LEVY NUCLEAR PLANT AND ASSOCIATED TRANSMISSION LINES
WETLAND MITIGATION PLAN

COMPREHENSIVE DESIGN DOCUMENT

LEVY COUNTY, FLORIDA

September 2011

FOR

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PEF 903
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REPORT BY

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EXECUTIVE SUMMARY

Progress Energy Florida (PEF), a regional power company that provides electric service to over five million people throughout Florida, has proposed to build a new nuclear generating facility in Levy County, Florida. PEF has been working with the Nuclear Regulatory Commission (NRC) through the long, complex entitlement process requiring numerous permits and approvals for the Levy Nuclear Plant (LNP). A part of the process is acquisition of wetland permits from the State of Florida and U.S. Army Corps of Engineers (ACOE). Wetland permit applications have been submitted to the Florida Department of Environmental Protection (FDEP) and ACOE. This plan addresses the compliance with the Environmental Resource Permit (ERP) rules through FDEP under the Power Plant Siting Act Site Certification process and the ACOE Section 404 and Section 10 Individual Permit for the plant and associated transmission lines. The content of this document is the detailed mitigation plan for LNP and associated transmission lines.

In June 2008, PEF formally filed a Site Certification Application (SCA) with FDEP which was approved in August 2009 (FDEP Site Certification No. PA 08-51C) and a Section 404 permit application with the ACOE (ACOE Permit No. SAJ-2008-490). These applications involve 668.4 acres of permanent wetland impacts related to the construction of LNP and associated new powerlines. An April 23, 2010 preliminary Wetland Mitigation Plan was submitted and has been preliminarily reviewed by FDEP, this document is the detailed mitigation plan and refinement of the watershed approach presented in the April plan.

Due to the location and substantial size and reach of the project, wetland impacts occur within several drainage basins. PEF proposes a mitigation plan that compensates wetland losses within the basin (watershed) of the impacts. The impacts occur in five different basins from the development of the power plant and associated transmission lines within the preferred rights-of-way. The watersheds being impacted include the Waccasassa, Withlacoochee, Hillsborough, Upper Coastal, and Tampa Bay watersheds as defined by FDEP. The mitigation plan has been designed to satisfy the requirements of the state and federal agencies based upon Uniform Mitigation Assessment Method (UMAM) and agency specific mitigation guidelines as outlined in the LNP Conditions of Certification (COC) and the 2008 mitigation rule for ACOE (33 CFR Parts 325 and 332, 40 CFR Part 230). The COC required the submittal of the wetland mitigation plan to FDEP by May 24, 2010 which was accomplished by the submittal of the April 2010 Wetland Mitigation Plan. As stated above, this plan is a refinement of the April plan.

The 2008 mitigation rule for ACOE indicates that a watershed based approach is the preferred method to provide wetland impact compensation. As stated above this mitigation plan meets the requirements of the permittee-responsible mitigation under a watershed approach. The 2008 mitigation rule also outlines the information needed in the mitigation plan such as the objectives, site selection, site protection, baseline information, determination of credits, mitigation work plan, maintenance plan, performance standards, monitoring plan management plan and financial assurances. The wetland mitigation plan presented herein meets these requirements.

Under the permittee-responsible mitigation approach PEF is financially responsible for all aspects of this wetland mitigation effort. The specific financial assurance instrument that PEF will use will be determined once the wetland mitigation plan has been reviewed and approved by the regulatory agencies. Funds for the mitigation activities contained in this plan for lands owned by the Florida Forest Service (FFS), and Pasco County are not contained in any of their budgets and would not occur if PEF was not funding and conducting these activities as a part of this wetland mitigation plan.

Wetland impacts for the LNP project have been assessed by UMAM for each basin on the project site (Table 1). Development will impact 59.1 acres of herbaceous wetlands (loss of 38.7 UMAM units) and 609.3 acres of forested wetland (loss of 250.4 UMAM units).

Table 1. Summary of wetland impacts for Levy Nuclear Plant development.

Watershed	Herbaceous Wetland Functional Loss Units	Herbaceous Wetland Acreage	Forested Wetland Functional Loss Units	Forested Wetland Acreage	Total Functional Loss Units	Total Acreage Impacted
Waccasassa	-1.3	2.6	-181.7	385.5	-183.0	388.1
Withlacoochee (plant site)	-0.4	2.4	-29.2	124.7	-29.6	127.1
Withlacoochee (trans. lines)	-9.8	13.8	-9.2	27.2	-19.0	41.0
Hillsborough River	-15.7	22.4	-0.9	1.1	-16.6	23.5
Upper Coastal	-5.2	8.5	-29.1	70.1	-34.3	78.6
Tampa Bay	-6.3	9.4	-0.3	0.7	-6.6	10.1
Total	**-38.7**	**59.1**	**-250.4**	**609.3**	**-289.1**	**668.4**

Source: April 23, 2010 Wetland Mitigation Plan

In response to the impacts defined above, PEF evaluated numerous mitigation sites and eventually identified six potential sites. Detailed mitigation plans have been developed for the six different mitigation sites. These sites include the following:

- Daniels Island Tract within the Goethe State Forest (GSF) in the Waccasassa watershed;
- LNP site with activities in the Waccasassa and Withlocoochee watersheds;
- Boarshead Ranch (BHR) in the Withlacoochee and Hillsborough watersheds
- Five Mile Creek (FMC) and Homosassa Tract within the Withlacoochee State Forest (HT) within the Upper Coastal watershed; and
- Brooker Creek Preserve (BCP) in the Tampa Bay watershed.

In the April 2010 Wetland Mitigation Plan, the Daniels Island Tract plan called for pine thinning, ditch filling and blocking, low water crossing (LWC) installation and timber thinning for management of Red Cockaded Woodpecker (RCW) habitat. This plan still incorporates some of these activities, but has eliminated the ditch filling/blocks and pine thinning. This plan also increases the number of LWC's and culvert replacements. Some of the LWC's are outside of the Daniels Island tract boundary so this site is now referred to as the Goethe State Forest site. The LNP site focused primarily on habitat restoration and hydrologic improvement through the installation of raised road beds with additional culverts and LWC's. This plan retains most of the same activities, but has reduced the number of raised road beds and culverts and proposes the installation of additional LWC's to achieve the hydrologic enhancement. The BHR site is

focused on enhancing existing wetland pasture and converting it to freshwater marsh habitat, in addition to several hydrologic improvements through the installation of several new culverts. This plan proposed a few different enhancement areas than the April 2010 plan, but is still taking the same basic approach. For the FMC site, this plan essentially utilizes the same plan, with very few changes. The HT under the April 2010 plan initially called for hydrologic improvements, wetland enhancement via supplemental planting and timber management activities. This plan has eliminated most of the supplemental plantings and timber management activities and now will include additional low water crossings, trail road removal and supplemental planting of additional wetland enhancement areas. The BCP site includes the same northern low water crossing, wetland enhancement planting and treatment of invasive/exotic species within some of the same specified areas, however, this plan has reduced the amount of wetland enhancement associated with treatment of invasive/exotic species, as it was not clear that credit would be given for enhancement in several large areas. This plan proposes the installation of an additional low water crossing in order to restore a historic flow path that was identified through historic aerial photographs.

Table 2 provides a summary of the proposed UMAM lift scores associated with each specific mitigation site. The mitigation for the impacts occurring on the tracts will be accomplished through a variety of mitigation techniques designed to result in environmentally enhanced, sustainable, natural areas. The mitigation plan produces more mitigation value than is necessary for each basin. Table 3 provides a summary of wetland impacts and mitigation by watersheds for Levy Nuclear Plant development.

Table 2. Summary of proposed UMAM lift scores for Levy Nuclear Plant development.

Mitigation Site	Watershed	Activity	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Upland Functional Gain Units	Total Functional Gain Units
Goethe State Forest	Waccasassa	wetland restoration	0	+62.3	+9.3	+71.6
LNP Site	Waccasassa	wetland enhancement and preservation	+16.5	+105.8	+194.8	+317.1
	Withlacoochee	wetland enhancement and preservation	+2.4	+8.4	+45.0	+55.8
Boarshead Ranch	Withlacoochee	wetland creation, enhancement and restoration	+11.0	+9.60	0.0	+20.6
	Hillsborough	wetland creation, enhancement and restoration	+19.0	+1.0	0.0	+20.0
Five Mile Creek	Upper Coastal	wetland creation, enhancement and restoration	+5.5	+0.2	+0.1	+5.8
Homosassa Tract	Upper Coastal	wetland enhancement and restoration	+3.5	+52.1	+0.0	+55.6
Brooker Creek Preserve	Tampa Bay	wetland enhancement and restoration	+3.2	+11.5	0.0	+14.7
Total			**+61.1**	**+250.9**	**+249.2**	**+561.2**

Table 3. Summary of wetland impacts and mitigation by watersheds for Levy Nuclear Plant development.

Watershed	Impacts		Mitigation		Upland
	Herbaceous Wetland Functional Loss Units	Forested Wetland Functional Loss Units	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Functional Gain Units
Waccasassa	-1.3	-181.7	+16.5	+168.1	+204.1
Withlacoochee	-0.4	-29.2	+13.4	+18.0	+45.0
Hillsborough	-15.7	-0.9	+19.0	+1.0	0.0
Upper Coastal	-5.2	-29.1	+9.0	+52.3	+0.1
Tampa Bay	-6.3	-0.3	+3.2	+11.5	0.0
Total	**-38.7**	**-250.4**	**+61.1**	**+250.9**	**+249.2**

The Goethe mitigation site is located on a FFS parcel in Levy County, Florida. This parcel is located at the southern extent of the 53,587 acre State Forest. Additionally, the site abuts the northeast corner of the LNP site. Surrounding the state forest is the 21,406 acre Gulf Hammock Conservation Easement to the north and a portion of the 110 mile Cross Florida Greenway (Inglis Island) to the south. The hydrologic enhancement/restoration activities proposed at Goethe will improve the link between these two regionally significant areas and will ultimately result in an ecologically improved and protected corridor between these two large systems. The proposed habitat restoration activities will improve the health and viability of on-site nesting for RCWs. These enhancement/restoration activities are not in the current state forest funding program and there is no timeline for their inclusion into the program.

The LNP mitigation site is located on a PEF-owned parcel in Levy County, Florida. This parcel abuts the southwestern portion of the Goethe State Forest parcel to the north and a portion of the 110 mile Cross Florida Greenway (Inglis Island) to the south. The enhancement/restoration activities proposed at LNP will improve the link between these two regionally significant preserves and will ultimately result in an ecologically improved and protected corridor between these two large systems.

The BHR mitigation site is located on a privately-owned parcel in Pasco County, Florida. This parcel is part of a corridor that is situated where the Hillsborough and Withlacoochee rivers diverge, and is adjacent to approximately nine square miles of Southwest Florida Water Management District (SWFWMD)-owned Green Swamp property and other conservation lands located to the north, east and south. The enhancement/restoration activities proposed at BHR will improve wetland and ecosystem functions in the floodplains of the aforementioned rivers

and will ultimately result in the removal of disturbances to native communities while creating habitat by enhancing the largest area of natural forest remaining in the upper Withlacoochee and Hillsborough Watersheds which allows for an ecologically improved and protected corridor between these two large systems. The enhancement will therefore have greater benefits than the site specific scores described herein.

The FMC mitigation site is located on a county-owned parcel in Pasco County, Florida. This parcel is part of a corridor that is situated between Connor Preserve, a 500-acre SWFWMD parcel to the east and Starkey Wilderness Preserve, a 19,000-acre SWFWMD wildlife preserve to the west. The enhancement/restoration activities proposed at FMC will improve the link between these two regionally significant preserves and will ultimately result in an ecologically improved and protected corridor between these two large systems.

The HT mitigation site is located on state owned lands managed by the FFS in Citrus County, Florida. This 5,529 acre parcel is part of the larger 157,479 acre Withlacoochee State Forest which is made up of seven tracts. The parcel is located just west of U.S. 19 and lies between the Homosassa River and the Chassahowitzka River. It is situated in close proximity to other public conservation lands such as the Chassahowitzka National Wildlife Refuge, Chassahowitzka Wildlife Management Area, Crystal River Preserve State Park, Crystal River Archaeological State Park, and Homosassa Springs Wildlife State Park. It is adjacent to the Chassahowitzka Riverine Swamp Sanctuary. The HT is also adjacent to but not within an aquatic preserve or Area of Critical State Concern and the Chassahowitzka National Wildlife Refuge has designated a Migratory Bird Sanctuary in a portion of the Refuge that adjoins the HT.

The BCP mitigation site refers to the existing Transmission Line Corridor (TLC) and the surrounding habitats, which totals approximately 1,300 acres. PEF owns the existing transmission line right-of-way (ROW), while the rest of BCP is owned and managed by Pinellas County, Florida. This parcel is part of the largest remaining natural forest in Pinellas County and the proposed mitigation plan will restore historic flow patterns that were disturbed during the construction of the PEF transmission line ROW, within the TLC. The installation of this existing ROW altered historic flow patterns and affected the hydrology and species composition of the adjacent natural wetlands. The proposed mitigation plan will help to return BCP to a more natural hydrologic condition and help to restore the adjacent natural wetlands within the Preserve.

The PEF wetland mitigation plan compensates for wetland losses within the basin of the impacts through the use of six strategically located sites. The plans calls for the restoration and enhancement of both wetland and adjacent upland vegetative communities in the effected basins to the greatest extent possible. The location of these ecological functional improvements are designed to satisfy the requirements of the state and federal agencies based upon UMAM and agency specific mitigation guidelines and result in the improvement in overall ecological function for wetland and upland vegetative communities, wetland and upland dependent species (protected and non-protected) across thousands of acres in regional

significant locations that expand conservation areas and meet regional watershed conservation goals.

Upon completion of the construction of the LNP project and implementation of the wetland mitigation plan, PEF customers and the public will benefit from clean energy and the restoration of thousands of acres of regionally significant habitat across five watershed basins.

Table of Contents

1.0 INTRODUCTION

Progress Energy Florida (PEF), a regional power company that provides electric service to over five million people throughout Florida, has proposed to build a new nuclear generating facility in Levy County, Florida (Figure 1-1). PEF has been working with the Nuclear Regulatory Commission (NRC) through the long, complex entitlement process requiring numerous permits and approvals for the Levy Nuclear Plant (LNP). A part of the process is acquisition of wetland permits from the State of Florida and U.S. Army Corps of Engineers (ACOE). Wetland permit applications have been submitted to the Florida Department of Environmental Protection (FDEP) and ACOE. This plan addresses the compliance with the Environmental Resource Permit (ERP) rules through FDEP under the Power Plant Siting Act Site Certification process and the ACOE Section 404 and Section 10 Individual Permit for the plant and associated transmission lines. The content of this document is the detailed mitigation plan for LNP and associated transmission lines.

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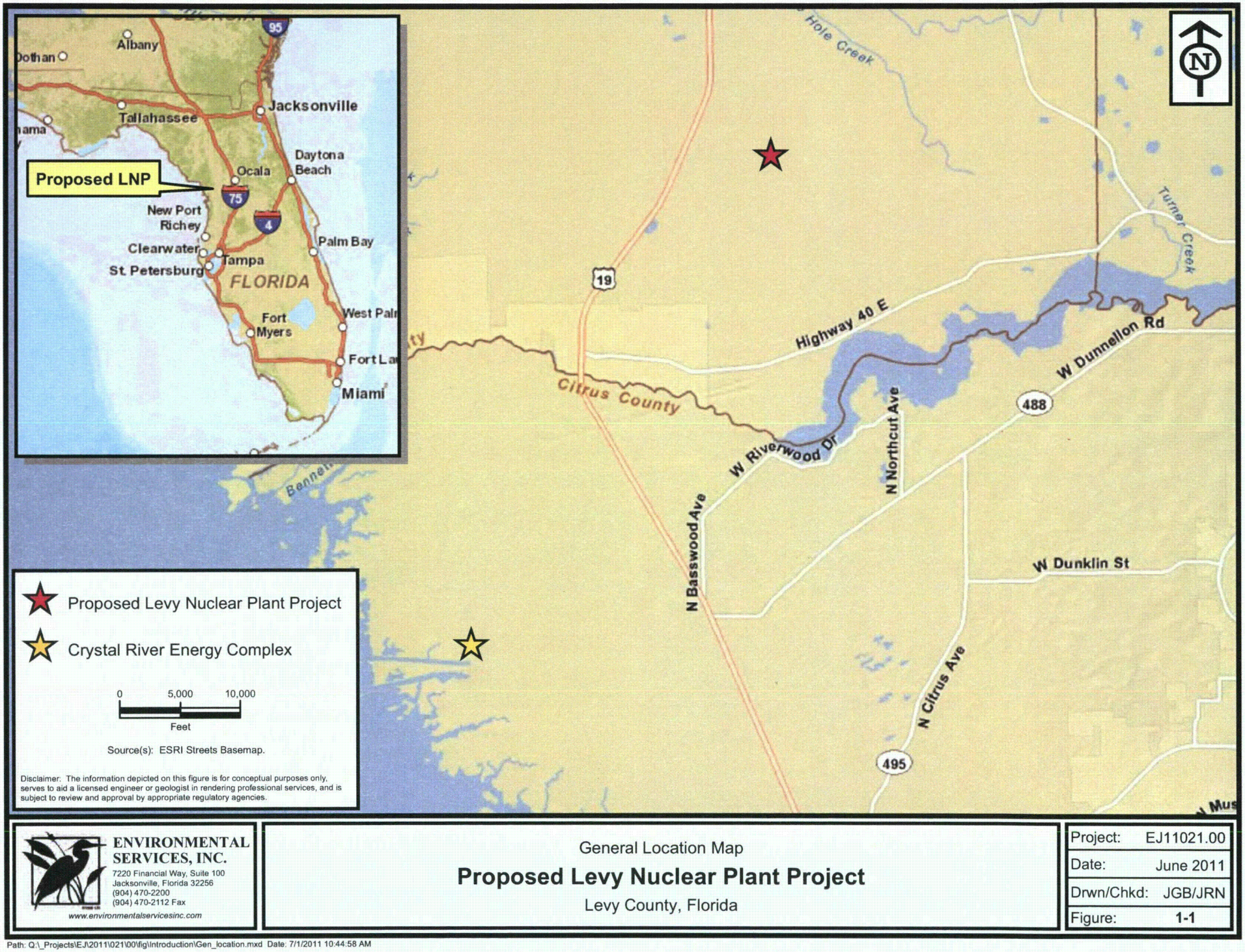

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General Location Map

Proposed Levy Nuclear Plant Project

Levy County, Florida

Project:	EJ11021.00
Date:	June 2011
Drwn/Chkd:	JGB/JRN
Figure:	1-1

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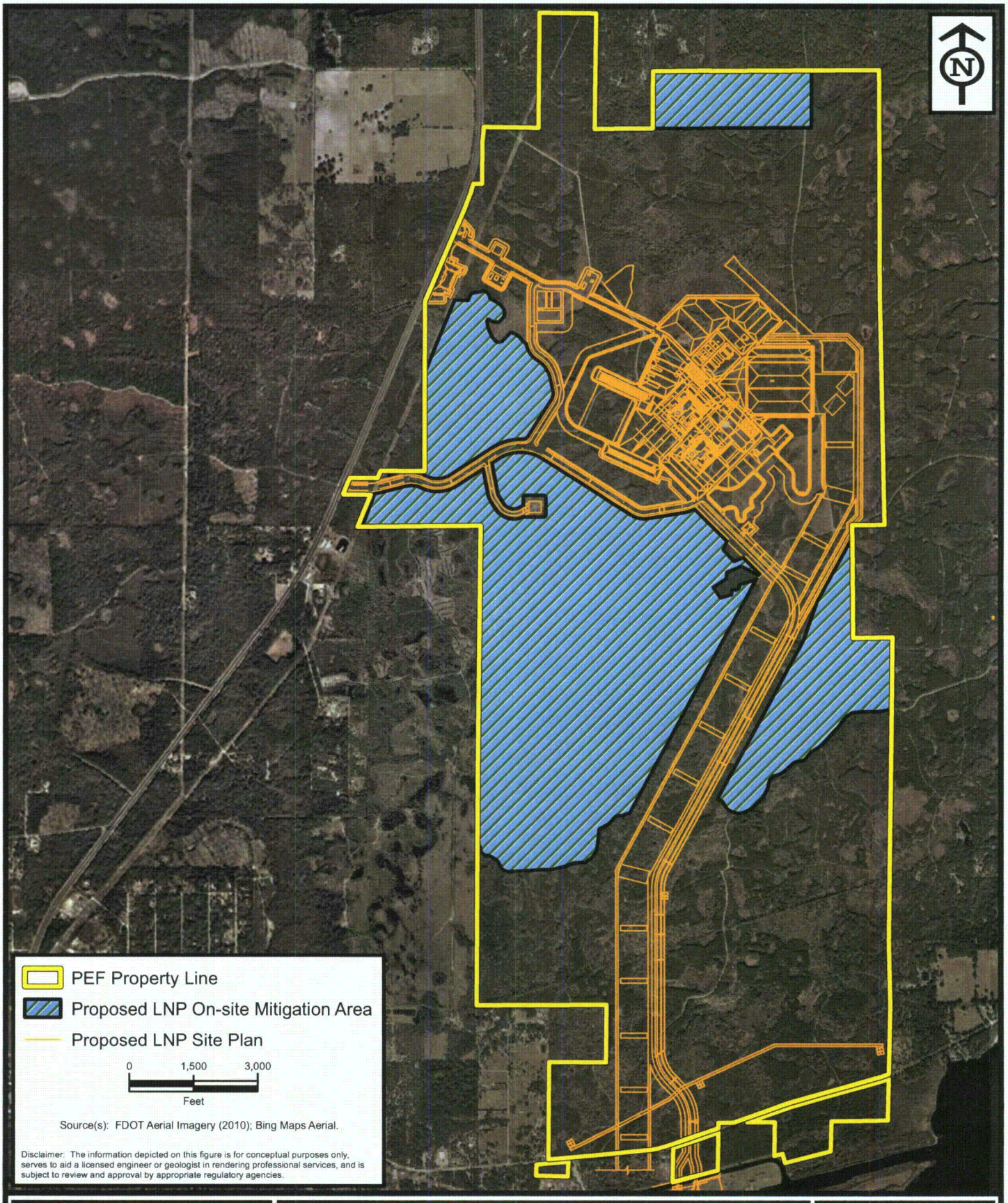

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Project Site

Proposed Levy Nuclear Plant Project

Levy County, Florida

Project:	EJ11021.00
Date:	Aug 2011
Drwn/Chkd:	JGB/JRN
Figure:	1-2

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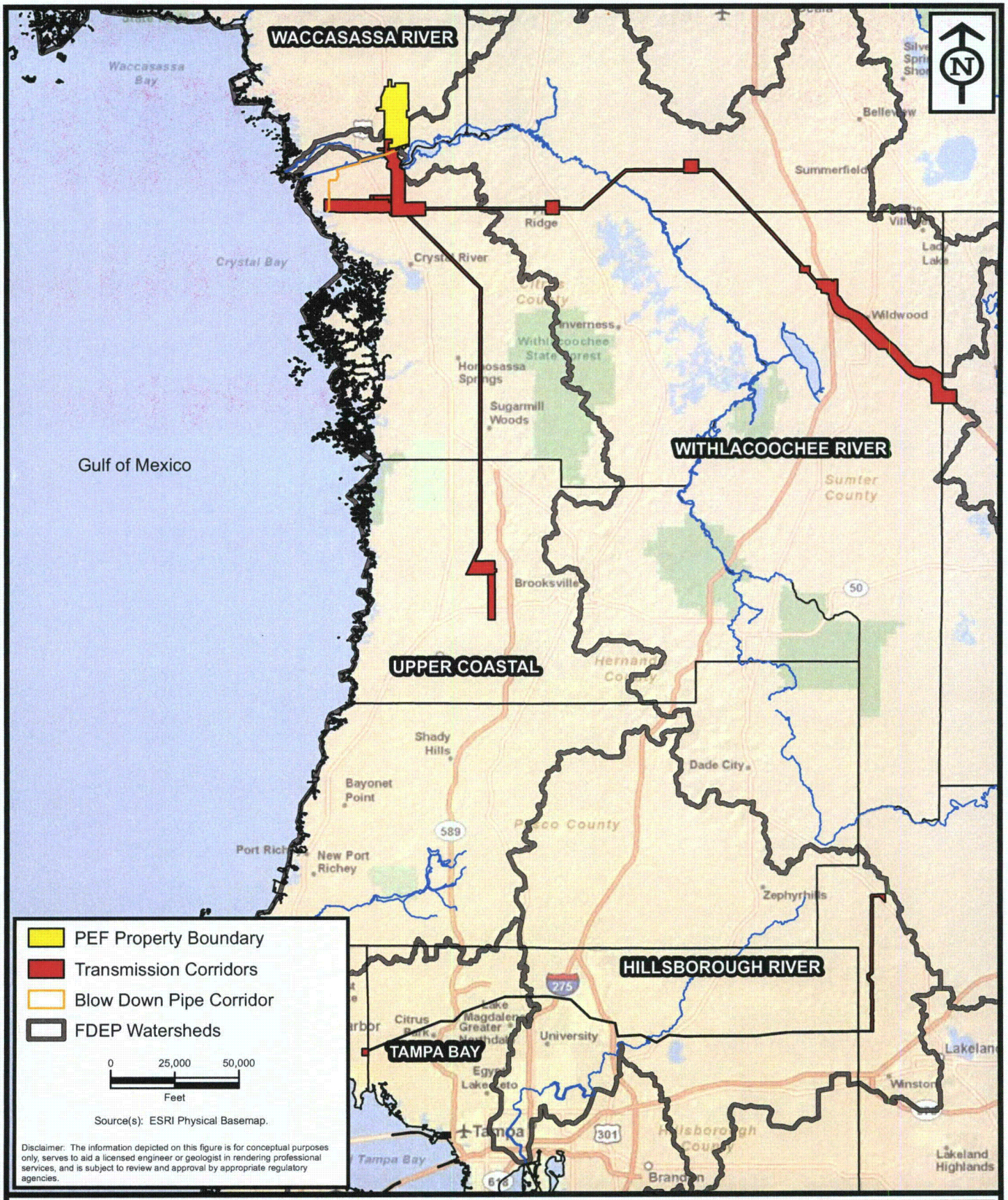

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LNP Site and Corridors

Proposed Levy Nuclear Plant Project

Florida

Project:	EJ11021.00
Date:	June 2011
Drwn/Chkd:	JGB/JRN
Figure:	1-3

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Table 1-1. Summary of wetland impacts for Levy Nuclear Plant development.

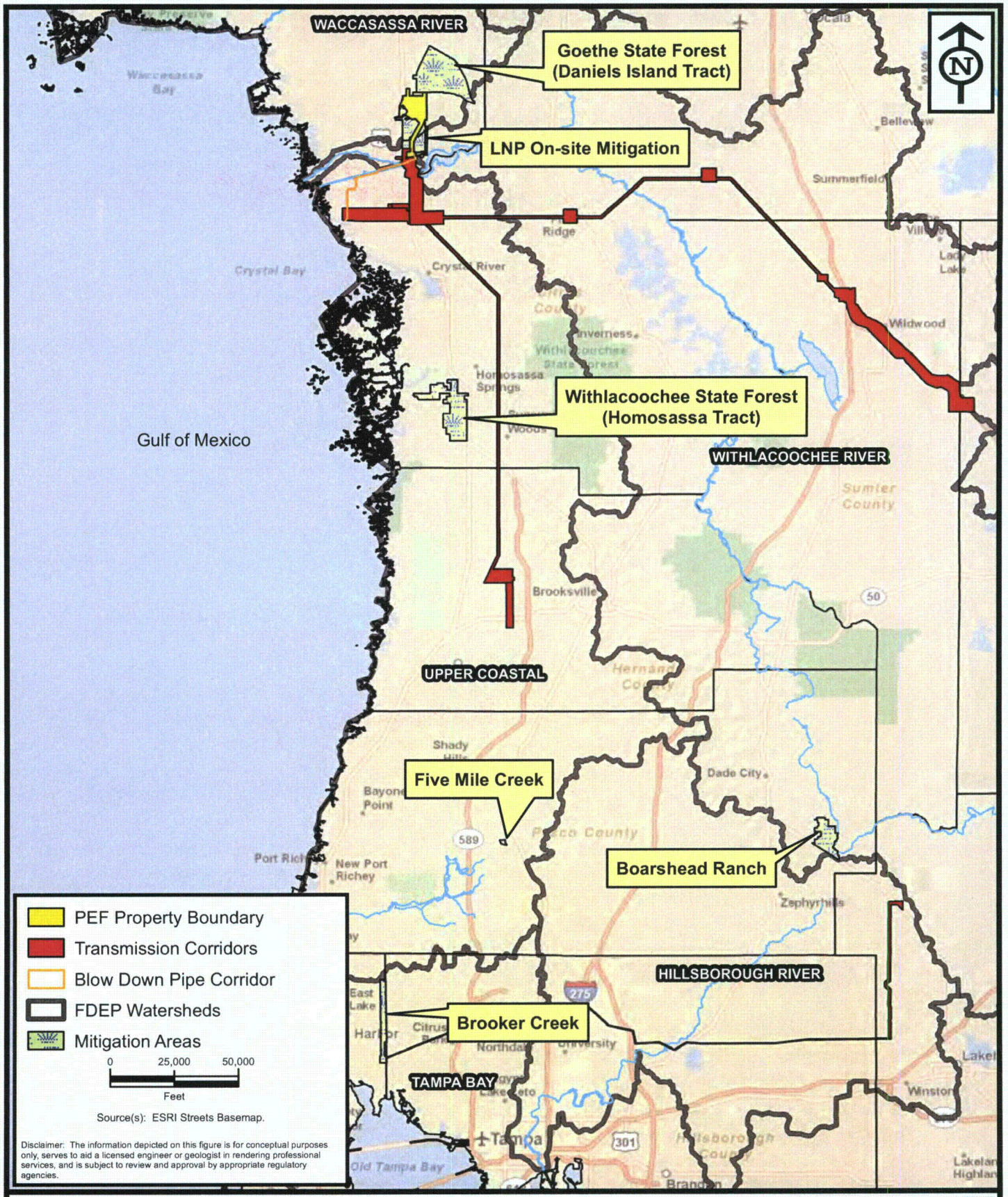
Watershed	Herbaceous Wetland Functional Loss Units	Herbaceous Wetland Acreage	Forested Wetland Functional Loss Units	Forested Wetland Acreage	Total Functional Loss Units	Total Acreage Impacted
Waccasassa	-1.3	2.6	-181.7	385.5	-183.0	388.1
Withlacoochee (plant site)	-0.4	2.4	-29.2	124.7	-29.6	127.1
Withlacoochee (trans. lines)	-9.8	13.8	-9.2	27.2	-19.0	41.0
Hillsborough River	-15.7	22.4	-0.9	1.1	-16.6	23.5
Upper Coastal	-5.2	8.5	-29.1	70.1	-34.3	78.6
Tampa Bay	-6.3	9.4	-0.3	0.7	-6.6	10.1
Total	**-38.7**	**59.1**	**-250.4**	**609.3**	**-289.1**	**668.4**

Source: April 23, 2010 Wetland Mitigation Plan

In response to the impacts defined above, PEF evaluated numerous mitigation sites and eventually identified six potential sites. Detailed mitigation plans have been developed for the six different mitigation sites (Figure 1-4). These sites include the following:

- Daniels Island Tract within the Goethe State Forest (GSF) in the Waccasassa watershed;
- LNP site with activities in the Waccasassa and Withlocoochee watersheds;
- Boarshead Ranch (BHR) in the Withlacoochee and Hillsborough watersheds
- Five Mile Creek (FMC) and Homosassa Tract within the Withlacoochee State Forest (HT) within the Upper Coastal watershed; and
- Brooker Creek Preserve (BCP) in the Tampa Bay watershed.

In the April 2010 Wetland Mitigation Plan, the Daniels Island Tract plan called for pine thinning, ditch filling and blocking, low water crossing (LWC) installation and timber thinning for management of Red Cockaded Woodpecker (RCW) habitat. This plan still incorporates some of these activities, but has eliminated the ditch filling/blocks and pine thinning. This plan also increases the number of LWC's and culvert replacements. Some of the LWC's are outside of the Daniels Island tract boundary so this site is now referred to as the Goethe State Forest site. The LNP site focused primarily on habitat restoration and hydrologic improvement through the installation of raised road beds with additional culverts and LWC's. This plan retains most of the same activities, but has reduced the number of raised road beds and culverts and proposes



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LNP Mitigation Parcels

Proposed Levy Nuclear Plant Project

Florida

Project:	EJ11021.00
Date:	June 2011
Drwn/Chkd:	JGB/JRN
Figure:	1-4

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the installation of additional LWC's to achieve the hydrologic enhancement. The BHR site is focused on enhancing existing wetland pasture and converting it to freshwater marsh habitat, in addition to several hydrologic improvements through the installation of several new culverts. This plan proposed a few different enhancement areas than the April 2010 plan, but is still taking the same basic approach. For the FMC site, this plan essentially utilizes the same plan, with very few changes. The HT under the April 2010 plan initially called for hydrologic improvements, wetland enhancement via supplemental planting and timber management activities. This plan has eliminated most of the supplemental plantings and timber management activities and now will include additional low water crossings, trail road removal and supplemental planting of additional wetland enhancement areas. The BCP site includes the same northern low water crossing, wetland enhancement planting and treatment of invasive/exotic species within some of the same specified areas, however, this plan has reduced the amount of wetland enhancement associated with treatment of invasive/exotic species, as it was not clear that credit would be given for enhancement in several large areas. This plan proposes the installation of an additional low water crossing in order to restore a historic flow path that was identified through historic aerial photographs.

Table 1-2 provides a summary of the proposed UMAM lift scores associated with each specific mitigation site. The mitigation for the impacts occurring on the tracts will be accomplished through a variety of mitigation techniques designed to result in environmentally enhanced, sustainable, natural areas. The mitigation plan produces more mitigation value than is necessary for each basin. Table 1-3 provides a summary of wetland impacts and mitigation by watersheds for Levy Nuclear Plant development. Subsequent sections of the document provide specific details for the mitigation efforts by basin for LNP project.

Table 1-2. Summary of proposed UMAM lift scores for Levy Nuclear Plant development.

Mitigation Site	Watershed	Activity	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Upland Functional Gain Units	Total Functional Gain Units
Goethe State Forest	Waccasassa	wetland restoration	0	+62.3	+9.3	+71.6
LNP Site	Waccasassa	wetland enhancement and preservation	+16.5	+105.8	+194.8	+317.1
	Withlacoochee	wetland enhancement and preservation	+2.4	+8.4	+45.0	+55.8
Boarshead Ranch	Withlacoochee	wetland creation, enhancement and restoration	+11.0	+9.60	0.0	+20.6
	Hillsborough	wetland creation, enhancement and restoration	+19.0	+1.0	0.0	+20.0
Five Mile Creek	Upper Coastal	wetland creation, enhancement and restoration	+5.5	+0.2	+0.1	+5.8
Homosassa Tract	Upper Coastal	wetland enhancement and restoration	+3.5	+52.1	+0.0	+55.6
Brooker Creek Preserve	Tampa Bay	wetland enhancement and restoration	+3.2	+11.5	0.0	+14.7
Total			**+61.1**	**+250.9**	**+249.2**	**+561.2**

Table 1-3. Summary of wetland impacts and mitigation by watersheds for Levy Nuclear Plant development.

Watershed	Impacts		Mitigation		Upland
	Herbaceous Wetland Functional Loss Units	Forested Wetland Functional Loss Units	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Functional Gain Units
Waccasassa	-1.3	-181.7	+16.5	+168.1	+204.1
Withlacoochee	-0.4	-29.2	+13.4	+18.0	+45.0
Hillsborough	-15.7	-0.9	+19.0	+1.0	0.0
Upper Coastal	-5.2	-29.1	+9.0	+52.3	+0.1
Tampa Bay	-6.3	-0.3	+3.2	+11.5	0.0
Total	**-38.7**	**-250.4**	**+61.1**	**+250.9**	**+249.2**

Listed Species

PEF and their contractors have spent hundreds of hours on each of these sites completing the analyses necessary to develop the wetland mitigation plan. Although formal listed species surveys have not been conducted on the mitigation sites, preliminary assessments and observations of listed plant and animal species occurrence on each site were conducted. The purpose of these assessments was to gather information regarding the existing habitat conditions on each site, and document the occurrence of listed species, if observed while on the site.

Listed plant species are those plants that are listed by the U.S. Fish and Wildlife Services (FWS) under Title 50, Part 17 of the Code of Federal Regulations (50 CFR 17) as endangered or threatened and the listed animal species are those classified as endangered, or threatened by FWS under 50 CFR 11-12. This list was developed by reviewing the available county species lists from the USFWS, literature review, and previous field work completed by PEF. Listed species with habitats not found on the mitigation sites were eliminated including aquatic species such as the West Indian manatee, gulf sturgeon, and the four species of sea turtles. Also eliminated were the piping plover and salt marsh vole due to no suitable habitat being present on the mitigation sites. Although no longer protected by Endangered Species Act, the bald eagle remains protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act and was included in the review

As part of the wetland mitigation plan implementation, PEF will conduct additional reviews for listed species and if necessary coordinate with FWS on any appropriate permits necessary prior to construction.

2.0 WACCASASSA WATERSHED – GOETHE STATE FOREST

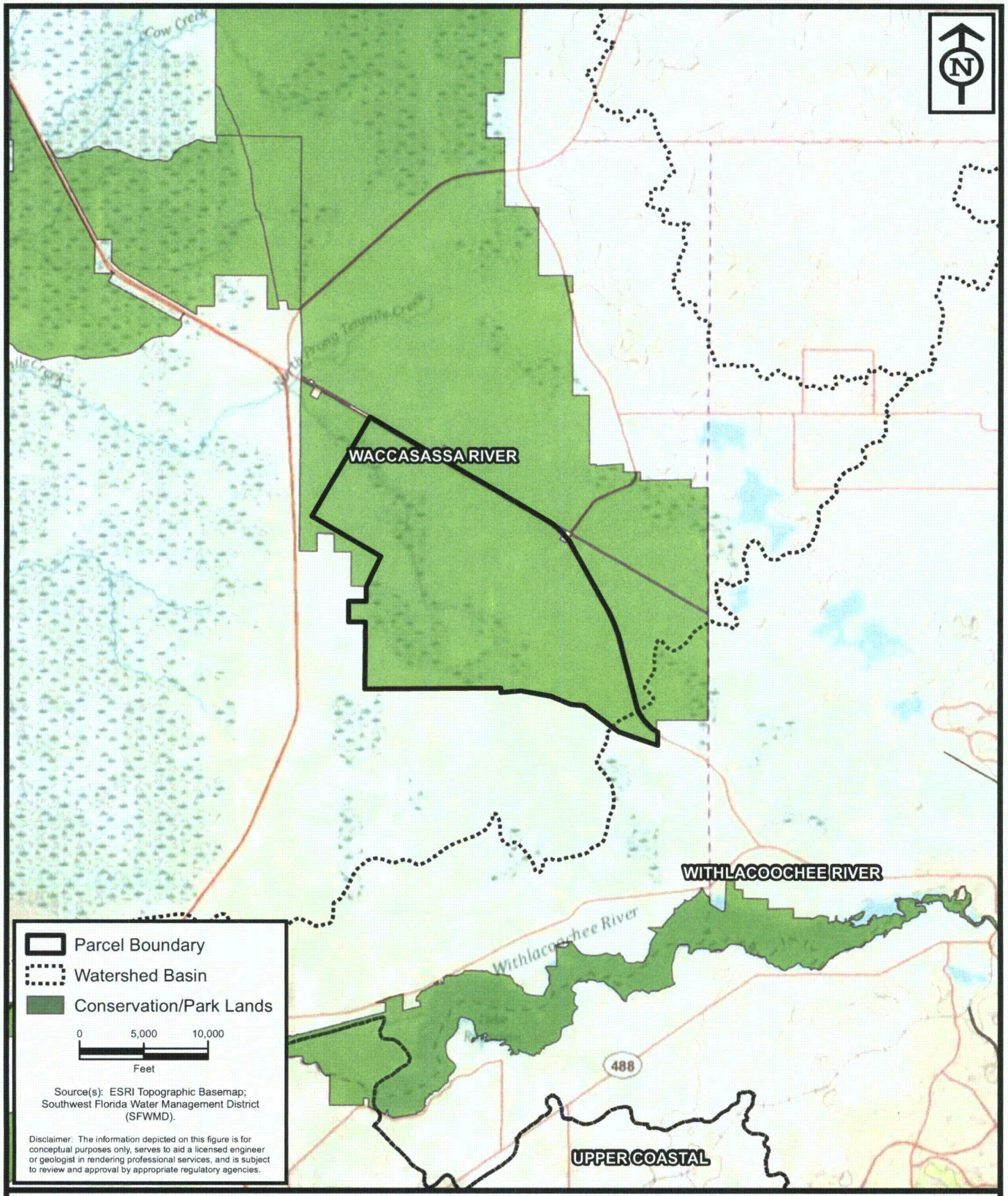
2.1 Introduction

The goal of the LNP mitigation plan is to utilize a "watershed" approach to offset wetland impacts by restoring/enhancing lower quality wetlands within the same watershed in which they occur. The Goethe State Forest (Goethe) site and the Levy Nuclear Plant site (LNP) are both located in the Waccasassa Watershed and will offset herbaceous and forested wetland impacts associated with the plant site development and installation of new transmission lines for the LNP project. More specifically, the Goethe site will offset wetland impacts through the enhancement and restoration of wetland hydrology and RCW habitat. This section deals specifically with the Goethe site; for the details of the mitigation efforts at the LNP Tract, please see Section 3.0.

The Goethe mitigation site is located on a FFS parcel in Levy County, Florida (Figure 2-1). This parcel is located at the southern extent of the 53,587 acre State Forest. Additionally, the site abuts the northeast corner of the LNP site. Surrounding the state forest is the 21,406 acre Gulf Hammock Conservation Easement to the north and a portion of the 110 mile Cross Florida Greenway (Inglis Island) to the south (Figure 2-2). The hydrologic enhancement/restoration activities proposed at Goethe will improve the link between these two regionally significant areas and will ultimately result in an ecologically improved and protected corridor between these two large systems. The proposed habitat restoration activities will improve the health and viability of on-site nesting for RCWs. These enhancement/restoration activities are not in the current state forest funding program and there is no timeline for their inclusion into the program.

2.2 Impact Summary

The wetland impacts within the Waccasassa Watershed from the proposed LNP project total ±357.3 acres of permanent fill and ±30.8 acres of permanent clearing. These impacts will generate a total loss of 183.0 functional units. The impact summary is provided on Table 2-1 (below). The majority of these impacts will be the result of permanently clearing and filling existing forested wetlands, with a smaller portion coming from clearing and filling of herbaceous and open water wetlands. The proposed mitigation plan will provide for ±388.7 functional units of lift within the Waccasassa Watershed; ±71.6 functional units of lift will be derived from the Goethe site which will offset the forested wetland impacts, while the remaining units will be provided in the LNP site (see Section 2.6 for details of the UMAM scores).



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Waccasassa River and Withlacoochee River Watersheds

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-1

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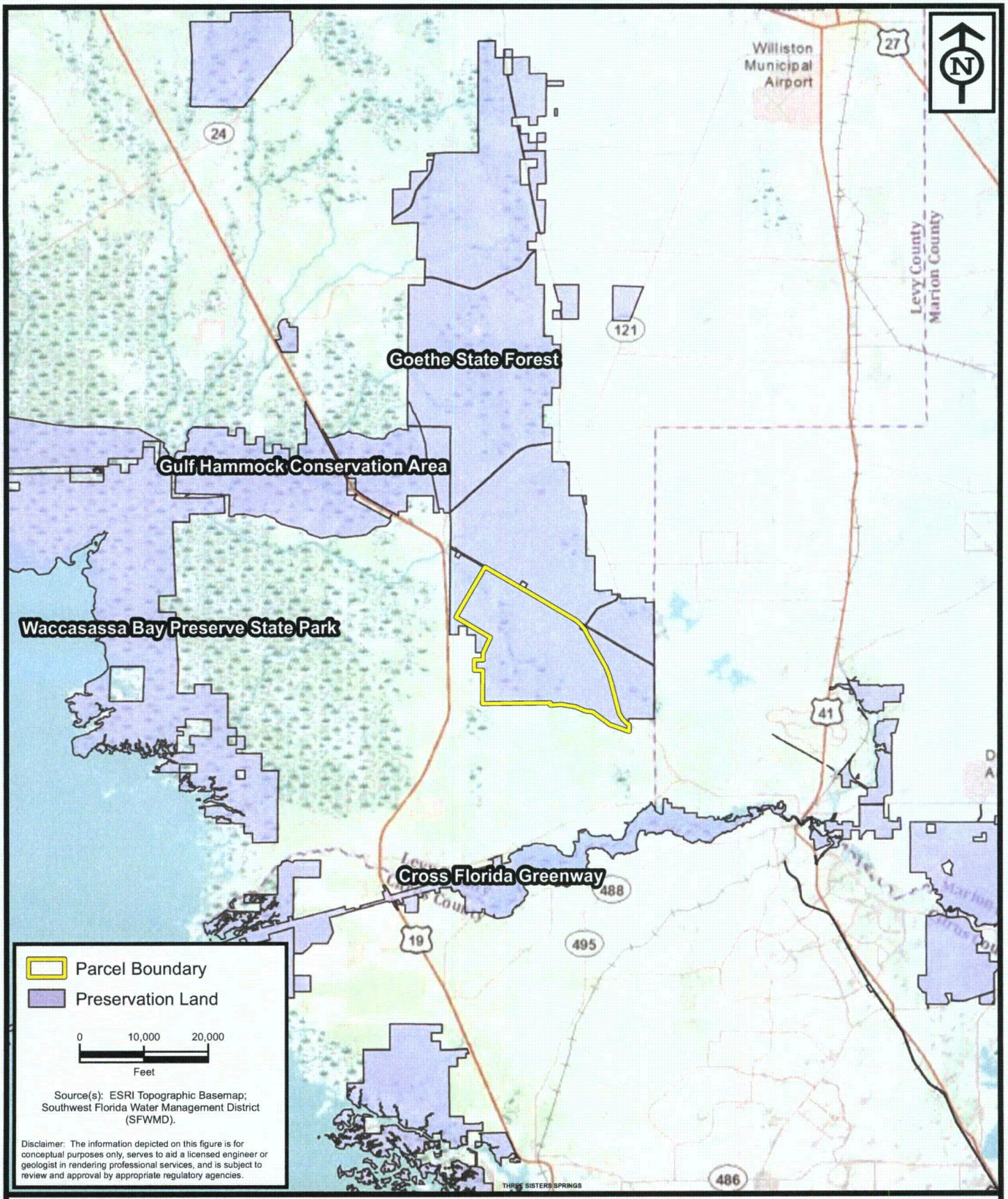

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Regional Preservation Land

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July2011
Drwn/Chkd:	JGB/JRN
Figure:	2-2

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Pro_location.mxd Date: 7/15/2011 9:41:20 AM

Table 2-1. Waccasassa Watershed wetland impacts by UMAM functional loss and acreage

Area	Herbaceous Wetland Acreage (including open water)	Herbaceous Wetland Functional Loss	Forested Wetland Acreage	Forested Wetland Functional Loss	Total Acres	Total Functional Loss
Permanent Fill	2.6 acres	-1.3 units	354.7 acres	-181.6 units	357.3	-182.9
Permanent Clearing	None	None	30.8 acres	-0.1 units	30.8	-0.1
Total					**388.1**	**-183.0**

2.3 Site Description

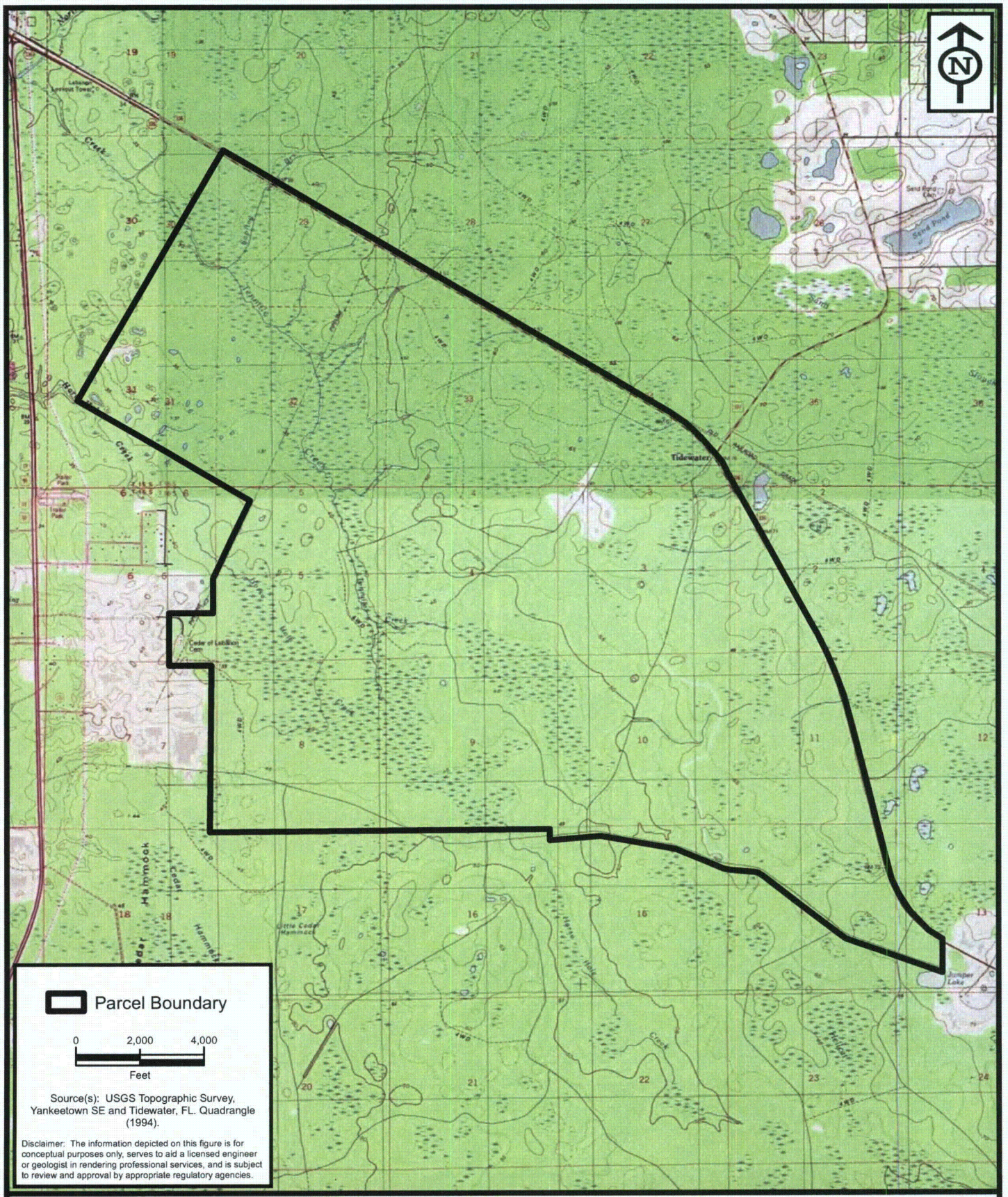
The Goethe site is located in Sections 32, 33, and 34 of Township 15 South, Range 17 East and Sections 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, and 17 in Range 17 East, Section 16 South. It is further located south of CR 336 and east of Gasline Road in Levy County, FL (Figure 2-3). The total area of the Goethe parcel is ±7,535.8 acres, and the proposed enhancement/restoration activities for this project are evenly distributed through the project area. Based on hydrologic modeling, water flows from the southern wetlands, off property to the northwest along Ten Mile Creek.

2.3.1 Historic Conditions

Historically, the property consisted of multiple isolated wetland domes, long strands of bottomland hardwood forest associated with Ten Mile Creek, and vast stands of pine flatwoods (Figure 2-4).

2.3.2 Current Conditions

Various habitat types are present at the Goethe site including the bottomland hardwoods associated with the creek, surrounding forested and herbaceous wetlands, and several vast pine flatwood stands. The land has been maintained and managed by the FFS since the purchase in 1992 from Mr. J.T. Goethe. Management of the state forest has focused on timber management, wildlife management, outdoor recreation, and ecological restoration. Additionally, water control structures have been installed in multiple locations.



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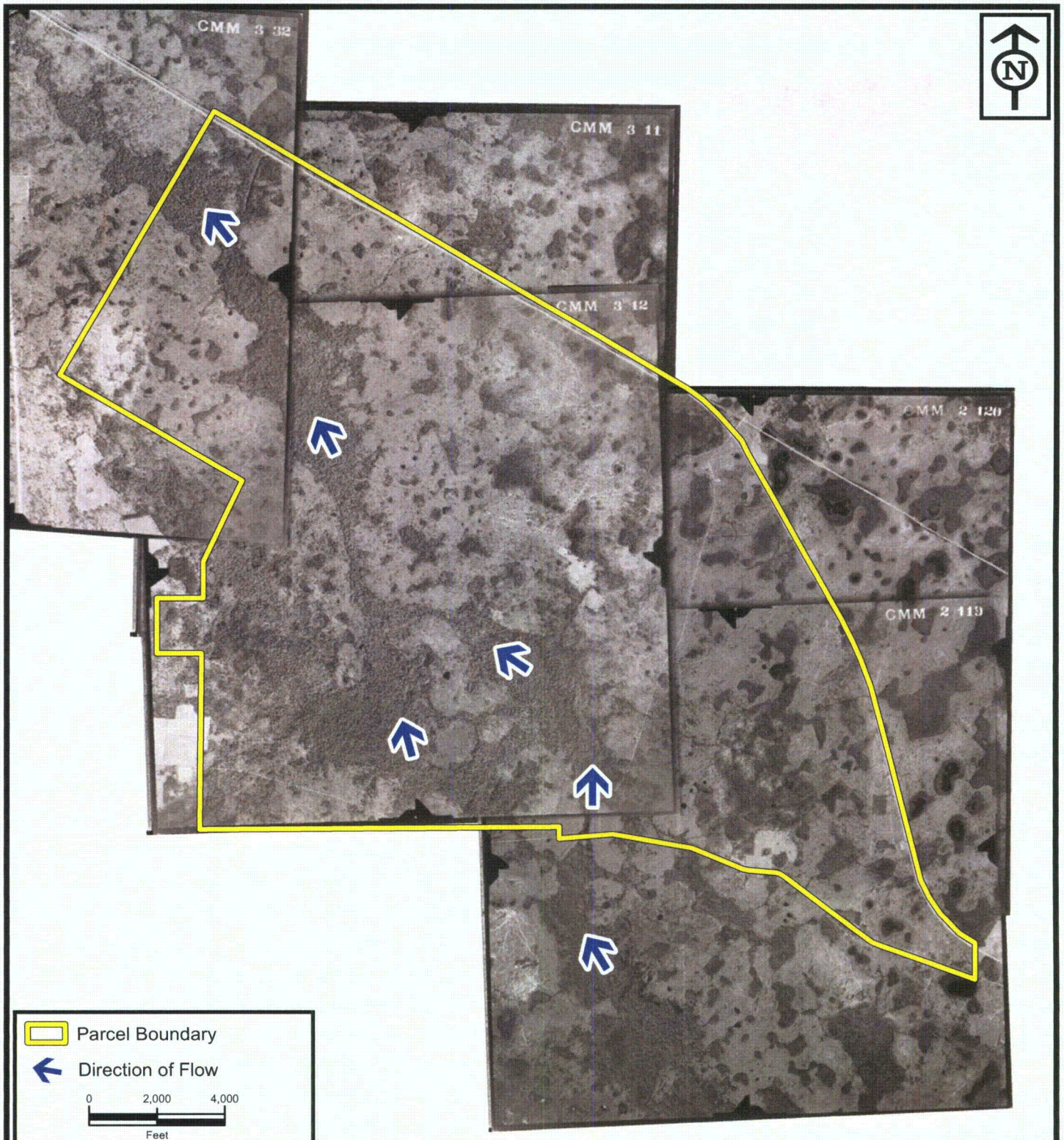
Project Location

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-3

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Pro_Quad.mxd Date: 7/15/2011 9:37:35 AM



Parcel Boundary

Direction of Flow

0 2,000 4,000

Feet

Source(s): University of Florida PALMM Imagery, (1940).

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1940 Historic Aerial Imagery

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-4

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Pro_historic.mxd Date: 7/15/2011 12:34:11 PM

The Florida Land Use, Cover, Forms and Classification System (FLUCFCS) was used to determine the different community types on site. Please see the Goethe Community Map, Figure 2-5, for details of the specific community locations.

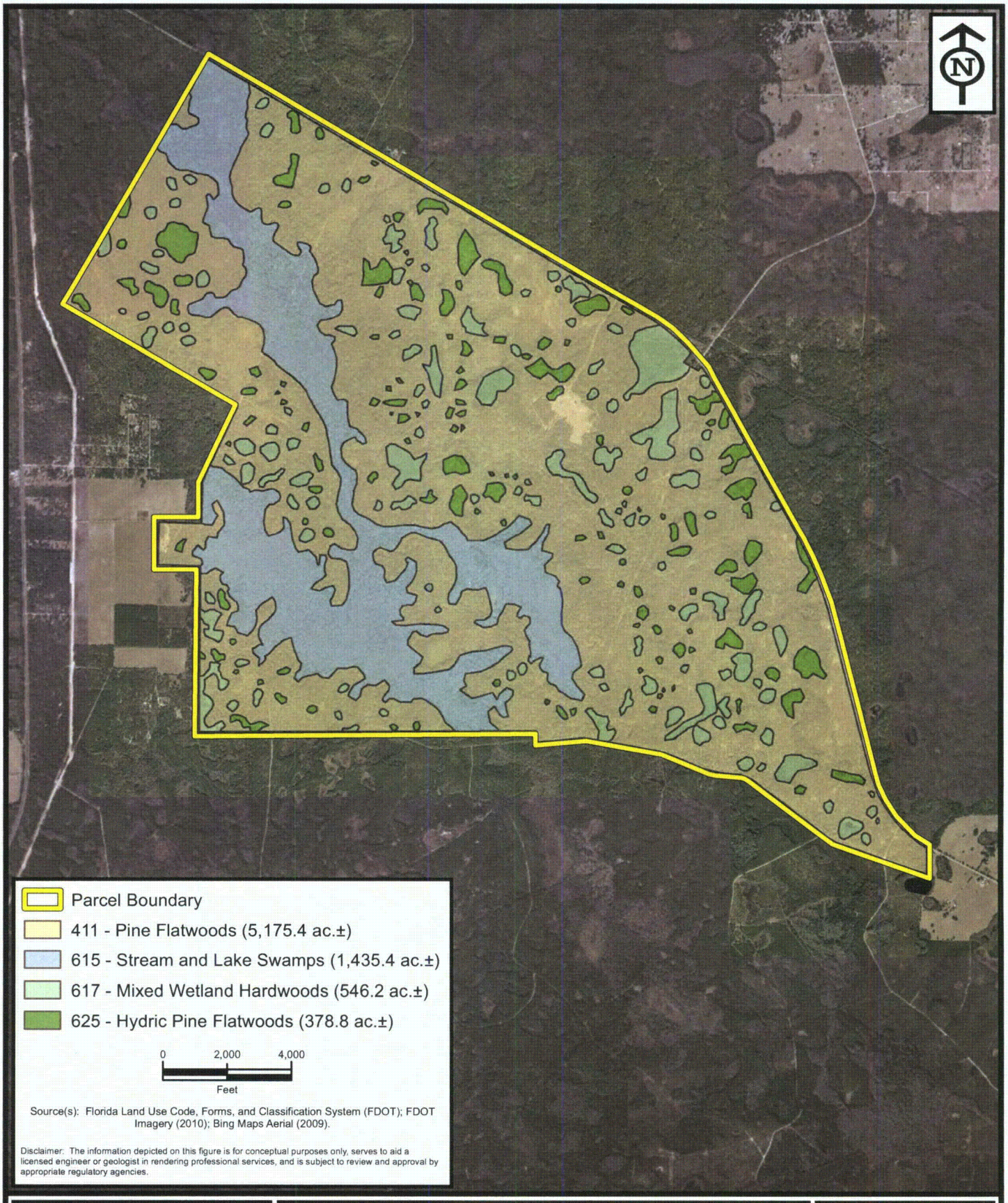
Uplands

1. Pine Flatwoods (FLUCFCS 411). On-site uplands are dominated by a mixture of mesic and slightly xeric pine flatwoods. The canopy consists of predominantly longleaf pine (*Pinus palustris*) and some slash pine (*P. elliottii*). The subcanopy and shrub layer includes saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), and shiny blueberry (*Vaccinium myrsinites*). The groundcover is predominantly grasses, including wiregrass (*Aristida stricta* var. *beyrichiana*), panicgrasses (*Dichanthelium* spp.), and broomsedges (*Andropogon* spp.).

Wetlands

1. Hydric Pine Flatwoods (FLUCFCS 625). Wetlands abutting the upland pine flatwoods share a dominance of pine trees. The pine canopy consists of a combination of longleaf pine, slash pine, and pond pine (*P. serotina*). The subcanopy consists of scattered sweetbay (*Magnolia virginiana*), swamp bay (*Persea palustris*), loblolly bay (*Gordonia lasianthus*), pond cypress (*Taxodium ascendens*), dahoon (*Ilex cassine*), titi (*Cyrilla racemiflora*), and/or wax myrtle (*Myrica cerifera*). Shrubs include gallberry, saw palmetto, and fetterbush (*Lyonia lucida*). Groundcover species include wiregrass (*Aristida stricta*), blue maidencane (*Amphicarpum muhlenbergianum*), yellow-eyed grass (*Xyris* spp.), Carolina redroot (*Lachnanthes caroliana*), beaksedges (*Rhynchospora* spp.), and pitcherplants (*Sarracenia* spp.).

2. Mixed Wetland Hardwoods (FLUCFCS 617). The project area is covered with small, scattered isolated depressions with no surface connection to other wetlands. Pond cypress, bald cypress (*T. distichum*), and swamp tupelo (*Nyssa sylvatica*) co-dominate. Other canopy or subcanopy species include red maple (*Acer rubrum*), dahoon (*Ilex cassine*), swamp bay, slash pine, sweetbay (*Magnolia virginiana*), loblolly bay. Shrubs include fetterbush, common buttonbush (*Cephalanthus occidentalis*), wax myrtle, titi, and St. John's wort (*Hypericum* spp.). Herbaceous species include Virginia chain fern (*Woodwardia virginica*), royal fern (*Osmunda regalis* var. *spectabilis*), cinnamon fern (*Osmunda cinnamomea*), maidencane (*Panicum hemitomon*), sawgrass (*Cladium jamaicense*), various species of beaksedge, lizard's tail (*Saururus cernuus*), Carolina redroot, and sphagnum moss (*Sphagnum* spp.).



Source(s): Florida Land Use Code, Forms, and Classification System (FDOT); FDOT Imagery (2010); Bing Maps Aerial (2009).

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Mitigation Activity Area - Existing Community Map

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-5

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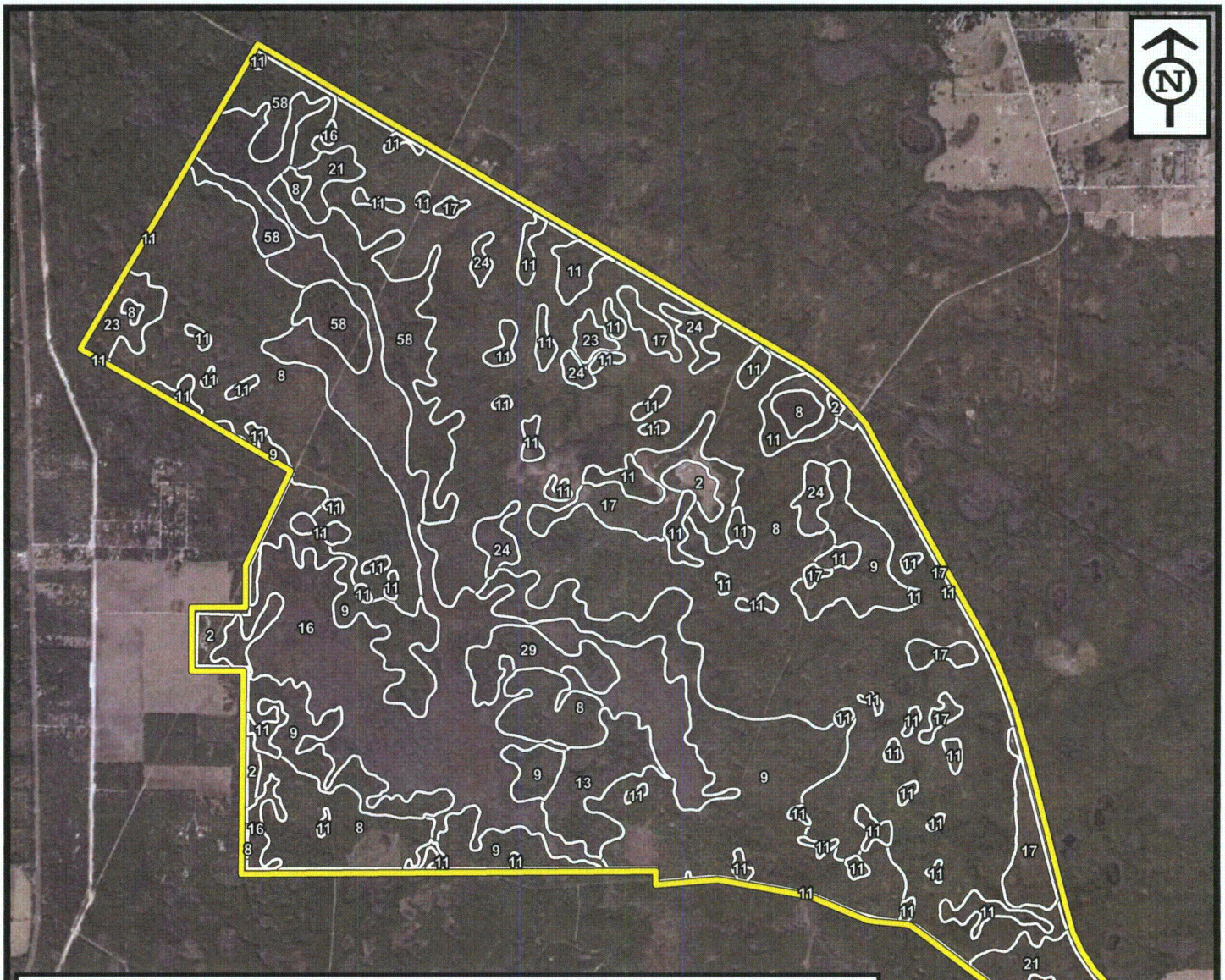
3. Stream and Lake Swamps (FLUCFCS 615). Wetlands associated with Ten Mile Creek, its tributaries, and associated naturalized ditches are dominated by bottomland hardwoods. Dominant species include sweetgum (*Liquidambar styraciflua*), sweetbay, bald cypress, and scattered water oak (*Q. nigra*). Smaller trees and shrubs include American hornbeam (*Carpinus caroliniana*), swamp dogwood (*Cornus foemina*), dahoon, saw palmetto, swamp bay, wax myrtle, and highbush blueberry (*Vaccinium corymbosum*). Herbaceous species are similar to the mixed wetland hardwoods and include Virginia chain fern, royal fern, cinnamon fern, maidencane, sawgrass, various species of beaksedge, lizard's tail, Carolina redroot, and sphagnum moss.

2.3.3 Soils

According to the Natural Resources Conservation Service (NRCS) soil map for Levy County, thirteen soil types are present on the Goethe site (Figure 2-6). The NRCS soils are listed below:

Table 2-2. Goethe site soil types

NRCS Soil Type	Hydric	Acreage
2 Tavares Fine Sand	No	63.1
8 Smyrna Fine Sand	No	3,564.1
9 Pomona Fine Sand	No	1,136.2
10 Placid Fine Sand	Yes	0.5
11 Placid and Samsula Soils, depressional	Yes	457.7
13 Wekiva Fine Sand	Yes	123.3
16 Chobee-Gator Complex, Frequently Flooded	Yes	1,122.5
17 Adamsville Fine Sand, 0-5 % slopes	No	264.8
21 Pompano Fine Sand	Yes	144.2
23 Zolfo Sand	No	74.5
24 Terra Ceia Muck, depressional	Yes	99.7
29 Chobee-Bradenton Complex, frequently flooded	Yes	85.6
58 Boca-Holopaw, Limestone Substratum, complex	Yes	399.5



Parcel Boundary
Soils
2 - Tavares fine sand, 1 to 5 percent slopes
8 - Smyrna fine sand
9 - Pomona fine sand
10 - Placid Fine Sand
11 - Placid and Samsula soils, depressional
13 - Wekiva fine sand
16 - Chobee-Gator complex, frequently flooded
17 - Adamsville fine sand, 0 to 5 percent slopes
21 - Pompono fine sand
23 - Zolfo sand
24 - Terra Ceia muck, depressional
29 - Chobee-Brandenton complex, frequently flooded
58 - Boca-Holopaw, limestone substratum, complex
99 - Water

0 2,000 4,000
Feet

Source(s): FDOT Imagery (2010). USDA Soil Survey, Levy County, Florida.

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NRCS Soils

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-6

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2.4 Mitigation Plan

The two major components of the mitigation plan for Goethe are hydrologic restoration and RCW habitat restoration (Figure 2-7). Currently, the land is being managed by the FFS for timber, wildlife, recreation, and ecological restoration. The goal of this plan is to complement and enhance the existing activities taking place within Goethe State Forest. For details of the proposed hydrologic restoration, please see Section 2.11 for engineering and planting detail drawings.

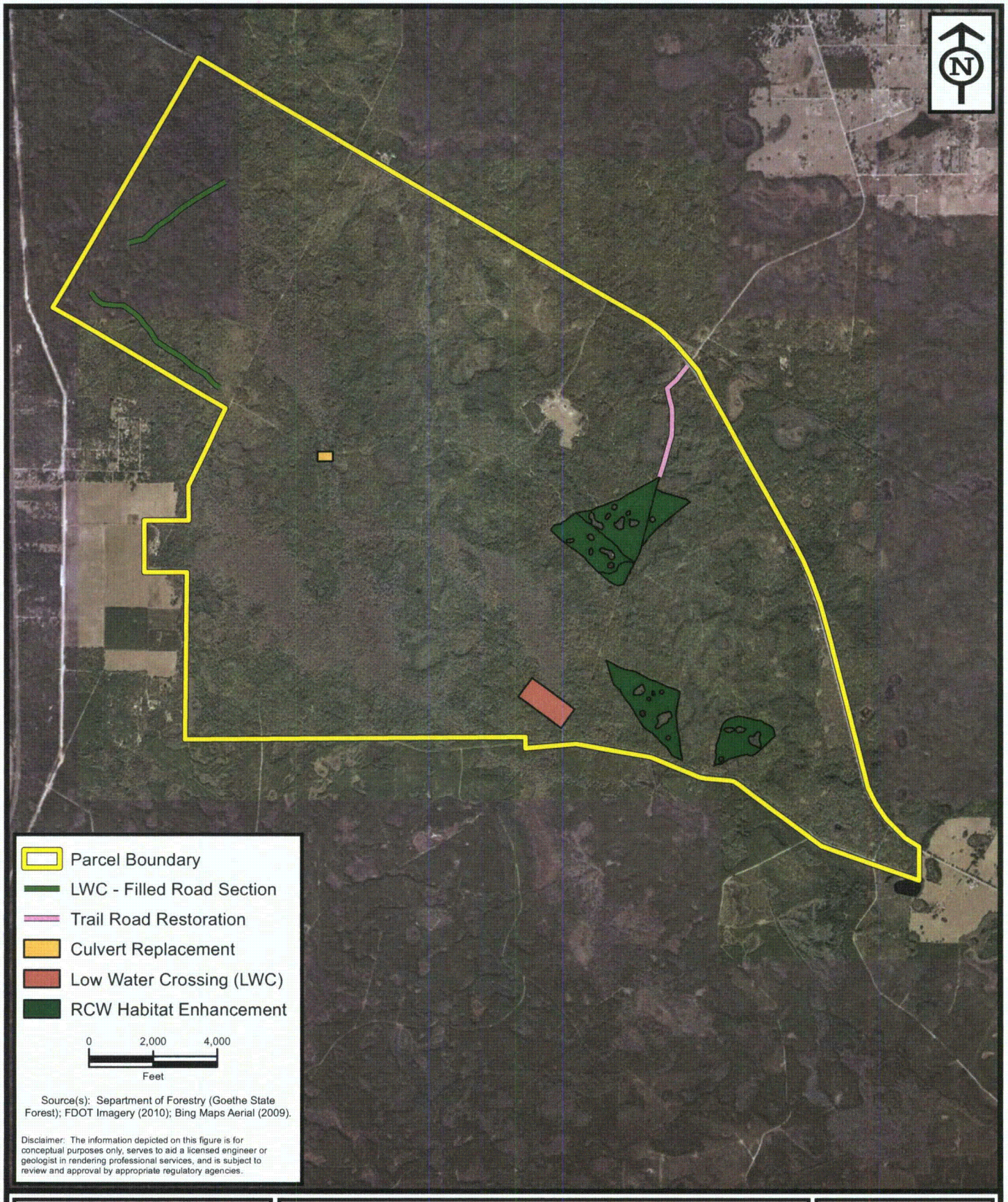
2.4.1 Hydrologic Restoration

Hydrology of the Goethe site has been altered over time by the construction of trail roads and the installation of artificial water control structures (culverts). This mitigation plan proposes to revert several of these areas to historic hydrology. Five activities are planned throughout the project area including three LWC's, one culvert replacement, and one trail road restoration.

Two of the LWC's are located in the northwest portion of the site and will consist of filling a depressed road channel to bring it up to grade with the surrounding wetlands. Currently the depressed road bed is capturing natural flow and diverting it perpendicular to how it would naturally flow in the surrounding landscape. One of the proposed LWC will be achieved by grading the roadside berms down to the elevation of the surrounding wetlands. Currently, the berms prevent natural sheet flow across the road.

The culvert replacement activity will occur where a large volume of water moves along Ten Mile Creek. The FFS has noted many problems with erosion control and has attempted to fix the problem with the installation of multiple (8+) culvert pipes. This solution has not reduced the erosion problem and will likely not withstand the significant weight of fully encumbered logging trucks. Therefore, the individual pipes will be replaced with an extensive concrete box culvert system designed to allow necessary flow and support the weight of vehicular traffic.

The trail road restoration will occur on the road currently used to enter the site. Wetlands located on either side of the road are currently hydrologically restricted by a few small culvert pipes. The proposed plan will remove the trail road entirely and replant the area to join the two wetland areas and recreate a contiguous system. The target community is described as mixed wetland hardwoods.



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Mitigation Activity Area - Proposed Mitigation Activities

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	2-7

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Pro_mitigation.mxd Date: 7/15/2011 9:44:10 AM

1. Mixed Wetland Hardwood Creation. The elevation of the trail road area will be graded down to adjacent wetland elevations to establish a hydrological connection; therefore, creating a hardwood forested wetland system once planted. The area will be hydrated by the abutting wetland systems.

The mixed wetland hardwood area will be planted on ten-foot centers at a density of 440 stems/acre with 3-gallon size Florida native trees including:

Red maple
Water oak
Carolina ash (*Fraxinus caroliniana*)

2.4.2 RCW Habitat Enhancement

Florida Natural Areas Inventory (FNAI) describes the Red Cockaded Woodpecker habitat as "open, mature pine woodlands that have a diversity of grass, forb, and shrub species". Optimal habitat should not consist of pine stands that are too crowded nor have too much woody vegetation – especially mid-level trees – near them. Management goals are generally to have a wide open, park-like stand of mid to old-age longleaf pine trees with a mostly herbaceous understory.

Traditionally, optimal habitat is maintained through fire management practices to retard the growth of large shrub or sub-canopy vegetation. Due to the limited availability of fire management in Goethe, the FFS has proposed to use extensive mowing in the areas where RCW nests have been identified or are likely to occur. The mowing will be used to prevent growth of sub-canopy species and maintain a healthy diversity of groundcover.

The UMAM rule (Chapter 62-345) describes Location and Landscape Support as the "value of functions provided by an assessment area to wildlife influenced by the landscape position of the assessment area and its relationship with surrounding areas." The rule goes on to describe that many wildlife species utilize multiple habitats throughout their life history for nesting, feeding, and cover. It is critical to the survival of all wildlife species to have adequate access to appropriate habitat.

Currently, the RCW suffers from a limited distribution combined with fragmentation and poor management of habitat. The proposed mowing activities will create and sustain a large concentrated area of optimal habitat and thus significantly increase the Location and Landscape support of Goethe for the RCW.

2.5 Hydrology & Hydraulics

2.5.1 Objective

The hydrologic and hydraulic engineering analysis for the Goethe site demonstrated improved rainfall runoff conveyance and flow patterns that better represent historic, unaltered conditions at sites within the state forest. These improvements addressed mitigation modifications – including larger roadway culverts, grading of disturbed terrain, and culvert removal to establish low-water crossings of wetlands – at several sites. To demonstrate improved water movement, a hydrologic and hydraulic modeling analysis was conducted as described below.

2.5.2 Model Setup

The Advanced Interconnected Pond Routing model (ICPR) Version 3.10 with service pack 3, 2002, was used to simulate rainfall runoff, conveyance, and flooding conditions in the Goethe system. The modeled system includes Ten Mile Creek, North Prong Ten Mile Creek, Sapling Branch, Horse Hole Creek, Crow Rookery Slough and Coffee Creek. These feed into Cow Creek, the Waccasassa River, and the Gulf of Mexico. The total basin area encompasses 30,000 acres.

This section describes the calculation of ICPR input parameters including basin area, time of concentration, curve number, interconnectivity, stage-storage relationships, and boundary forcing conditions.

Subbasin Area

Contributing basin boundaries and areas were determined from a combination of a Suwannee River Water Management District (SRWMD) Geographic Information System (GIS) basin coverage, U.S. Geologic Survey (USGS) Digital Elevation Models (DEMs), and Florida Department of Emergency Management (FDEM) lidar data (2006). DEMs supplemented the lidar which was not available for the entire basin. The overall watershed was subdivided into 27 subbasins as shown in Figure 2-8. Notably, subbasin connectivity and divides, or model nodes, generally coincide with locations of mitigation sites to enable and facilitate analyses of modifications to improve basin flow. Table 2-3 provides the calculated drainage area, curve number, and time of concentration for each subbasin.

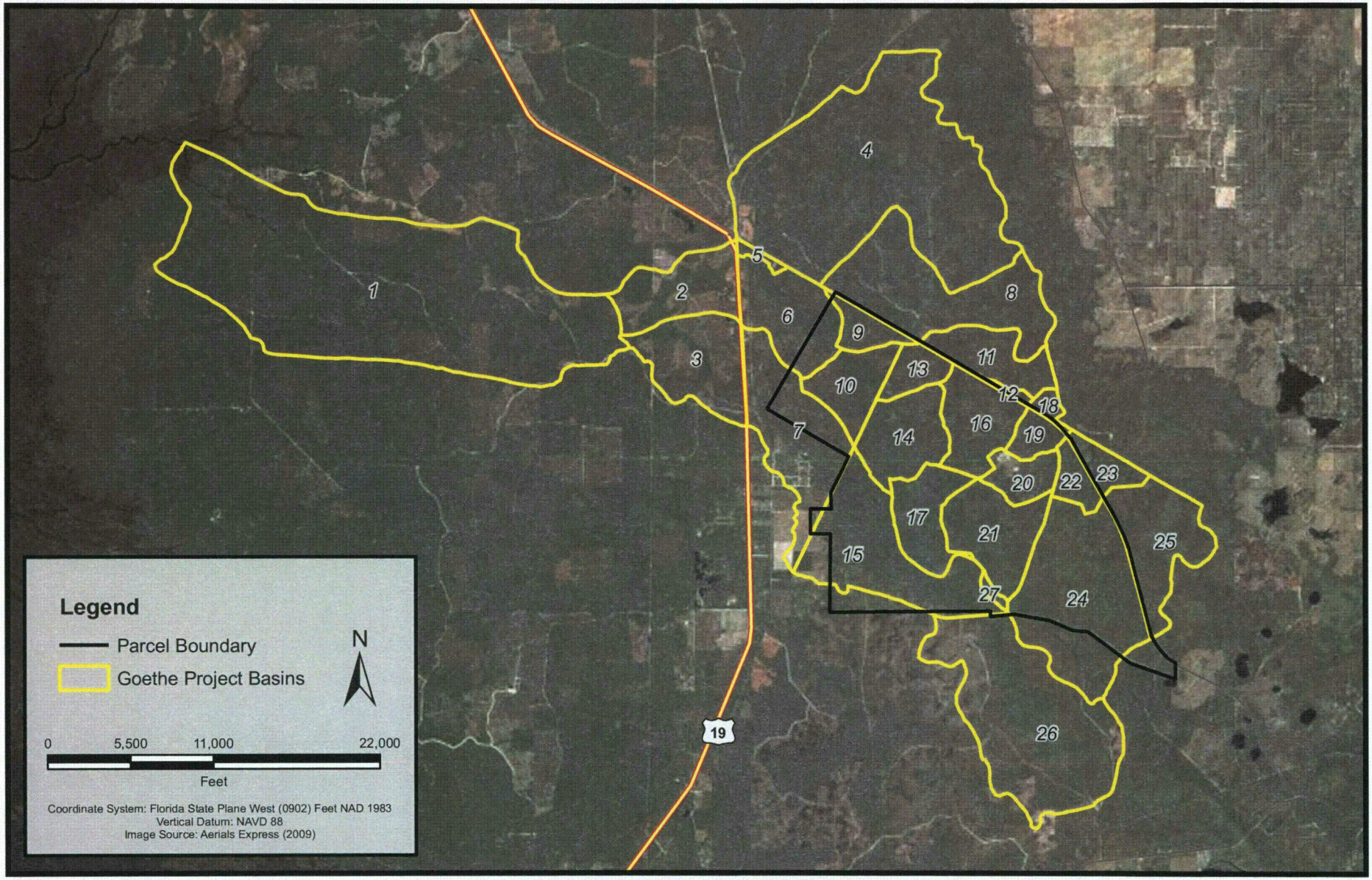

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Figure 2-8 - Goethe Drainage Subbasins
Goethe State Forest Parcel
Levy County, Florida

PROJECT	C2011-025
FIGURE	2-8
DRAWN BY	JK
DATE	JUNE 2011

Table 2-3. Goethe ICPR model hydrologic input parameters

Subbasin	Area (acres)	Weighted Curve Number	Time of Concentration, T_c (min)
1	6038	83	3311
2	756	78	951
3	897	81	457
4	4041	84	1075
5	50	88	34
6	823	85	1292
7	1196	74	444
8	1531	84	550
9	226	80	311
10	492	88	166
11	526	84	237
12	42	82	173
13	249	84	148
14	671	87	207
15	1398	86	834
16	621	84	340
17	544	88	232
18	83	81	168
19	188	88	197
20	295	82	221
21	771	89	381
22	204	84	183
23	225	85	236
24	1841	84	398
25	870	84	419
26	2356	83	963
27	37	83	34

Curve Number

The U.S. Soil Conservation Service Curve Number (CN) generally represents the subbasin's rainfall runoff properties – its ability to store or shed rainfall – and is a function of the soil properties as well as land cover/use. Geographic Information System tools were applied to SRWMD digital soil and land use coverages to calculate the CNs. The CN calculation assumes an antecedent rainfall condition corresponding to SCS Type II – or typical, mean conditions.

Time of Concentration

Time of concentration is a characteristic of the response of a watershed to a rainfall event and represents the time required for a drop of water to travel from the most hydrologically remote location within a subbasin. It is a function of the subbasin slope, length, and CN. For each subbasin, the main channel slope was calculated based on lidar and DEM topographic data. Lag time was calculated from the SCS lag time equation with this slope and converted to time of concentration.

Subbasin Interconnectivity

The subbasins were interconnected in the ICPR model to reflect the natural movement of water in the system. Connectivity included overland flow/natural weirs, existing culverts, and channels. Natural weirs correspond to elevated roadways.

Stage-Storage Relationships

For each subbasin, a stage-storage relationship was calculated to represent the amount (volume) of rainfall runoff potentially stored in the basin during a storm event. Model input parameters account for this storage capacity as volume of water stored within the available subbasin topography at one-foot vertical intervals. These relationships allow the ICPR model to simulate the rate at which each subbasin will be inundated from rainfall runoff. Lidar and USGS DEMs provided the necessary topographic data to calculate these relationships.

Boundary Conditions

Two types of boundary conditions were applied within the model. One boundary condition was the tailwater condition at the model outlet at Cow Creek near the Gulf of Mexico (the outlet of subbasin 1). Consistent with Federal Emergency Management Agency guidelines, the 2.33-year hurricane surge stillwater condition was applied at this boundary (for all rainfall runoff events). The 2.33-yr peak stillwater elevation was calculated by extrapolating the published 10-, 50-, 100-, and 500-yr stillwater surge elevations from the Levy County Flood Insurance Study Report (FEMA, 1983). The resulting elevation was 2.0 ft. NAVD.

Stage-Storage Relationships

For each subbasin, a stage-storage relationship was calculated to represent the amount (volume) of rainfall runoff potentially stored in the basin during a storm event. Model input parameters account for this storage capacity as volume of water stored within the available subbasin topography at one-foot vertical intervals. These relationships allow the ICPR model to simulate the rate at which each subbasin will be inundated from rainfall runoff. Lidar and USGS DEMs provided the necessary topographic data to calculate these relationships.

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The second boundary condition was rainfall (volume and temporal distribution) applied at each subbasin. The SCS Type II, Florida Modified, 24-hour distribution was applied with the 24 hour rainfall depths shown in Table 2-4 for the five rainfall events simulated (according to the Southwest Florida Water Management District Environmental Resource Permitting Information Manual - Part D Project Design Aids - July 1996).

Table 2-4. Goethe ICPR Model 24-hour Rainfall Depths

Recurrence Interval (years)	Rainfall Depth (inches)
2.33	4.8
10	6.7
25	8.5
50	9.5
100	11.2

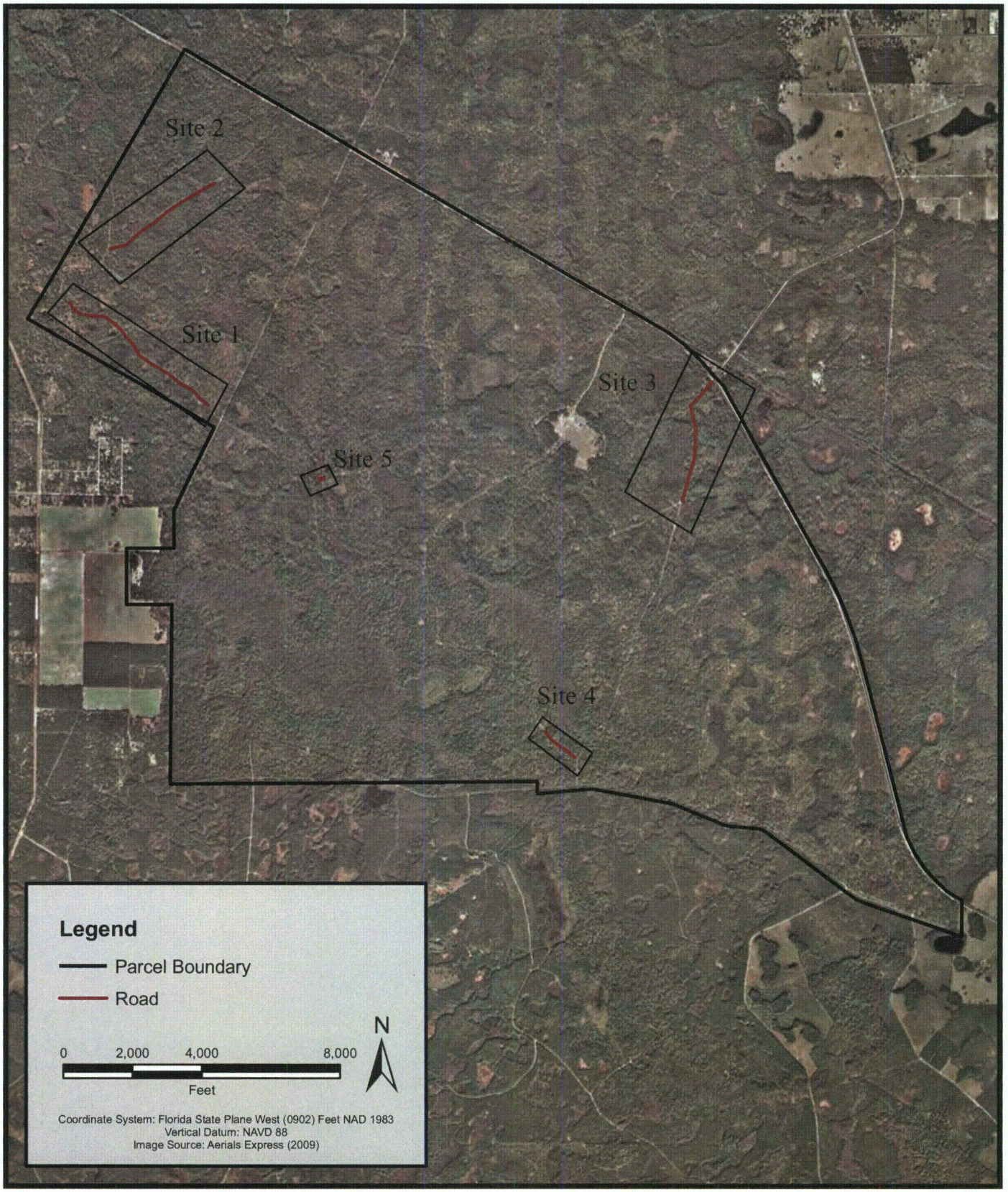

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Figure 2-9 - Progress Energy Mitigation Sites
Goethe State Forest Parcel
Levy County, Florida

PROJECT	C2011-025
FIGURE	2-9
DRAWN BY	JK
DATE	JUNE 2011

Table 2-5. Pre- and post-construction peak flows at each mitigation site

Site*	Pre-construction Flow, cfs		Post-construction Flow, cfs		Difference, cfs		Percent Change	
	2.33YR	25YR	2.33YR	25YR	2.33YR	25YR	2.33YR	25YR
2	528.7	1072.0	601.4	1117.8	72.6	45.9	13.7	4.3
3**	10.1	236.8	77.8	239.8	67.6	3.0	667.6	1.3
4	11.3	98.8	19.1	83.1	7.8	-15.7	69.1	-15.9
5	423.7	1298.7	446.5	1296.3	22.8	-2.4	5.4	-0.2

*Site 1 was not modeled, see below.

** This is the combined flow from subbasin 22 to subbasins 19 and 20.

Site 1

Modifications at Site 1 include grading of the terrain along a dirt road. The road follows a depression (likely created by heavy use) with small ridges bordering the road (typically on both sides). Sheet flow (which historically traveled perpendicular to the road) is intercepted by the ridges and road and diverted along the road. The modification intends to restore the natural sheetflow by scraping down the ridges and filling the road bed as necessary to create a naturally sloping terrain.

These modifications were not simulated in ICPR due to the scale and location of the subbasin (upstream of the road near a drainage divide). Nevertheless, topographic contours and surveys indicate the existing conditions of the road do divert the natural flow, and the percent flow improvement should be similar to that gained at Site 2 described below.

Site 2

Modifications at Site 2 include grading of the terrain along a dirt road. Site 2 lies between subbasins 10 and 6 and is represented in the model as a channel (in Ten Mile Creek) connecting the basins. Similar to Site 1, use of the road has apparently created a depression along the road itself with small ridges bordering the road. As a result, sheet flow (which historically traveled perpendicular to the road) is intercepted by the ridges and road and diverted along the road (perpendicular to its historical path). The modification intends to restore the

natural sheetflow by scraping down the ridges and filling the road bed as necessary to creating a naturally sloping terrain.

While this flow pattern is two-dimensional, the improvement of one-dimensional flow along the natural flow path was simulated in ICPR (a one-dimensional model) by lowering the model cross section ground elevations 0.25 ft. along the road to represent removal of the ridges. Comparison of pre- and post-construction model results indicates Site 2 peak flow for the mean annual event (2.33-yr storm) increases 14%. The 25-year peak flow increases 4%.

Site 3

Proposed modifications at Site 3 include grading the dirt road to restore natural sheet flow currently being intercepted and diverted by the road. Site 3 falls along the boundaries of subbasins 22, 19 and 20. The pre-construction condition of this site is represented in the model as two culverts and a weir to simulate the flow that overtops the road. The post-construction condition of this site removes the two culverts and simulates the weir with adjusted elevations to represent the proposed regrading. Comparison of pre- and post-construction model results indicates Site 3 peak flow for the mean annual event (2.33-yr storm) increases over 600%, and the peak 25-year event flow increases 1 percent.

Site 4

Site 4 falls along the boundary of subbasins 27 and 21. At Site 4, one 12-in corrugated metal pipe (CMP) under a gravel road blocks the natural flow. The pre-construction condition of this site is represented in the ICPR model as a culvert and a weir to simulate the flow that overtops the road. Model results indicate the constriction created by the culvert and road cause the mean annual flow to overtop the road.

Three 14-in x 23-in horizontal elliptical pipes are proposed at Site 4. The ICPR model represents the post-construction condition of this site by removing the culvert and replacing it with three- 14-in x 23-in horizontal elliptical pipes. Model results indicate these pipes will pass the mean annual peak flow (19 cfs) without road overtopping. Comparison of pre- and post-construction model results indicates Site 4 peak flow for the mean annual event (2.33-yr storm) increases 69%. The 25-year peak flow decreases 16%. The decrease is attributable to a slight increase in tailwater in the downstream subbasin (21). The increase is due to cumulative mitigation modifications (at other sites) that are restoring the system to more natural conditions.

Site 5

Site 5 lies along the boundary of subbasins 17 and 14. It is understood that the pipes through a dirt road at Site 5 continually wash out due to erosion that results in stream turbidity and sedimentation. Also, trucks damage the pipes. Currently, eight pipes cross the dirt road. These pipes include four 50" plastic pipes and four 36" corrugated metal pipes. No existing erosion control is apparent. This condition is simulated in the ICPR model as eight pipes, four plastic and four CMP and a weir to simulate the flow that could overtop the road.

According to model results, the eight culverts pass the mean annual flow without road overtopping. Events greater than the mean annual storm do overtop the road. For example, 627 cfs of the 25-year peak flow passes over the road due to the existing pipes' inability to convey the peak flow.

The proposed solution is replacement of the existing pipes with eight 3-ft x 6-ft box culverts robust enough to withstand loads from large trucks. This condition is simulated in the ICPR model as eight 3-ft x 6-ft box culverts and a weir to simulate the flow that could overtop the road. With proper erosion protection, these culverts should withstand washouts for the 25-year event (25 percent chance of occurrence in any given year) and pass the peak flow without road overtopping. Comparison of pre- and post-construction model results indicates Site 5 peak flow for the mean annual event increases 5%. The 25-year peak flow has virtually no change.

The proposed culverts also reduce the head difference from the upstream to the downstream side of the road from about 4.5 ft. to 3.0 ft. This increase in 2.33-yr event flow and decrease in head loss will better represent historical conditions.

2.6 UMAM Score

All wetland impacts in Florida must be assessed using UMAM, pursuant to Chapter 62-345 Florida Administrative Code (F.A.C.). The Jacksonville District Office of The US Army Corps of Engineers and all of the State permitting agencies utilize this methodology when assessing wetland impacts. Under the UMAM process, each proposed wetland impact is assessed, based on its current condition, and assigned specific numeric scores for the location, hydrologic status and plant structure community. These scores are then converted into a number representing the value of the wetland being impacted, as it relates to fish and wildlife utilization, utilizing the formula provided in Chapter 62-345 F.A.C. The numeric value for each impact is then summed to generate the overall value of the proposed impacts for the project.

The same process is applied to the proposed mitigation activities to offset the wetland impacts. Each proposed activity (wetland enhancement, wetland restoration etc.) is assigned a numeric score, utilizing the same parameters listed above, based on the type of activity and acreage proposed. Each activity is then assigned a numeric score, and these scores are then summed to generate the overall value of the proposed mitigation for the project. The proposed mitigation value must be greater than or equal to the impact value in order for the wetland impacts to be sufficiently offset.

The proposed mitigation plan for Goethe will provide for 71.6 units of functional lift to offset the wetland impacts within the Waccasassa watershed (Table 2-6), while the rest of the impacts will be mitigated for at the LNP site. The scoring system utilized during the UMAM process is outlined in the UMAM handbook and its scoring requirements.

Water environment scores for existing communities were assessed at a 6 due to the abundance of artificial water control structures (culverts). Target water environment UMAM scores presented in Table 2-6 ranged from 7 to 8 based on the proximity of the area to the proposed low water crossing. Additionally, the Location and Landscape Support for the RCW habitat was assessed at 6 based on the natural growth of the subcanopy in areas not maintained for RCW populations. Scores for the proposed trail road restoration went from 0 to 7 based on the current absence of wetland functions and values.

Table 2-6. Goethe mitigation plan proposed UMAM score summary

Area	Location		Water		Community		Acreage	Risk	Time Lag	RFG[1]	FG[2]
	Current	With	Current	With	Current	With					
Direct wetland hydrologic enhancement	8	8	6	8	7	7	275.0	1.25	1.14	0.0468	12.7
Indirect wetland hydrologic enhancement	8	8	6	7	7	7	2,085.4	1.25	1.14	0.0234	48.8
RCW upland mowing	6	7	0	0	7	7	233.0	1.25	1.00	0.04	9.3
Trail road restoration	0	7	0	8	0	7	3.6	1.50	2.18	0.2141	0.8
Total							2,597.0				71.6

[1]Relative Functional Gain
[2]Functional Gain

2.5.3 Model Application Results

The ICPR model setup described above was applied to the system for five rainfall events representing the 2.33-, 10-, 25-, 50-, and 100-year return periods. The model was applied to both existing (pre-construction) and proposed (post-construction) conditions. The post-construction conditions represent the proposed mitigation modifications at several candidate sites (shown in Figure 2-9) within the system (more details about the modifications are provided in the civil design section of this report). Comparison of the pre- and post-construction model results at each site demonstrate the improved flow conveyance gained from the cumulative effect of all modifications. These results are presented in Table 2-5 and described below for each site.

2.7 Engineering

Proposed engineering improvements for the five sites within the Goethe site will generally consist of either road improvements or culvert installation. The paragraphs below summarize the proposed improvements for each site.

Site 1 - The contractor will provide approximately 1100 cy of fill and re-grade approximately one mile of the existing dirt road to bring the road elevation up to the adjacent existing grade elevations (Section 2.11, Sheet 10 and Sheet 12 of 22, typical section).

Site 2 - The contractor will provide approximately 1000 cy of fill and re-grade approximately 3500 linear ft. of the existing dirt road to bring the road elevation up to the adjacent existing grade elevations (Section 2.11, Sheet 11 and Sheet 12 of 22, typical section).

Site 3 - The contractor will excavate approximately 1000 cy of soil and re-grade approximately 3800 linear ft. of dirt road in order to bring the road elevation down to the adjacent existing grade elevations (Section 2.11, Sheets 13-15 of 22). The road elevations are roughly 6 inches above the existing adjacent grade.

Site 4 - The contractor will demolish the existing 12-in diameter culvert and install three 14-in. x 23-in.diameter elliptical reinforced concrete culverts at the same location (Section 2.11, Sheet 10). The proposed plan calls for north inverts of 42.7 ft. and south inverts of 43.2 ft. for all three culverts (Section 2.11, Sheets 16 and 17 of 22). The contractor will dewater as necessary and will provide backfill so as to establish a minimum of 12 inches of soil cover over the culverts.

Site 5 - The contractor will demolish four 50-in. diameter plastic pipe culverts and four 36-in. diameter reinforced concrete pipe culverts (Section 2.11, Sheet 18 of 22). The contractor will install eight 6-ft x 3-ft precast reinforced concrete box culverts so as to provide a North and South invert of 33.0 ft. (Section 2.11, Sheets 18 and 19 of 22). Before installation, the contractor will de-water and compact the subgrade beneath the box culverts. Upon installation of the box culverts, the contractor will backfill and provide a minimum of 12 inches of soil cover over the proposed box culverts.

2.8 Implementation Schedule

The construction of the Goethe site will begin upon the commencement of construction and wetland impacts associated with the LNP project. The mitigation plan will be implemented in phases, as some activities, such as the excavation and planting of the trail road area, are seasonal in nature and can only be completed under favorable conditions. The replacement of multiple culverts on Ten Mile Creek and RCW habitat

have the highest priority, with the low water crossings having the next highest priority, and the trail road restoration having the lowest priority.

As with any construction project, natural conditions and weather patterns will be observed and activities will be planned to best coincide with suitable weather conditions. Prior to any land disturbance, all appropriate erosion and sedimentation control measures will be installed, including silt fence around all disturbed areas and sediment curtains in the channel. Any other applicable compliance items, such as County land clearing permits or any other local permit requirements, will also be addressed before the construction aspect begins. Excavation of the trail road area will occur during the dry season (October-March) and wetland plantings will occur once excavation is complete and the area has been constructed properly and approved. Maintenance for invasive/exotic species will be conducted year-round, with manual, mechanical and/or chemical removal methodologies to be utilized throughout the year to ensure the best results.

Based on the above-referenced priorities, an implementation schedule of the mitigation activities is listed below:

Activity	Timeframe
Acquire local land disturbance permits, mobilization of contractor and equipment, establish all turbidity/erosion control measures	Week 1
Clear and excavate areas and dispose of excess material	Week 2
Finish grade roadway	Week 3
Generate and review as-built surveys	Week 4
Plant wetland restoration area	Weeks 5-6
Begin 5 year monitoring and maintenance period	Week 7

* Optimal planting season for herbaceous species is March through September, and October through March for forested species.

2.9 Monitoring and Maintenance Requirements

The hydrologic enhancement areas (LWC, box culvert, and trail road removal) will be monitored continuously for five years to ensure their success. Monitoring will document that daily, monthly, and seasonal water levels are matching those proposed in the hydrologic modeling. In addition, wildlife utilization, hydrologic conditions,

presence of invasive/exotic species and any other management issues will be noted and addressed.

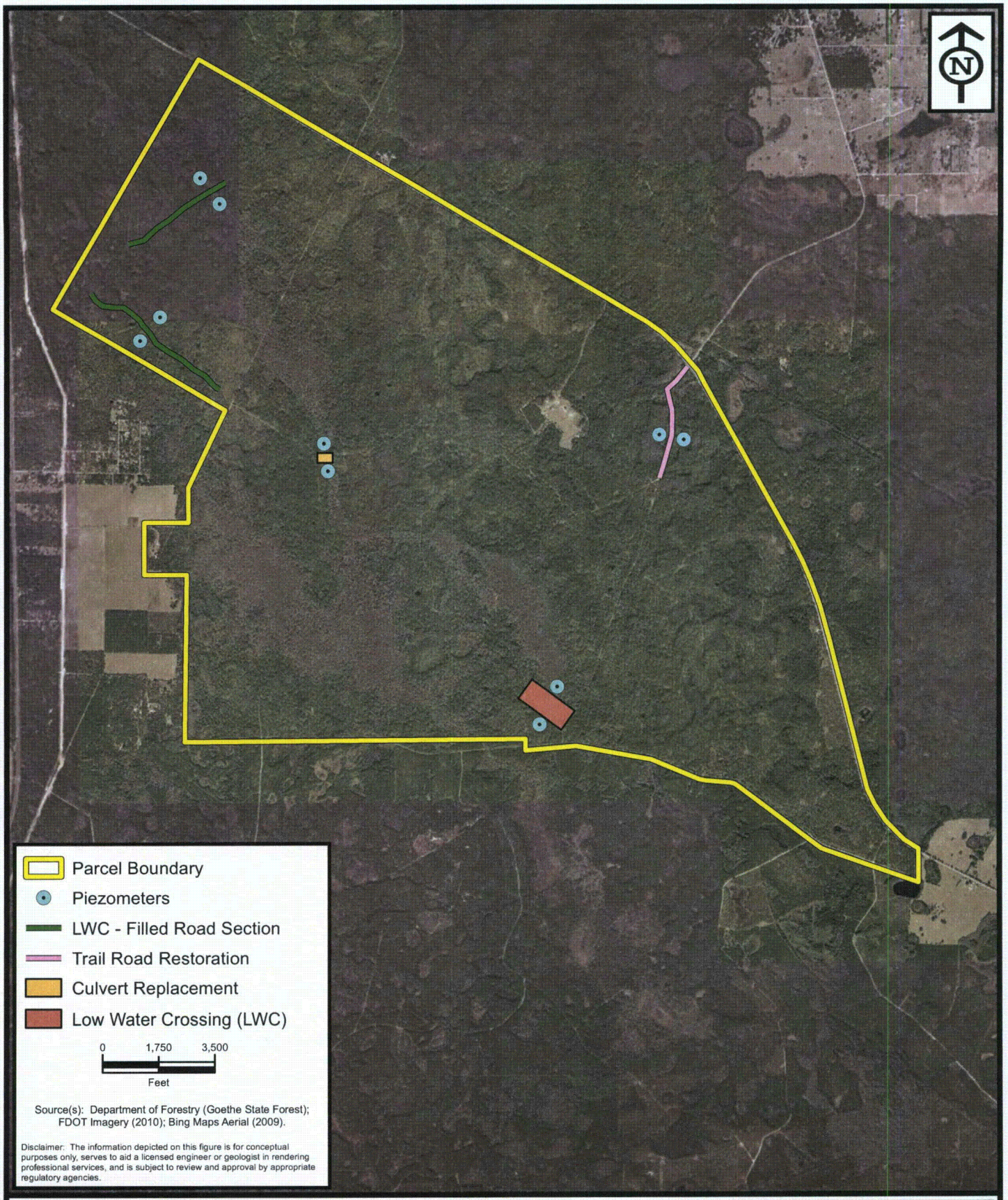
The wetland restoration areas (trail road removal) will be monitored annually and maintained on a quarterly basis to ensure their success. Monitoring will document that each habitat type is naturally progressing to resemble its intended target community in regard to plant species and composition. In addition, wildlife utilization, hydrologic conditions, presence of invasive/exotic species and any other management issues will be noted and addressed.

The RCW habitat control will be maintained on an as needed basis based on the current conditions of the shrub and subcanopy growth. Regular mowing of the area will be used to maintain minimal growth of undesirable species. Factors that will likely determine the mowing schedule include, but are not limited to, seasonal climate conditions, occurrence of wildfires, and availability of mowing equipment.

The quantitative monitoring of the forested restoration area will consist of establishing fixed linear transects covering approximately 10 percent of the area. The transects will be 25 ft. wide and will average 300 ft. long. Hydrology will be observed through the use of recording piezometers installed strategically throughout the site (Figure 2-10). The data that will be observed and recorded within each transect/plot will include:

- date of installation and number and types of plants installed;
- total coverage and survivorship of desirable planted species and any other dominant species;
- the presence and overall coverage of any listed invasive/exotic species;
- success of any previously recommended treatment methods and any future methods proposed;
- any areas of mortality of planted or other natural species;
- current hydrologic conditions, water depths and hydric soils observed;
- any evidence of wildlife presence or utilization;
- any maintenance needs in regard to stabilization, erosion, vandalism etc. and suggested corrective actions.

Hydrologic restoration areas will be monitored by the installation of piezometers and the collection of pre-construction and post-construction data. Post-construction data collected with the piezometers will be compared to both pre-construction data and the proposed hydrologic model.



Source(s): Department of Forestry (Goethe State Forest); FDOT Imagery (2010); Bing Maps Aerial (2009).

Disclaimer: The information depicted on this figure is for conceptual purposes only, serves to aid a licensed engineer or geologist in rendering professional services, and is subject to review and approval by appropriate regulatory agencies.

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Mitigation Activity Area - Monitoring Activities

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Figure:	**2-10**

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Pro_monitoring.mxd Date: 7/15/2011 9:48:00 AM

A baseline monitoring event for the restoration area will be conducted at Goethe no less than 60 days after the completion of planting. The baseline event will help to establish the initial conditions after construction and will be used as a reference to assess progression during future monitoring events. The annual monitoring will commence after the baseline event and will be submitted to FDEP and ACOE in the fall (September/October) of each year. The report will consist of a narrative describing the site conditions, the management activities that have occurred, photographs taken from fixed location points and maps depicting the mitigation area. The forested restoration area will be monitored for at least five years until the success criteria are met. The monitoring period may be adjusted based upon the performance of the vegetation establishment.

Baseline monitoring for the hydrologic restoration areas will begin within one year of pre-construction data. The baseline event will help to establish the initial conditions after construction and will be used as a reference to assess progression during future monitoring events. Data will be collected from the piezometers monthly and compiled for 6-month and annual reports. The post-construction monitoring will commence after the baseline event and will be submitted to FDEP and ACOE by April 1 (annual report) and July 1 (6-month report) of each year. The report will consist of a narrative describing the site conditions, photographs taken from fixed location points, summary data from each piezometer, local rainfall data, and maps depicting the mitigation area.

2.10 Success Criteria

Specific success criteria outlined below will ensure that the proposed mitigation activities achieve their intended design and function. The main focus of the success criteria for Goethe will emphasize the re-establishment of historic hydrology patterns and flow. Regular monitoring and maintenance implementation is crucial to ensuring success at Goethe. The mitigation area will be considered successful when the following criteria have been met after the required monitoring time frame:

Forested Restoration (trail road) Area:

- 80% survivorship/species composition of planted (or naturally recruited) wetland trees including red maple, water oak, Carolina ash, or any other wetland tree;
- 5% or less total coverage of any invasive/exotic species;
- hydrology is well established and visibly apparent based on the hydrologic indicators as defined by Rule 62-340, Florida Administrative Code (F.A.C.);
- the above criteria must be met within the five years of annual monitoring.

Hydrologic Restoration Areas:

- hydrology is well established and visibly apparent based on the hydrologic indicators as defined by Rule 62-340, Florida Administrative Code (F.A.C.);

- monthly hydrology readings for areas downstream of mitigation activities increase proportionally with monthly rainfall data.

RCW Habitat Mowing:

- This process is ongoing with no specified end date due to the need to sustain this vanishing habitat.

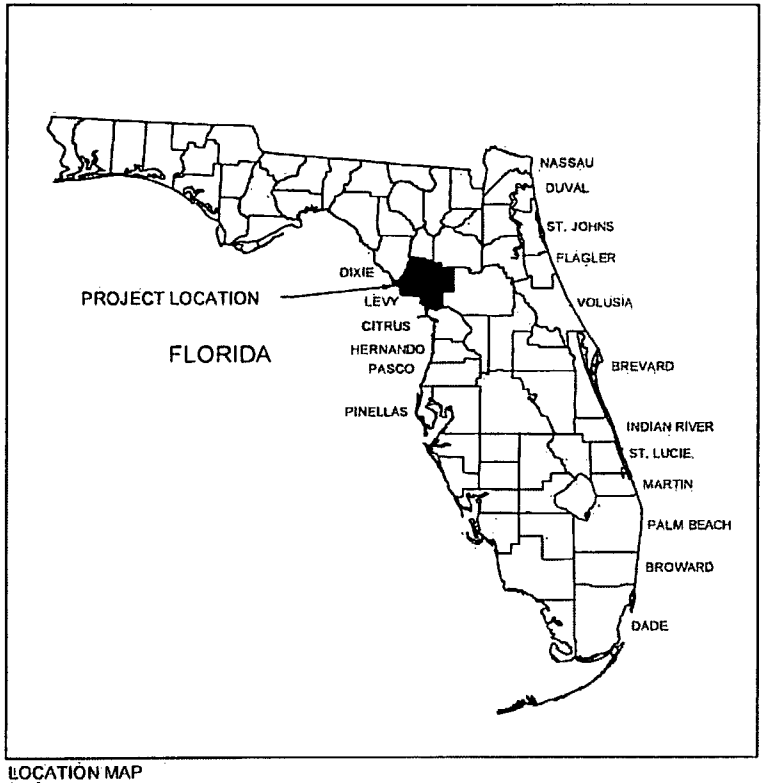
The progress of the mitigation area towards reaching success is tracked through the monitoring reports that will be submitted annually to FDEP and ACOE for review and approval. In the event that the above criteria are not met at the end of the monitoring period, or it is becoming obvious during annual monitoring that an area will not meet the established success criteria, then PEF will work closely with FDEP and ACOE staff in order to identify and correct any issues identified during the monitoring. Once the success criteria outlined above are met, the mitigation effort will be deemed a success and the monitoring of the mitigation area will be ended.

2.11 Engineering and Planting Detail Drawings

Please see the attached engineering and planting detail drawings.

PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

DRAWING INDEX



LOCATION MAP
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TITLE SHEET
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	1 of 22
DATE	JUNE 2011

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PROFESSIONAL ENGINEER
9-2011

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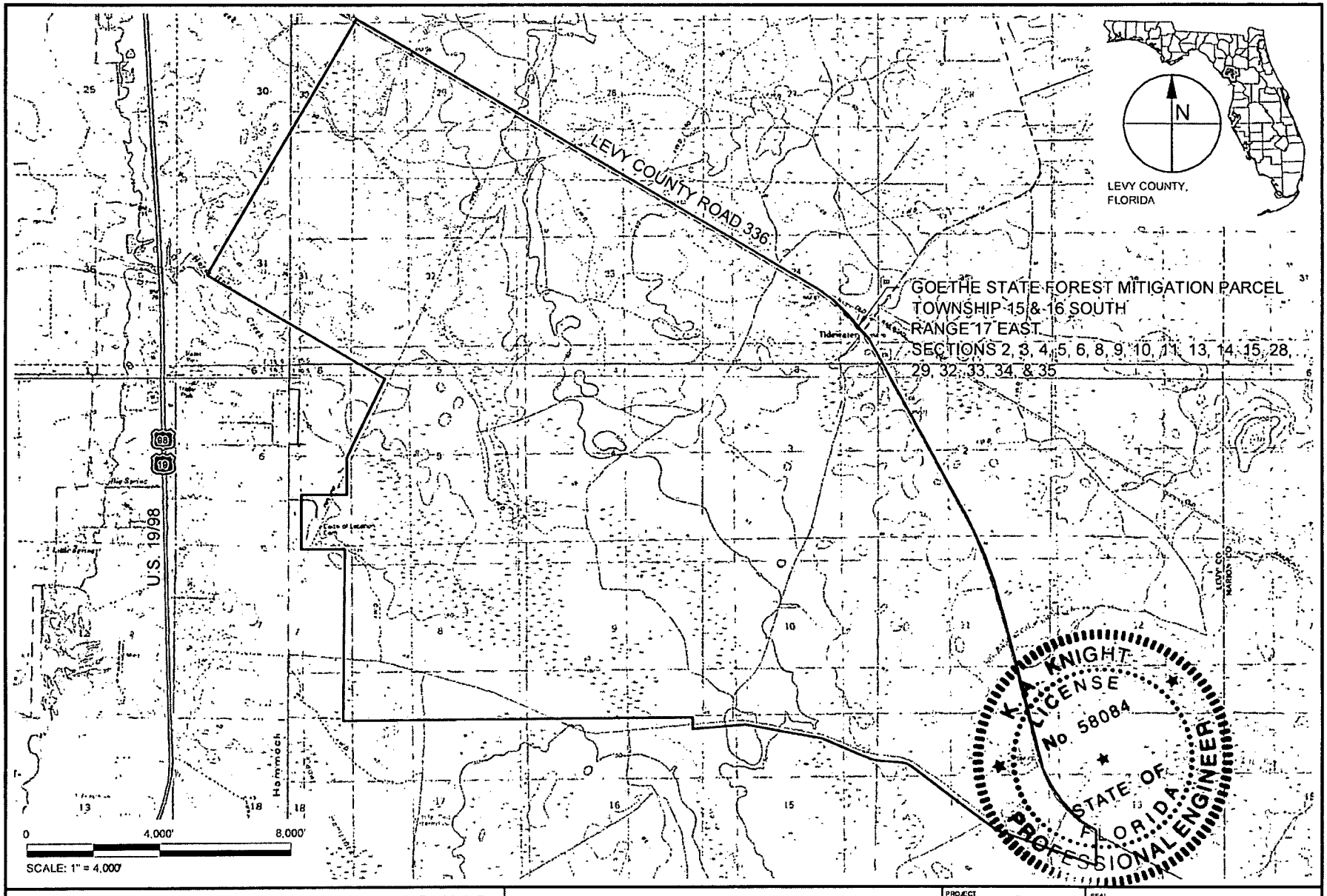

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PROJECT LOCATION MAP
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LEVY COUNTY, FLORIDA

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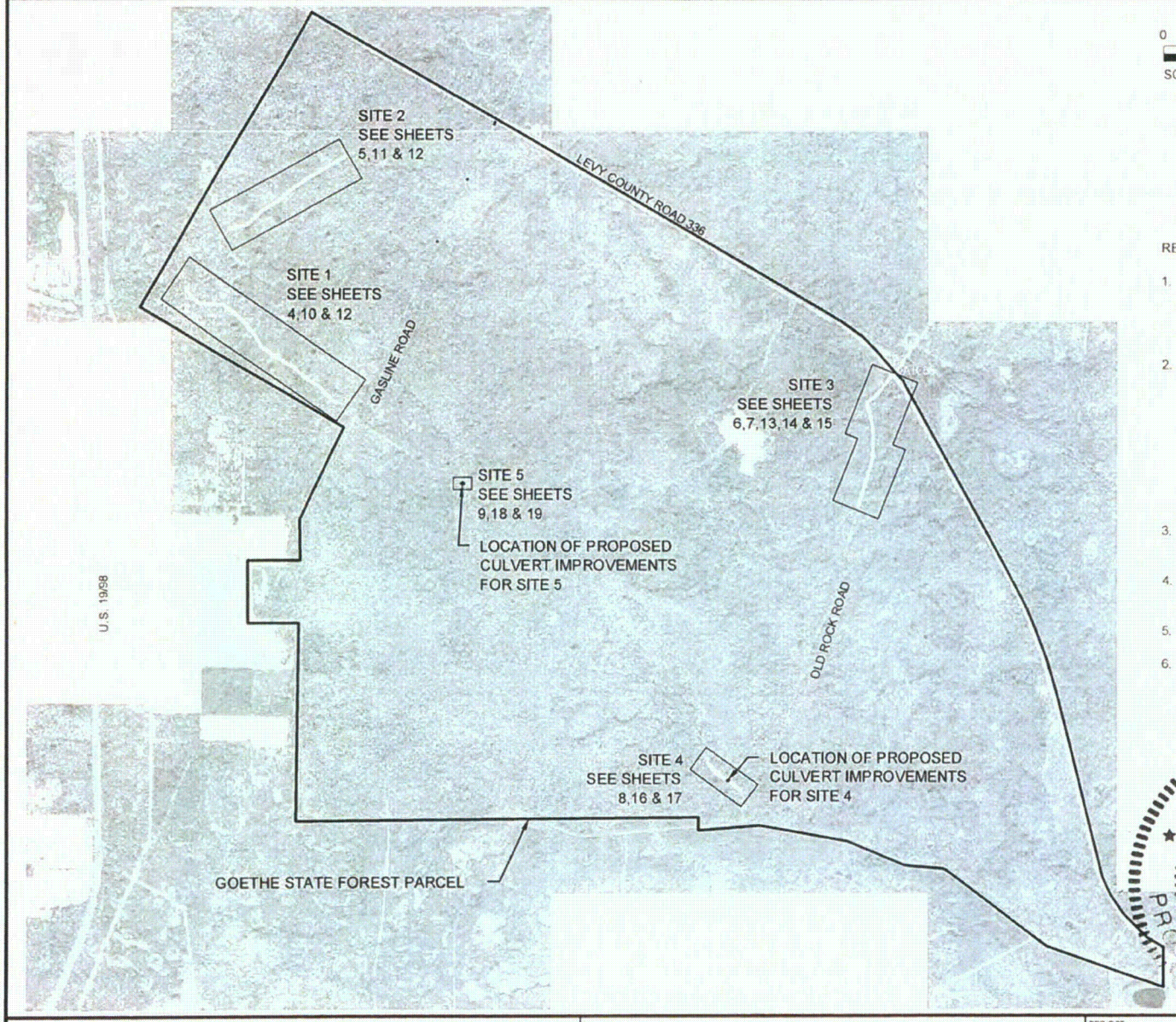

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REFERENCES:

1. ALL HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO STATE PLANE NAD 1983 FLORIDA WEST ZONE (2007 ADJUSTMENT), U.S. SURVEY FEET.
2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO DATUM NAVD 1988, U.S. SURVEY FEET. THE BENCHMARKS UTILIZED WERE NGS (NATIONAL GEODETIC SOCIETY) BENCHMARK "FLGPS 35 1989" WITH AN ELEVATION OF 35.18 FEET, NGS BENCHMARK "LEVY 57 1996" WITH AN ELEVATION OF 32.74 FEET, AND NGS BENCHMARK "LEVY 58 1996" WITH AN ELEVATION OF 31.79 FEET.
3. LIMITED TOPOGRAPHICAL SURVEY PROVIDED BY MORGAN & EKLUND, INC., DATED MAY 2011.
4. ADDITIONAL TOPOGRAPHICAL INFORMATION TAKEN FROM UGSG DEM DATA, 2009.
5. AERIAL REFERENCE: FDOT, 2006
6. LIDAR OBTAINED FROM FLORIDA DIVISION OF EMERGENCY MANAGEMENT, 2007.

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PROJECT OVERVIEW
PROGRESS ENERGY MITIGATION PROJECT
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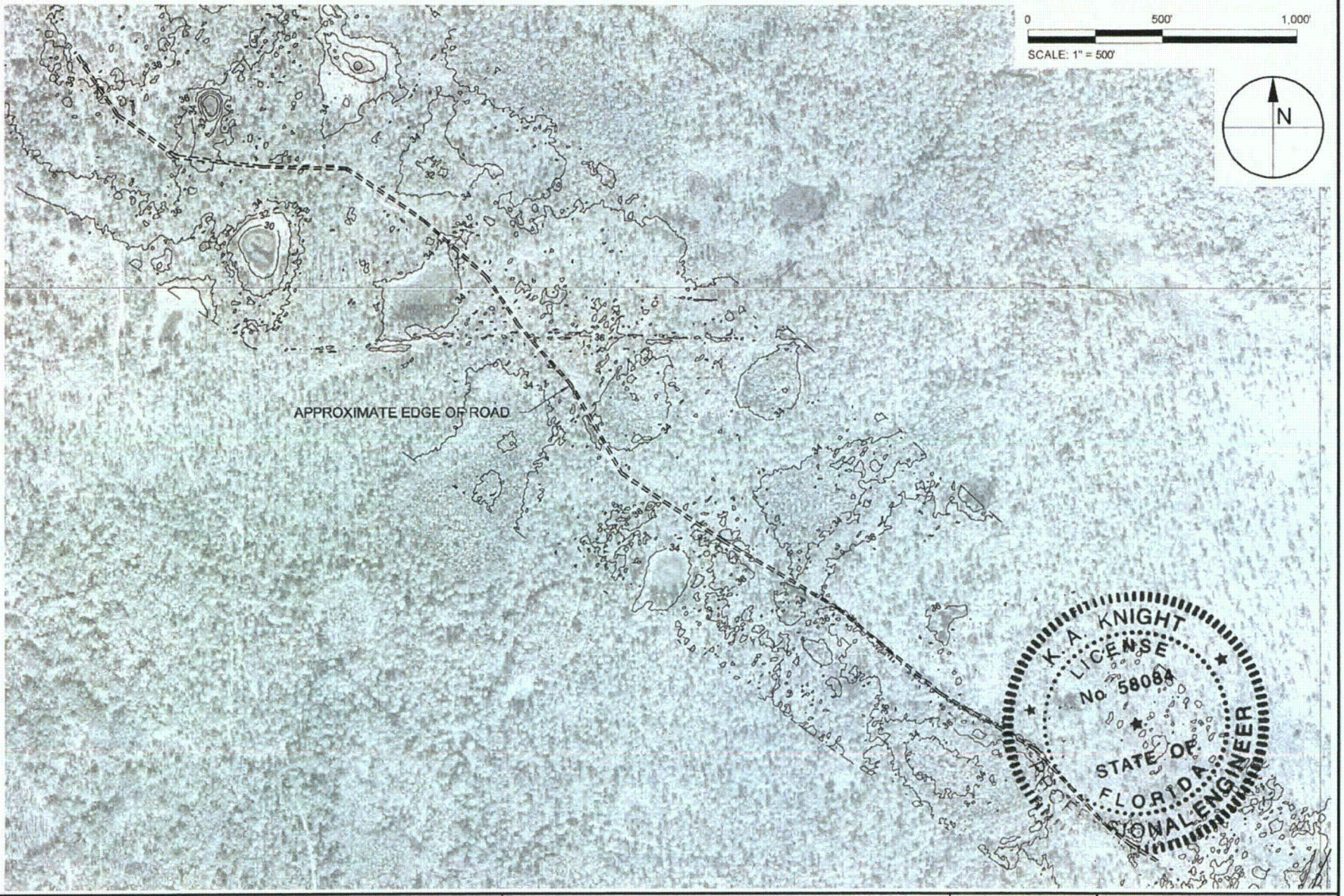

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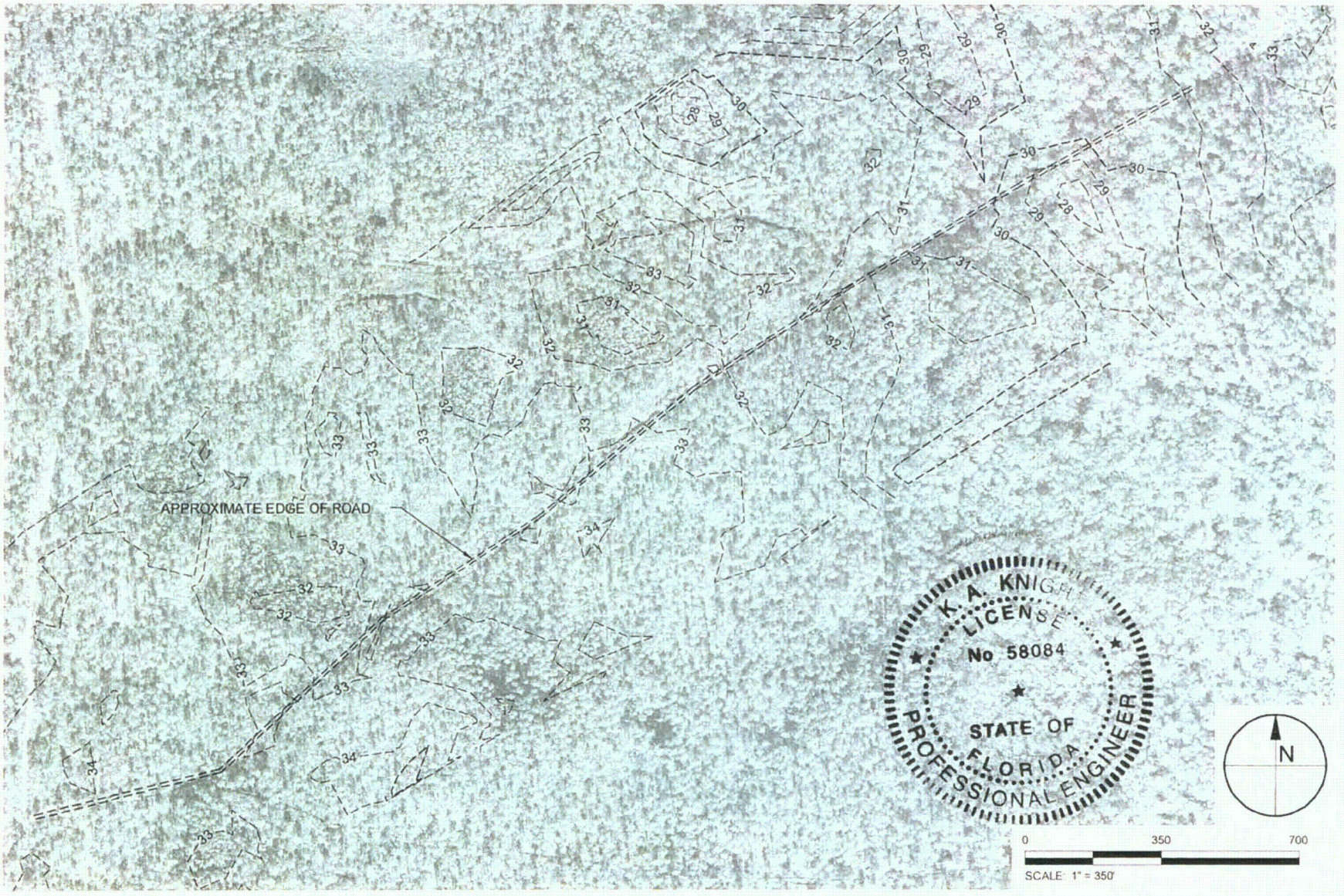

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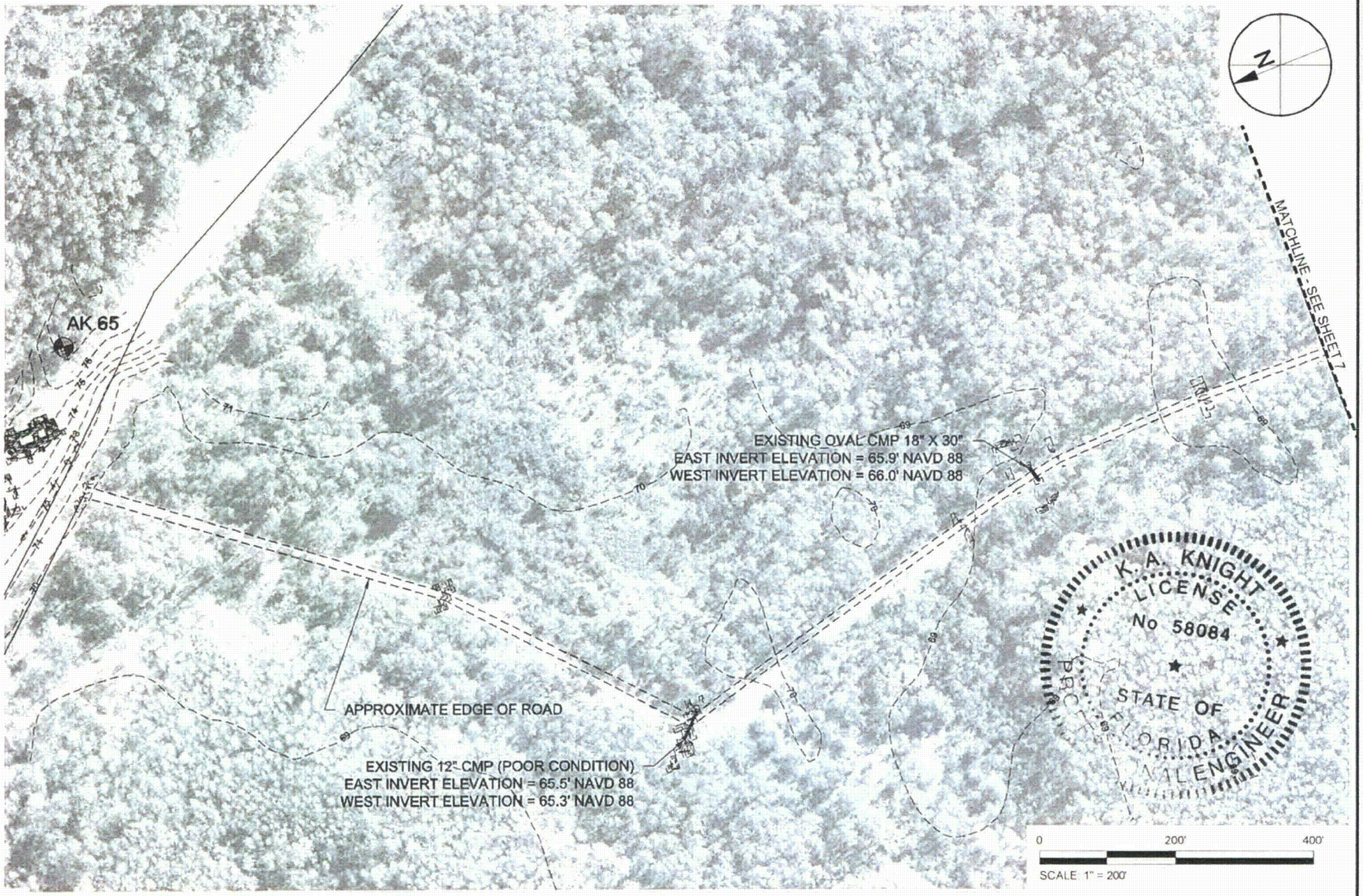

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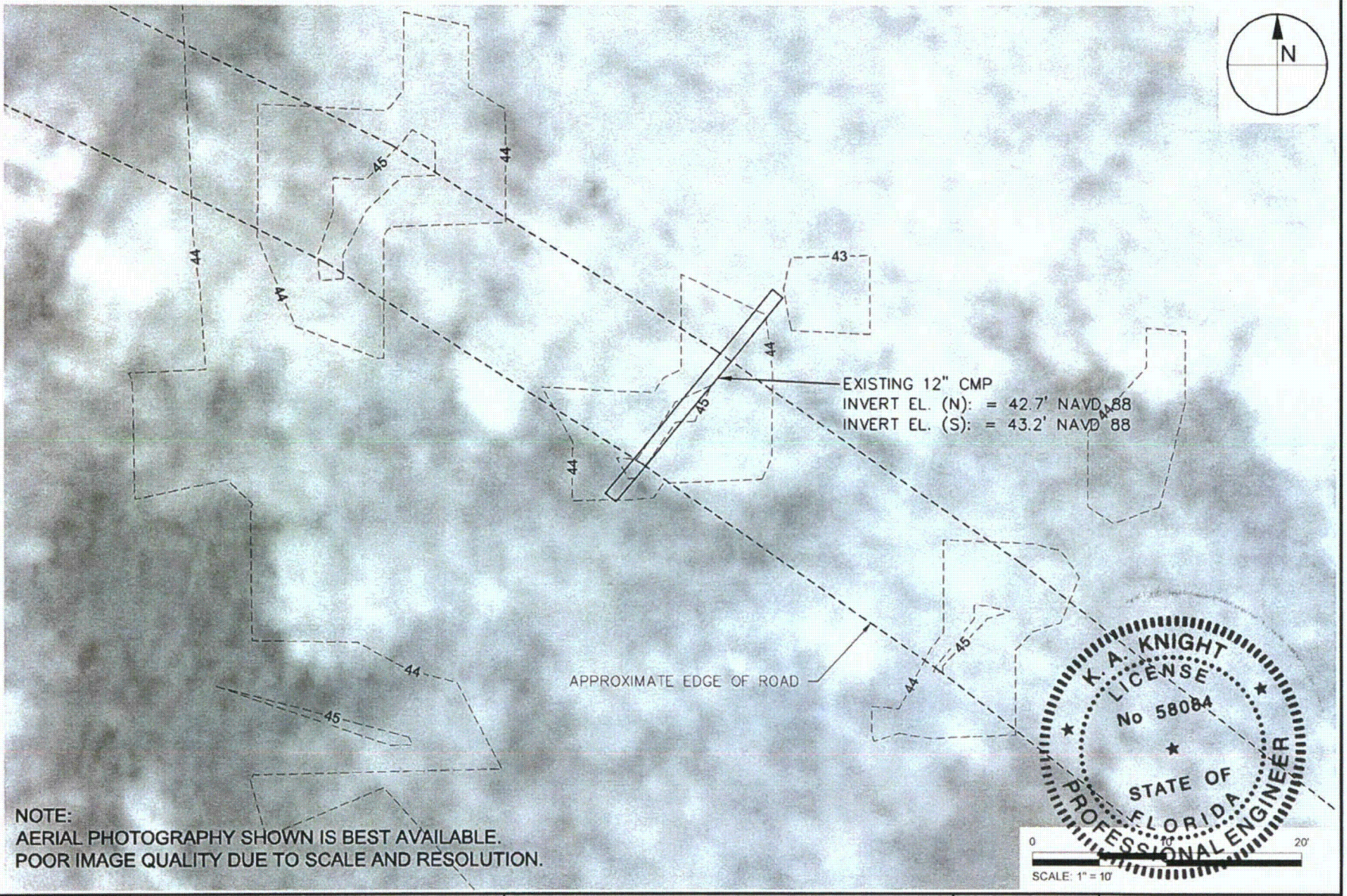

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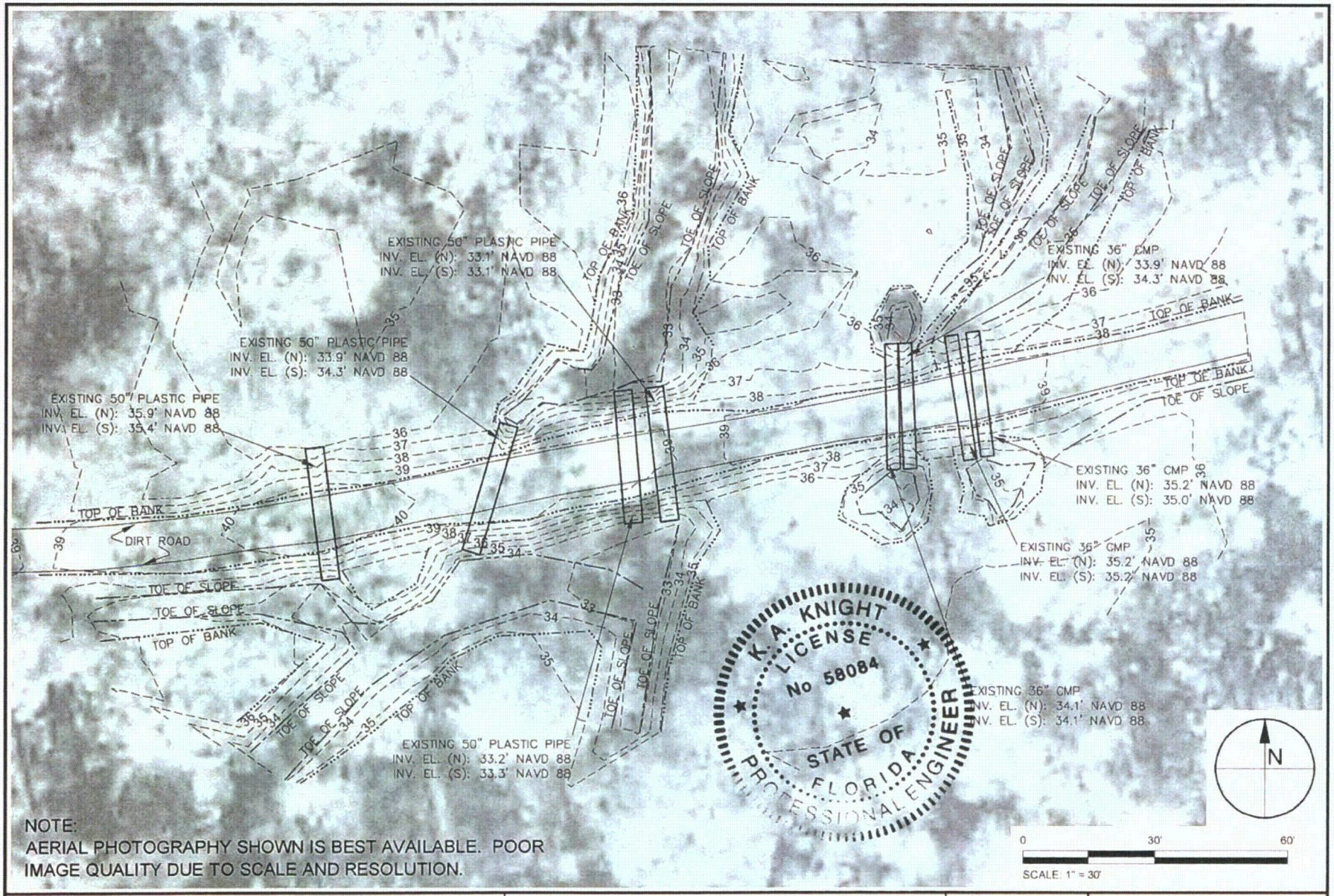

NOTE:
AERIAL PHOTOGRAPHY SHOWN IS BEST AVAILABLE. POOR IMAGE QUALITY DUE TO SCALE AND RESOLUTION.

TAYLOR ENGINEERING INC.

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EXISTING CONDITIONS - SITE 5
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

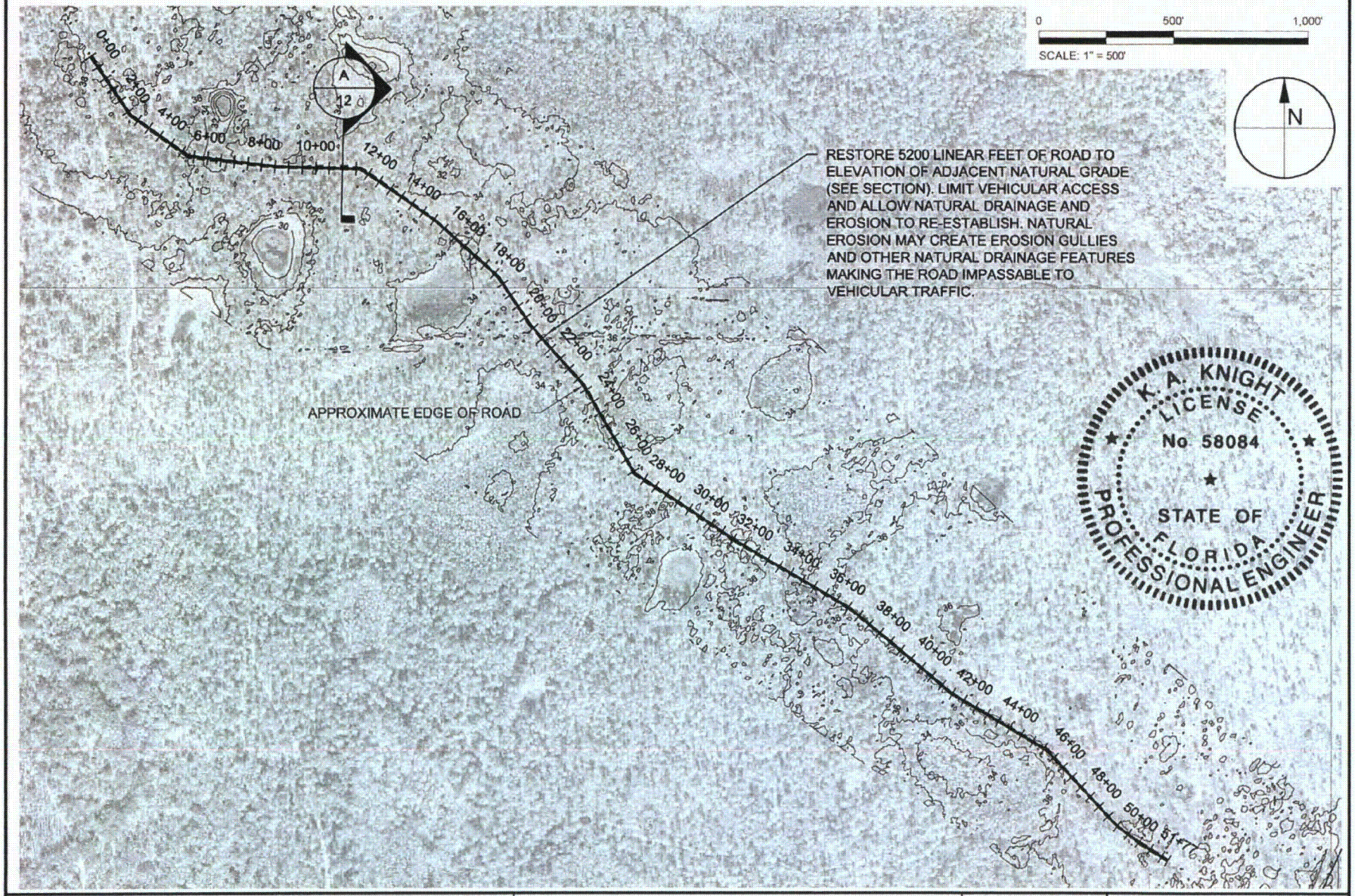
PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	9 of 22
DATE	JUNE 2011

SEAL

KEITH A. KNIGHT P.E.# 58084 — DATE 9-20-11

PRELIMINARY DRAWINGS: THESE DRAWINGS ARE NOT IN FINAL FORM, BUT ARE BEING TRANSMITTED FOR AGENCY REVIEW.

CATHY SHELL X:\SITE\PROJECTS\C2011-025 PROGRESS ENERGY\PERMIT\SITE\PC2011-025-P-GSP-SITE5.DWG 7/18/2011 8:26:26 PM



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JACKSONVILLE, FL 32256
CERTIFICATE OF AUTHORIZATION # 4815

GRADING PLAN - SITE 1
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	10 of 22
DATE	JUNE 2011

SEAL

9-20-11
KEITH A. KNIGHT P.E. # 58084 DATE

CATHY SHELL X:\SYS\PROJECTS\C2011-025 PROGRESS ENERGY\PERMITS\PC2011-025-P-GEP-SITE1.DWG 7/18/2011 5:20:41 PM

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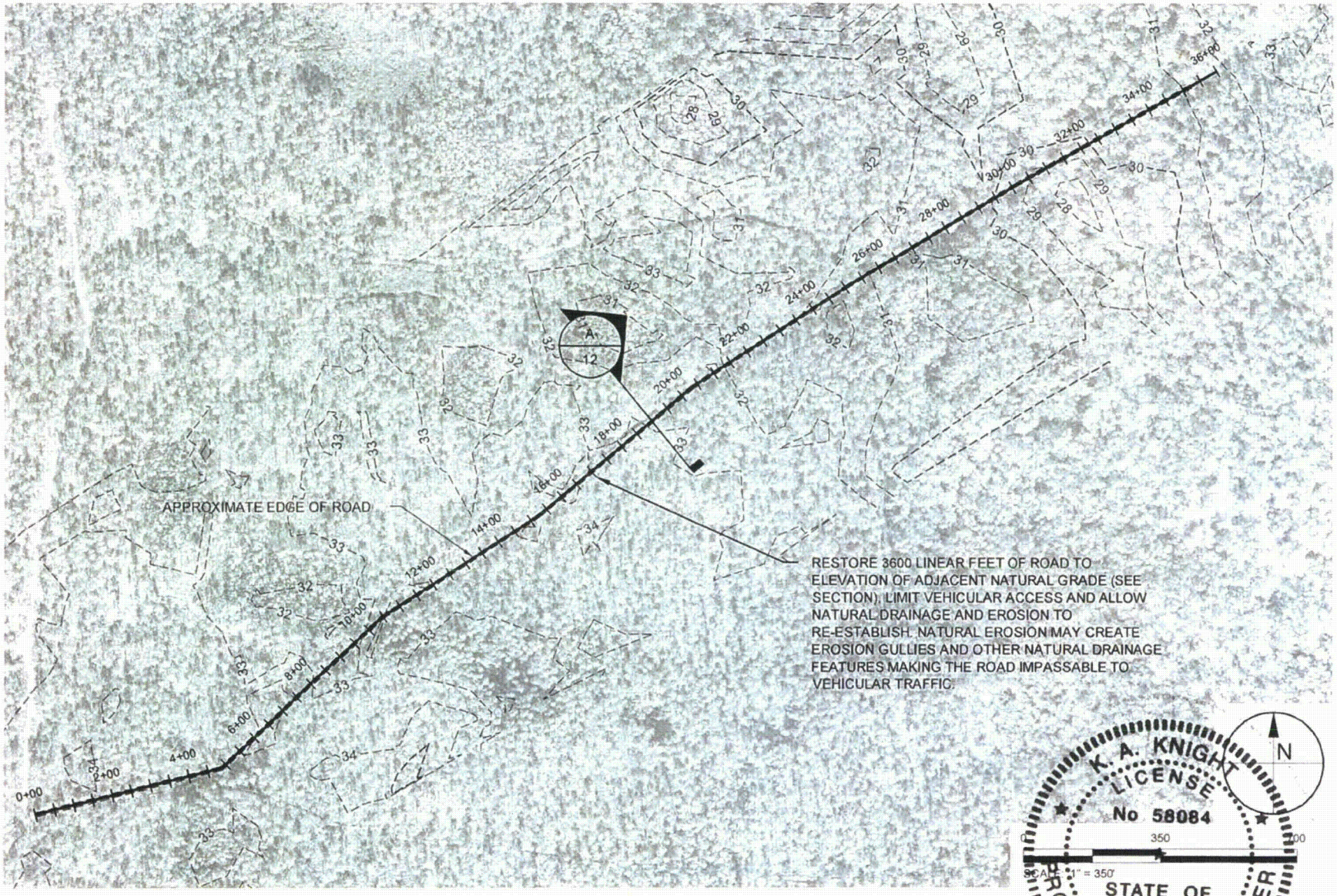

K. A. KNIGHT LICENSE No 58084 STATE OF FLORIDA PROFESSIONAL ENGINEER

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GRADING PLAN - SITE 2
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	11 of 22
DATE	JUNE 2011

KEITH A. KNIGHT P.E.# 58084 — DATE 7-29-2011

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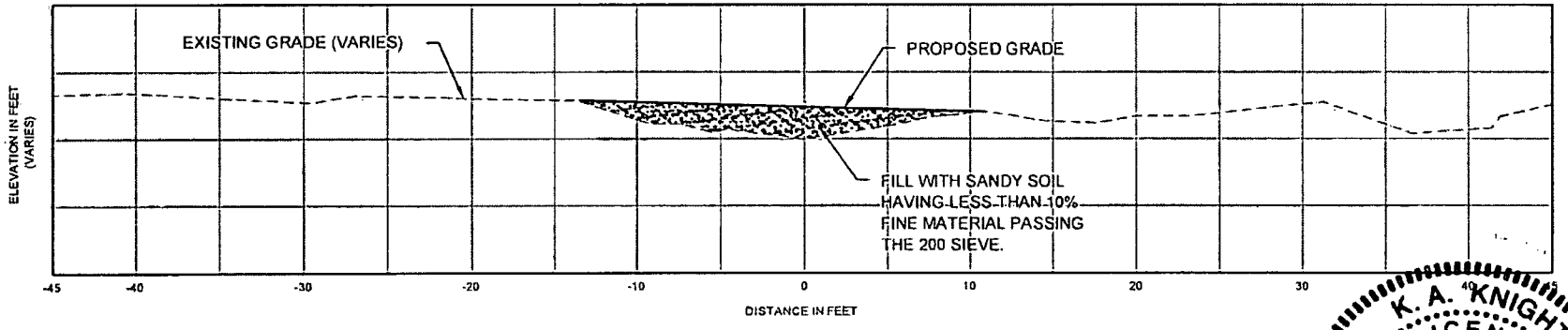

A TYPICAL SECTION DETAIL
ROADWAY RESTORATION LOW ROAD ELEVATION

SCALE: 1" = 10'
V-SCALE: 1" = 5'

0 10'

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CERTIFICATE OF AUTHORIZATION # 4815

CROSS SECTION - SITES 1 AND 2
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	12 of 22
DATE	JUNE 2011

KEITH A. KNIGHT P.E. # 58084 — DATE 6-20-11

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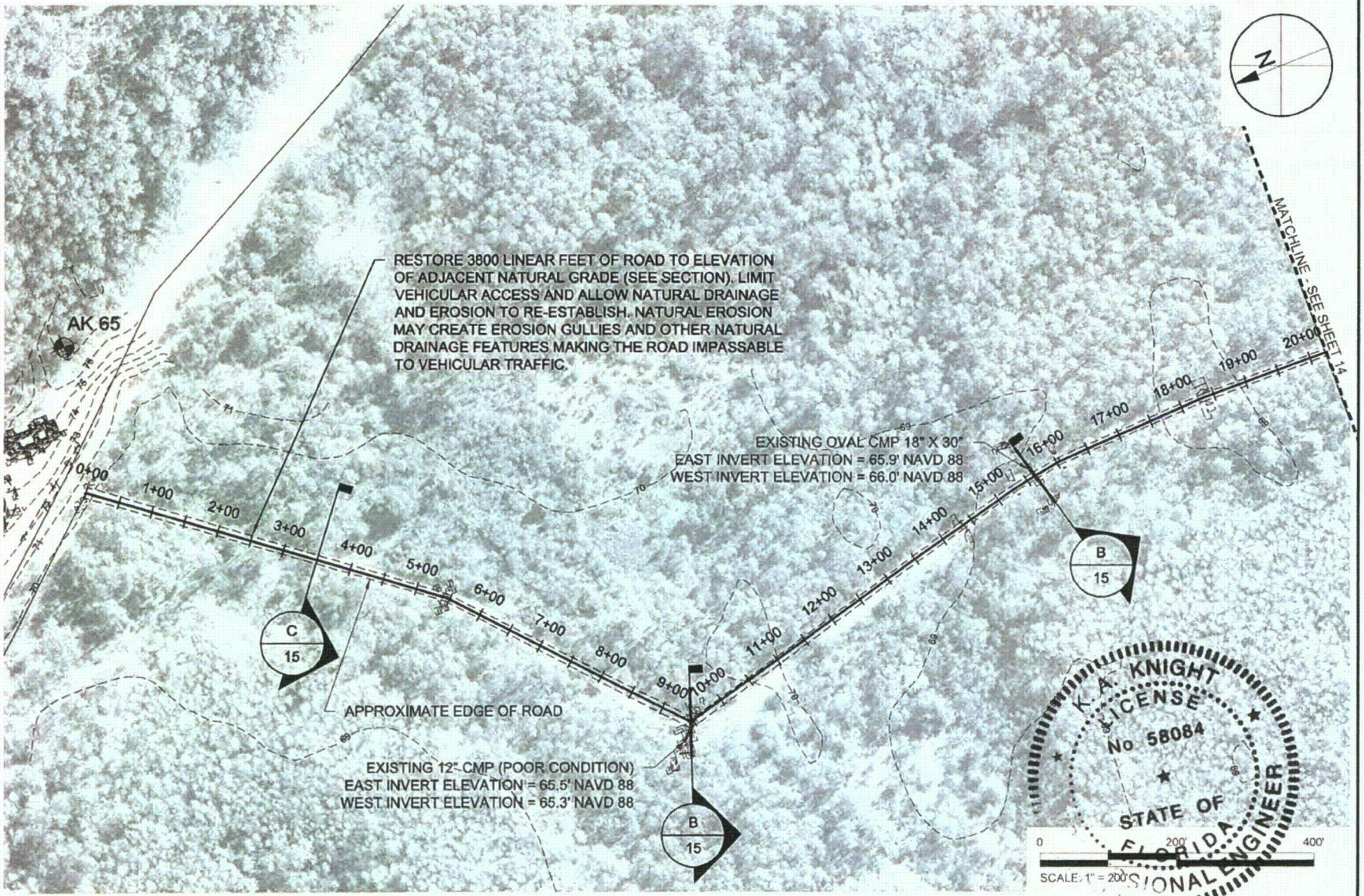

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GRADING PLAN 1 OF 2 - SITE 3
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	13 of 22
DATE	JUNE 2011

SEAL

9-20-11
KEITH A. KNIGHT P.E. # 58084 — DATE

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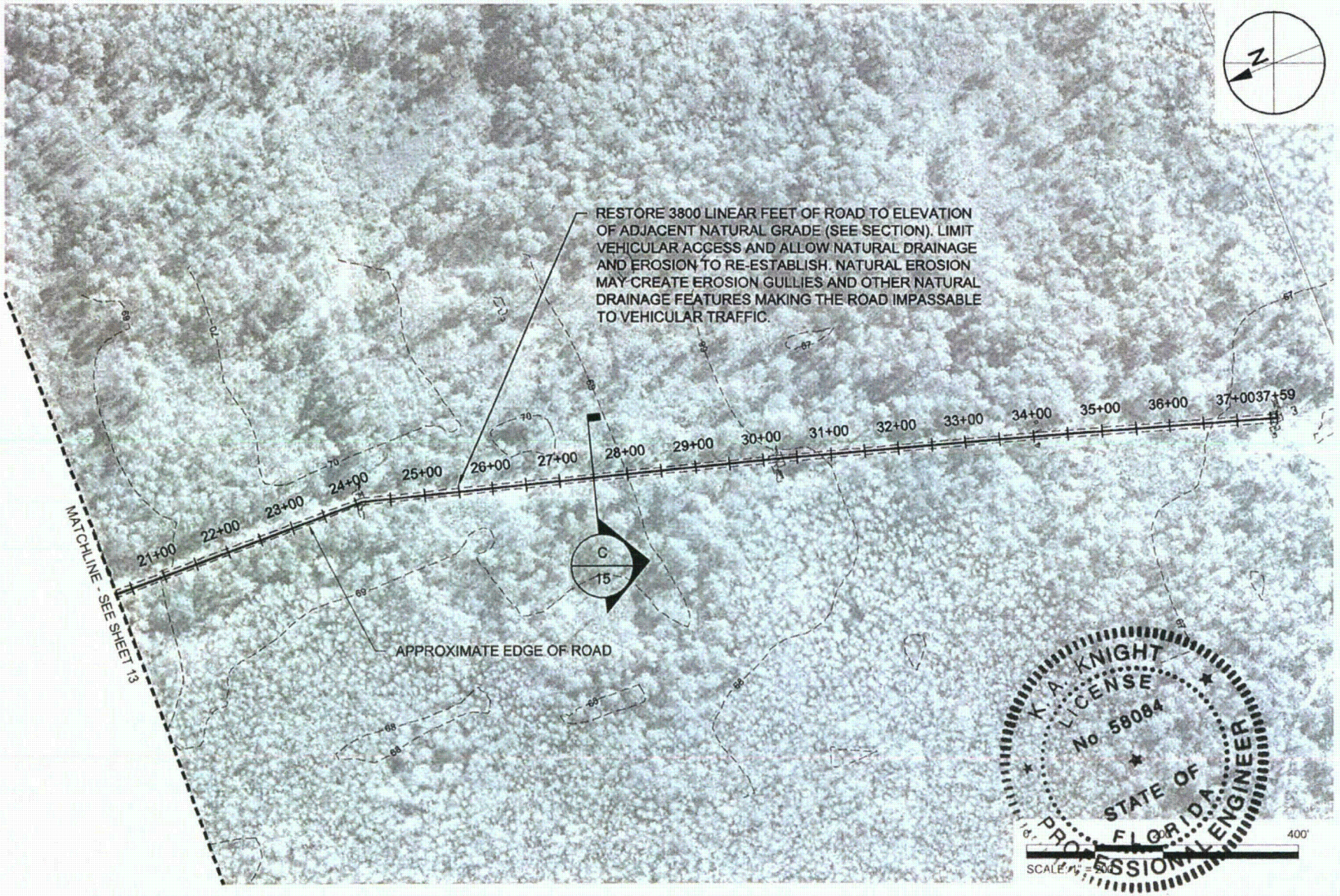
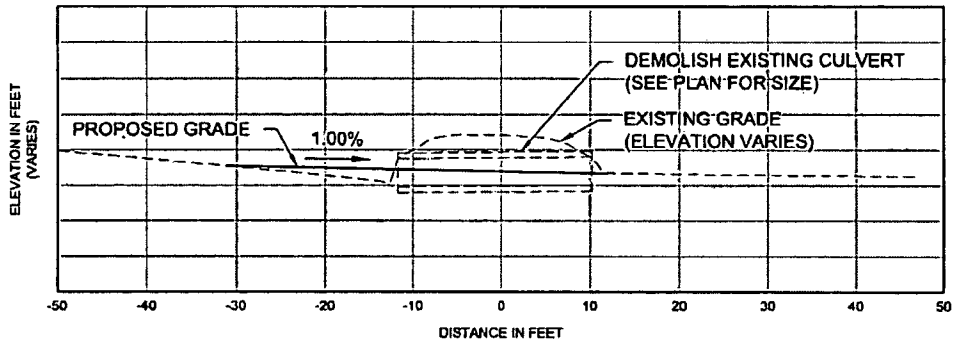
PRELIMINARY DRAWINGS: THESE DRAWINGS ARE NOT IN FINAL FORM, BUT ARE BEING TRANSMITTED FOR AGENCY REVIEW.



TAYLOR ENGINEERING INC. 10151 DEERWOOD PARK BLVD. BLDG. 300, SUITE 300 JACKSONVILLE, FL 32256 CERTIFICATE OF AUTHORIZATION # 4815	GRADING PLAN 2 OF 2 - SITE 3 PROGRESS ENERGY MITIGATION PROJECT GOETHE STATE FOREST PARCEL LEVY COUNTY, FLORIDA	PROJECT: C2011-025 DRAWN BY: RLJ/CAS SHEET: 14 of 22 DATE: JUNE 2011	SEAL KEITH A. KNIGHT P.E. # 58084 9-2011 DATE

PRELIMINARY DRAWINGS: THESE DRAWINGS ARE NOT IN FINAL FORM, BUT ARE BEING TRANSMITTED FOR AGENCY REVIEW.

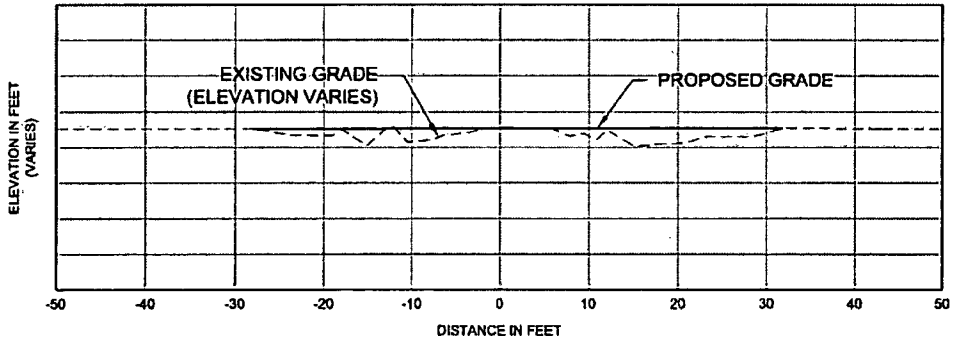
CATHY SHELL X:\SYS\PROJECTS\C2011-025 PROGRESS ENERGY\PERMITS\PC2011-025-P-GSP-GTE3.DWG 7/8/2011 5:21:11 PM



B TYPICAL ROAD RESTORATION SECTION AT CULVERT LOCATIONS

SCALE: 1" = 20'
V-SCALE: 1" = 10'

0 20'



C TYPICAL ROAD RESTORATION SECTION

SCALE: 1" = 20'
V-SCALE: 1" = 10'

0 20'

K. A. KNIGHT
LICENSE
No 58084
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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CERTIFICATE OF AUTHORIZATION # 4915

CROSS SECTION - SITE 3
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	15 of 22
DATE	JUNE 2011

SEAL

KEITH A. KNIGHT P.E. # 58084 — DATE 9-20-11

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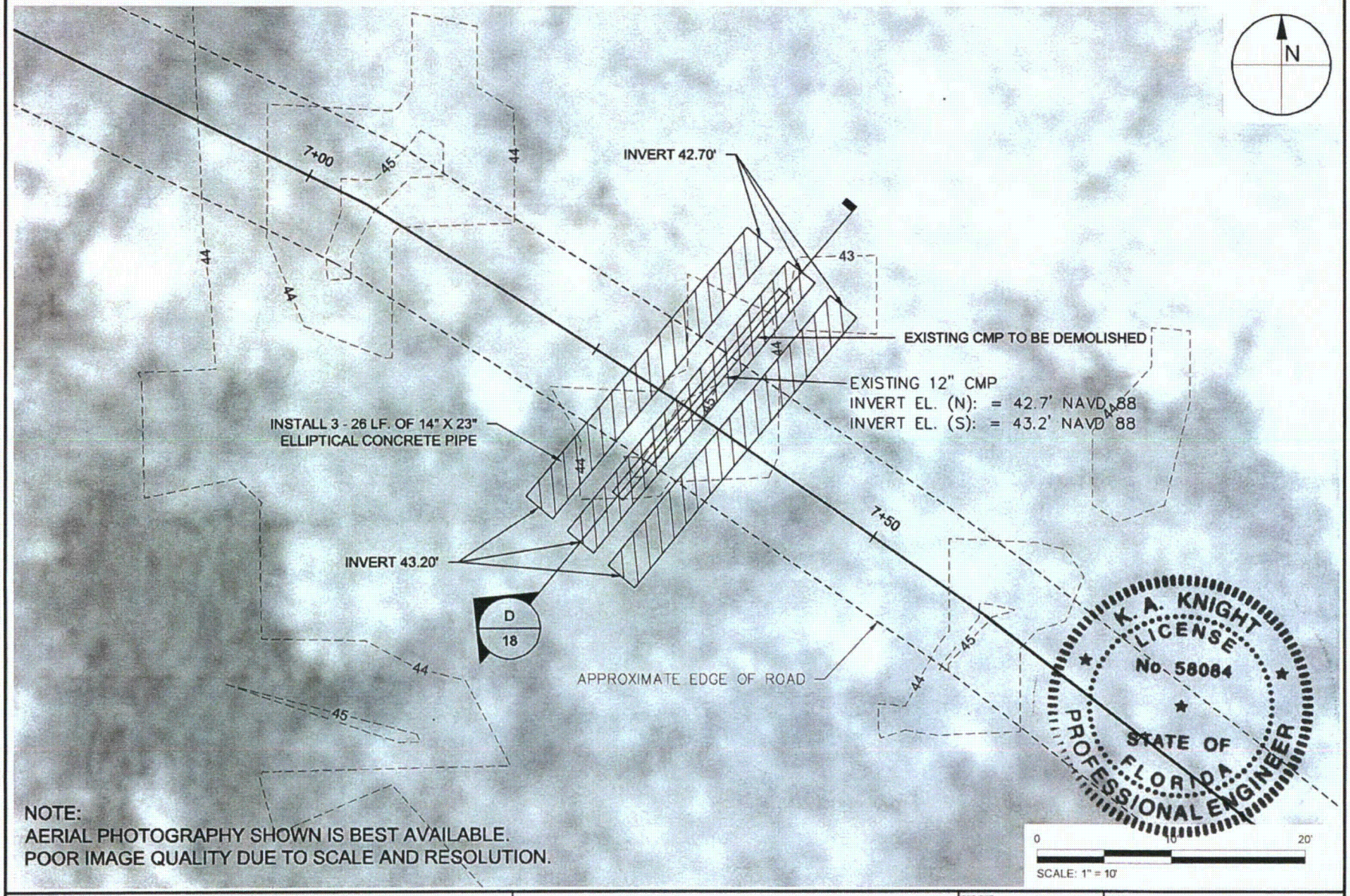

NOTE:
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POOR IMAGE QUALITY DUE TO SCALE AND RESOLUTION.

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GRADING PLAN - SITE 4
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	16 of 22
DATE	JUNE 2011

SEAL

KEITH A. KNIGHT P.E.# 58084 DATE 7-2011

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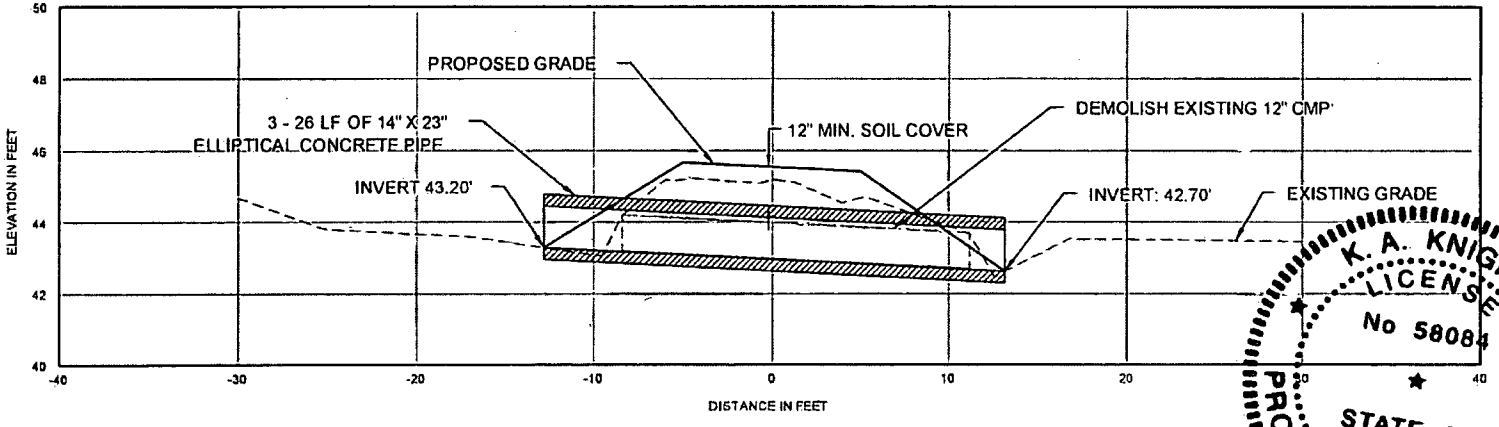

D SITE 4 - CULVERT CROSS SECTION

SCALE: 1" = 10'
V-SCALE: 1" = 5'

0 10'

K. A. KNIGHT
LICENSE
No 58084
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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CERTIFICATE OF AUTHORIZATION # 4815

CROSS SECTION - SITE 4
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	17 of 22
DATE	JUNE 2011

SEAL

KEITH A. KNIGHT P.E. # 58084 — DATE

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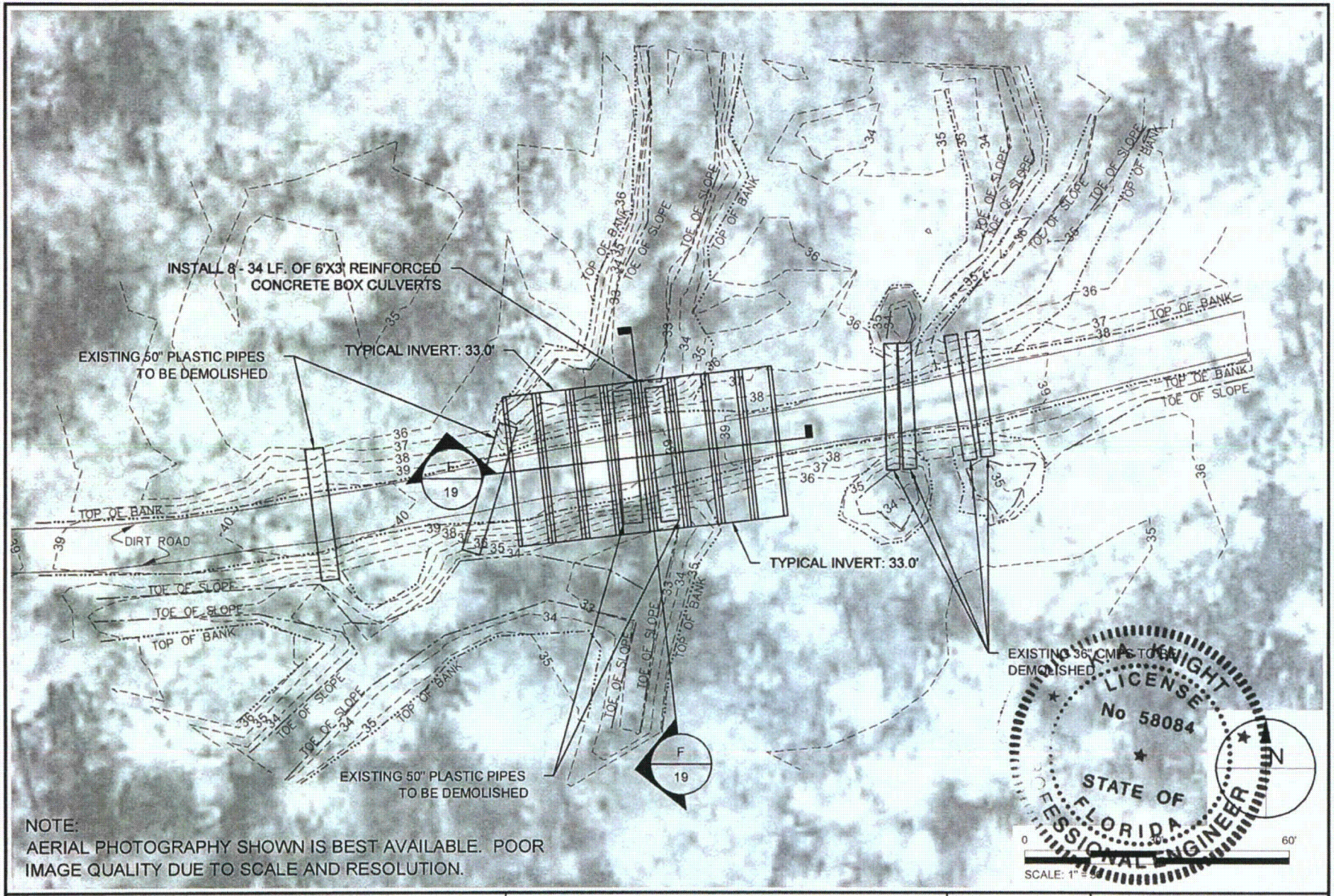

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JACKSONVILLE, FL 32256
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GRADING PLAN - SITE 5
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	18 of 22
DATE	JUNE 2011

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KEITH A. KNIGHT P.E. # 58084 — DATE 9-20-11

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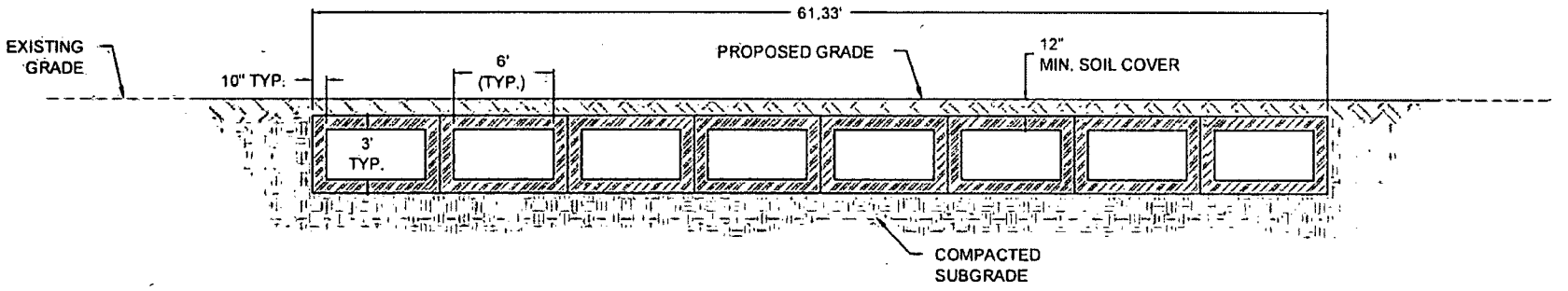
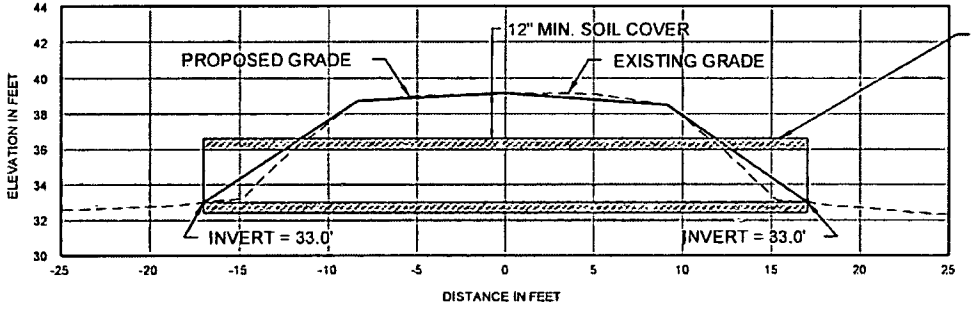


E SITE 5 CULVERT - DETAIL
6'X3' CONCRETE BOX CULVERTS

SCALE: 1" = 10'

0 10'



F SITE 5 CULVERT - CROSS SECTION

SCALE: 1" = 10'

0 10'

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CERTIFICATE OF AUTHORIZATION # 4815

CROSS SECTION & DETAIL - SITE 5
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	19 of 22
DATE	JUNE 2011

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KEITH A. KNIGHT P.E. # 58084 DATE

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EROSION CONTROL AND GENERAL VEGETATION NOTES:

1. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN EROSION CONTROL MEASURES AS NECESSARY TO COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND COMPLY WITH STATE WATER QUALITY CRITERIA FOR STORMWATER DISCHARGE. EROSION CONTROL MEASURES INCLUDE BUT ARE NOT LIMITED TO TURBIDITY SCREENS, MULCHING, HAY BALES, AND SILT FENCE. IF A WATER QUALITY VIOLATION OCCURS, THE CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR ALL DAMAGE AND ALL COSTS WHICH MAY RESULT INCLUDING LEGAL FEES, CONSTRUCTION COSTS, AND FINES.

2. DISTURBED AREAS SHALL BE VEGETATED, FERTILIZED, MULCHED, AND MAINTAINED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND CITY, COUNTY, STATE, AND FEDERAL REQUIREMENTS.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING PERMANENT VEGETATION AT ALL DISTURBED AREAS PER NPDES FINAL STABILIZATION REQUIREMENTS.

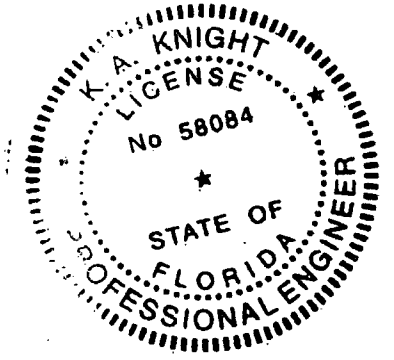
4. EROSION CONTROL MEASURES SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THE PROJECT OR UNTIL PERMANENT VEGETATION IS ESTABLISHED.

5. EROSION CONTROL MEASURES SHALL BE PLACED TO CONTAIN ALL POINTS OF DISCHARGE TO SURFACE WATERS OR WETLANDS INCLUDING CURB INLETS, DITCH BOTTOM INLETS, DITCHES, AND DOWNSTREAM PORTIONS OF NATURAL DRAINAGE PATHWAYS, STREAMS, CANALS, AND TIDAL WATERS ADJACENT TO CONSTRUCTION.

6. 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR WILL SUBMIT A "NOTICE OF INTENT" TO THE EPA IN ACCORDANCE WITH NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM RULES AND REGULATIONS.

7. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.

8. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.



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EROSION CONTROL NOTES
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS
SHEET	20 of 22
DATE	JUNE 2011

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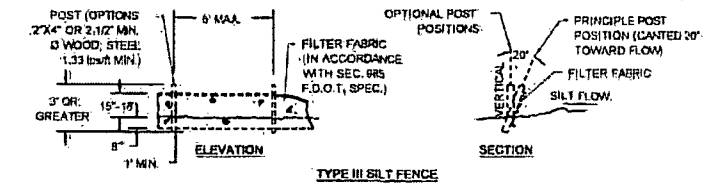
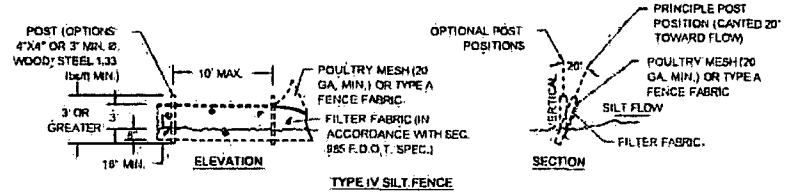
9-2011
KEITH A. KNIGHT P.E. # 58084 DATE

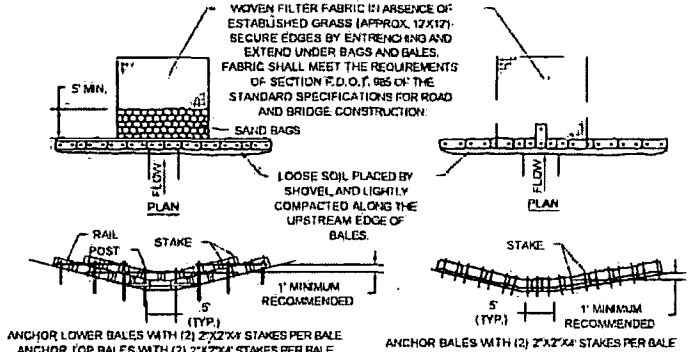
PRELIMINARY DRAWINGS: THESE DRAWINGS ARE NOT IN FINAL FORM, BUT ARE BEING TRANSMITTED FOR AGENCY REVIEW.



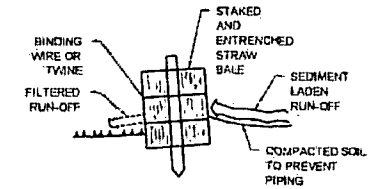
TYPE III SILT FENCE



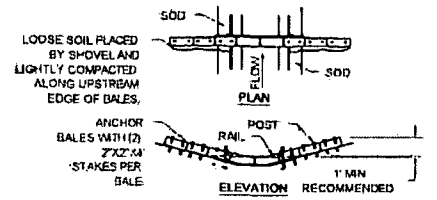
TYPE IV SILT FENCE



TYPICAL STRAW BALE DETAIL

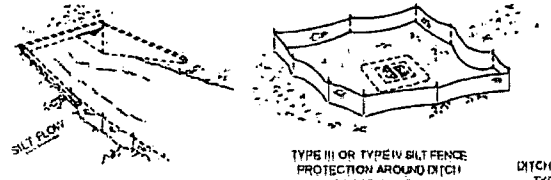


CROSS SECTION OF A PROPERLY INSTALLED STRAW BALE



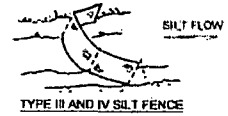
SPACING, BALE BARRIERS FOR PAVED DITCHES SHOULD BE SPACED IN ACCORDANCE WITH CHART 1, SHEET 1 OF 3, INDEX NO. 102 OF THE F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS.

STRAW BALE BARRIER FOR PAVED DITCH



TYPE III OR TYPE IV SILT FENCE PROTECTION AROUND DITCH BOTTOM INLETS.

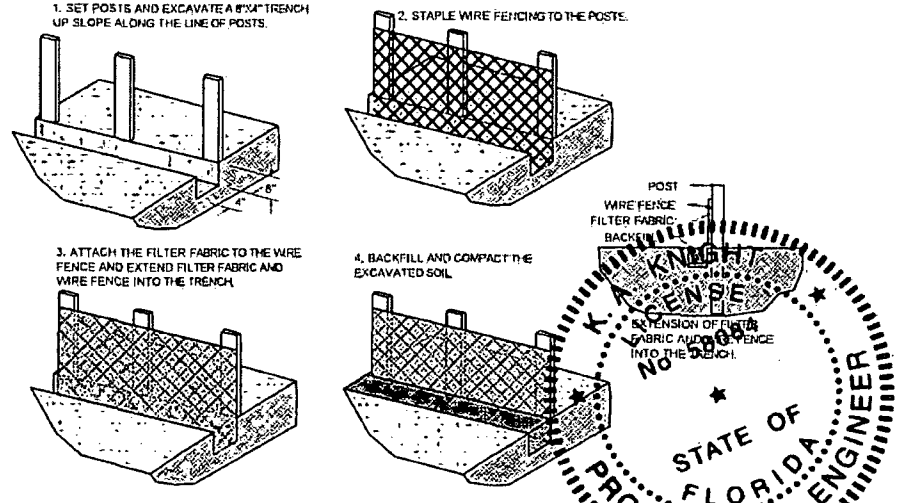
TYPE III OR TYPE IV SILT FENCE



TYPE III AND IV SILT FENCE

DITCH INSTALLATION AND SPACING FOR TYPE III & TYPE IV FENCE TO BE IN ACCORDANCE WITH SHEET 1 OF 3, OF THE F.D.O.T. INDEX NO. 102

DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.



SILT FENCE INSTALLATION DETAILS

K. A. KNIGHT LICENSE No. 59084 STATE OF FLORIDA PROFESSIONAL ENGINEER

TAYLOR ENGINEERING INC.
10151 DEERWOOD PARK BLVD.
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CERTIFICATE OF AUTHORIZATION # 4815

EROSION CONTROL DETAILS
PROGRESS ENERGY MITIGATION PROJECT
GOETHE STATE FOREST PARCEL
LEVY COUNTY, FLORIDA

PROJECT	C2011-025
DRAWN BY	RLJ/CAS.
SHEET	21 of 22
DATE	JUNE 2011

SEAL

KA Knight 9-20-11
KEITH A. KNIGHT P.E.# 59084 DATE

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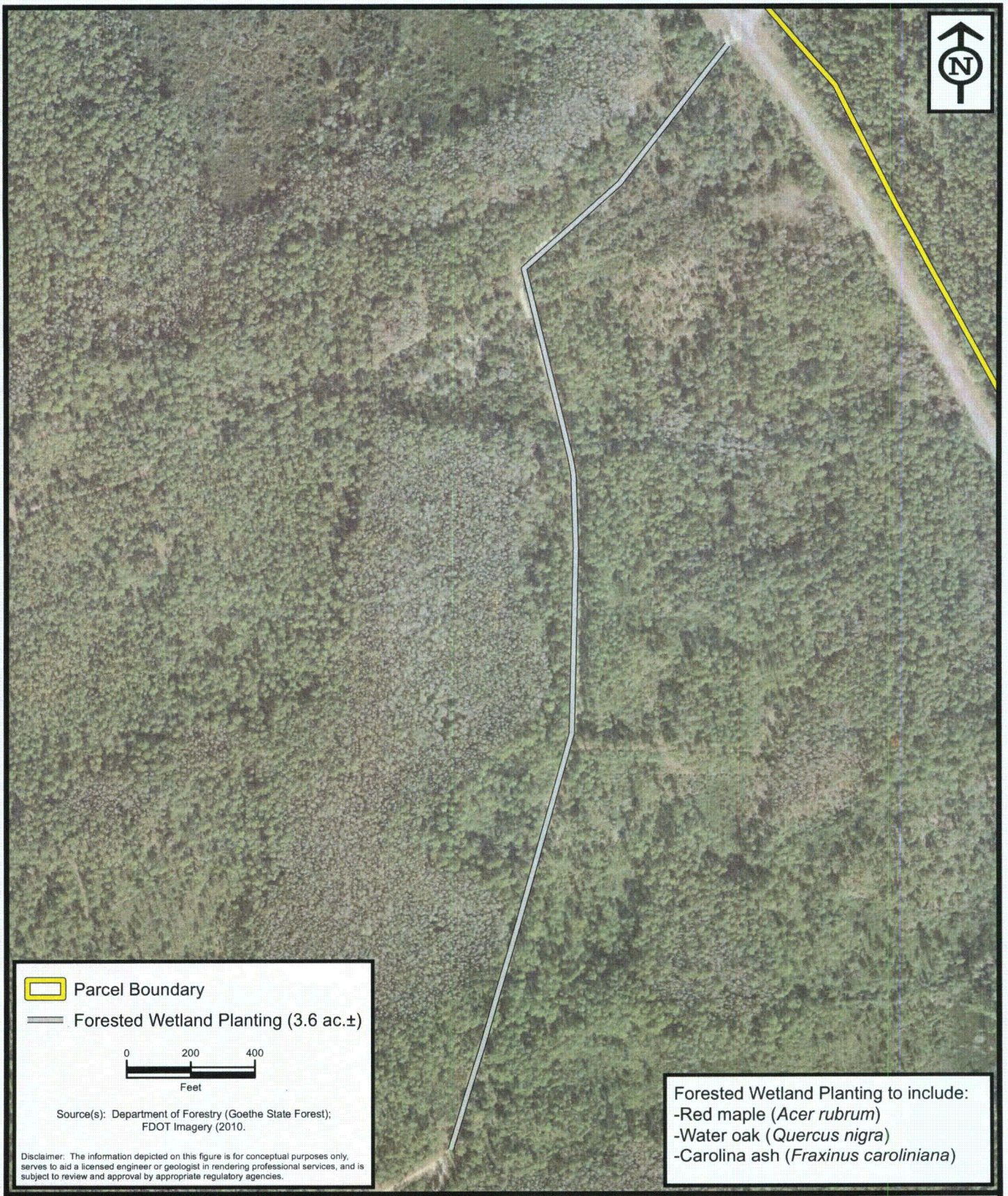

ENVIRONMENTAL SERVICES, INC.
7220 Financial Way, Suite 100
Jacksonville, Florida 32256
(904) 470-2200
(904) 470-2112 Fax
www.environmentalservicesinc.com

Proposed Planting Plan

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.00
Date:	July 2011
Drwn/Chkd:	JGB/JRN
Sheet:	22 of 22

Path: Q:_Projects\EJ\2011\021\00\fig\Daniels\Report\Planting.mxd Date: 7/15/2011 9:50:23 AM