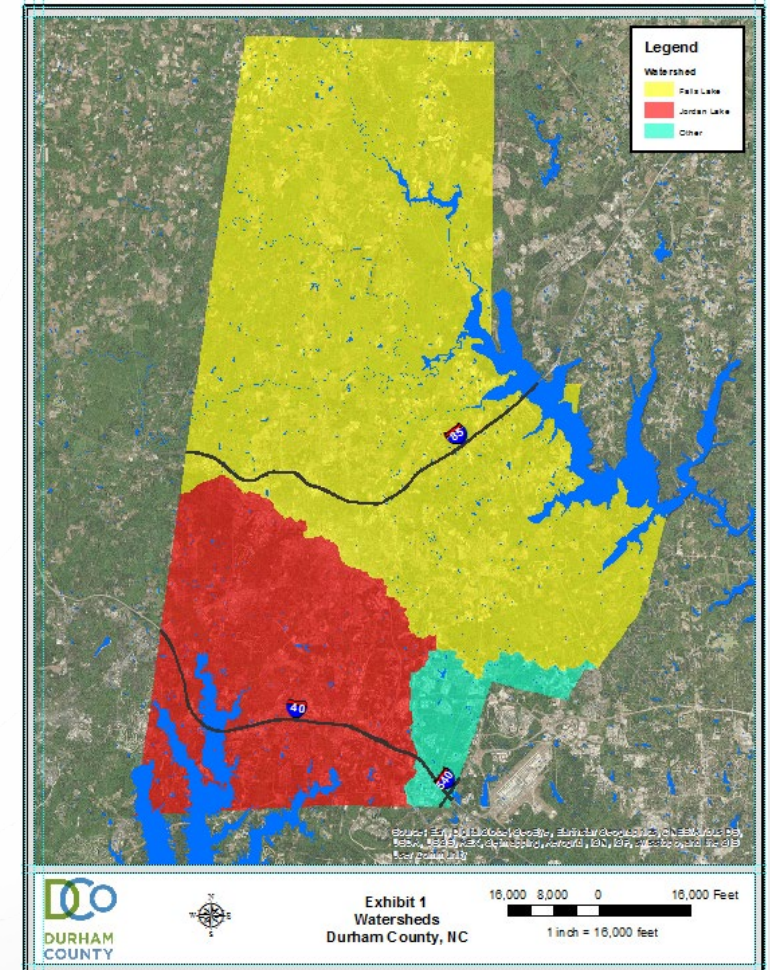
**Reduce nutrients entering our waterways!**

## **How?**

- Require new development to meet nutrient rules on-site
- Design and construct stormwater control measures to help treat runoff before entering the stormwater system
  - Purchase undeveloped land for conservation
- Retrofit old stormwater measures to function better for water quality

# Durham County Watersheds and Compliance Costs

- Neuse River - including Falls Lake & Remainder
- Cape Fear River - including Jordan Lake
  - Neuse River Rules = No New Cost
  - Falls Lake Rules (estimated costs):
    - Stage 1 = \$666,500 (IAIA)
    - Stage 2 = \$67,000,000 (approx. 2026-2041)
  - Jordan Lake Rules (estimated costs):
    - Stage 1 = No New Cost
    - Stage 2 = \$5,900,000 (on hold)



# Stormwater Program Priorities

## Rules Compliance

Durham County's ultimate goal is to be in compliance with the Falls and Jordan Rules



## Efficiency

Recognizing these are taxpayer dollars, we will seek to get the best bang for your buck.

## Resiliency

The County will seek out opportunities to address not only water quality, but the effects of climate change and flooding

## Environmental Justice

Where possible, the County will prioritize underserved areas and populations for projects to improve watershed health.







# Stormwater Utility Fee

- 14,875 parcels billed in 2020-21 fiscal year
  - Tiered Residential Structure
  - NSFR for Commercial, Industrial, Gov't, etc.
- Initial fee reduced to 1/3 based on financial burdens associated with COVID-19 to \$24 per ERU per year (ERU = 4,300 sq ft)
- Increased to \$48 per ERU per year in 2022

# Interim Alternative Implementation Approach

- Falls Lake Rules Stage I
- Joint Compliance (under the Rules)
- Financial Approach vs Nutrient Loading Approach
- Administered through the Upper Neuse River Basin Association (UNRBA)

Member	Annual Funding Level	Member	Annual Funding Level
Town of Butner	\$23,393	Town of Hillsborough	\$34,221
City of Creedmoor	\$16,926	Orange County	\$161,943
City of Durham	\$337,587	Person County	\$114,394
Durham County	\$133,300	City of Raleigh	\$466,081
Franklin County	\$19,058	Wake County	\$88,968
Granville County	\$100,453	Town of Wake Forest	\$13,692

- Durham County Commitment = \$133,300/year



# Interim Alternative Implementation Approach

## Eligible Activities:

- State Approved Practices – SCMs
- Green Infrastructure with Water Quality/Quantity Improvement
- Stream and Riparian Buffer Restoration and Enhancement
- Programmatic Measures
  - Fertilizer Application Education
  - Onsite Wastewater
  - Waste Management
- Infrastructure Improvement
- IDDE
- Land Conservation (in High Priority Areas)
- Floodplain Restoration and Reconnection
- Greenways and Parks with Water Quality/Quantity Benefits
- Flooding Reduction Projects with Water Quality Benefit
- O&M for Long-Term Functionality of Practices



# IAIA Compliance

- Durham County Commitment = \$133,300/year
- Compliance May Be Reached Through:
  - Self Funding Projects – all aspects (Planning, Land Acquisition, Construction, etc)
  - Inter-Local Agreements – joint funding projects
  - Funding Existing Programs – specific to water quality/watershed improvement
  - Contribute to a Pool of Program Funds

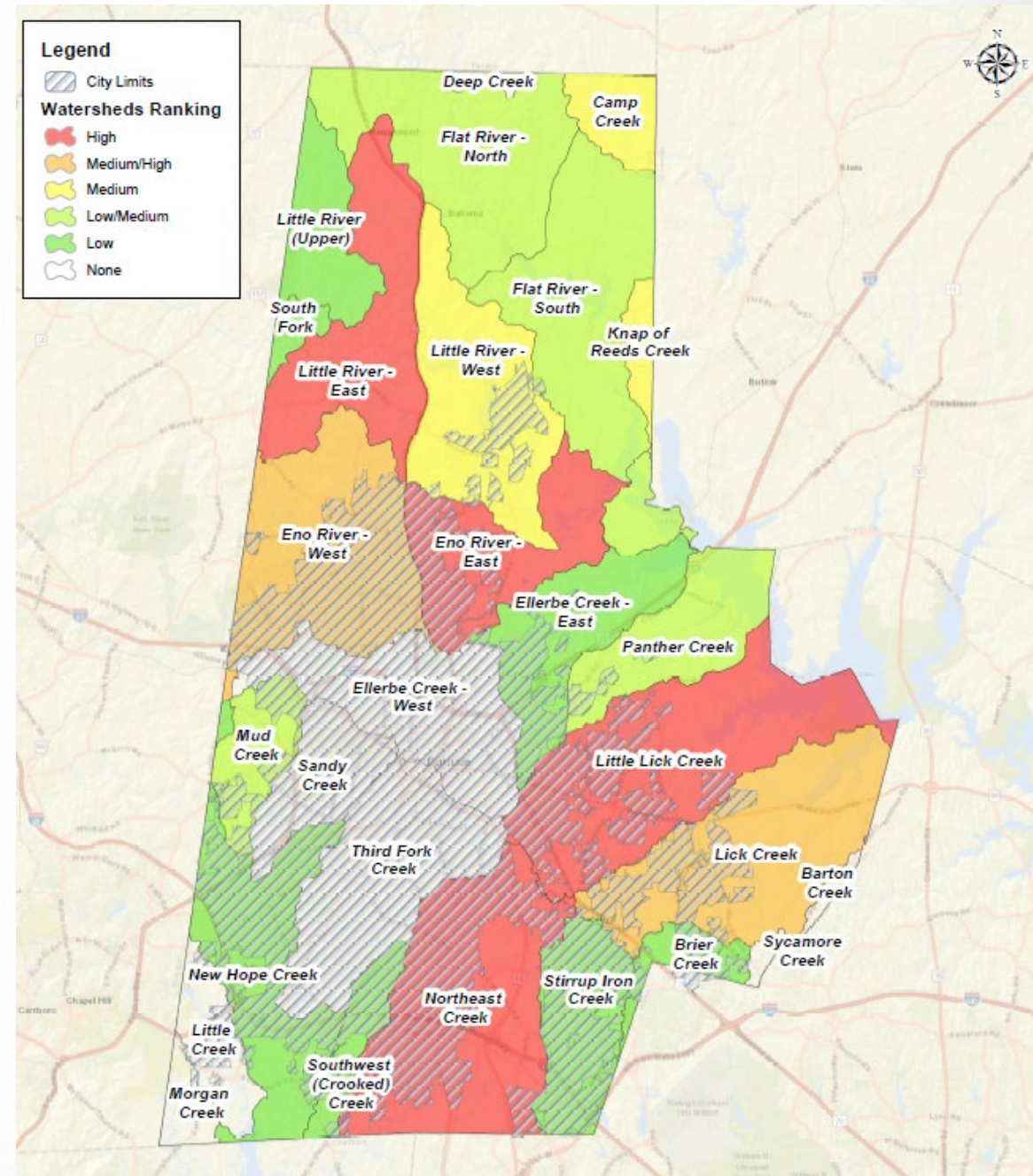


# Nutrient Management Study

- Desktop/GIS analyses to identify high priority watersheds for implementation
- Develop prioritization rubric in alignment with four program priorities
- Identify structural nutrient management projects for near-term implementation
- Develop framework for identification and prioritization of future projects

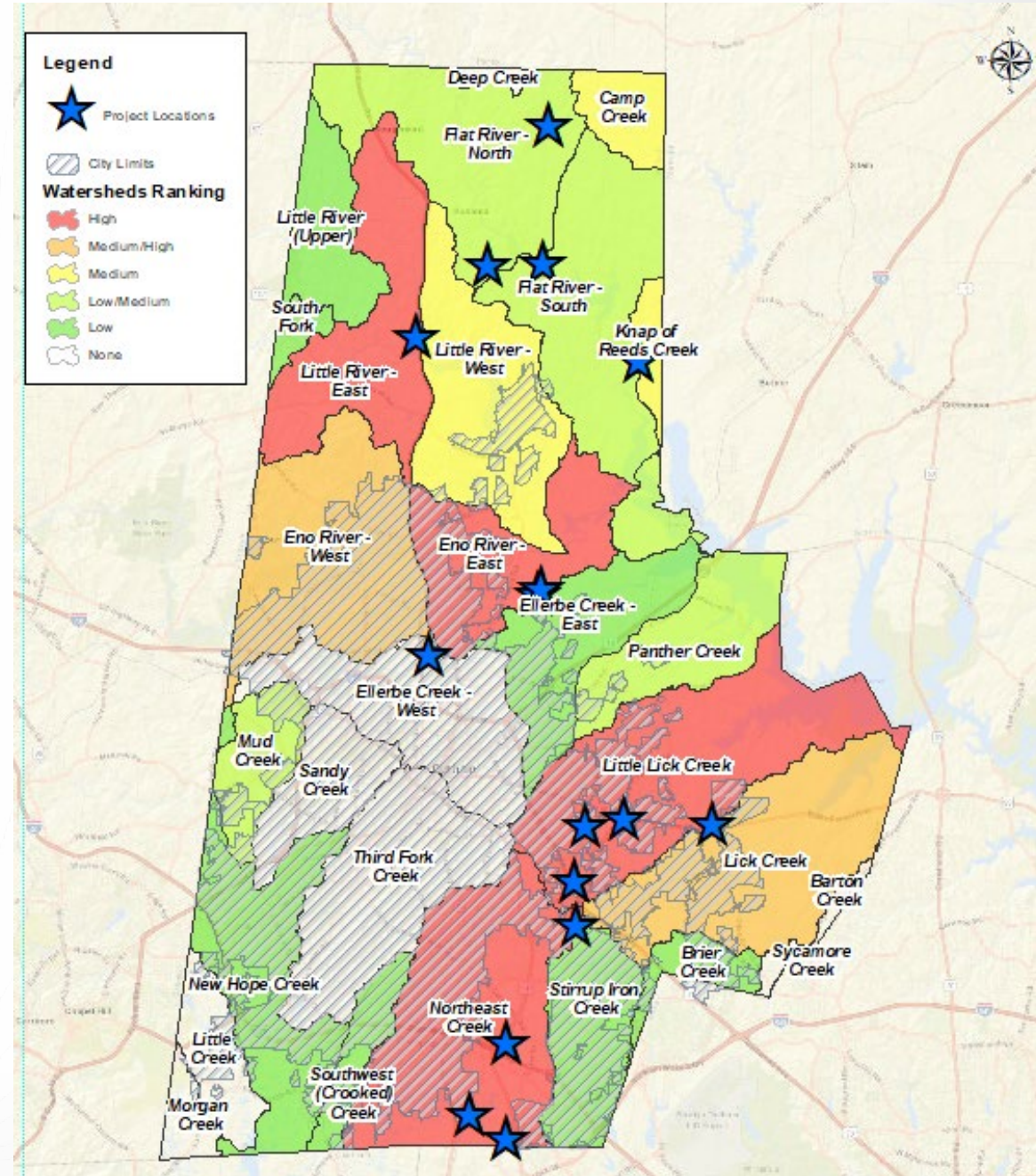
# Countywide Desktop Analyses

- Analyses
  - Floodplains
  - Impervious area
  - Riparian corridor
  - Stormwater control measures (SCMs)
  - Land conservation
  - Property ownership
- Watershed prioritization



# Project Identification

- 15 desktop identified projects
- Focus in high-priority watersheds
- Distribute projects throughout County
- Include variety of nutrient management strategies
  - New SCMs
  - Retrofit SCMs
  - Stream enhancement and floodplain connection
  - Riparian buffer and stream restoration



# Project Selection

- Focus on visible projects for community
- Ground-truth projects for feasibility
- Identified six (6) sites for near-term implementation
  - Concept design
  - Cost estimate
  - Nutrient reduction (SNAP tool)
  - Rubric scoring





# Rubric Scoring

				Durham Public Schools Operations	Little River Community Complex	Mangum Elementary School	Neal Middle School	Oak Grove Elementary School	Whispering Pines Mobile Home Park
Category	Criteria	Rating	Weighting Factor						
<b>Water Quality Treatment</b>									
	Nutrient Reduction (Total lbs) - Compliance	1 - 5	3	9	6	3	9	6	15
	Targeted Watershed - Compliance	1 - 5	1	5	5	2	5	5	5
<b>Community Enhancement</b>									
	Public Education- Efficiency	0 - 2	1	0	0	2	2	2	0
	Recreation Creation/Enhancement - Efficiency	0 - 3	2	0	6	0	0	0	4
	Environmental Justice/Equity - Environment Justice	0 - 5	2	2	0	10	2	6	10
<b>Implementation Constraints</b>									
	Property Ownership - Efficiency	1 - 3	3	9	6	9	9	9	3
	Site Accessibility for Construction and O&M - Efficiency, Resiliency	1 - 3	1	3	1	1	3	3	1
	Permitting Requirements - Efficiency	1 - 3	1	3	3	3	3	3	1
	Constructability - Efficiency	1 - 3	1	3	3	3	3	3	1
<b>Public Safety &amp; Public Property Considerations</b>									
	Flood Protection or Reduction - Efficiency, Resiliency	1 - 5	1	1	1	1	1	1	5
	FEMA Floodplain - Efficiency, Resiliency	1 - 5	1	0	0	0	0	0	3
<b>Costs - Constuction and Maintenance</b>									
	Cost Benefit - Efficiency	1 - 3	5	15	5	5	15	5	15
	Maintenance - Efficiency, Resiliency	1 - 3	1	1	1	1	1	2	1
<b>Multi-Layer</b>									
	Bonus for Achieving >1 of Counties Priorities - Efficiency	0 - 4	4	16	12	16	16	16	16
				<b>TOTAL SCORE</b>					
Total Maximum Score				<b>67</b>	<b>49</b>	<b>56</b>	<b>69</b>	<b>61</b>	<b>80</b>

# Scoring Categories

- Water quality treatment
  - **Compliance**
  - Total nutrient reduction
  - Targeted watershed
- Community enhancement
  - **Efficiency and environmental justice**
  - Proximity to schools
  - Proximity to public parks or community centers
  - Percentage of population classified as low income or minority



# Scoring Categories

- Implementation constraints
  - **Efficiency and resiliency**
  - Property ownership
  - Site access
  - Permitting
  - Constructability
- Public safety
  - **Efficiency and resiliency**
  - Flood reduction or prevention
  - Proximity to floodplain



# Scoring Categories

- Cost (construction and maintenance)
  - **Efficiency**
  - Cost benefit related to nutrient removal
  - Maintenance requirements
- Multi-layer
  - Bonus points for achieving >1 of the County's 4 priorities





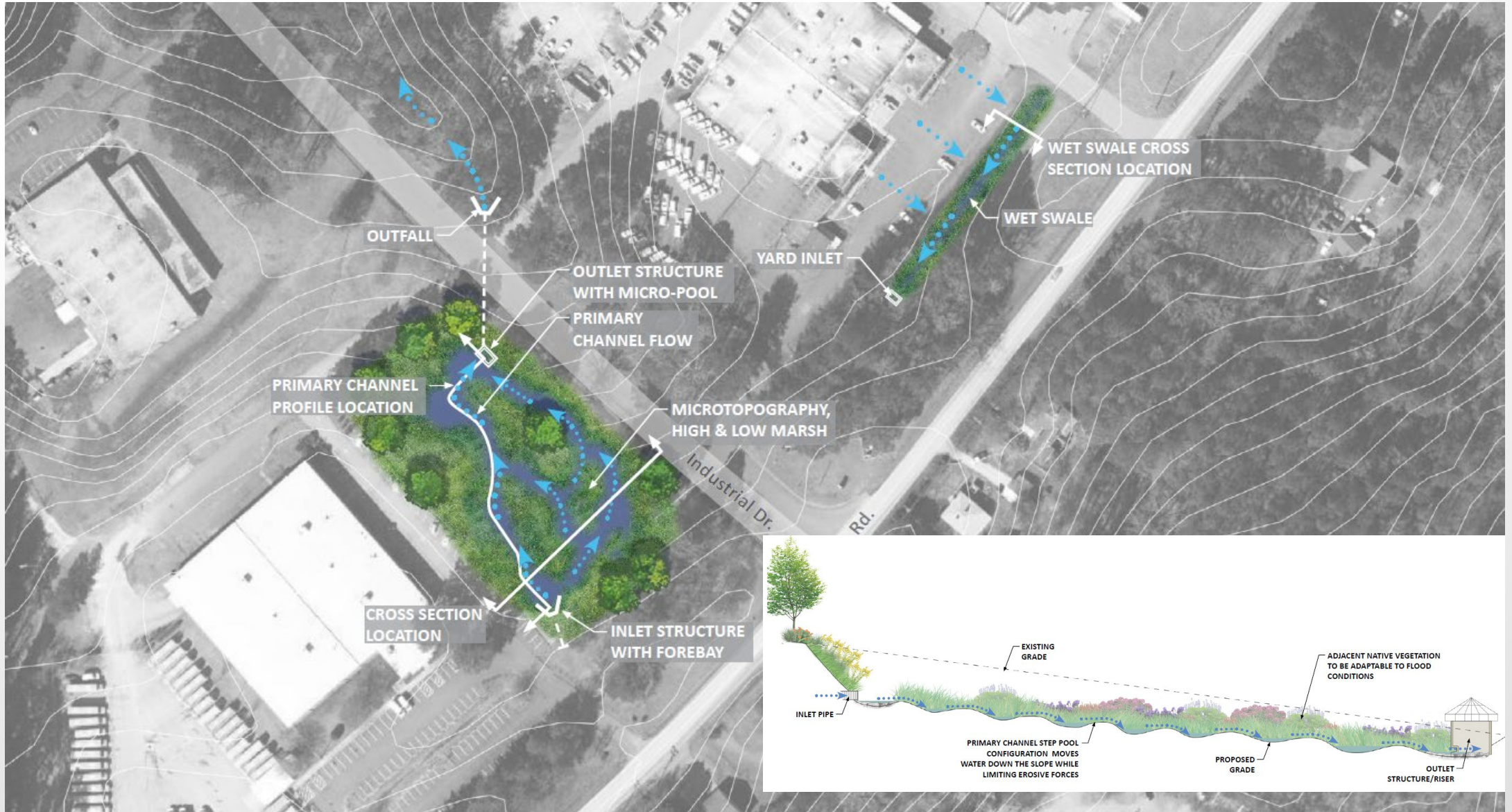
# Whispering Pines Mobile Park – Stream Enhancement and Bioretention (Score: 80)



# Neal Middle School – Bioretention (Score: 69)

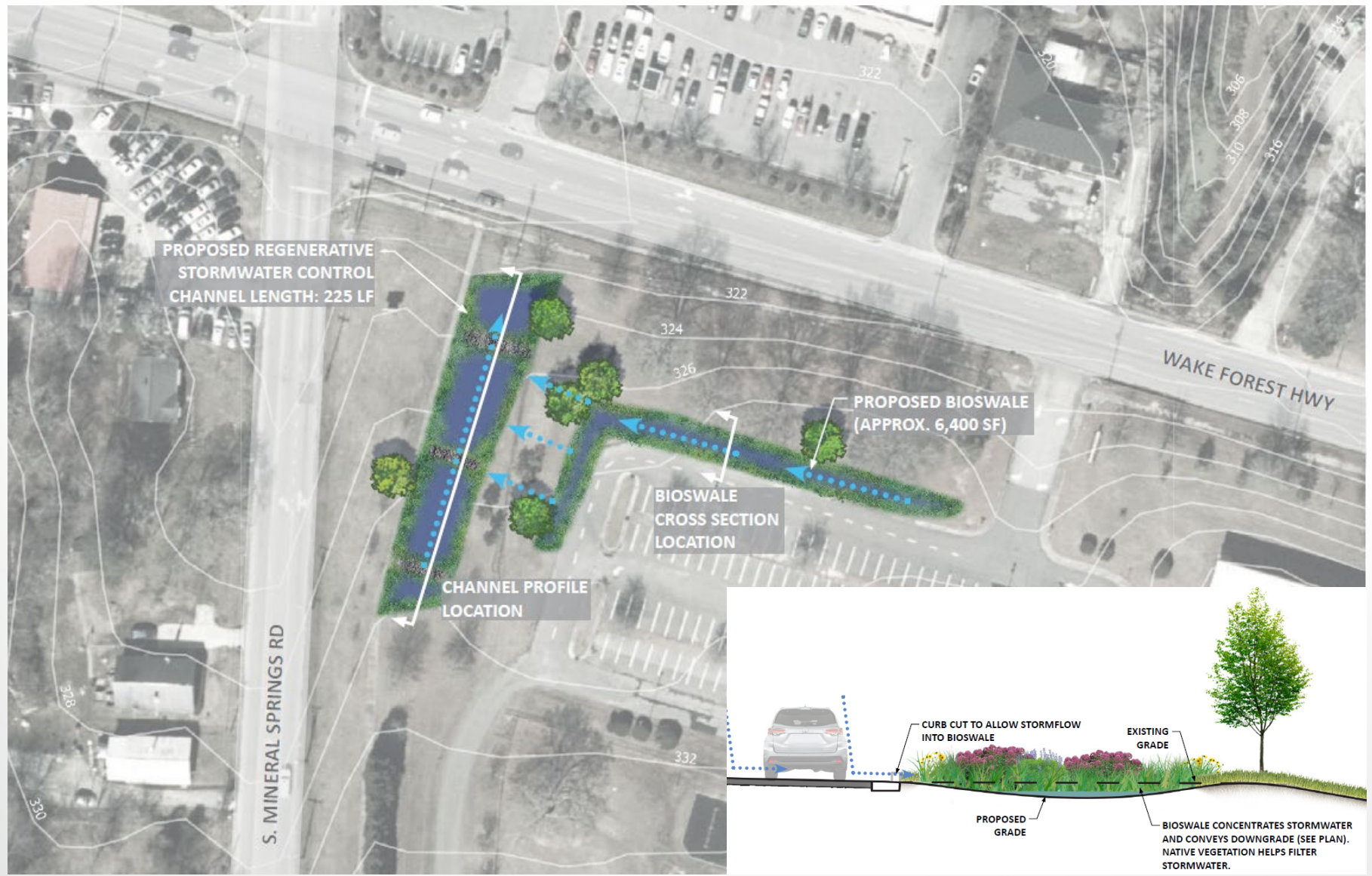


# DPS Operations – Wetland Retrofit (Score: 67)





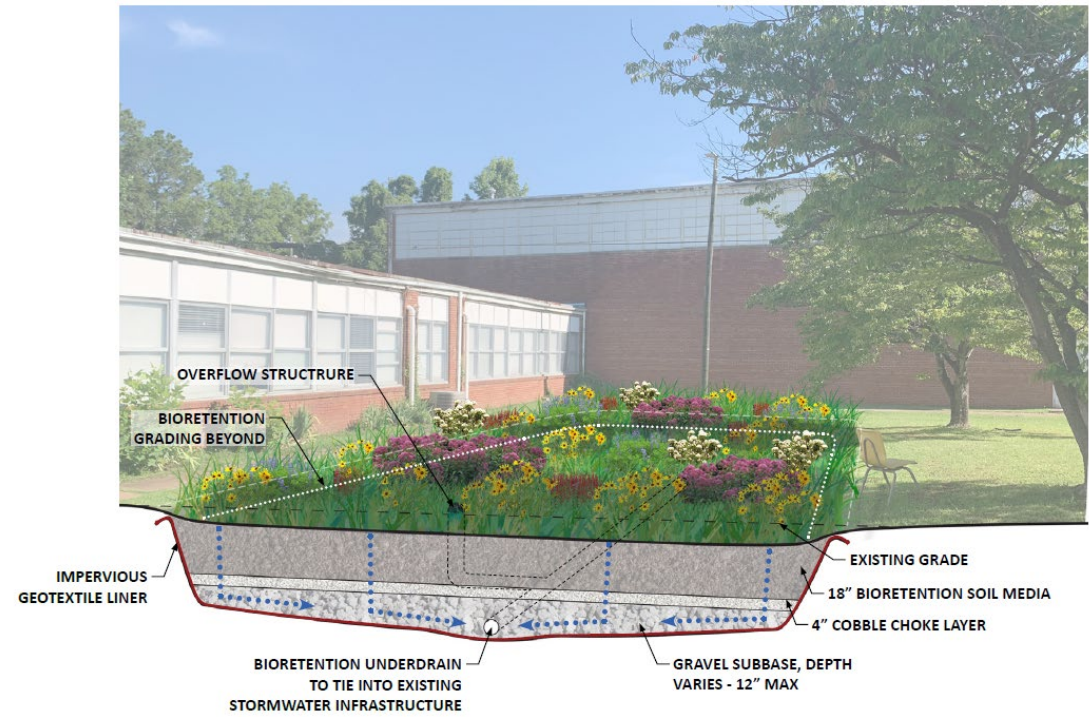
# Oak Grove Elementary – RSC and Bioswale (Score: 61)





# Little River Community – Bioretention and Wetland

(Score: 49)





# Project Summary

Name	Rubric Score	Cost*
Whispering Pines Mobile Park	80	\$2,368,000
Neal Middle School	69	\$417,000
Durham Public Schools Operations	67	\$543,000
Oak Grove Elementary School	61	\$935,000
Mangum Elementary School**	56	\$501,000
Little River Community Complex	49	\$557,000

\*Total IAIA commitment for 5 years: \$666,500

\*\*Mangum Elementary School planning renovations and removed from consideration at this time



# Next Steps

- Pursue external funding for implementation
  - LASII (ARPA)
  - EEG
  - EPA 319
- Re-evaluate internal funding for implementation
- Construct recommended projects
- Develop county-wide project atlas pending Falls Lake Phase II rules
  - Alternative delivery methods
  - Increased focus on private property



# Questions?

