"Manning Farm Property"
Buffer Restoration Project

Edgecombe County, NC
Tar-Pamlico River Basin
(Cataloging Unit #03020103)

Mitigation Report
(Task 6)

NC EEP Contract #D05026

Prepared For:

North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Ecosystem Enhancement PROGRAM

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Prepared By:

Land Management Group, Inc.
PO Box 2522
Wilmington, NC 28403

Phone. 910-452-0001
Fax. 910-452-0060

Project Manager:
Christian A. Preziosi
Office. 910-452-0001
Cell. 910-471-0515
Email. cpreziosi@lmgroup.net

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EXECUTIVE SUMMARY

Prior to project implementation, the Manning Farm Property was farmed for soybean and cotton production. The site consisted entirely of open agricultural fields with no existing riparian buffer (i.e. trees and shrubs are absent within 200 ft of existing surface waters). Under contract with the North Carolina Ecosystem Enhancement Program (EEP), Land Management Group, Inc. (LMG) implemented the restoration of 10.0 acres of riparian buffer habitat along Knight Canal (a tributary of Conetoe Creek) and contiguous surface-waters (i.e. field ditches) in Edgecombe County, NC.

The entire 10.0-ac project area has been planted with characteristic tree and shrub species on an average density of 900 stems/ac. Planting was completed in February 2006. Five (5) permanent 0.10-ac monitoring plots (equivalent to 5% of the restoration area) were established subsequent to planting. Annual monitoring will be conducted near the end of each growing season for a period of five years beginning in October 2006. 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, LMG implemented the restoration of 10.0 acres of farmland located adjacent to Knight Canal (a tributary of the Tar River) and a series of contiguous surface waters (i.e. field ditches). The project area is part of the "Manning Farm", located approximately 4.0 miles southeast of Tarboro in Edgecombe County, NC (refer to Figure 1). The site is bordered to the north by US 64 Alternate and to the west by Knight Canal (refer to Figure 2). The property is situated within TAR-3 of the lower Tar-Pamlico River Basin (USGS Cataloging Unit 03020103).

Mitigation Goals and Objectives

The proposed restoration project is intended to provide suitable, high-quality riparian buffer restoration as compensatory mitigation for riparian buffer impacts authorized through the EEP. The objective of the project is to restore riparian buffer vegetation and diffuse flow conditions to help reduce non-point source discharge of contaminants into adjacent water bodies. The primary function of the riparian buffer project detailed in this document is to restore the nitrogen (N) 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 10.0-acre riparian buffer restoration area represents a portion of a larger 250-acre tract ("Manning Farm") formerly farmed for the production of soybean and cotton. Land use practices (including herbicide, pesticide, and fertilizer application) served as potential contributors to decreased water quality of adjacent surface waters (i.e. ditches and 'blue-line' streams). Application of nitrogen-rich fertilizer represented the most significant non-point source of nitrogen within the immediate project area. Woody vegetation along ditches was either absent or sparse (less than 100 stems per acre that are > 5 inches diameter at breast height). As a result, nutrient-laden runoff was discharged from agricultural fields directly into surface waters with little or no nutrient filtration/transformation.

Restoration Summary

The restoration project included the planting of characteristic tree and shrub seedlings adjacent to open ditches and blue-line streams on the 10.0-ac restoration site (refer to Figure 3). No federal or state permits were necessary to conduct the restoration activities. The riparian buffer was planted

with characteristic tree species including river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), water oak (*Quercus nigra*), tulip poplar (*Liriodendron tulipifera*), and red bay (*Persea borbonia*). Bare-root seedlings were planted at a density of 600 trees per acre. The outer 50 feet of the proposed buffer areas were planted with characteristic shrub species including wax myrtle (*Myrica cerifera*), American beautyberry (*Callicarpa americana*), and elderberry (*Sambucus canadensis*). Shrubs were planted at a density of 1,200 plants per acre. These species are considered to be well suited for site-specific conditions (including soil characteristics and moisture regimes). In addition, each of these species is listed within NCDENR's "Guidelines for Riparian Buffer Restoration" as appropriate species for use in riparian buffer restoration projects. Approximately 7,700 trees and shrubs were planted throughout the project footprint. On-site planting was completed in February 2006. Refer to Table 1 for a list of species planted (with corresponding quantities) within the buffer restoration area.

TABLE 1. Manning Farm Plant List

Buffer Zone	**Zone 1 (Trees)**		**Zone 2 (Shrubs)**	
Stem Target:	**600/ac.**	**4,500 (% of total)**	**1,200/ac. # planted**	**3,000 (% of total)**
Species	**# planted**			
River Birch (*Betula nigra*)	1,200	26.67%		
Sycamore (*Platanus occidentalis*)	800	17.78%		
Green Ash (*Fraxinus pennsylvanica*)	500	11.11%		
Overcup Oak (*Quercus lyrata)*	200	4.44%		
Water Oak (*Quercus nigra*)	500	11.11%		
Red Bay (*Persea borbonia*)	500	11.11%		
Yellow Poplar (*Liriodendron tulipifera*)	1,000	22.22%		
Sweet pepperbush (*Clethra alnifolia*)			500	16.67%
Elderberry (*Sambucus canadensis*)			1,000	33.33%
American Beautyberry (*Callicarpa americana*)			1,000	33.33%
Wax Myrtle (*Myrica cerifera*)			500	16.67%
			TOTAL	7,700

2.0 AS-BUILTS

Refer to the attached survey (Appendix A) of the buffer restoration area with the corresponding location and number of permanent vegetative monitoring plots established on the site.

3.0 MONITORING PLAN

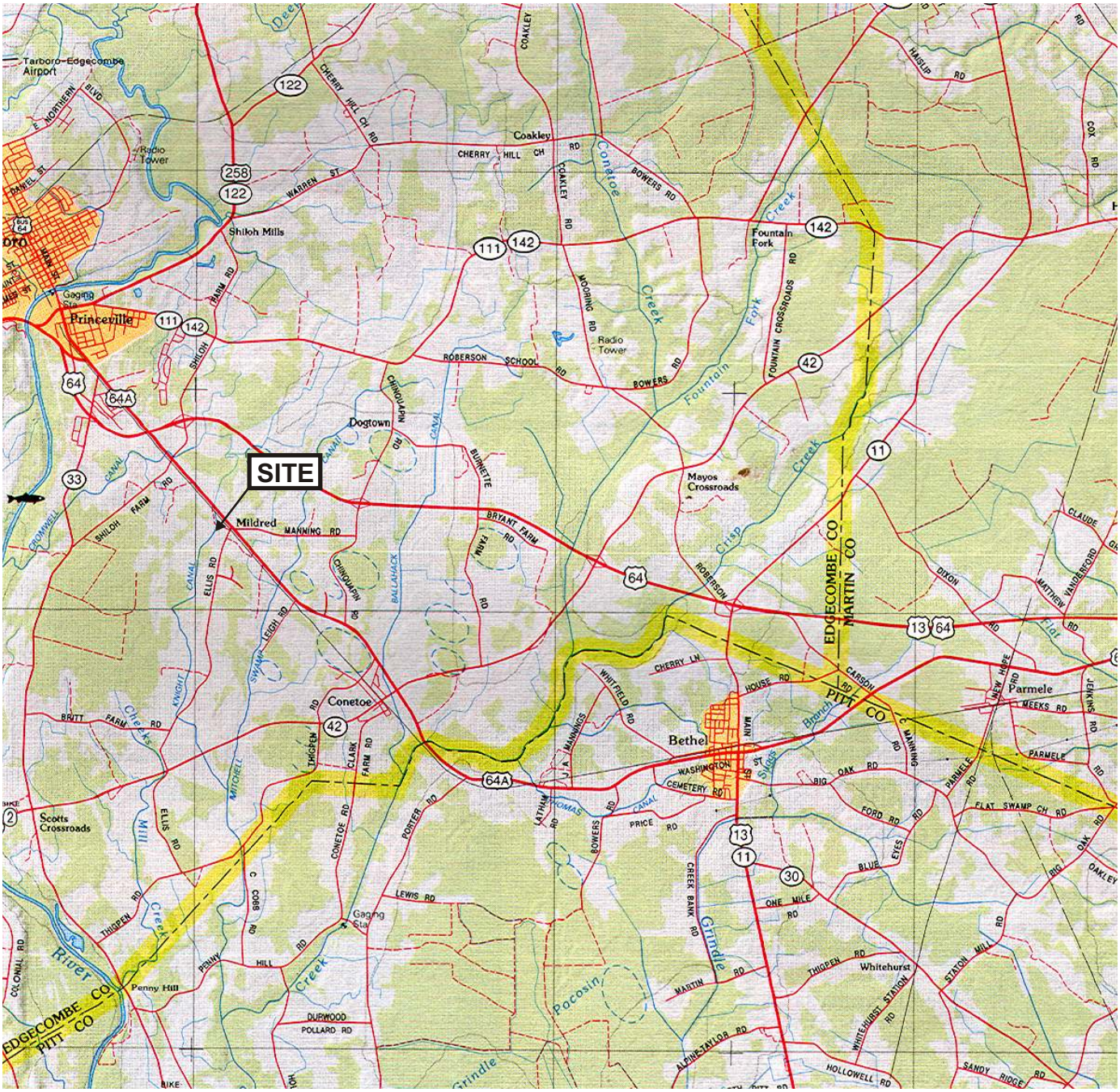
Annual monitoring will be conducted near the end of each growing season for a period of five years. Vegetative monitoring has included the establishment of five (5) 0.10-acre permanent plots corresponding to a total of 0.5 acres (equivalent to 5% of the restoration area). Vegetative planting will be 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.

4.0 CONCLUSION

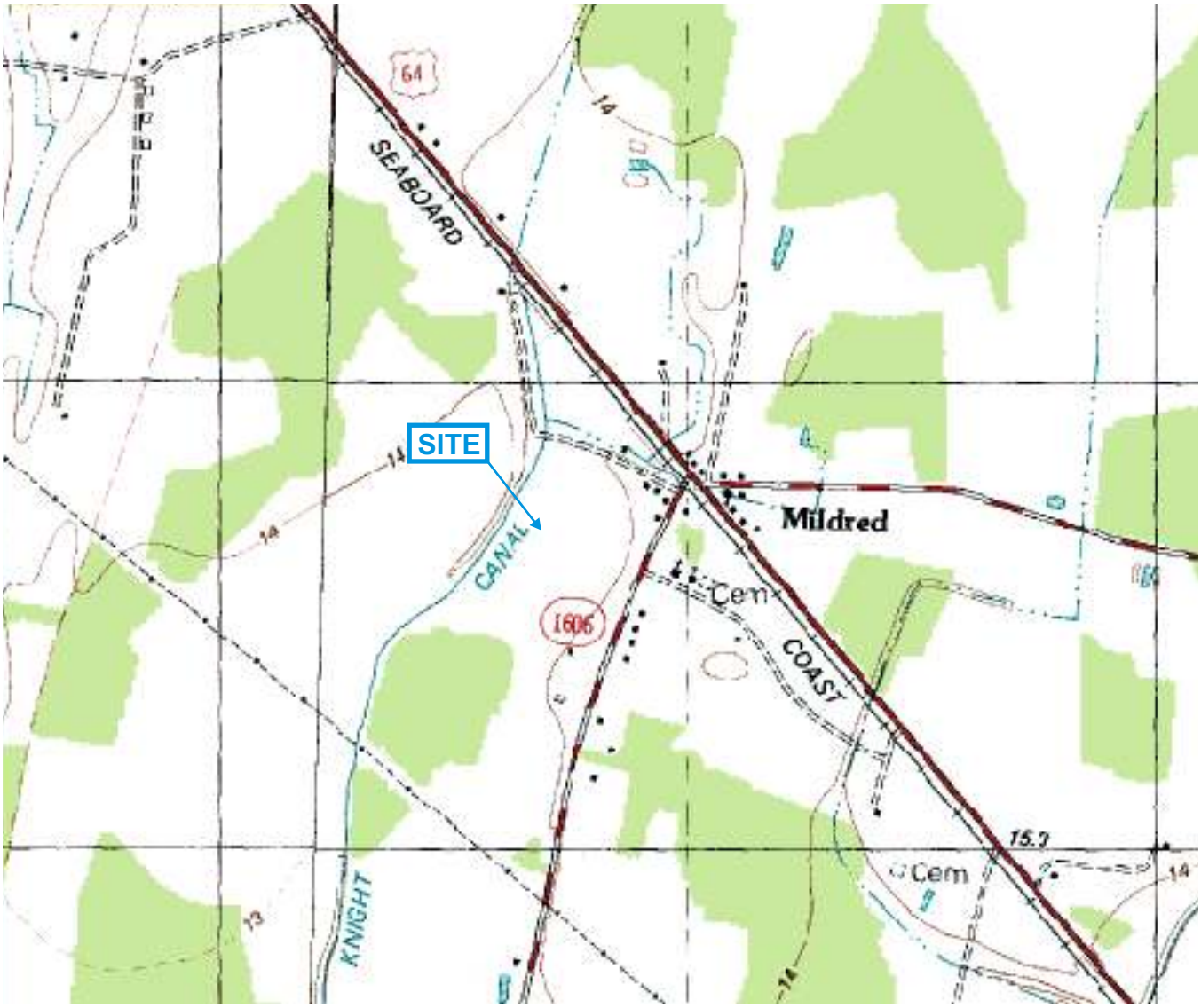
LMG has completed the implementation of 10.0 acres of riparian buffer restoration located in TAR-3 of the lower Tar-Pamlico Basin. Reversion of agricultural land to wooded riparian buffer will decrease source nutrient loading and concurrently increase nutrient removal capacity. In addition, the project 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 riparian buffers within the Tar-Pamlico River Basin.

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



Map Source: DeLorme: North Carolina Atlas and Gazetteer., 1997 p. 46.

NC EEP Conetoe Creek Buffer Site Manning Farm Edgecombe County	***Land Management Group, Inc.*** **Environmental Consultants** Wilmington, N.C. July 2006	**Figure 1.** Site Location Map



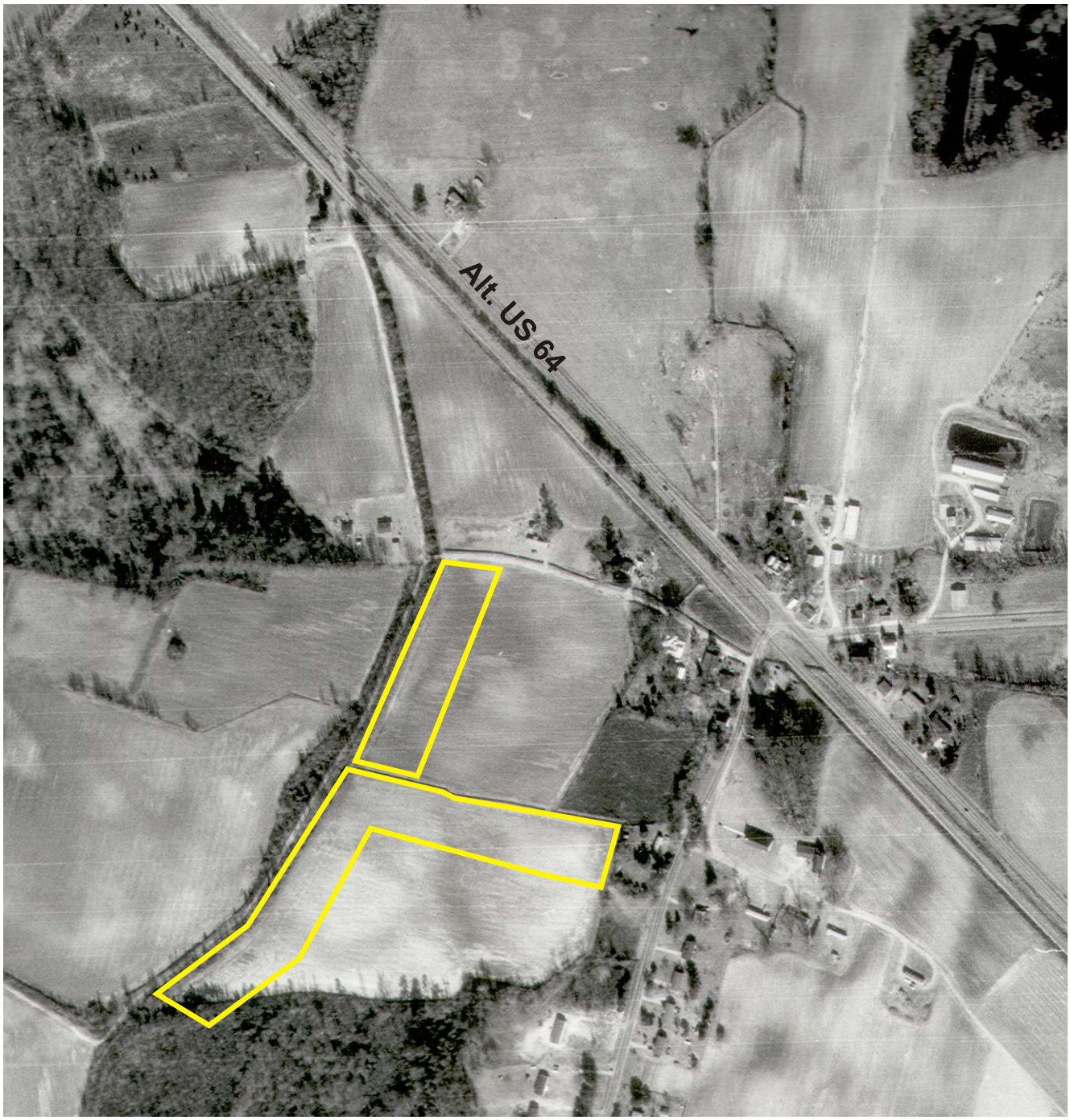
Boundaries are approximate
and not meant to be absolute.

Map Source: 1990, USGS 7.5' Topographic Quadrangle. Conetoe Quadrangle

N

SCALE 1" = 2000'

NC EEP Conetoe Creek Buffer Site Manning Farm Edgecombe County	***Land Management Group, Inc.*** **Environmental Consultants** Wilmington, N.C. July 2006	**Figure 2.** 1990 Topographic Quad



200’ Buffer Planting Area (10.0 acres)

N

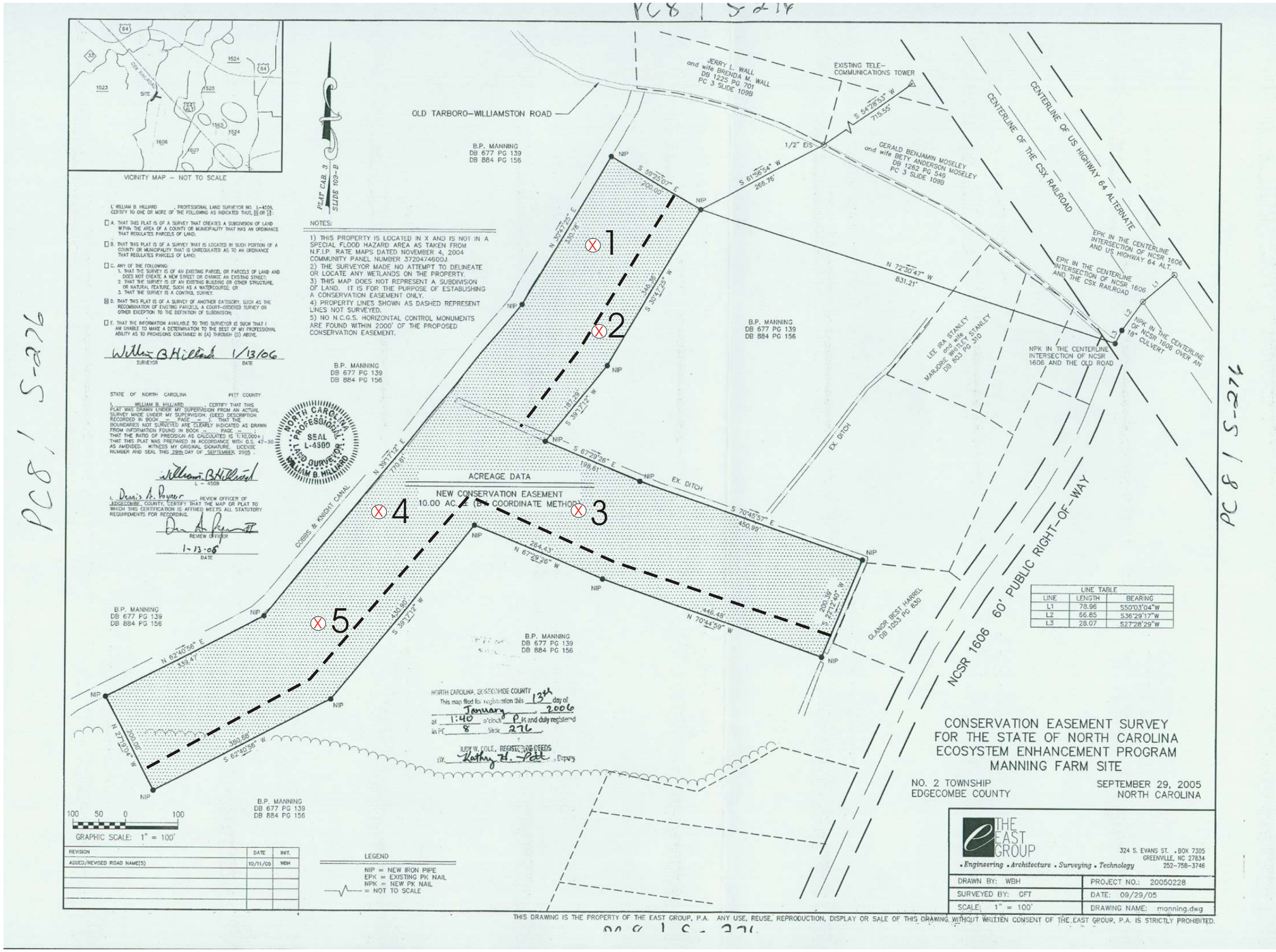
SCALE 1" = 500’

Boundaries are approximate
and not meant to be absolute.

Map Source: 1993 Aerial Photography NCGIA

NC EEP Conetoe Creek Buffer Site Manning Farm Edgecombe County	***Land Management Group, Inc.*** **Environmental Consultants** Wilmington, N.C. July 2006	**Figure 3.** Buffer Planting Overview

Appendix A. Conservation Easement Plat (includes monitoring plots)



⊗ Permanent Monitoring Plot	
Plot #	**UTM Coordinates**
1	745578.75002 233843.862283
2	745591.202791 233810.111316
3	745575.130088 233667.657117
4	745477.154439 233661.641541
5	745464.062895 233622.895396