"Simpson Tract"
Buffer Restoration Project

Beaufort County, NC
Tar-Pamlico River Basin
(Cataloging Unit #03020104)

Mitigation Plan
(Task 6)

NC EEP Contract #D05027

Prepared For:

North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
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Submitted By:

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EXECUTIVE SUMMARY

Prior to project implementation, the Simpson Tract was managed for silvicultural production. The site consisted entirely of mono-culture pine stands with sparse hardwood colonization. Under contract with the EEP, Wetlands Resource Center (WRC) restored 45.0 acres of riparian buffer which will improve water quality within Pungo Creek (a tributary of the Pungo River) in Beaufort County, NC.

The entire 45.0 acre area has been planted with an appropriate mixture of tree and shrub species at an average density of 600 stems/acre. Planting was completed in February 2007. A total of twenty-three (23) 0.10-acre permanent plots corresponding to a total of 2.3 acres (equivalent to 5% of the restoration area) were established throughout the project area. Annual monitoring will be conducted near the end of the growing season (September-October) for a period of five years. Vegetative planting will be deemed successful if survivorship of plantings and volunteers of desirable species meets or exceeds a target stem density of 320 stems/acre.

Monitoring reports will be submitted annually to the EEP (by January 1 of each year). These reports will include results of vegetative monitoring and photographic documentation of site conditions. Monitoring reports will also identify any contingency measures that may need to be employed to remedy any site deficiencies.

The following mitigation report summarizes the restoration project and includes more specific information related to project implementation and 'as-built' conditions.

1.0 NARRATIVE

Introduction

As approved by the EEP, WRC implemented the restoration of 45.0 acres of riparian buffer located at the headwaters of Pungo Creek, a fourth-order tributary of the Pungo River within the Tar-Pamlico River Basin (USGS 8-digit Hydrologic Unit 03020104; DWQ Subbasin 03-03-07). The project area is part of the "Simpson Tract", located approximately 10 miles south of Plymouth in Beaufort County, NC (refer to Figure 1). The project includes the establishment of characteristic tree and shrub species adjacent to open field ditches on the north side of Rodman Road (refer to Figures 2-5).

Mitigation Goals and Objectives

The proposed restoration project is intended to provide suitable, high-quality riparian buffer restoration as compensatory mitigation for buffer impacts authorized through the NC Division of Water Quality. The objective of the project is to restore appropriate vegetation and diffuse flow conditions to help reduce non-point source discharge of contaminants into adjacent water bodies and increase flood water retention. The primary function of the buffer restoration project detailed in this document is to restore the nitrogen (N) and sediment removal capacity of those areas situated adjacent to surface waters. In addition, the project will provide ancillary benefits to aquatic and wildlife habitat via enhanced niche habitat, microclimate modification and shade, and increased food-web support.

Pre-Construction Conditions

The 45-acre restoration area is part of a larger timber tract totaling 1,391 acres. Approximately 950 acres have been determined to be non-jurisdictional ("non-wetlands") by the NRCS (USACE concurrence of this determination has also been provided in previous submittals to the EEP). The remaining acreage has been confirmed to be jurisdictional wetlands. The predominant land use of the tract (both jurisdictional and non-jurisdictional areas) is silvicultural production. Prior land use practices (including herbicide, pesticide, and fertilizer application) serve as potential contributors to decreased water quality of adjacent surface waters (i.e. ditches and 'blue-line' streams). The natural vegetative assemblage of the tract has been modified over the years via prescribed drainage improvements (i.e. ditching), bedding, and planting of loblolly pine (*Pinus taeda*). These silvicultural practices have resulted in a community dominated by pine in more mature stands outside of the proposed buffer area. Hardwood species characteristic of headwater swamp communities of the Coastal Plain are either absent entirely or occur only in sparse locations. Typical canopy species of an undisturbed area would include swamp tupelo (*Nyssa biflora*), bald cypress (*Taxodium distichum*), pond pine (*Pinus serotina*), and Atlantic white cedar (*Chamaecyparis thyoides*). Understory species typical of non-

riverine swamp forest communities include American titi (*Cyrilla racemiflora*), sweet bay (*Magnolia virginiana*), red bay (*Persea borbonia*), fetterbush (*Lyonia lucida*), red maple (*Acer rubrum*), and catbrier (*Smilax* species).

Project Implementation

Site preparation commenced in the fall of 2006. During this period, areas of invasive or non-target species were drum-chopped and bush-hogged. Following these activities, an herbicide was applied to reduce competition within the project area. A water soluble herbicide was used and applied by a licensed applicator to reduce impacts to the surrounding open water areas. Refer to Appendix A for photographs of post-construction conditions.

Site planting was completed on February 23, 2007. The installation of approximately 35,000 seedlings was supervised by LMG to ensure proper spacing and planting depths. LMG obtained a mix of hardwood and shrub seedlings which accurately represent the targeted headwater swamp community discussed in the approved restoration plan (Table 1). Hardwood tree seedlings comprised a majority of the planting for Zone 1 (150' wide), while shrubs were installed throughout Zone 2 (remaining 50'). Seedlings were planted on 8' centers at a depth sufficient to cover the root collar throughout the project area. Following the planting activities, LMG inspected the project area to ensure that seedlings had been installed correctly.

2.0 AS-BUILTS

As defined by the approved restoration plan, a total of twenty-three (23) permanent monitoring plots were established, which corresponds to a total of 2.3 acres (equivalent to 5% of the restoration area). These plots were installed throughout the project area to provide for a representative sampling of the vegetative community.

Refer to Appendix A for photo documentation of the February 2007 planting. Refer to the attached survey (Appendix B) of the buffer restoration area for the location and corresponding number of the permanent vegetative monitoring plots a on the site.

3.0 MONITORING PLAN

Annual monitoring will be conducted near the end of each growing season for a period of five years. Vegetative monitoring will be conducted at each of the twenty-three (23) 0.10-acre permanent plots.

Vegetative planting will be deemed successful if survivorship of plantings and volunteers of desirable species[1] meets or exceeds a target stem density of 320 stems/acre. Monitoring reports will be submitted annually to the EEP (by January 1 of each year). These reports will include results of vegetative monitoring and photographic documentation of site conditions. Monitoring reports will also identify any contingency measures that may need to be employed to remedy any site deficiencies. For instance, deer browse tubes and fencing may need to be used if evidence of significant herbivory or deer browse is observed. In addition, supplemental planting may be necessary in areas of reduced survivorship.

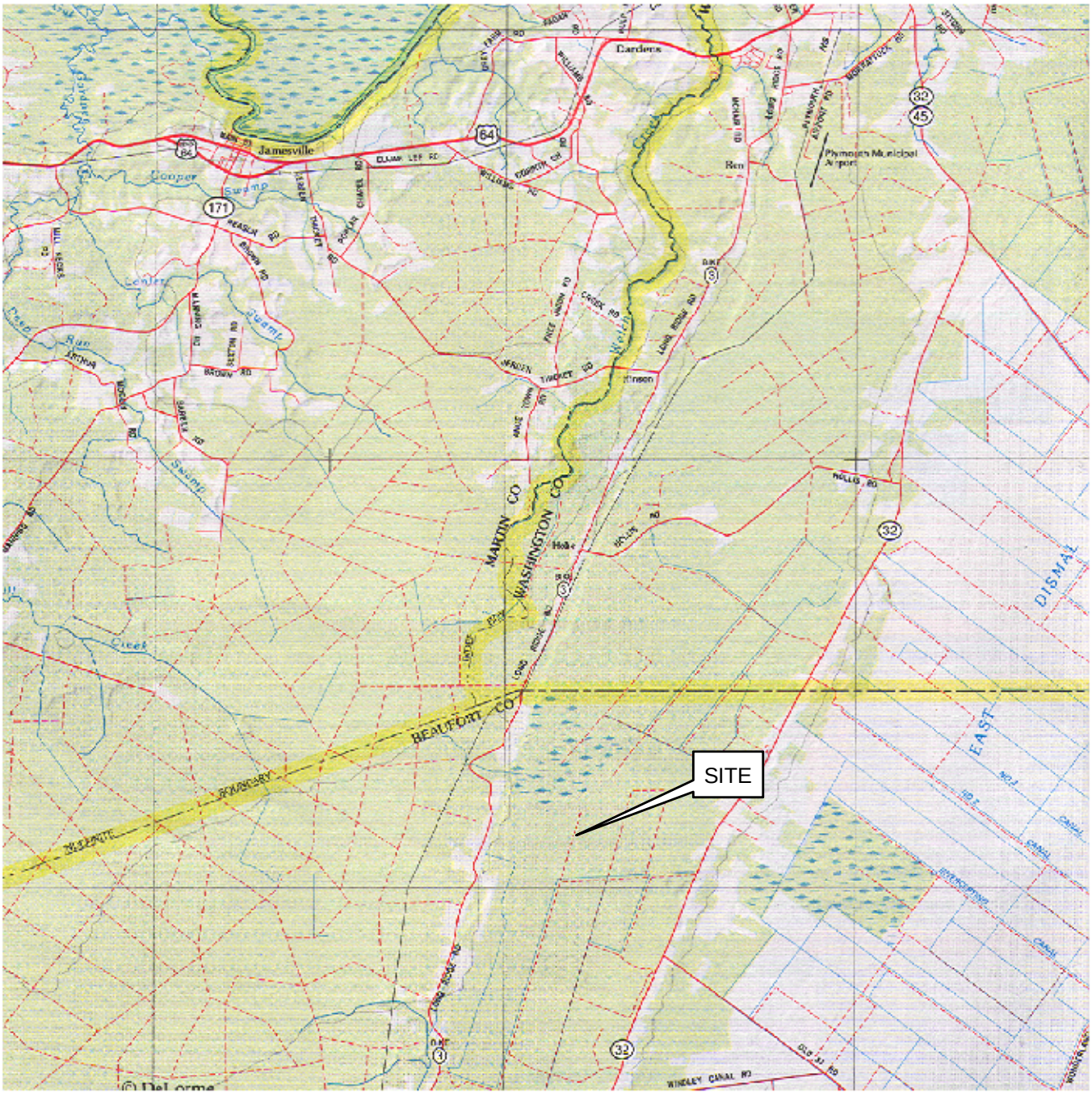
TABLE 1. Simpson Buffer Restoration Plant List

Buffer Zone	**Zone 1 (Trees)**	
Stem Target:	**600/ac (30ac.)**	**17,000**
Species	**# planted**	**(% of total)**
Bald cypress (*Taxodium distichum*)	5,000	27.78%
White Cedar (*Chamaemycyparis thyoides*)	3,000	16.67%
Black Gum (*Nyssa sylvatica*)	4,000	22.22%
Green Ash (*Fraxinus pennsylvanica*)	5,000	27.78%
	Zone 2 (Shrubs)	
	1,000/ac (15ac.)	**18,500**
Red Bay (*Persea borbonia*)	5,000	33.33%
Sweet Bay (*Magnolia virginiana*)	6,000	40.00%
Fetterbush (*Lyonia lucida*)	2,000	13.33%
Wax Myrtle (*Myrica cerifera*)	5,500	36.67%
Total	**35,500**	

[1] Desirable species are considered as noninvasive species characteristic of riparian habitats.

4.0 CONCLUSION

WRC has completed the implementation of 45.0 acres of buffer restoration located in TAR-7 of the lower Tar-Pamlico Basin. Restoration of riparian buffer along "blue-line" surface waters will help to decrease source nutrient loading and concurrently increase nutrient removal capacity. In addition, the project will provide ancillary benefits to aquatic and wildlife habitat via enhanced niche habitat, microclimate modification and shade, and increased food-web support. By doing so, the proposed project will help to effectively mitigate for authorized loss of buffer habitat within the Tar-Pamlico Basin.



SCALE: 1" = 2 miles

Simpson Tract
Tar-Pamlico River Basin
HUC: 03020104
Subbasin:03-03-07

Figure 1.
Vicinity Map

Delorme Gazetteer

Land Management Group, Inc.

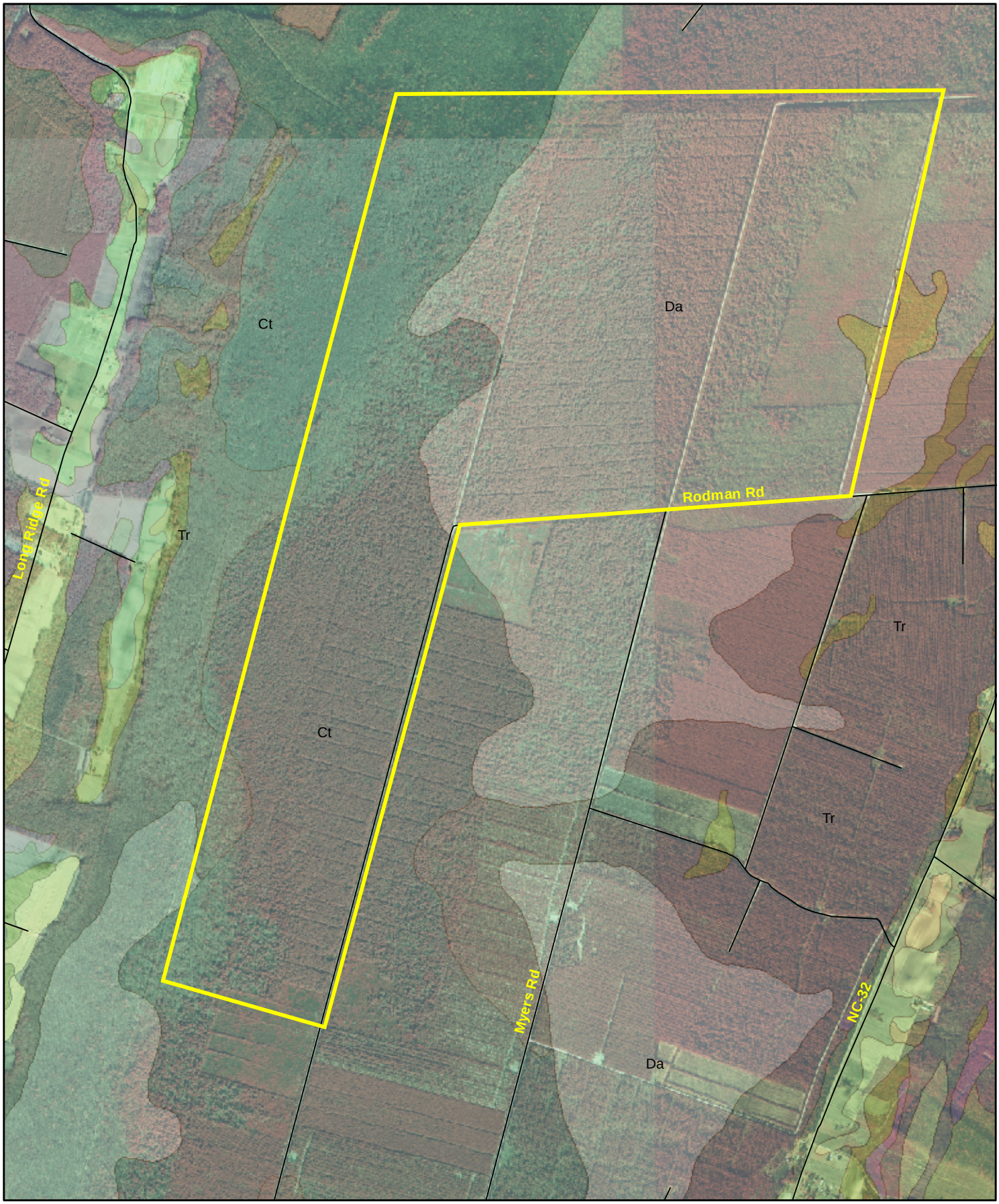


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Figure 2.
USDA Soil Survey

Beaufort County
Land Management Group, Inc.

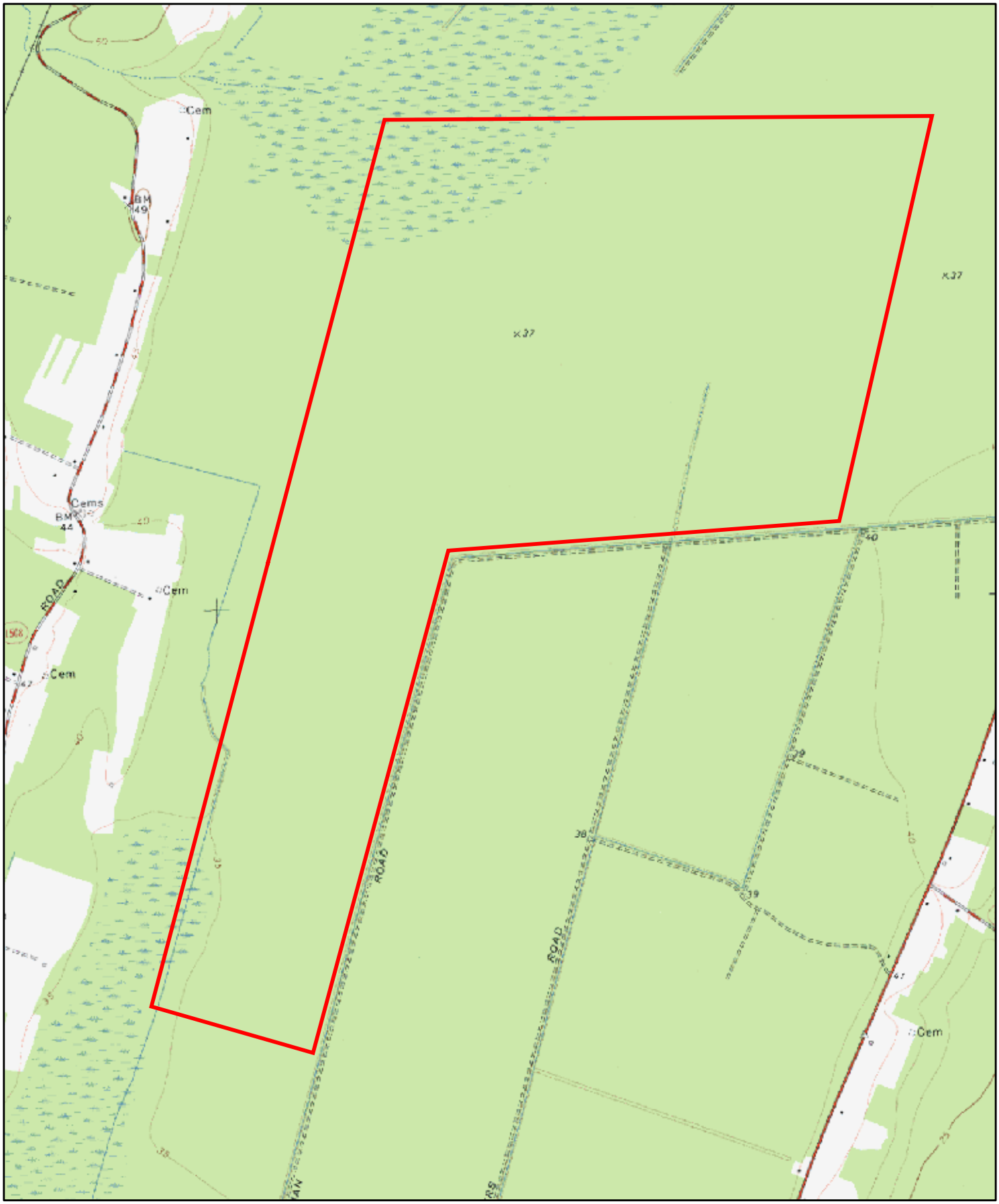

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Figure 3.
USGS Topographic Map
Hoke, NC

Land Management Group, Inc.

0 2,000 4,000 ft

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Figure 4.
1998 Aerial Photography

Land Management Group, Inc.

Simpson Tract
Tar-Pamlico River Basin
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Figure 5.
Wetland and Buffer
Restoration Plan

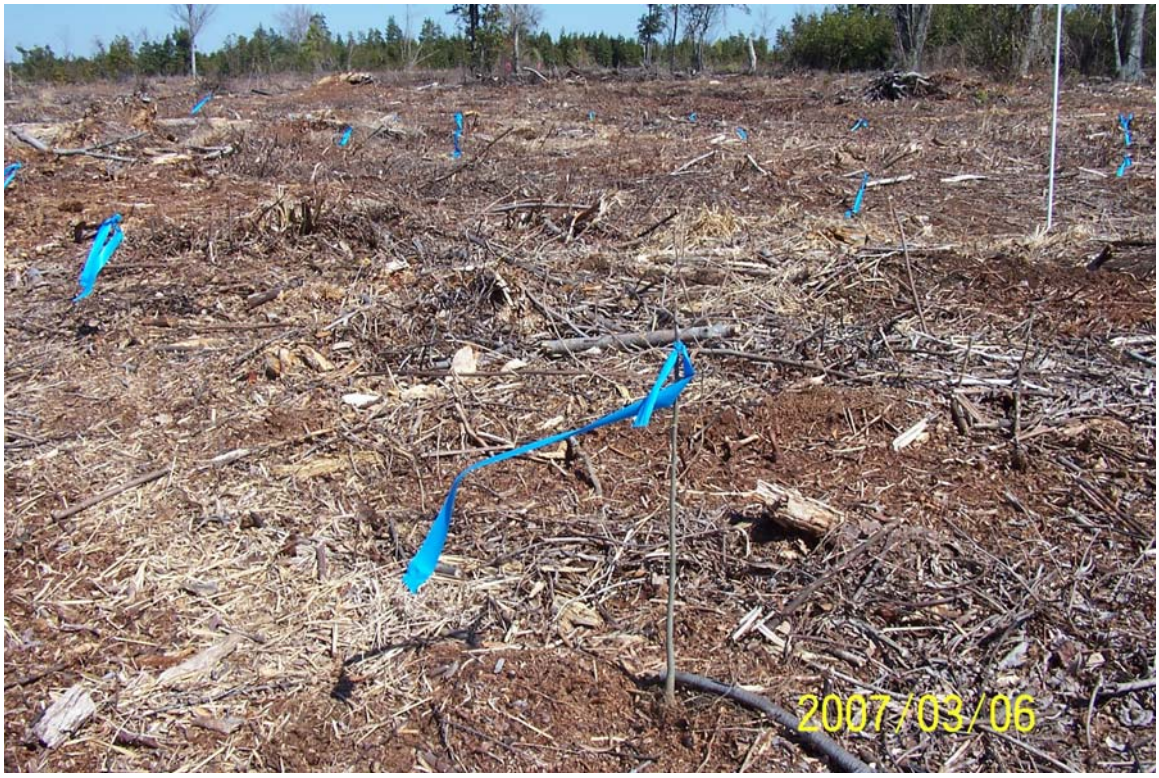
Land Management Group, Inc.

Appendix A. Site Photographs

Site conditions along western side prior to planting.

Site conditions along eastern side prior to planting.

Hardwood seedlings and shrubs used for buffer planting.

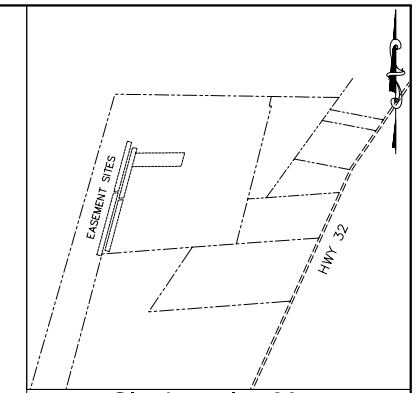


Black gum seedlings within monitoring plot.

Bald Cypress seedling planting within project area.

View of typical monitoring plot established along eastern side of the project.

Appendix B. Conservation Easement with Monitoring Plot Locations



Site Location Map
NTS

THOMAS D. SIMPSON
DB 1418 PG 558
PLAT CAB. "F" SLIDE 23-4

THE SOUTHERN BOUNDARY OF THE NEW CONSERVATION EASEMENTS RUN ALONG THE NORTHERN BANK OF THE EXISTING CANALS (TYPICAL OF THE EASEMENTS ON THE NORTH SIDE OF THE ROAD)

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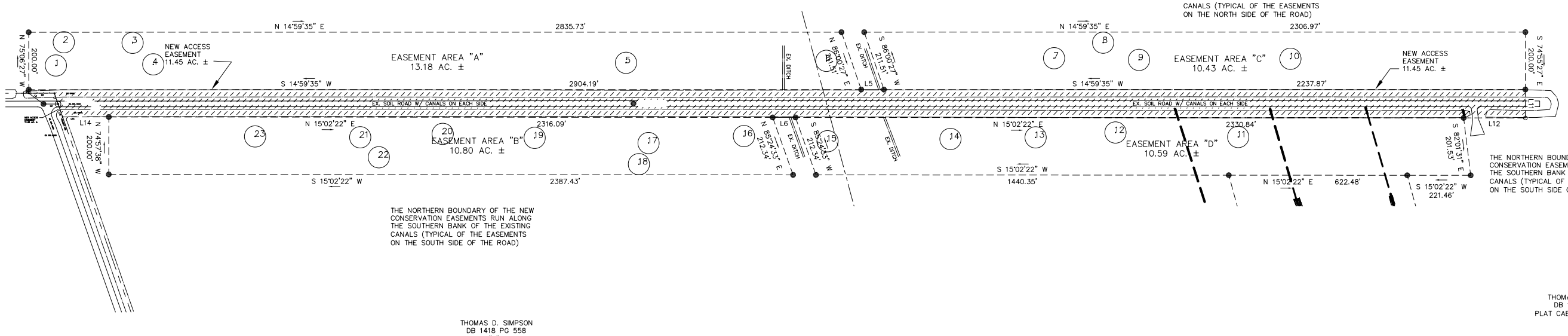

THE NORTHERN BOUNDARY OF THE NEW CONSERVATION EASEMENTS RUN ALONG THE SOUTHERN BANK OF THE EXISTING CANALS (TYPICAL OF THE EASEMENTS ON THE SOUTH SIDE OF THE ROAD)

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0 100 200 400 800

THIS MAP IS BASED ON ORIGIANL DRAWINGS AND/OR SURVEY INFORMATION FROM:

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Engineering · Architecture · Surveying · Technology

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