

South Buffalo Creek Water Quality and Habitat Improvement Project

A Decade of Lessons Learned and Applied
Using Adaptive Management and Design

Jeremy McCall, P.E., CFM
Greensboro, NC Water Resources Department
Jeremy.McCall@greensboro-nc.gov

Jennifer Murphy, P.E.
Kimley-Horn
Jennifer.Murphy@kimley-horn.com

Kimley»»Horn





Presentation Outline

- Project Background and Overview
- Construction of Phases I-III
- Repairs to Previous Phases
- Phase IV
- Lessons Learned



Project Background and Overview

- History and Project Goals
- Site Location and Acquisition
- Greensboro's Goals and Requirements
- Design Approach and Objectives

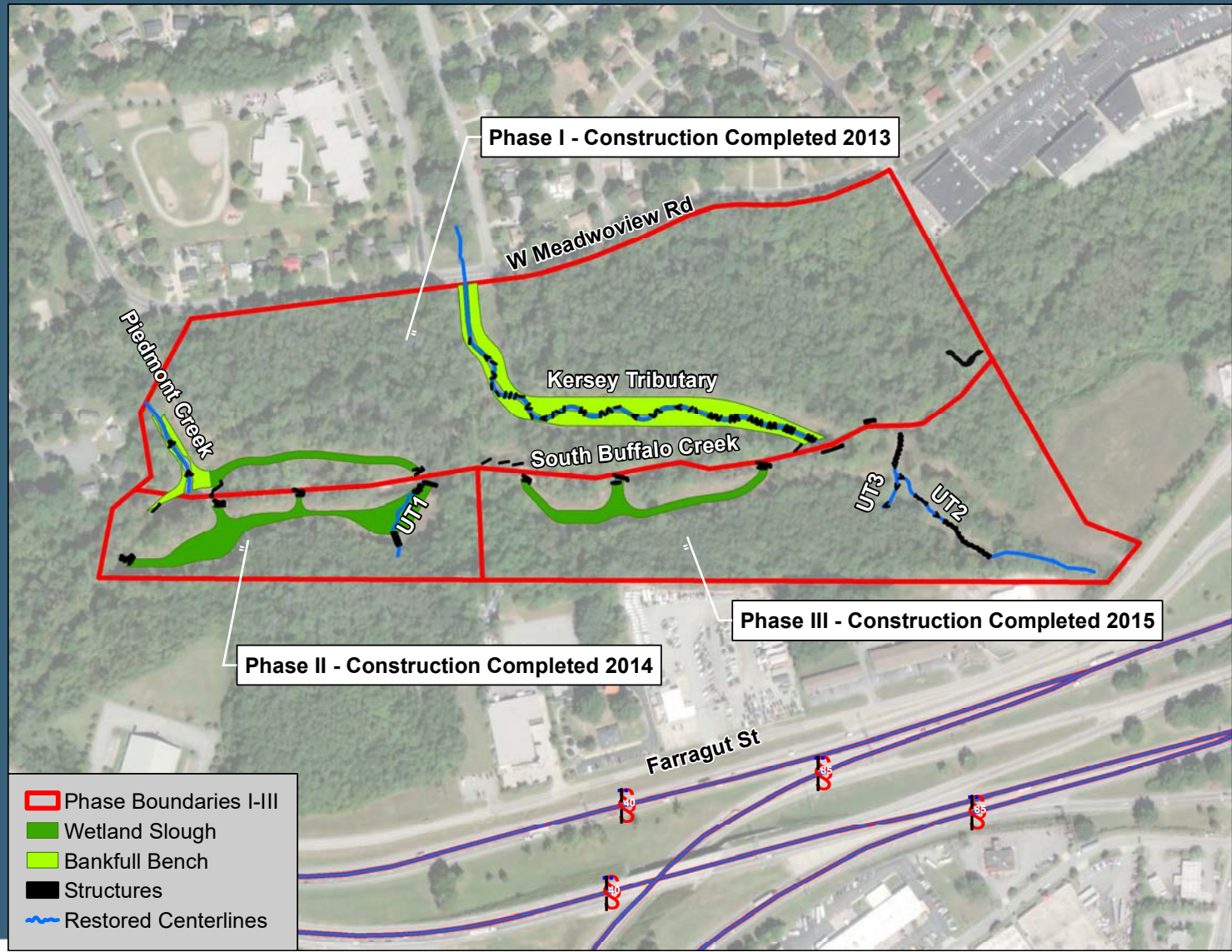


Clean Water Management Trust Fund Grant

- Applied for grants in 2008, 2012, 2013, 2014, and 2015
- Awarded a total of **\$1,467,350!**



The Original Plan: Three Phases





Existing Floodplain Slough Wetlands





South Buffalo Constructed Slough



Early Spring 2014



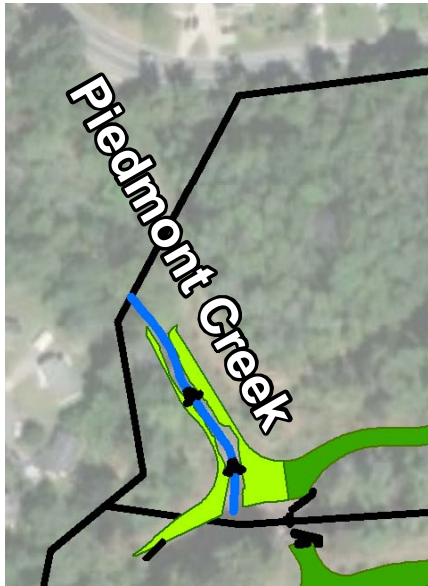
July 2018

Late Spring 2014 with sediment deposition





Piedmont Creek Enhancement



Map



Before construction



Spring 2014



Kersey Tributary Relocation



Before construction



Map



3 months after construction



5 years after construction



Kersey

South Buffalo



Piedmont Creek Repair During Phase IV



October 2016



July 19, 2018



Kersey Tributary Repair During Phase IV



Damage from beaver activity



Immediately after repair



South Buffalo Creek

- Drainage area of 15 square miles
- Highly urban
- 30% to 35% impervious cover
- On 303(d) list as impaired biology (fish and benthos)
- Featureless bed form (poor habitat)
- Eroding banks

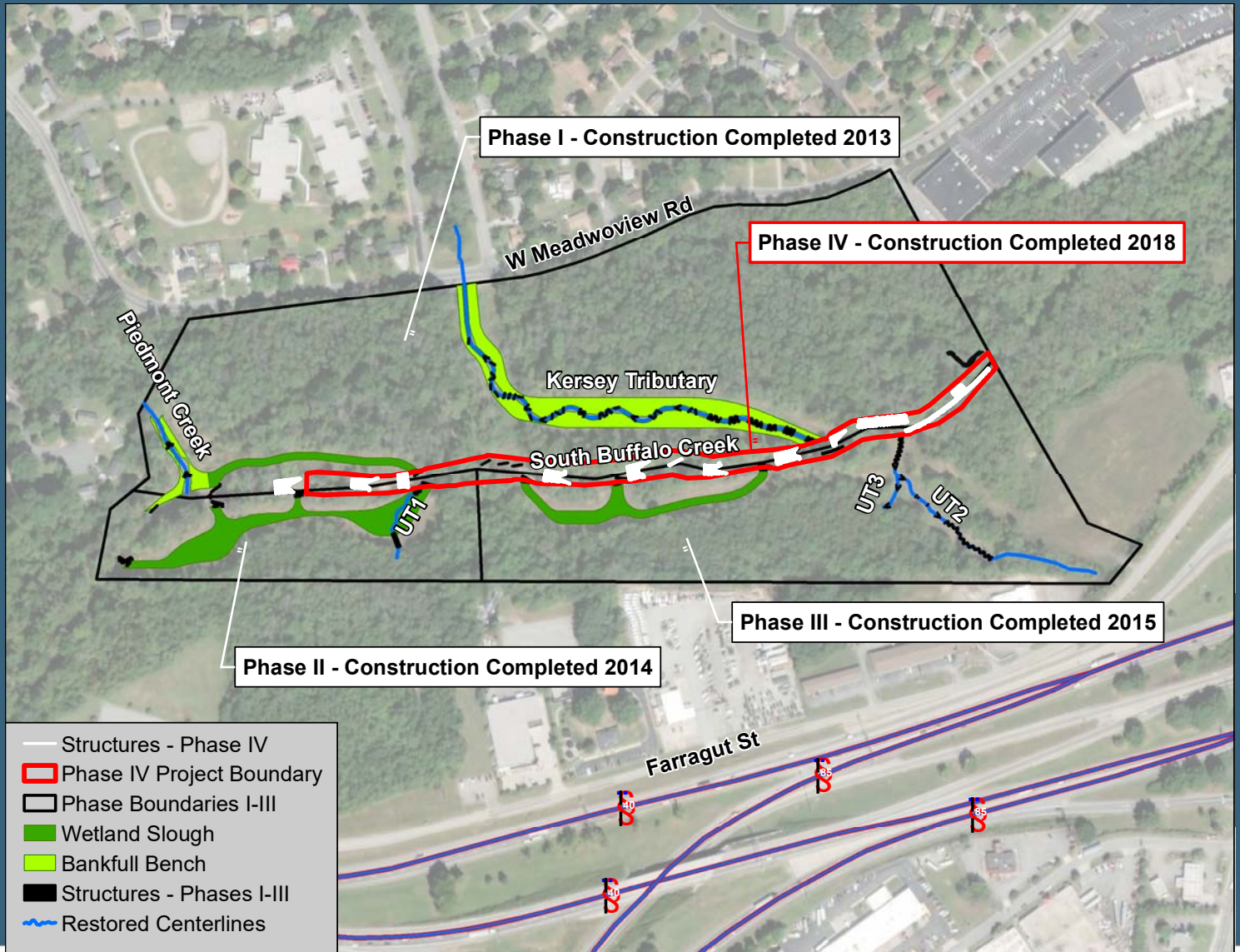


Incision of South Buffalo Creek

Approximately 1.5 feet of incision
from Phase III construction to
Phase IV design



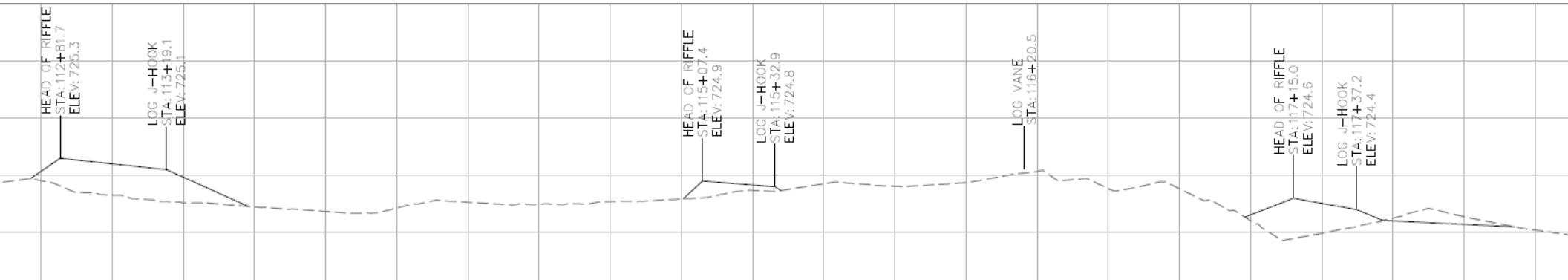
Phase IV!





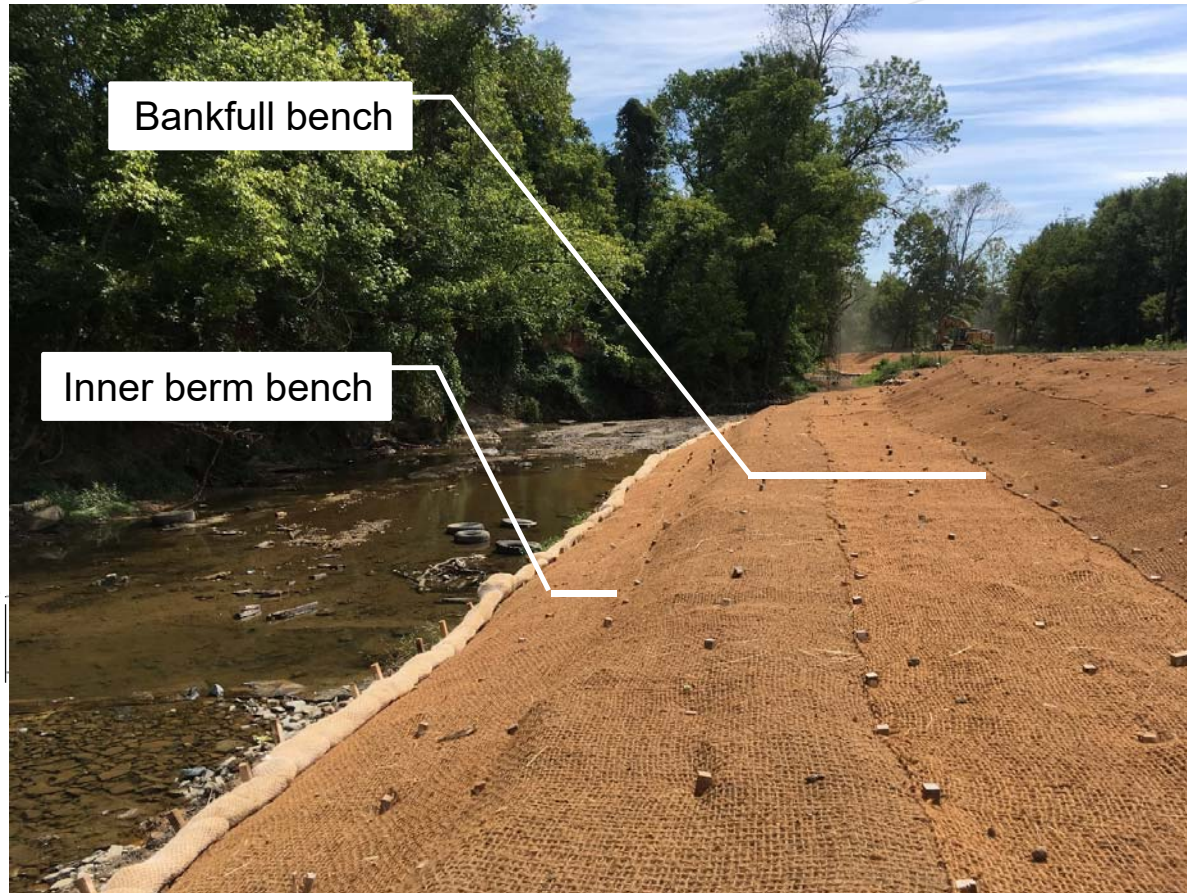
Incision of South Buffalo Creek

- Adjust profile with riffles and J-Hook structures
- Tie in to existing structures and bedrock
- Reduce channel width and construct benches





Inner Berm and Bankfull Bench



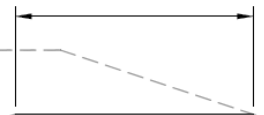
Bankfull bench

Inner berm bench

BANKFULL

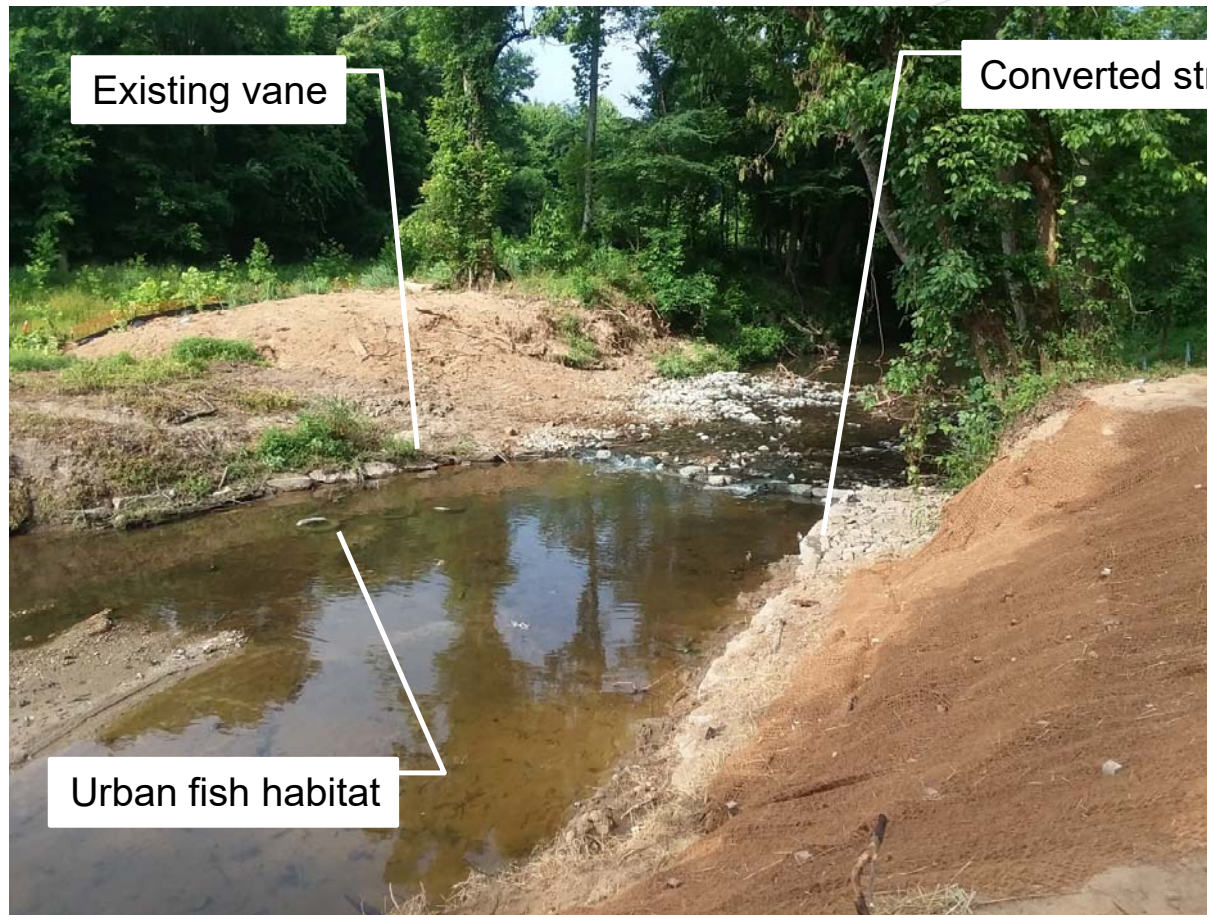
INNER BERM

10' MIN. BERM WIDTH BETWEEN
STREAM AND SLOUGH





Rock Vane to Cross Vane with Riffle





Toe Wood

Toe wood under construction



Completed toe wood and bank grading



South Buffalo Creek left bank looking downstream, immediately before construction of toe wood



Rock Toe Protection

Before Phase IV



Rock toe and bank grading





Log J-Hook with Constructed Riffle



Lessons Learned

Stump grave



- It
- D
- In
- c
- E
- W
- If
- C

field during

– or find another

Next Steps

- Final plantings
- Annual inspection by City
- Invasive species program
- Observation!



Questions?

Jeremy McCall, P.E., CFM

City of Greensboro, NC Water Resources Department

2602 South Elm-Eugene Street

Greensboro, NC 27406

Jeremy.McCall@greensboro-nc.gov

(336) 373-2527

Jennifer Murphy, P.E.

Kimley-Horn

421 Fayetteville Street, Suite 600

Raleigh, NC 27601

Jennifer.Murphy@kimley-horn.com

(919) 677-2072

Kimley»»Horn

