Reaching for Healthy Streams

Navigating Restoration and Stabilization in Tight Urban Spaces

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Brookhaven GEORGIA

LOWE ENGINEERS

SINCE 1894

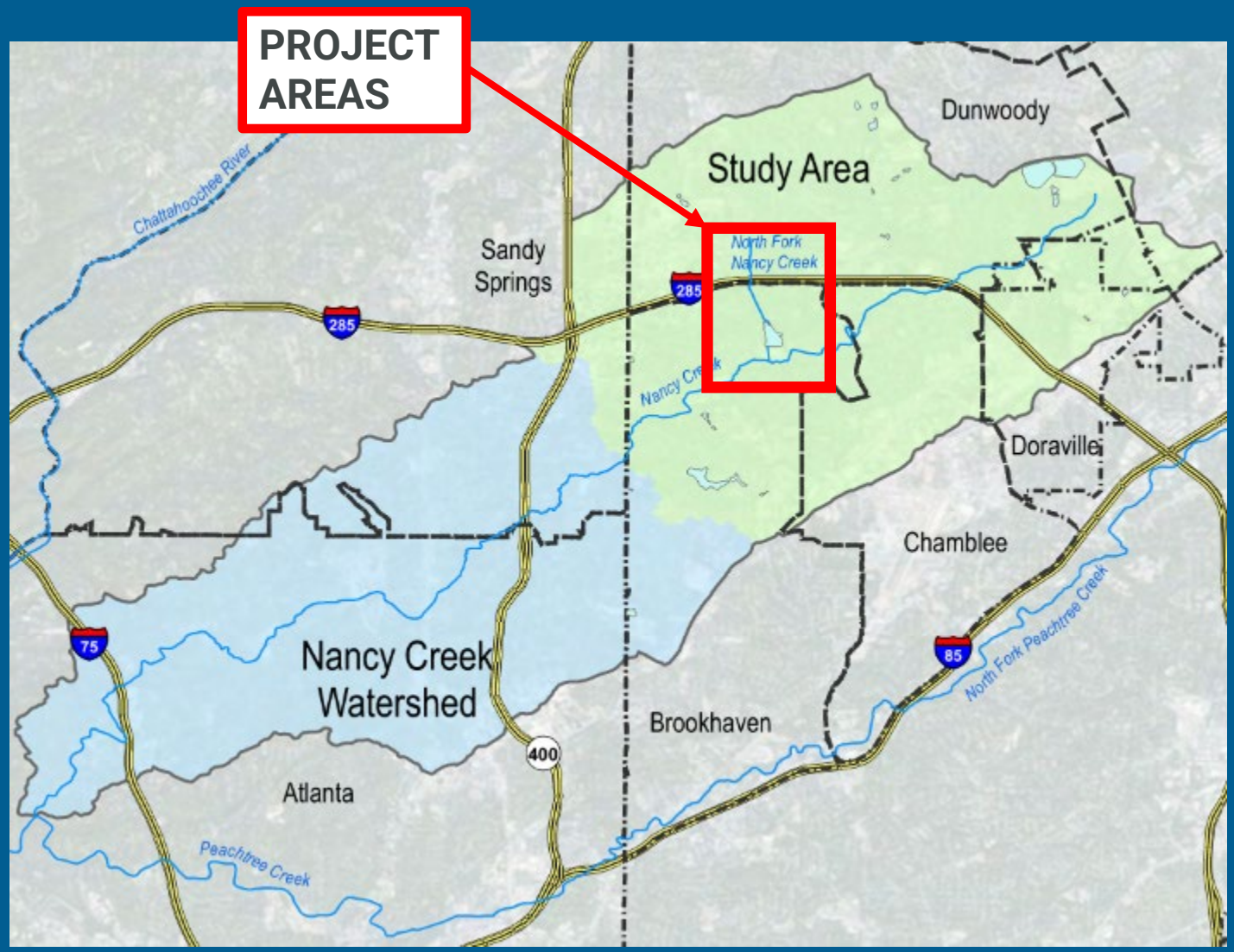
FREESE AND NICHOLS

Outline

- Background
  - Nancy Creek Watershed Overview
  - Watershed Planning & Prioritization
  - 319(h) Grant Funding
- Fluvial Ecosystem Restoration
- Project Overview
- Upper North Fork Nancy Creek
- Lower North Fork Nancy Creek
- Bidding
- Construction
- Lessons Learned
- Where we are now
- Load Reductions
- Questions

Nancy Creek Watershed

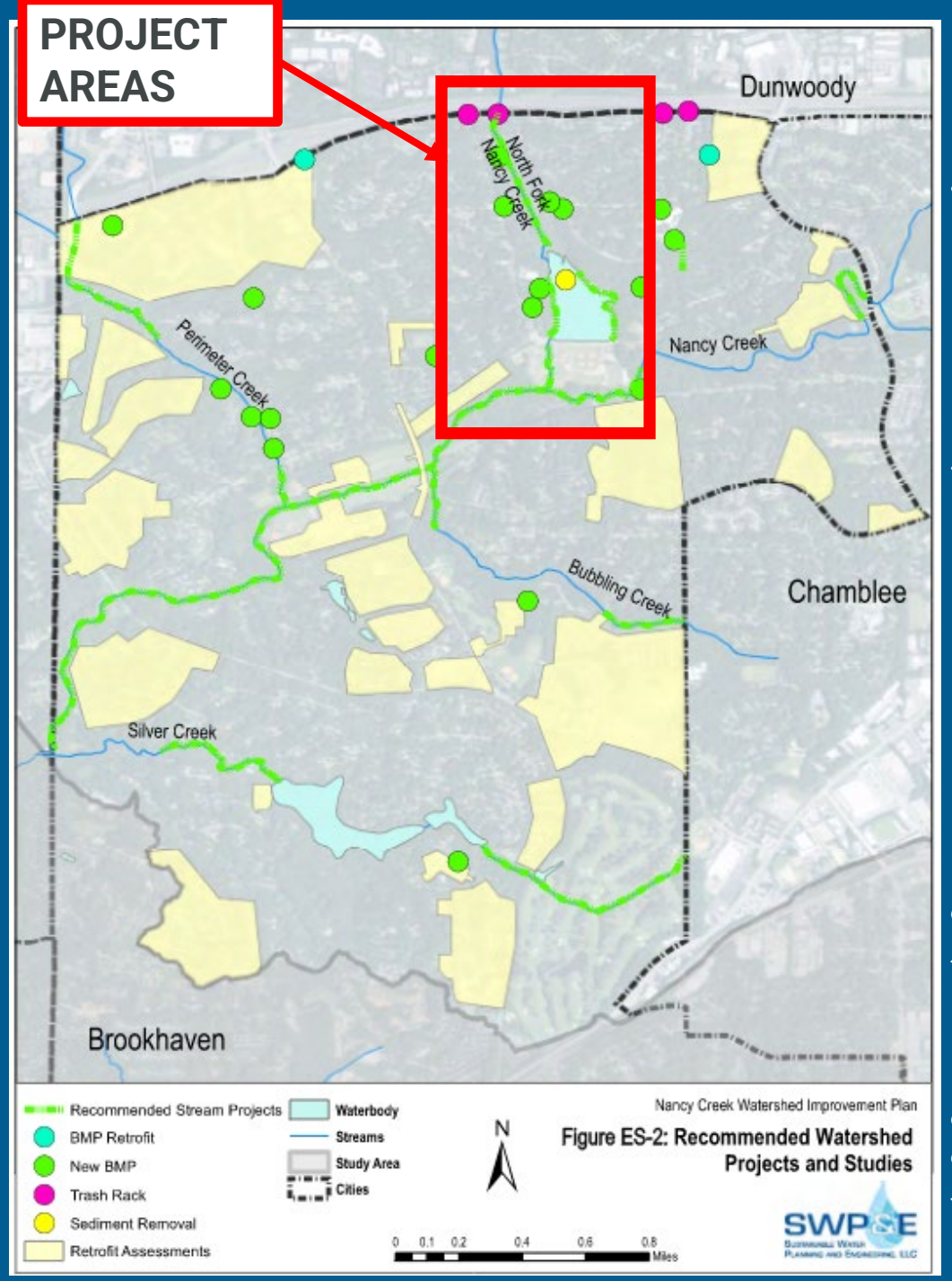
- Nancy Creek Watershed
  - Perennial Stream
  - 39% Impervious
  - Mostly residential/suburban land use
  - 19.3 square miles (12,300 acres)
  - Includes Dunwoody, Doraville, Chamblee, and Brookhaven, & Sandy Springs.
- 303(d) TMDL for Nancy Creek
  - Intended Use = Fishing
  - Not supporting (Bio F, FC)
  - Load Reduction required:
    - 35% for Bio F,
    - 85% for FC



Nancy Creek Watershed Improvement Plan | Brookhaven Georgia (brookhavenga.gov)

Watershed Improvement Plan (2016)

- Drivers
  - Improve watershed conditions
  - Evaluate Murphey Candler Lake
  - Increase City eligibility of grant funds
  - Keep compliant with MNGWPD Watershed Management Plan (2009)
- Goals
  - Meet state water quality standards;
  - Restore stream buffers to prevent the loss of soil/buffer
  - Improve streams to “sub-optimal” habitat condition or better; and
  - Support projects that promote wildlife diversity and aesthetics.
- Results
  - 43 identified projects
  - 28 assessments
  - 7 programs



Nancy Creek Watershed Improvement Plan | Brookhaven Georgia (brookhavenga.gov)

319(h) Grant Funding

- Supported by WIP
  - EPA 9 Element Watershed Plan
- Establish activities and measures of success
- Cost share for design & construction
- Upper Project
  - 50/50 match
- Lower Project
  - 50/50 match
- Best Practices

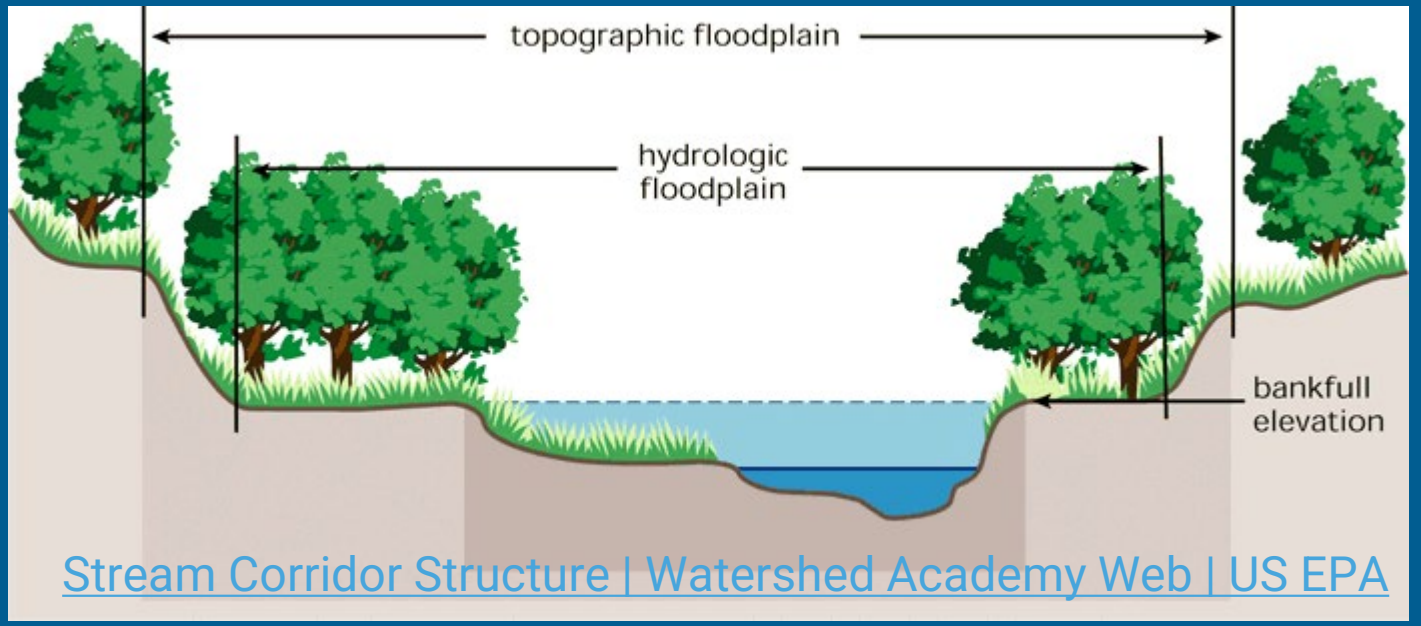
Fluvial Ecosystem Restoration (FER)

Restoration

Reestablishment of the structure and function of ecosystems and floodplains to return the ecosystem as closely as possible to its natural conditions and functions prior to being developed (FEMA)

Stabilization

Treatment(s) used to stabilize and protect banks of streams or constructed channels and shorelines of lakes, reservoirs, or estuaries. (NRCS)



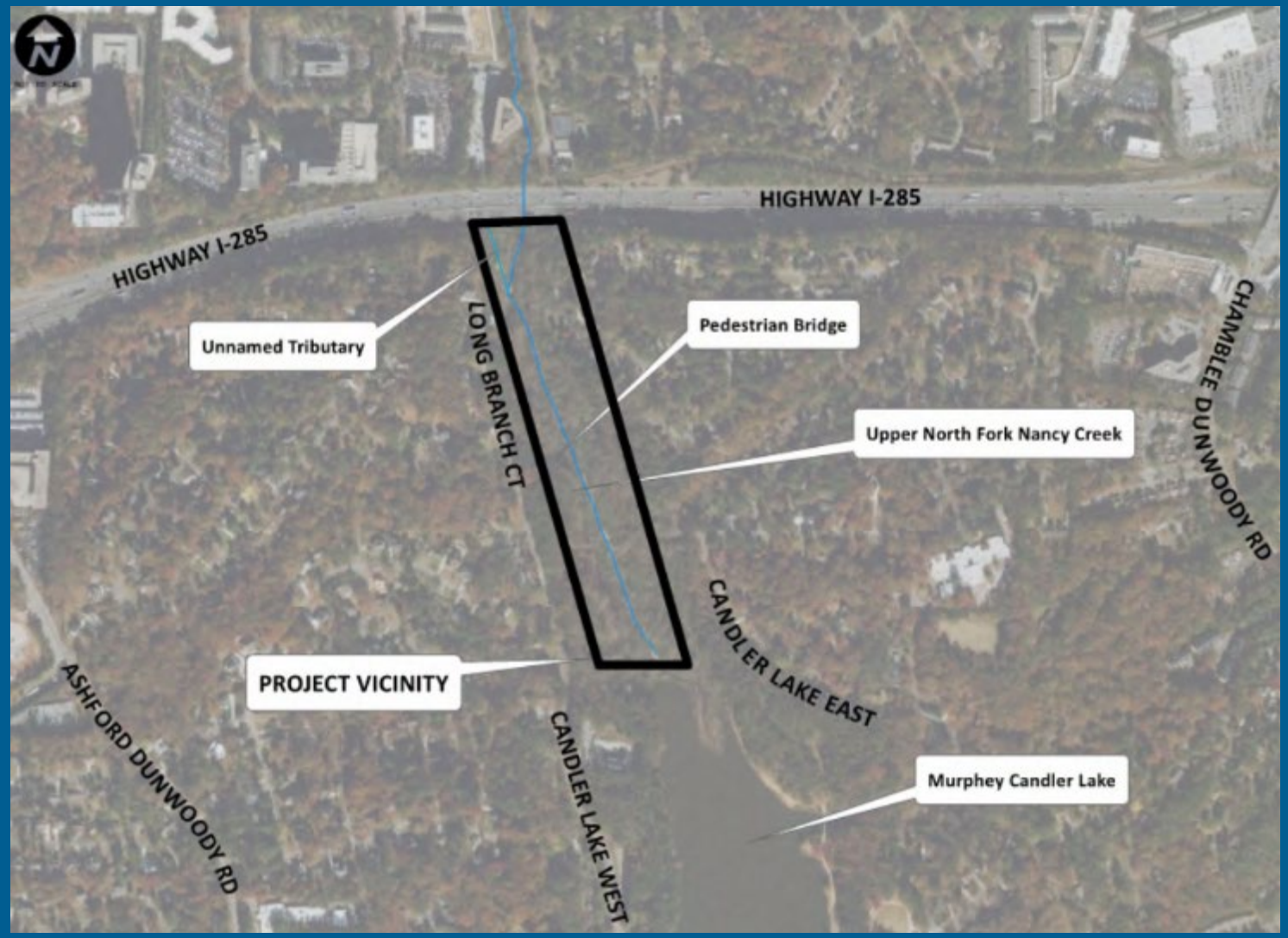
Stream Corridor Structure | Watershed Academy Web | US EPA

Project Overview

- Goals
  - Restore Habitat
  - Address erosion issues
  - Improve WQ
  - Improve overall lake system
- Approach
  - Natural Channel Design
    - Reference reach
    - Empirical
    - Analog
    - Analytical
  - Minimize impacts via surgical methods
    - Alignment/planform adjustments limited due to lateral constraints
  - Rocky vs Woody

“Upper” North Fork Nancy Creek

- Length = 2000 LF
- Drainage Area ~1.9 Square Miles
- Flowpath
  - Begins at I-285 Culvert
  - Private Properties
  - Murphey Candler Park
  - Ends in backwater to Murphey Candler Lake
- Nationwide 27 Permit
  - Aquatic Habitat Restoration, Enhancement, and Establishment Activities



“Upper” Cont’d

- Issues:
  - Invasive overgrowth
  - Entrenched
  - Incised
  - Exposed sewer line
- Challenges:
  - Lateral constraints (trees, private property)
- Goals:
  - Bank stabilization
  - Re-establishing native riparian vegetation,
  - Restore channel
  - Encase sewer line

“Upper” Solutions

- Bank protection measures
  1. “Double Mud Sill”
  2. Toe Wood
  3. Coir fiber matting
  4. Soil Layer Lifts
  5. Step Plunge Pools
  6. Live Stakes and Bare Roots (not shown)
  7. Regrading

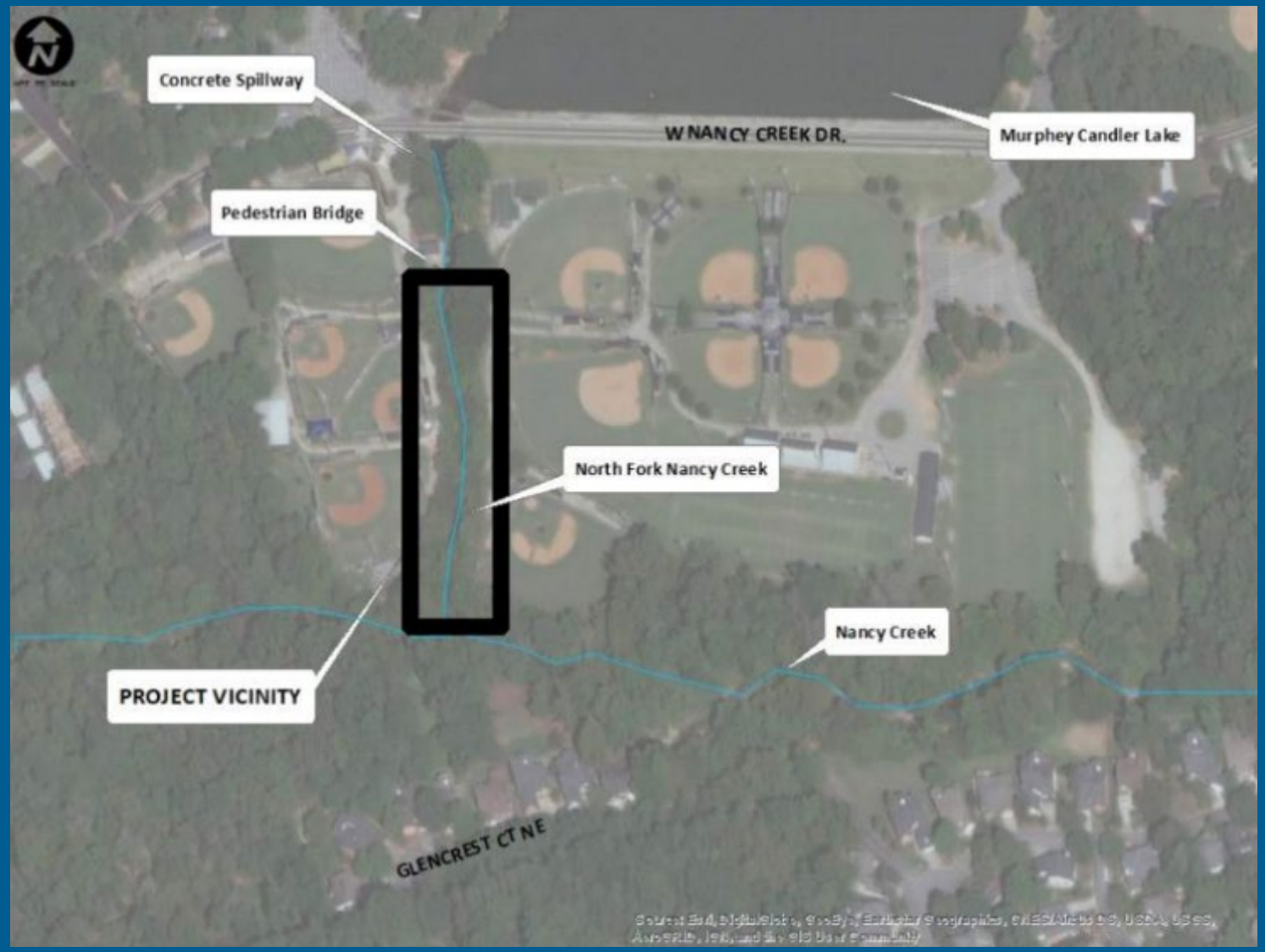
“Upper” Solutions

In-stream structures

1. Rock n’ Roller
2. Log Vane
3. Log Sill
4. Concrete Encasement

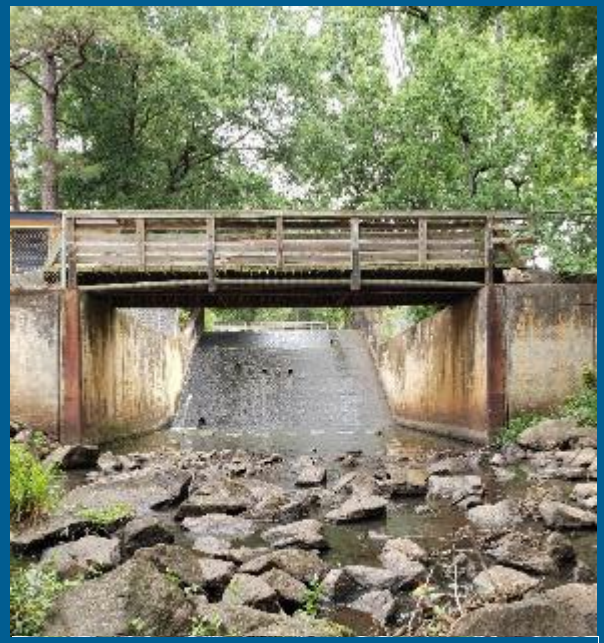
“Lower” North Fork Nancy Creek

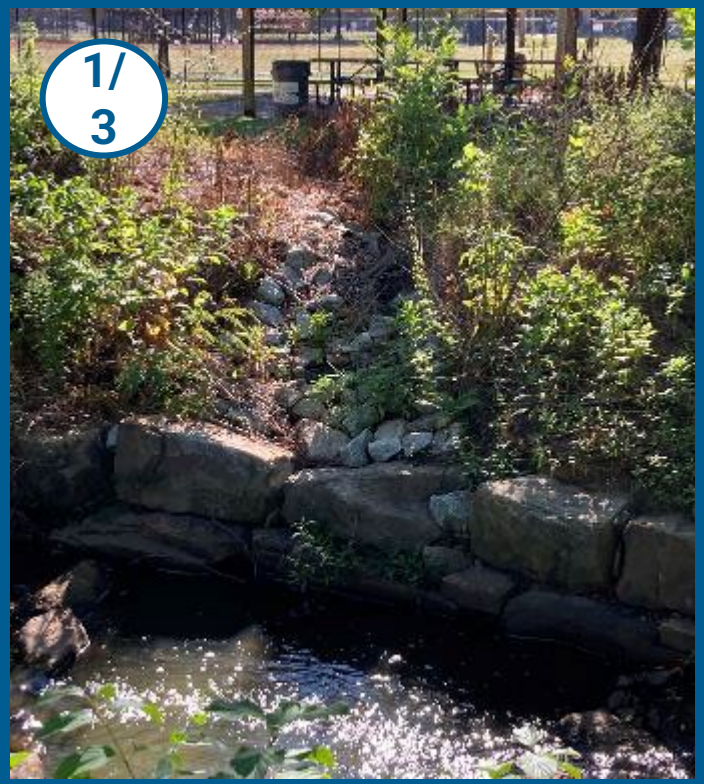
- Length = 600 LF
- Drainage Area ~2.4 Square Miles
- Flowpath
  - Begins at auxillary spillway to Murphey Candler Lake Dam
  - Public property (baseball field)
  - Ends at confluence with Nancy Creek
- Nationwide 13 Permit
  - Bank Stabilization



“Lower” Cont’d

- Issues:
  - Invasive overgrowth
  - Bank erosion
  - Channel debris
  - Heavy incision
- Challenges:
  - Dam prevention of channel bed loading
  - Lateral constraints (sidewalks, trees, baseball fields, structures)
  - Sewer aerial crossing
- Goals:
  - Bank stabilization
  - Re-establishing native riparian vegetation
  - Restore & stabilize channel





“Lower” Solutions

- Bank protection measures
  1. Rock Toe/Wall
  2. Coir fiber matting (not shown)
  3. Step Plunge Pools
  4. Cascades
  5. Plantings
  6. Regrading

“Lower” Solutions

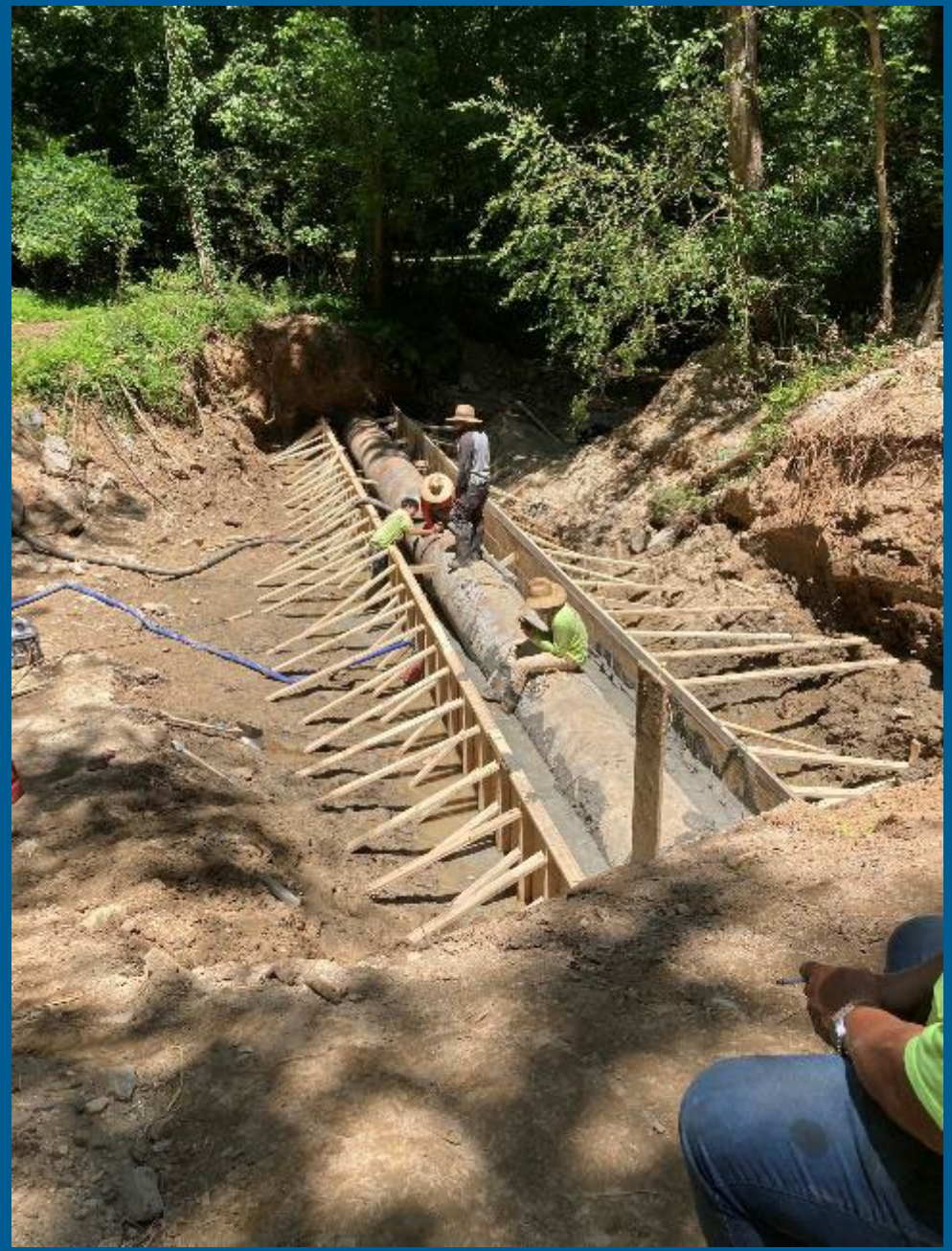
- In-stream structures
  1. Rock n’ Roller
  2. Rock Cross Vane
  3. Boulder cluster

Bidding

- Upper NFNC Bid = $1,100,000
- Lower NFNC Bid = $280,000
- Recommendations
  - Minimum pre-qualifications
  - Competitive
  - References
  - Reach out to contractors during design & before bid
  - Clear and concise plans

Construction

- Clear and concise plans
- Engineer involvement
- Construction oversight
- Erosion and sediment control
- Immediate stabilization
- Constant communication



Lessons Learned

- Federal/State/Local Permitting
- Stakeholder Communication & Coordination
- Means & Methods vs Minimizing Disturbance
- Coordination with Grant Agency
- Don’t Force It
- Location Location Location!

Where are we now?

- Upper
  - Began 2020
  - Construction in progress
  - Final plantings anticipated Fall/WInter 2024
  - Post-Construction monitoring to begin
- Lower
  - Began 2019
  - Completed March 2022
  - Post-Construction assessment anticipated Fall 2025
  - Ongoing O&M by City

STEPL Load Reductions – Upper

- **35% TMDL Reduction Goal for Sediment in Nancy Creek Watershed**

346

Tons per year of sediment

8,601

Pounds per year of Nitrogen

1,346

Pounds per year of Phosphorus

-114

Tons per year of sediment reduction

-118

Pounds per year of Nitrogen reduction

-23

Pounds per year of Phosphorus reduction

33%

decrease

1.4%

decrease

1.7%

decrease

STEPL Load Reductions – Lower

- **35% TMDL Reduction Goal for Sediment in Nancy Creek Watershed**

310

Tons per year of sediment

6,175

Pounds per year of Nitrogen

1,019

Pounds per year of Phosphorus

-109

Tons per year of sediment reduction

-113

Pounds per year of Nitrogen reduction

-22

Pounds per year of Phosphorus reduction

35%

decrease

1.8%

decrease

2.2%

decrease

Thank you

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