

# Little River Watershed Restoration Project



Mark Powell, Consultant  
Natural Resources Management

# Lessons Learned

- Strong partnerships – RC&D, Soil and Water, 2 counties, Albemarle Commission, Universities, local groups
- Good communication with county managers and local and state government representatives
- Good connections and communication with local farmers
- BMPs part of whole farm management
- Persistence pays off!

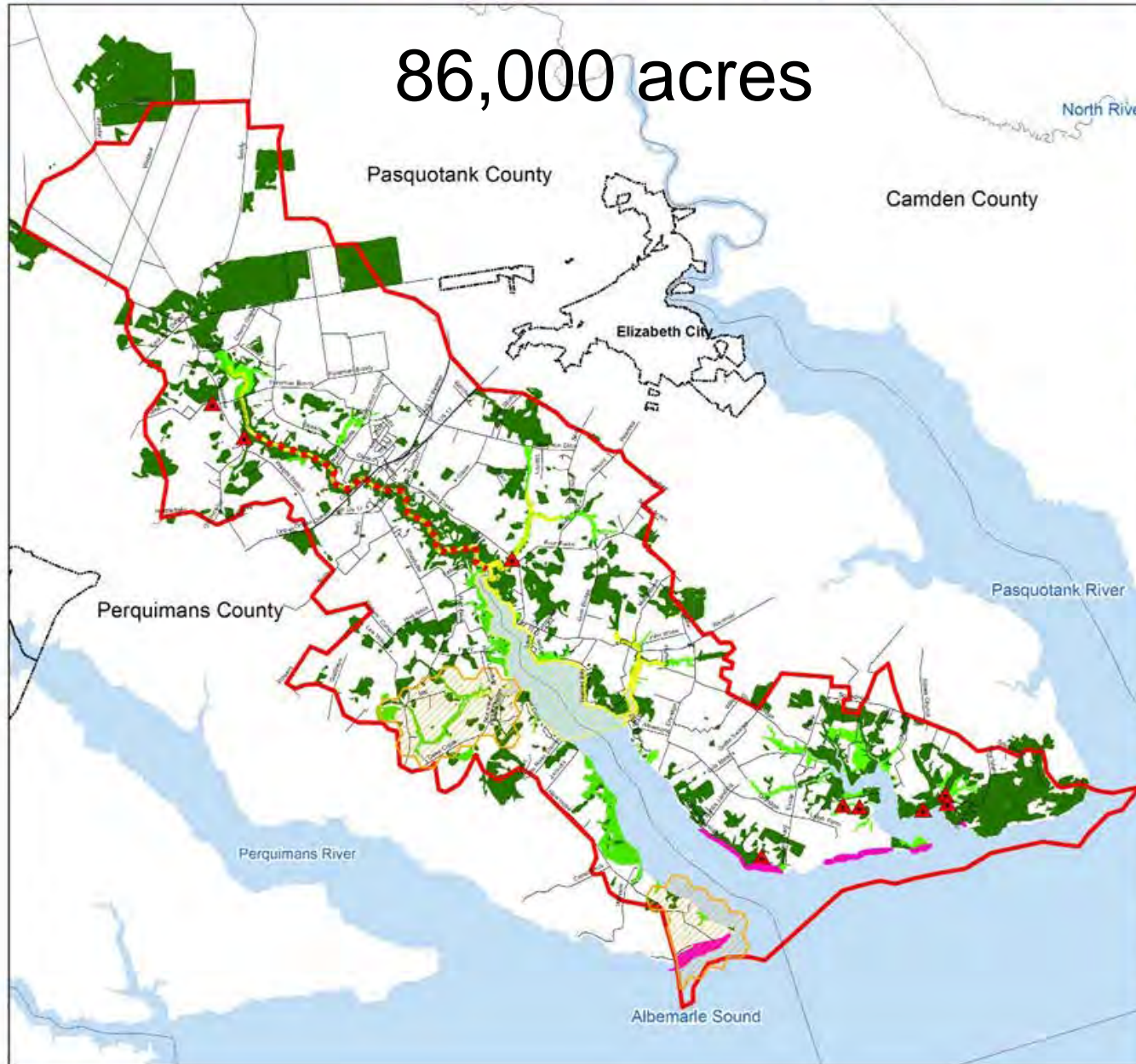
# Little River Watershed HUC 10





# Little River Watershed Restoration Project

86,000 acres



## Legend

- Little River Watershed - HU10
- Impaired Section Little River (2012, 303d)
- Key Anadromous Fish Habitat (BWHA)
- Strategic Habitat Area
- Submerged Aquatic Vegetation
- ▲ Natural Heritage Location
- Key Wetlands (BWHA)**
  - 6
  - 7

Map author: Mark Powell, Consultant  
Albemarle RC&D Council

Date: 4/2/2014

Revision:

### Notes:

Layers -- Anadromous fish, shell fish areas and key wetlands are from the state Biodiversity Wildlife Habitat Assessment (BWHA).

Topo Quads -- Pasquotank, Nixonton, Weeksville, Chapanoke, Hertford.

0 1 2 4 Miles



## Project Area





# Upper River





# Middle River at US 17





# Lower River South of US 17

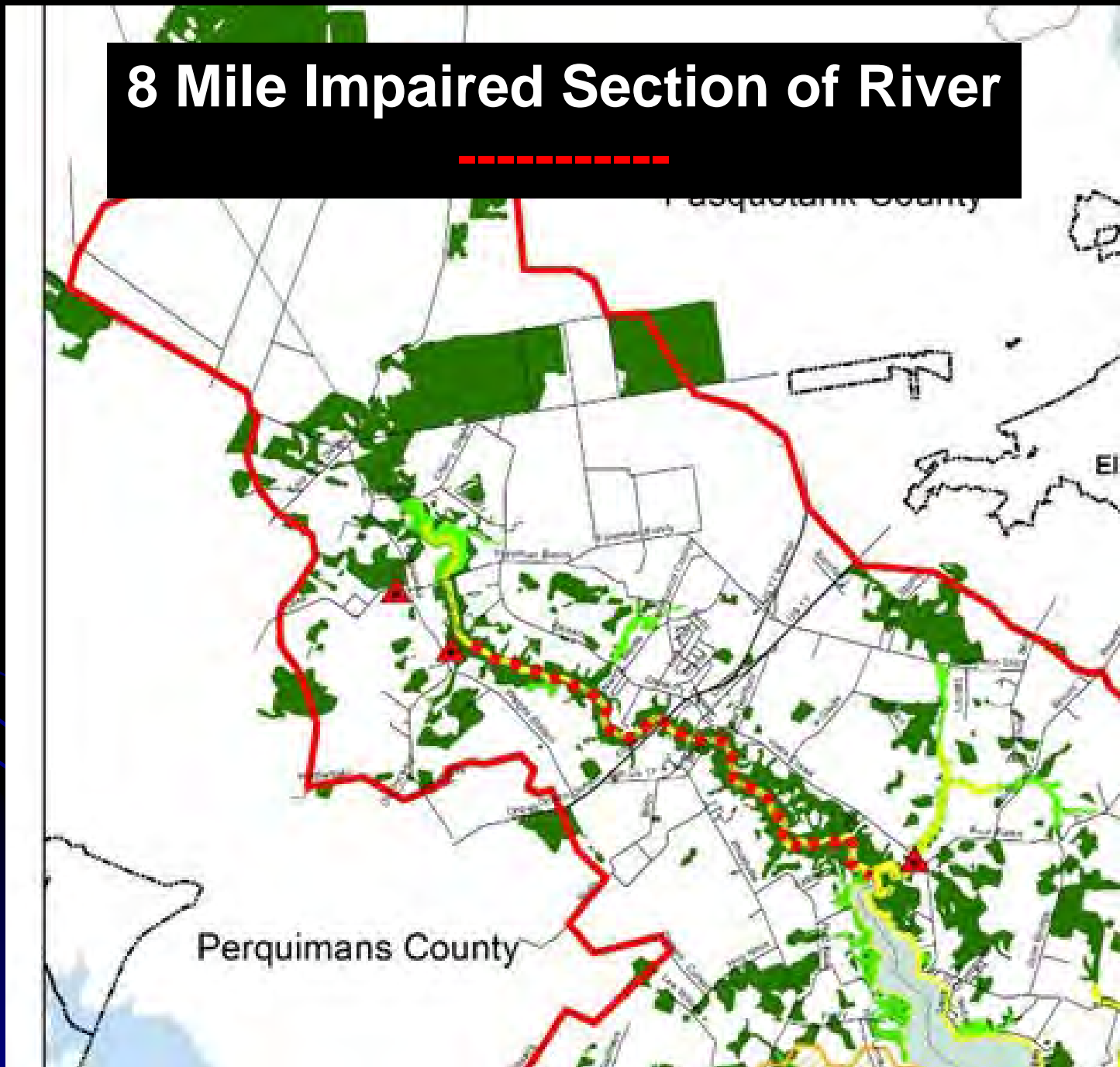


# Impairments

- 1998 the upper section of the river from its source to Halls Creek (12 mi.) on the 303(d) list of Impaired waters for low Dissolved Oxygen.
- In 2012 and 2014, an 8-mile section of the Little River from SR 1225 to Halls Creek was listed Impaired for Chlorophyll *a* indicating nutrient enrichment in this segment of the river.



## 8 Mile Impaired Section of River



# Little River Watershed

- Nine-element restoration plan completed early 2015
- 5,300 acres of Strategic Habitat Area.
- 2,500 acres and 17,000 acres of Exceptional and Substantial wetlands, respectively.
- 7.5 square miles of Critical anadromous fish spawning areas.
- 540 acres Submerged Aquatic Vegetation along the Albemarle Sound
- Nine animal, plant and natural communities identified by the NC Natural Heritage Program.



# Impairments

- Agricultural operations have opened drainage canals that directly carry sediments and nutrients to the river, and residential and commercial developments have increased pollution from stormwater runoff.



# Impairments

- Riparian forest buffers have been eliminated or severely degraded in many locations along the river.





# 9-Element Restoration Plan

- Construct in-stream wetlands on main drainage canals
- Work with counties and landowners to conserve and/or restore riparian forest buffers

# Locations for In-stream Wetlands



## Legend

- Little River Watershed - HU10
- Potential In-Stream Wetlands
- Impaired Section Little River

Map author: Mark Powell, Consultant  
Albemarle RC&D Council  
Date: 4/28/2015 Revision:

Notes:  
Key locations on drainage ditches and canals  
where in-stream wetlands may be constructed  
to improve water quality and increase wildlife habitat.

0 1 2 4 Miles



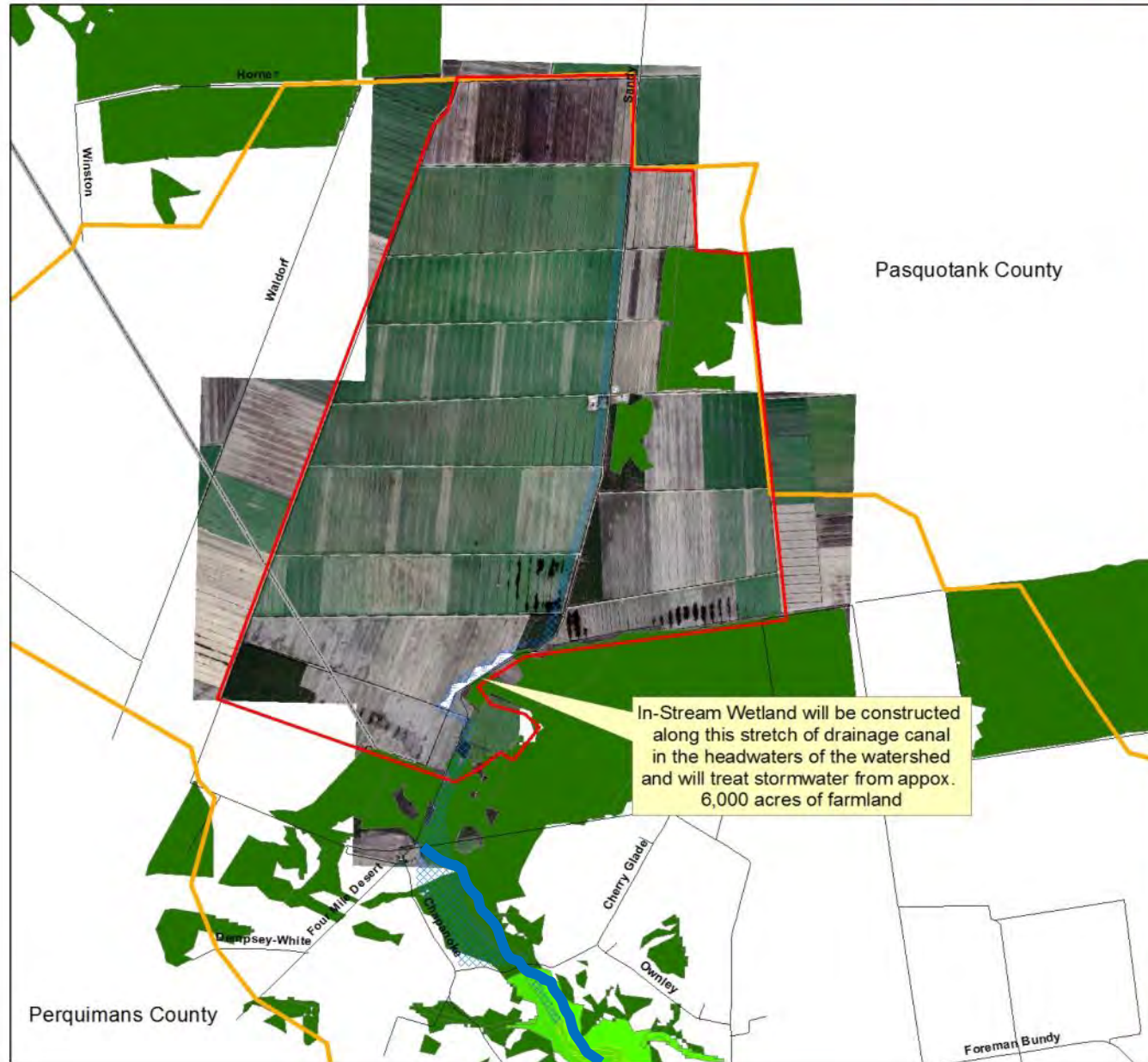


- **Approx 6 acres of in-stream wetlands**
- **\$141,878 CWMTF**
- **\$25,000 USFWS**





# MAP 4. Innovative In-stream Wetland Location Upper Watershed



## Legend

- Little River Watershed - HU10
- Key Anadromous Fish Habitat (BWHA)
- Key Wetlands (BWHA)**
  - 6
  - 7

Map author: Mark Powell, Consultant  
 Albemarle RC&D Council  
 Date: 1/27/2015 Revision:

**Notes:**  
 Layers -- Anadromous fish, shell fish areas and key wetlands are from the state Biodiversity Wildlife Habitat Assessment (BWHA).

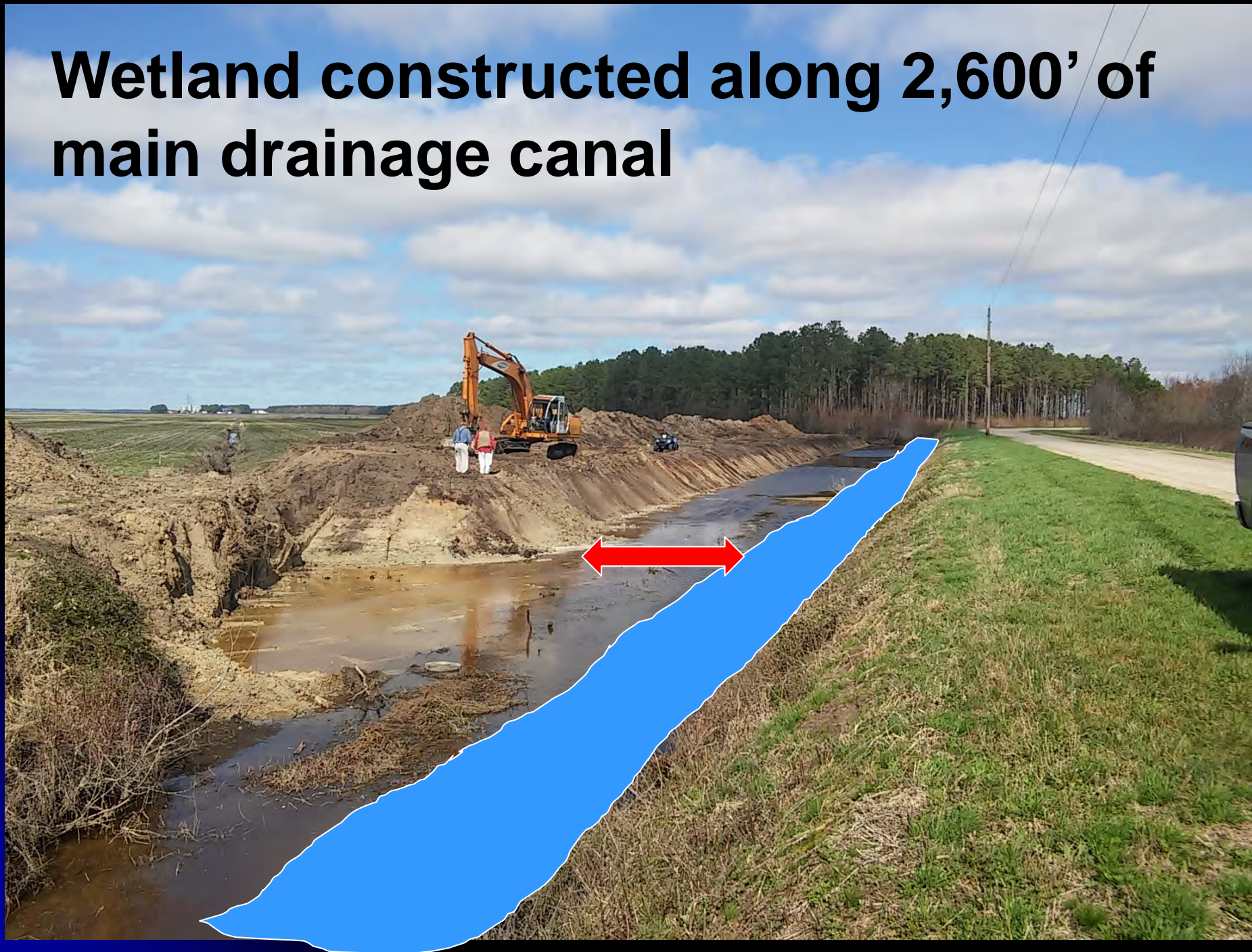
**Topo Quads --** Pasquotank, Nixonton, Weeksville, Chapanoke, Hertford.

0 0.25 0.5 1 Miles





# Wetland constructed along 2,600' of main drainage canal





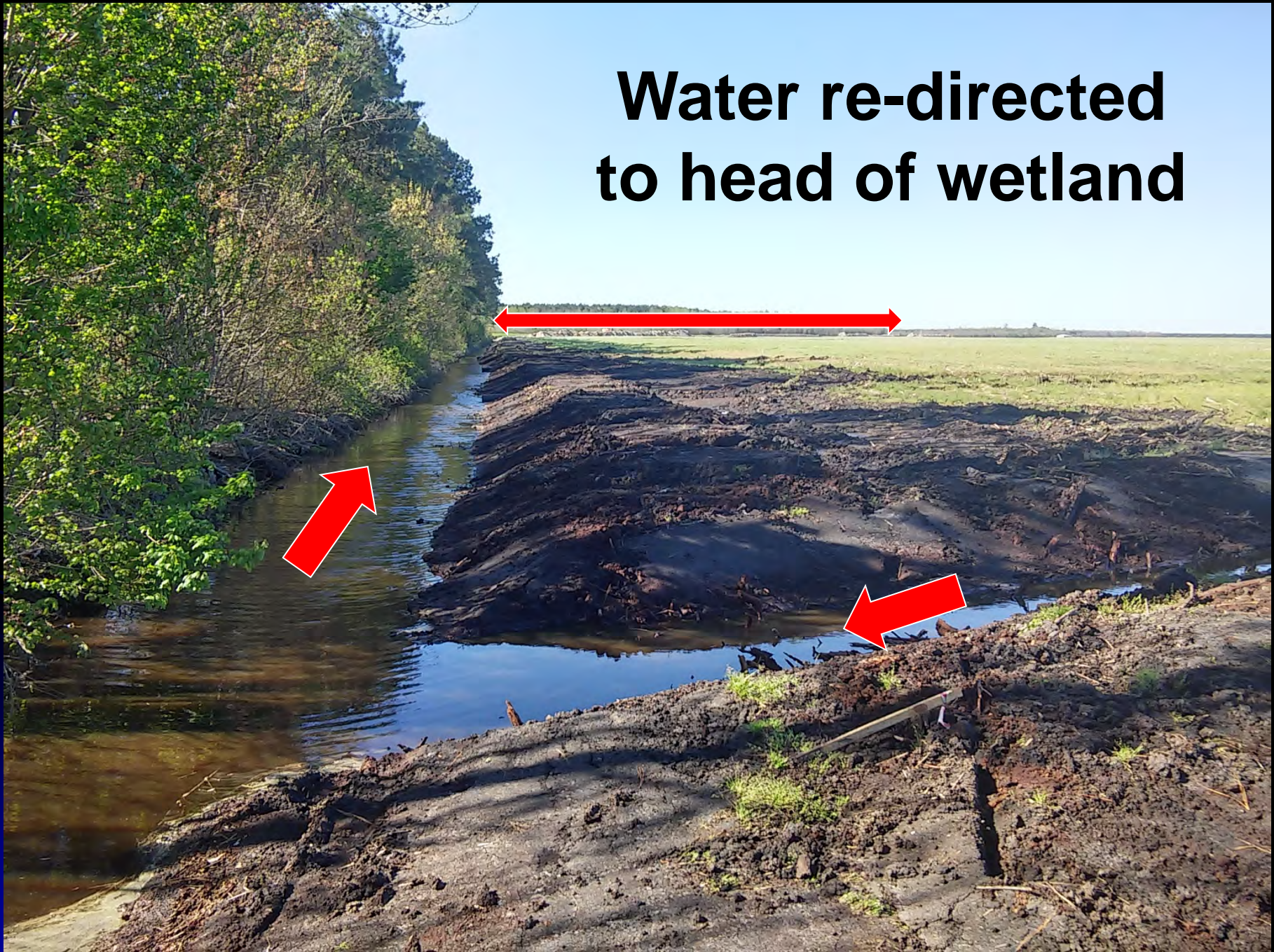








**Water re-directed  
to head of wetland**



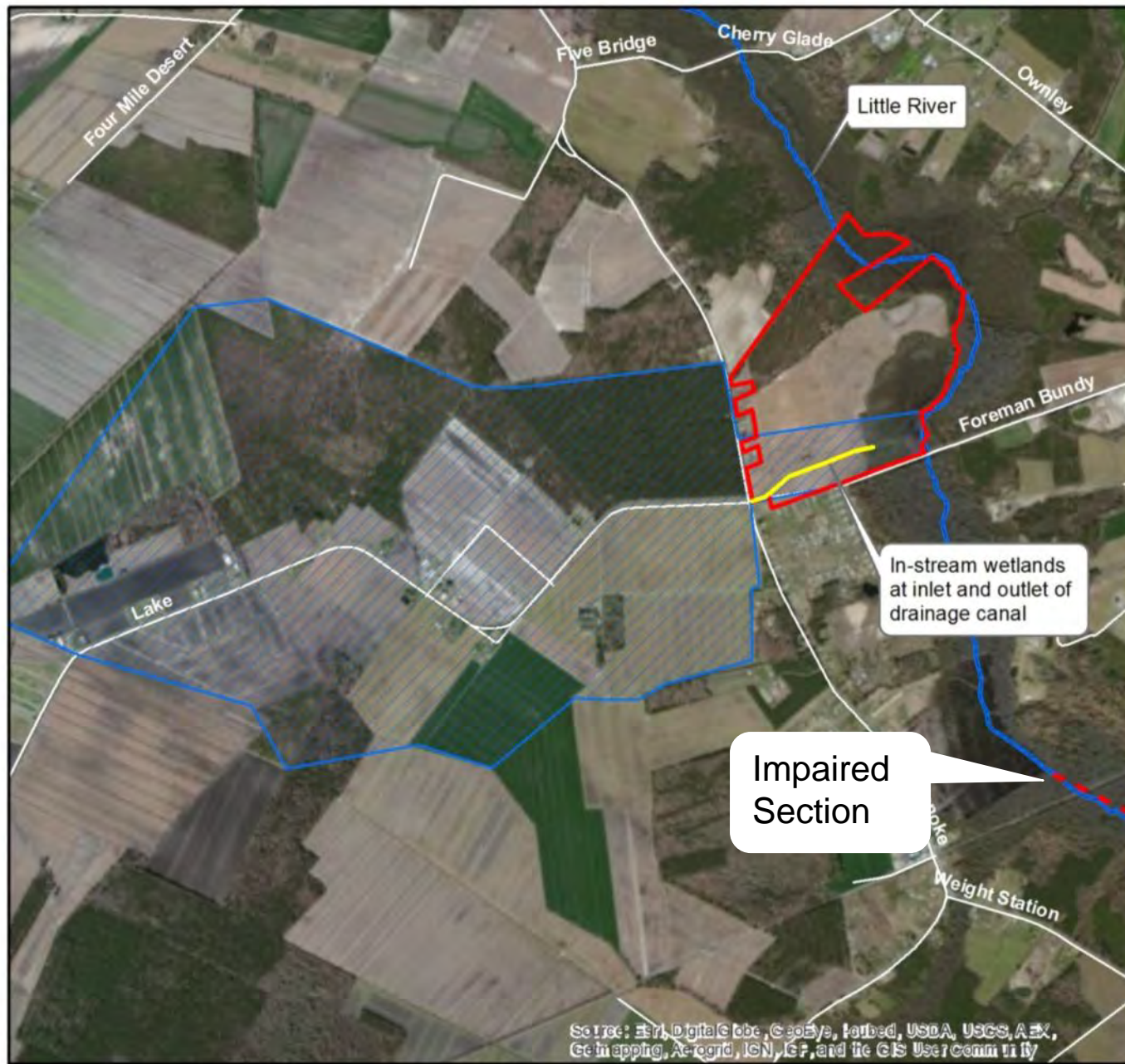


**4 acres of cypress inter-planted**





# In-stream Wetland Project -- Wade Boyce Tract



## Legend

- Wade Boyce Tract
- Boyce Watershed Approx. 600 Acres
- Impaired Section (2014, 303d)

Map author: Mark Powell, Consultant  
Albemarle RC&D Council  
Date: 4/27/2015 Revision:

Notes:  
Topo Quads: Chapanoke, Pasquotank

0 500 1,000 2,000 Feet





# EPA 319 Grant - Boyce Tract

Outlet to Little River





- Rock weirs to stage water
- J-hooks to slow water flow
- Rock drop structures





- Rock weirs to stage water
- J-hooks to slow water flow
- Rock drop structures





# 3 tile lines for cropland water management





# Locations for In-stream Wetlands



## Legend

- Little River Watershed - HU10
- Potential In-Stream Wetlands
- Impaired Section Little River

Map author: Mark Powell, Consultant  
Albemarle RC&D Council  
Date: 4/28/2015 Revision:

**Notes:**  
Key locations on drainage ditches and canals  
where in-stream wetlands may be constructed  
to improve water quality and increase wildlife habitat.

0 1 2 4 Miles



## Little River Watershed



# Riparian Forest Conservation

- Worked with Perquimans and Pasquotank counties to develop a voluntary riparian forest conservation program
- Conserve 300 ft forest buffer and receive break on taxes for acreage enrolled
- Easy enrollment and flexible – tax office manages program, GIS department determines buffer area



# Monitoring and Evaluation

- M&E led by NCSU Department of Bio&Ag Engineering
- Compare predicted drainage and runoff from the watershed and measured wetland outflow volumes.
- Take water quality samples over time and at various flow stages to measure water flow, N, P and sediment.
- In the second year, conduct two field days for farmers and conservation professionals in eastern NC.

# Lessons Learned

- Strong partnerships – RC&D, Soil and Water, 2 counties, Albemarle Commission, Universities, local groups
- Good communication with county managers and local and state government representatives
- Good connections and communication with farmers
- BMPs part of whole farm management
- Persistence pays off!



# Little River Watershed Restoration Project



Mark Powell, Consultant  
Natural Resources Management