LEVY NUCLEAR PLANT AND ASSOCIATED TRANSMISSION LINES
WETLAND MITIGATION PLAN

COMPREHENSIVE DESIGN DOCUMENT

LEVY COUNTY, FLORIDA

October 2014

FOR

Duke Energy Florida, Inc.
299 First Avenue N.
St. Petersburg, Florida 33733

REPORT BY

Environmental Services, Inc.
7220 Financial Way, Suite 100
Jacksonville, Florida 32256

and

Taylor Engineering, Inc.
10151 Deerwood Park Boulevard
Building 300, Suite 300
Jacksonville, Florida 32256

EXECUTIVE SUMMARY

Duke Energy Florida (DEF), 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. DEF 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, DEF 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. The detailed mitigation plan and refinement of the watershed approach presented in the April plan was submitted to ACOE in September 2011. This plan is the refinement of the September 2011 plan in response to comments received from ACOE and changes in the availability of some of the proposed mitigation sites.

Due to the location and substantial size and reach of the project, wetland impacts occur within several drainage basins. DEF 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 2010 and September 2011 plans.

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.

DEF is an electric utility that is regulated by the Florida Public Service Commission (PSC). All costs associated with required mitigation, including for construction and perpetual management, are included within DEF's base rate and passed along to all of DEF's consumers. By virtue of the fact that DEF is regulated by the PSC, the Army Corps of Engineers has a high confidence level that funds will be available and used for mitigation projects as required by the CWA §404 permit. Florida's Department of Environmental Protection and water management districts acknowledge the confidence provided by PSC regulation of electric utilities and such entities are expressly exempted at the state level from the need to provide financial assurances specific to mitigation projects. *Environmental Resource Permit Applicant's Handbook Volume I (General and Environmental), effective October 1, 2013, section 10.3.7.1(c).*

Regardless, DEF has agreed to provide financial assurance for the long-term maintenance and operation of the proposed mitigation. For the construction and implementation costs, DEF has fully budgeted for the mitigation costs within the project cost projections and therefore there is no need for separate construction financial assurances.

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 DEF 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 (Tables 1A and 1B). Development will impact 105.3 acres of herbaceous wetlands (loss of 26.6 UMAM units) and 805.5 acres of forested wetlands by both direct and indirect impacts for ACOE (loss of 258.0 UMAM units) and 97.5 acres of herbaceous wetlands (loss of 39.7 UMAM units) and 795.4 acres of forested wetlands by both direct and indirect impacts for FDEP (loss of 262.6 UMAM units).

Table 1A. Summary of Wetland Impacts for Levy Nuclear Plant Development (ACOE)

Watershed	Direct Forested Impacts Functional Loss	Direct Forested Impacts Acreage	Direct Herbaceous Impacts Functional Loss	Direct Herbaceous Impacts Acreage	Indirect Forested Impacts Functional Loss	Indirect Forested Impacts Acreage	Indirect Herbaceous Impacts Functional Loss	Indirect Herbaceous Impacts Acreage	Total Forested Functional Loss	Total Forested Acreage	Total Herbaceous Functional Loss	Total Herbaceous Acreage
Waccasassa	184.2	443.1	0.7	1.9	4.0	81.8	0.02	0.5	188.2	524.9	0.7	2.4
Withlacoochee*	39.7	149.8	2.9	4.0	0.9	26.6	1.0	13.8	40.6	176.4	3.9	17.7
Hillsborough River	0.1	0.1	12.2	16.8	0.7	14.2	3.2	42.7	0.8	14.3	15.4	59.5
Upper Coastal *	27.7	64.6	1.9	4.0	0.4	18.4	0.1	2.3	28.1	83.0	2.0	6.3
Tampa Bay	0.02	0.2	3.7	5.5	0.3	6.7	0.9	13.8	0.3	6.9	4.6	19.3
Total	**251.7**	**657.8**	**21.4**	**32.2**	**6.3**	**147.8**	**5.2**	**73.1**	**258.0**	**805.5**	**26.6**	**105.3**

*There are 2.1 acres of impact to open water in the Withlacoochee Watershed and 1 acre of impact to open water in the Upper Coastal Watershed that do not require mitigation.

Table 1B. Summary of Wetland Impacts for Levy Nuclear Plant Development (FDEP)

Watershed	Direct Forested Impacts Functional Loss	Direct Forested Impacts Acreage	Direct Herbaceous Impacts Functional Loss	Direct Herbaceous Impacts Acreage	Indirect Forested Impacts Functional Loss	Indirect Forested Impacts Acreage	Indirect Herbaceous Impacts Functional Loss	Indirect Herbaceous Impacts Acreage	Total Forested Functional Loss	Total Forested Acreage	Total Herbaceous Functional Loss	Total Herbaceous Acreage
Waccasassa	184.7	446.0	1.2	3.1	4.0	81.8	0.02	0.5	188.7	527.8	1.2	3.6
Withlacoochee*	41.6	157.4	10.2	15.4	0.6	15.9	0.5	7.3	42.2	173.3	10.7	22.6
Hillsborough River	0.1	0.1	15.7	22.4	0.9	11.0	1.5	22.2	0.9	11.1	17.3	44.6
Upper Coastal*	30.0	69.9	3.6	7.1	0.4	6.9	0.1	2.1	29.9	76.8	3.7	9.2
Tampa Bay	0.4	0.5	6.3	9.4	0.5	6.0	0.5	8.0	0.8	6.5	6.8	17.4
Total	**256.2**	**673.8**	**37.0**	**57.3**	**6.3**	**121.6**	**2.7**	**40.1**	**262.6**	**795.4**	**39.7**	**97.5**

*There are 2.1 acres of impact to open water in the Withlacoochee Watershed and 1 acre of impact to open water in the Upper Coastal Watershed that do not require mitigation.

In response to the impacts defined above, DEF evaluated numerous mitigation sites and eventually identified six potential sites. Detailed mitigation plans were developed for the six different mitigation sites and presented in the September 2011. 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 Withlacoochee 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. The September 2011 plan still incorporated some of these activities, but eliminated the ditch filling/blocks and pine thinning. The September 2011 plan also increased the number of LWC's and culvert replacements. Some of the LWC's were 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. The September 2011 plan retained most of the same activities, but reduced the number of raised road beds and culverts and proposed the installation of additional LWC's to achieve the hydrologic enhancement. The BHR site 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. The September 2011 plan proposed a few different enhancement areas than the April 2010 plan, but still had the same basic approach. For the FMC site, the September 2011 plan essentially utilized the same plan, with very few changes. The HT site under the April 2010 plan initially called for hydrologic improvements, wetland enhancement via supplemental planting and timber management activities. The September 2011 plan eliminated most of the supplemental plantings and timber management activities and now includes 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, the September 2011 plan 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. The September 2011 plan proposed the installation of an additional low water crossing in order to restore a historic flow path that was identified through historic aerial photographs.

The revised mitigation plan presented herein includes four of the six sites in the September 2011 plan which are the GSF, LNP, HT and BCP sites. The BHR and FMC sites are no longer available to provide mitigation for this project and have been deleted from the proposed

mitigation plan. In an effort to replace the mitigation provided by these sites UMAM mitigation bank credits have been purchased from the Green Swamp Mitigation Bank, the Withlacoochee Mitigation Bank and the Hillsborough River Mitigation Bank. The other revisions proposed to the September 2011 plan present in this plan includes the removal of the trail road restoration and one low water crossing filled road section, the refinement of the existing site conditions map to better identify the connected wetlands on the site and the addition of another road re-grading at the GSF site. At the LNP site the proposed mitigation activity areas are the same as the September 2011 plan but the proposed activities include wetland creation in place of upland preservation and the UMAM scoring of the proposed mitigation has been adjusted for the areas that are indirectly impacted by the proposed development activities. On the HT site one of the proposed low water crossings has been changed to culvert replacement and improvements at the request of the FFS. An increase in the recreational use of this crossing necessitates that this area remains dry year round. The activities proposed on the BCP site are the same as those presented in the September 2011 plan.

Table 2 provides a summary of the current mitigation plan's 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. Overall the mitigation plan produces more mitigation value than is necessary to offset the proposed impacts for the project. From the watershed approved the mitigation plan generates more than is necessary for each basin except for the Hillsborough Basin. The Hillsborough River Mitigation Bank will offset a portion of the impacts associated with the Hillsborough River Watershed with the remaining Functional Loss Units will be offset with some of the additional Functional Gain Units generated in Withlacoochee Basin on the LNP site or in the Upper Coastal Basin on the Homosassa Tract. Also during final design additional mitigation credits could be purchase from an appropriate mitigation bank if they become available to offset the secondary impacts in the Hillsborough River 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	+68.7	+9.3	+78.0
LNP Site	Waccasassa	wetland enhancement and preservation	+65.2	+228.4	+2.6	+296.2
LNP Site	Withlacoochee	wetland enhancement and preservation	+9.4	+40.8	0.0	+50.2
Green Swamp Mitigation Bank	Withlacoochee	UMAM bank credits	0.0	+9.2	0.0	+9.2
Withlacoochee Mitigation Bank	Withlacoochee	UMAM bank credits	0.0	+9.8	0.0	+9.8
Hillsborough River Mitigation Bank	Hillsborough	UMAM bank credits	0.0	+15.9	0.0	+15.9
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			**+81.3**	**+436.4**	**+11.9**	**+529.6**

Table 3. Summary of Wetland Impacts and Mitigation by Watersheds for Levy Nuclear Plant Development

Watershed	Impacts				Mitigation		Upland
	ACOE Herbaceous Wetland Functional Loss Units	ACOE Forested Wetland Functional Loss Units	FDEP Herbaceous Wetland Functional Loss Units	FDEP Forested Wetland Functional Loss Units	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Functional Gain Units
Waccasassa	-0.7	-188.2	-1.2	-188.7	+65.2	+297.1	+11.9
Withlacoochee	-3.9	-40.6	-10.7	-42.2	+9.4	+59.8	0.0
Hillsborough	-15.4	-0.8	-17.3	-0.9	+0.0	+15.9	0.0
Upper Coastal	-2.0	-28.1	-3.7	-29.9	+3.5	+52.1	0.0
Tampa Bay	-4.6	-0.3	-6.8	-0.8	+3.2	+11.5	0.0
Total	**-26.6**	**-258.0**	**-39.7**	**-262.6**	**+81.3**	**+436.4**	**+11.9**

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 flow pattern in approximately 1,084 acres of wetlands which 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 DEF-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 three mitigation banks include the Green Swamp Mitigation Bank, the Withlacoochee Mitigation Bank and the Hillsborough River Mitigation Bank. The Green Swamp Mitigation Bank (GSMB) is a 632 +/- acre property located in the north-central portion of Polk County, Florida. The GSMB is located approximately 2.42 miles east of U.S. Highway 33, 4.15 miles north of Deen Still Road and north of Van Fleet Drive. The GSMB is connected to the Withlacoochee River System via the Smokey Sutton Canal. The Green Swamp ecosystem is identified as an Outstanding Florida Water (OFW) and is a critical headwater tributary to four major rivers: the Ocklawaha River, Withlacoochee River, Hillsborough River, and the Peace River. The Withlacoochee Mitigation Bank (WWMB) is a 734.5 acre property located northeast of Polk City in Polk County, Florida. More specifically, the WWMB is located north of Fussell Road at the intersection of Stagecoach Road. Historically, the property was used for agricultural purposes and impacted the forested wetlands and pine flatwoods through the practices of sod production and cattle farming. The goals of the WWMB are to restore the historically forested and herbaceous wetlands and to restore upland areas to pine flatwoods. The Hillsborough River Mitigation Bank (HRMB) is a ± 1,109-acre property located 1 mile west of I-75, south of State road 52. The HRMB has a large presence of exotic/invasive plant species which has greatly impacted the overall ecological function of the property. Some of the main goals of the HRMB are to eradicate these plant species, implement a prescribed fire management plan, and restore historic water flow through the floodplain.

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. DEF 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 DEF 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 DEF wetland mitigation plan compensates for wetland losses within the basin of the impacts through the use of four strategically located mitigation sites and the three permitted wetland mitigation 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, DEF customers and the public will benefit from clean energy and the restoration of thousands of acres of regionally significant habitat across five watershed basins.

1.0 INTRODUCTION

1.1 Project Summary

Duke Energy Florida (DEF), 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). DEF 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, DEF 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 wetland impacts related to the construction of LNP (Figure 1-2) and associated new powerlines. An April 23, 2010 preliminary Wetland Mitigation Plan was submitted and has been preliminarily reviewed by FDEP. The detailed mitigation plan and refinement of the watershed approach presented in the April plan was submitted to ACOE in September 2011. This plan is the refinement of the September 2011 plan in response to comments received from ACOE and changes in the availability of some of the proposed mitigation sites.

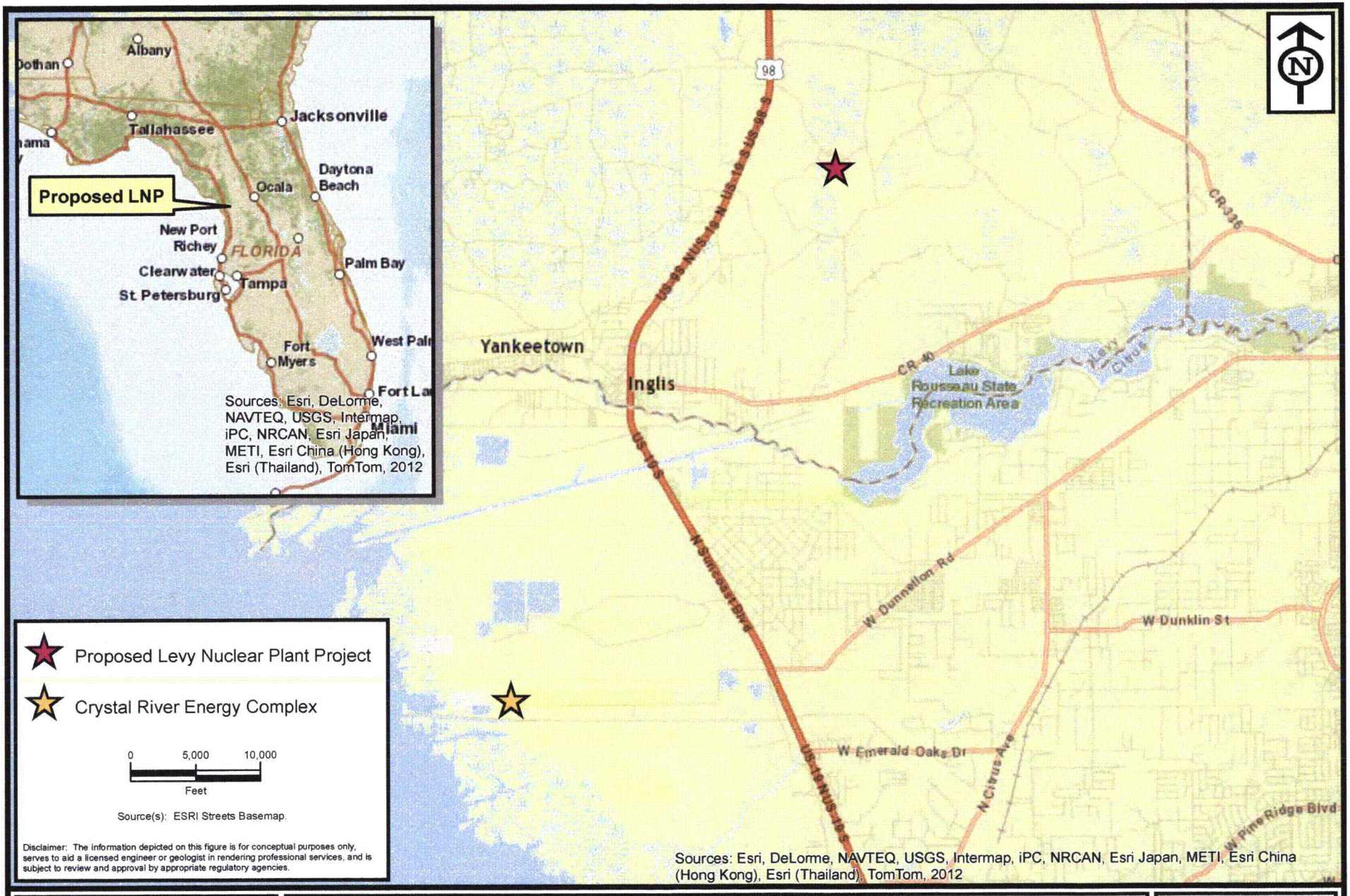
Due to the location and substantial size and reach of the project, wetland impacts occur within several drainage basins. DEF proposes a mitigation plan that compensates wetland losses within the basin (watershed) of the impacts. The impacts occur in five different basins from the development of the power plant and associated transmission lines within the preferred rights-of-way (Figure 1-3). 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 2010 and September 2011 plans.

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.

Wetland impacts for the LNP project have been assessed by UMAM for each basin on the project site (Tables 1-1A and 1-1B). Development will impact 105.3 acres of herbaceous wetlands (loss of 26.6 UMAM units) and 805.5 acres of forested wetlands by both direct and indirect impacts for ACOE (loss of 258.0 UMAM units) and 97.5 acres of herbaceous wetlands (loss of 39.7 UMAM units) and 795.4 acres of forested wetlands by both direct and indirect impacts for FDEP (loss of 262.6 UMAM units).

Indirect impacts for ACOE were determined by establishing an area of effect for each wetland community that is adjacent to the proposed development activities. The width of the area of effect was determined by proposed development activities. For the remaining wetlands adjacent to the plant site, a width of 150 feet was used to determine the indirect effects wetland assessment area (WAA). The WAA for the wetlands adjacent to roads was based on a 100 foot width. The wetlands adjacent to the pipelines and transmission lines had a 75 foot wide WAA. The indirect effects on the wetland functions for each WAA was determined by taking a 10 % loss of the UMAM functional value for each wetland community adjacent to the plant and roads and a 5 % loss of UMAM functional value for the wetlands adjacent to the pipelines and transmission lines.

The WAA for the indirect impacts for FDEP was based on a 100 foot wide area of effect adjacent to the plant and roads and a 30 foot wide area of effect adjacent to the transmission lines tower pads and access roads. The indirect effects on the wetland functions for each FDEP wetland community was determined by taking a 10 % loss of UMAM functional value for each WAA.



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

General Location Map

Proposed Levy Nuclear Plant Project

Levy County, Florida

Project:	EJ11021.03
Date:	June 2014
Drwn/Chkd:	JGB/JRN
Figure:	1-1

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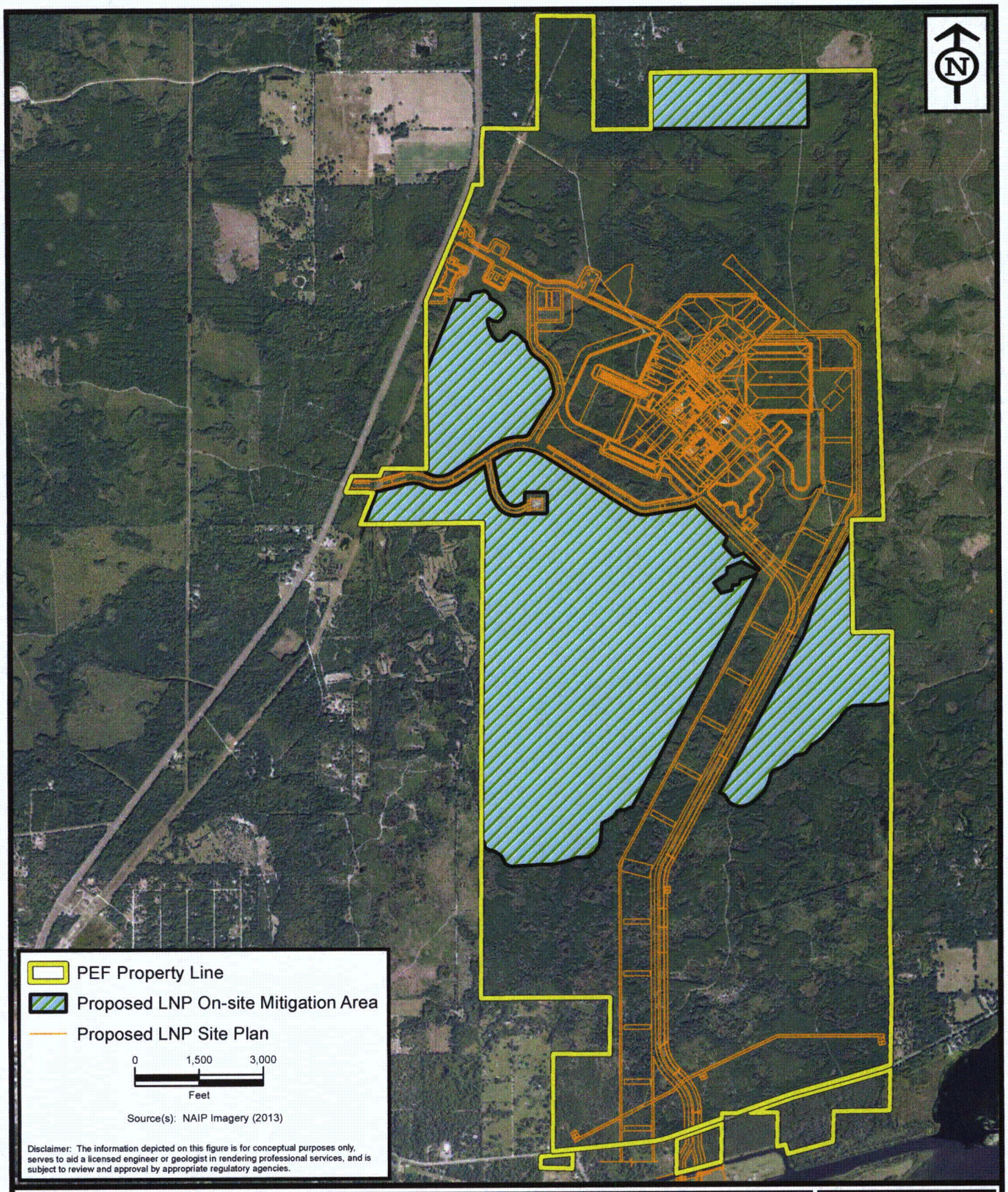

ENVIRONMENTAL SERVICES, INC.
7220 Financial Way, Suite 100
Jacksonville, Florida 32256
(904) 470-2200
(904) 470-2112 Fax
www.environmentalservicesinc.com

Project Site

Proposed Levy Nuclear Plant Project

Levy County, Florida

Project:	EJ11021.03
Date:	Aug 2014
Drwn/Chkd:	JGB/JRN
Figure:	1-2

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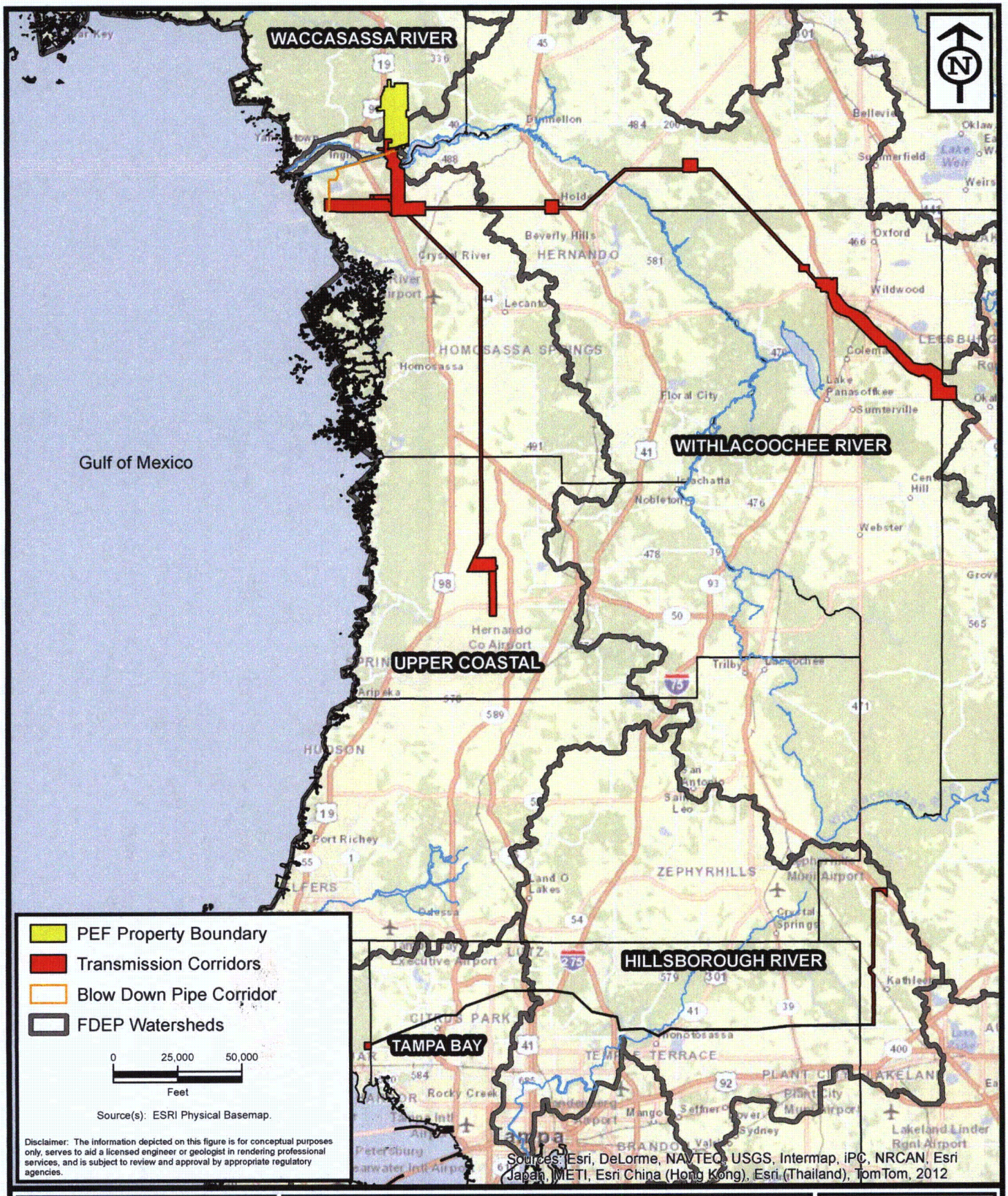

ENVIRONMENTAL SERVICES, INC.
7220 Financial Way, Suite 100
Jacksonville, Florida 32256
(904) 470-2200
(904) 470-2112 Fax
www.environmentalservicesinc.com

LNP Site and Corridors

Proposed Levy Nuclear Plant Project

Florida

Project:	EJ11021.03
Date:	June 2014
Drwn/Chkd:	JGB/JRN
Figure:	1-3

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Table 1-1A. Summary of Wetland Impacts for Levy Nuclear Plant Development (ACOE)

Watershed	Direct Forested Impacts Functional Loss	Direct Forested Impacts Acreage	Direct Herbaceous Impacts Functional Loss	Direct Herbaceous Impacts Acreage	Indirect Forested Impacts Functional Loss	Indirect Forested Impacts Acreage	Indirect Herbaceous Impacts Functional Loss	Indirect Herbaceous Impacts Acreage	Total Forested Functional Loss	Total Forested Acreage	Total Herbaceous Functional Loss	Total Herbaceous Acreage
Waccasassa	184.2	443.1	0.7	1.9	4.0	81.8	0.02	0.5	188.2	524.9	0.7	2.4
Withlacoochee (trans. lines)	39.7	149.8	2.9	4.0	0.9	26.6	1.0	13.8	40.6	176.4	3.9	17.7
Hillsborough River	0.1	0.1	12.2	16.8	0.7	14.2	3.2	42.7	0.8	14.3	15.4	59.5
Upper Coastal	27.7	64.6	1.9	4.0	0.4	18.4	0.1	2.3	28.1	83.0	2.0	6.3
Tampa Bay	0.02	0.2	3.7	5.5	0.3	6.7	0.9	13.8	0.3	6.9	4.6	19.3
Total	**251.7**	**657.8**	**21.4**	**32.2**	**6.3**	**147.8**	**5.2**	**73.1**	**258.0**	**805.5**	**26.6**	**105.3**

*There are 2.1 acres of impact to open water in the Withlacoochee Watershed and 1 acre of impact to open water in the Upper Coastal Watershed that do not require mitigation.

Table 1-1B. Summary of Wetland Impacts for Levy Nuclear Plant Development (FDEP)

Watershed	Direct Forested Impacts Functional Loss	Direct Forested Impacts Acreage	Direct Herbaceous Impacts Functional Loss	Direct Herbaceous Impacts Acreage	Indirect Forested Impacts Functional Loss	Indirect Forested Impacts Acreage	Indirect Herbaceous Impacts Functional Loss	Indirect Herbaceous Impacts Acreage	Total Forested Functional Loss	Total Forested Acreage	Total Herbaceous Functional Loss	Total Herbaceous Acreage
Waccasassa	184.7	446.0	1.2	3.1	4.0	81.8	0.02	0.5	188.7	527.8	1.2	3.6
Withlacoochee (trans. lines)	41.6	157.4	10.2	15.4	0.6	15.9	0.5	7.3	42.2	173.3	10.7	22.6
Hillsborough River	0.1	0.1	15.7	22.4	0.9	11.0	1.5	22.2	0.9	11.1	17.3	44.6
Upper Coastal	30.0	69.9	3.6	7.1	0.4	6.9	0.1	2.1	29.9	76.8	3.7	9.2
Tampa Bay	0.4	0.5	6.3	9.4	0.5	6.0	0.5	8.0	0.8	6.5	6.8	17.4
Total	**256.2**	**673.8**	**37.0**	**57.3**	**6.3**	**121.6**	**2.7**	**40.1**	**262.6**	**795.4**	**39.7**	**97.5**

*There are 2.1 acres of impact to open water in the Withlacoochee Watershed and 1 acre of impact to open water in the Upper Coastal Watershed that do not require mitigation.

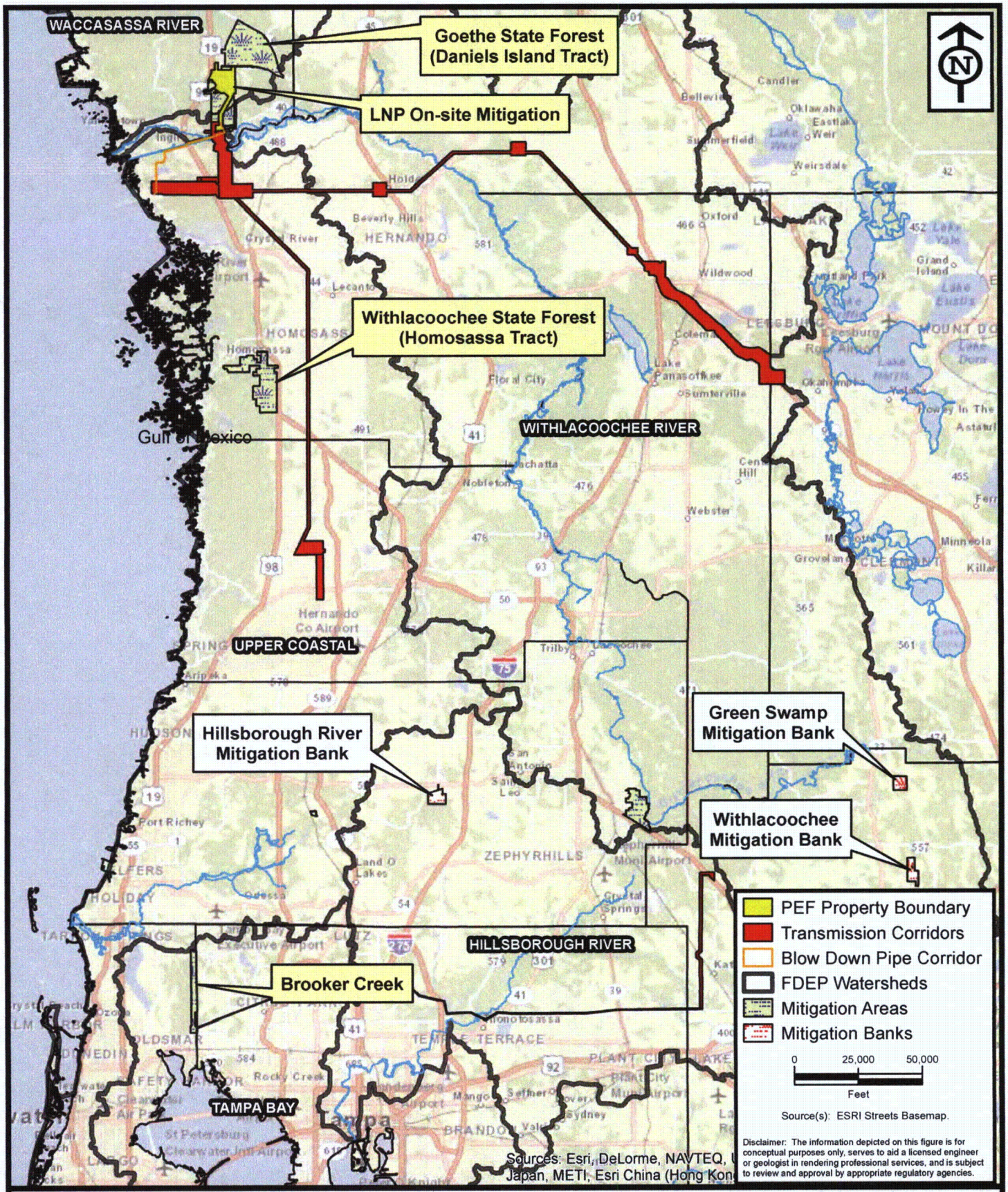
In response to the impacts defined above, DEF evaluated numerous mitigation sites and eventually identified six potential sites. Detailed mitigation plans were developed for the six different mitigation sites and presented in the September 2011. These sites include the following:

- Daniels Island Tract within the Goethe State Forest (GSF) in the Waccasassa watershed;
- LNP site with activities in the Waccasassa and Withlacoochee 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. The September 2011 plan still incorporated some of these activities, but eliminated the ditch filling/blocks and pine thinning. The September 2011 plan also increased the number of LWC's and culvert replacements. Some of the LWC's were 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. The September 2011 plan retained most of the same activities, but reduced the number of raised road beds and culverts and proposed the installation of additional LWC's to achieve the hydrologic enhancement. The BHR site 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. The September 2011 plan proposed a few different enhancement areas than the April 2010 plan, but still had the same basic approach. For the FMC site, the September 2011 plan essentially utilized the same plan, with very few changes. The HT site under the April 2010 plan initially called for hydrologic improvements, wetland enhancement via supplemental planting and timber management activities. The September 2011 plan eliminated most of the supplemental plantings and timber management activities and now includes 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, the September 2011 plan 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. The September 2011 plan proposed the installation of an additional low water crossing in order to restore a historic flow path that was identified through historic aerial photographs.

The revised mitigation plan presented herein includes four of the six sites in the September 2011 plan which are the GSF, LNP, HT and BCP sites. The BHR and FMC sites are no longer available to provide mitigation for this project and have been deleted from the proposed mitigation plan. In an effort to replace the mitigation provided by these sites UMAM mitigation bank credits have been purchased from the Green Swamp Mitigation Bank, the Withlacoochee Mitigation Bank and the Hillsborough River Mitigation Bank. The other revisions proposed to the September 2011 plan present in this plan includes the removal of the trail road restoration and one low water crossing filled road section, the refinement of the existing site conditions map to better identify the connected wetlands on the site and the addition of another road re-grading at the GSF site. At the LNP site the proposed mitigation activity areas are the same as the September 2011 plan but the proposed activities include wetland creation in place of upland preservation and the UMAM scoring of the proposed mitigation has been adjusted for the areas that are indirectly impacted by the proposed development activities. On the HT site one of the proposed low water crossings has been changed to culvert replacement and improvements at the request of the FFS. An increase in the recreational use of this crossing necessitates that this area remains dry year round. The activities proposed on the BCP site are the same as those presented in the September 2011 plan.

Table 1-2 provides a summary of the current mitigation plan's 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. Overall the mitigation plan produces more mitigation value than is necessary to offset the proposed impacts for the project. From the watershed approved the mitigation plan generates more than is necessary for each basin except for the Hillsborough Basin. The Hillsborough River Mitigation Bank will offset a portion of the impacts associated with the Hillsborough River Watershed with the remaining Functional Loss Units will be offset with some of the additional Functional Gain Units generated in Withlacoochee Basin on the LNP site or in the Upper Coastal Basin on the Homosassa Tract. Also during final design additional mitigation credits could be purchase from an appropriate mitigation bank if they become available to offset the secondary impacts in the Hillsborough River Basin. Table 1-3 provides a summary of wetland impacts and mitigation by watersheds for Levy Nuclear Plant development.



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LNP Mitigation Parcels

Proposed Levy Nuclear Plant Project

Florida

Project:	EJ11021.03
Date:	July 2014
Drwn/Chkd:	JRN/GKH
Figure:	1-4

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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	+68.7	+9.3	+78.0
LNP Site	Waccasassa	wetland enhancement and preservation	+65.2	+228.4	+2.6	+296.2
LNP Site	Withlacoochee	wetland enhancement and preservation	+9.4	+40.8	0.0	+50.2
Green Swamp Mitigation Bank	Withlacoochee	UMAM bank credits	0.0	+9.2	0.0	+9.2
Withlacoochee Mitigation Bank	Withlacoochee	UMAM bank credits	0.0	+9.8	0.0	+9.8
Hillsborough River Mitigation Bank	Hillsborough	UMAM bank credits	0.0	+15.9	0.0	+15.9
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			**+81.3**	**+436.4**	**+11.9**	**+529.6**

Table 1-3. Summary of Wetland Impacts and Mitigation by Watersheds for Levy Nuclear Plant Development

Watershed	Impacts				Mitigation		Upland
	ACOE Herbaceous Wetland Functional Loss Units	ACOE Forested Wetland Functional Loss Units	FDEP Herbaceous Wetland Functional Loss Units	FDEP Forested Wetland Functional Loss Units	Herbaceous Wetland Functional Gain Units	Forested Wetland Functional Gain Units	Functional Gain Units
Waccasassa	-0.7	-188.2	-1.2	-188.7	+65.2	+297.1	+11.9
Withlacoochee	-3.9	-40.6	-10.7	-42.2	+9.4	+59.8	0.0
Hillsborough	-15.4	-0.8	-17.3	-0.9	+0.0	+15.9	0.0
Upper Coastal	-2.0	-28.1	-3.7	-29.9	+3.5	+52.1	0.0
Tampa Bay	-4.6	-0.3	-6.8	-0.8	+3.2	+11.5	0.0
Total	**-26.6**	**-258.0**	**-39.7**	**-262.6**	**+81.3**	**+436.4**	**+11.9**

1.2 Listed Species

DEF 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 FWS, literature review, and previous field work completed by DEF. 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, DEF will conduct additional reviews for listed species and if necessary coordinate with FWS on any appropriate permits necessary prior to construction.

1.3 Financial Assurance

DEF is an electric utility that is regulated by the Florida Public Service Commission (PSC). All costs associated with required mitigation, including for construction and perpetual management, are included within DEF's base rate and passed along to all of DEF's consumers. By virtue of the fact that DEF is regulated by the PSC, the Army Corps of Engineers has a high confidence level that funds will be available and used for mitigation projects as required by the CWA §404 permit. Florida's Department of Environmental Protection and water management districts acknowledge the confidence provided by PSC regulation of electric utilities and such entities are expressly exempted at the state level from the need to provide financial assurances specific to mitigation projects. *Environmental Resource Permit Applicant's Handbook Volume I (General and Environmental), effective October 1, 2013, section 10.3.7.1(c).*

Regardless, DEF has agreed to provide financial assurance for the long-term maintenance and operation of the proposed mitigation. For the construction and implementation costs, DEF has fully budgeted for the mitigation costs within the project

cost projections and therefore there is no need for separate construction financial assurances.

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 DEF was not funding and conducting these activities as a part of this wetland mitigation plan.

2.0 WACCASASSA WATERSHED – GOETHE STATE FOREST

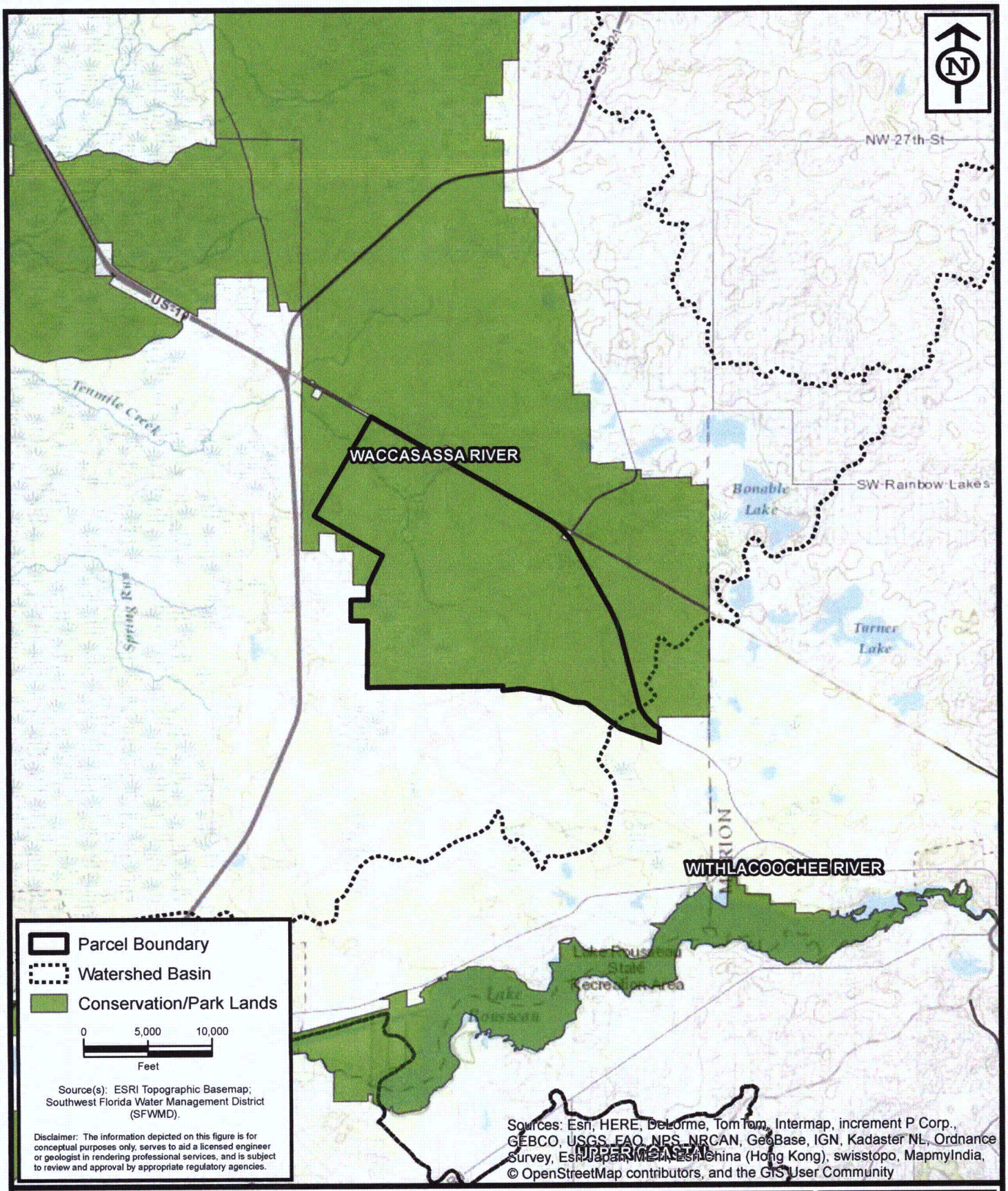
2.1 Introduction

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 flow pattern in approximately 1,084 acres of wetlands which 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 233 acres 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 Development will impact 2.4 acres of herbaceous wetlands (loss of 0.7 UMAM units) and 524.9 acres of forested wetlands by both direct and indirect impacts for ACOE (loss of 188.2 UMAM units) and 3.6 acres of herbaceous wetlands (loss of 1.2 UMAM units) and 527.8 acres of forested wetlands by both direct and indirect impacts for FDEP (loss of 188.7 UMAM units). These impacts will generate a total loss of 189.9 functional units. The impact summary is provided on Table 2-1. 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 and indirect impacts. The proposed mitigation plan will provide for ±374.2 functional units of lift within the Waccasassa Watershed; ±78.0 functional units of lift will be derived from the Goethe site which will offset some of 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:	EJ11021.03
Date:	July 2014
Drwn/Chkd:	JGB/JRN
Figure:	2-1

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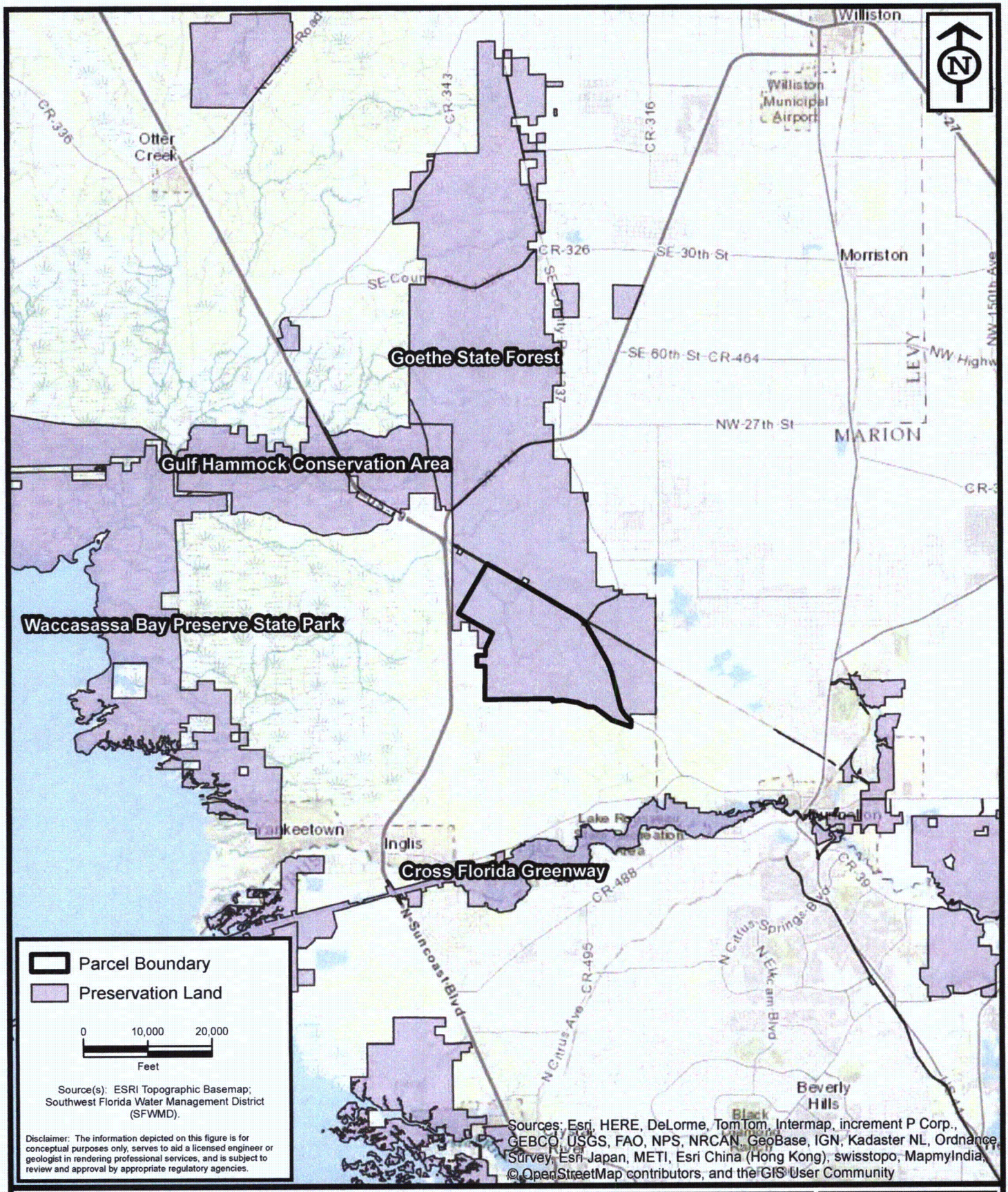

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Regional Preservation Land

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.03
Date:	July 2014
Drwn/Chkd:	JGB/JRN
Figure:	2-2

Path: Q:_Projects\EJ\2011\021\03\fig\Mitigation Update\Goethe\Regional Preservation Land.mxd Date: 8/8/2014 5:25:56 PM

Table 2-1. Waccasassa Watershed Wetland Impacts by UMAM Functional Loss

	ACOE Herbaceous Wetland Functional Loss	ACOE Forested Wetland Functional Loss	ACOE Total Functional Loss	FDEP Herbaceous Wetland Functional Loss	FDEP Forested Wetland Functional Loss	FDEP Total Functional Loss
UMAM Units	-0.7	-188.2	-188.9	-1.2	-188.7	-189.9

2.3 Site Description

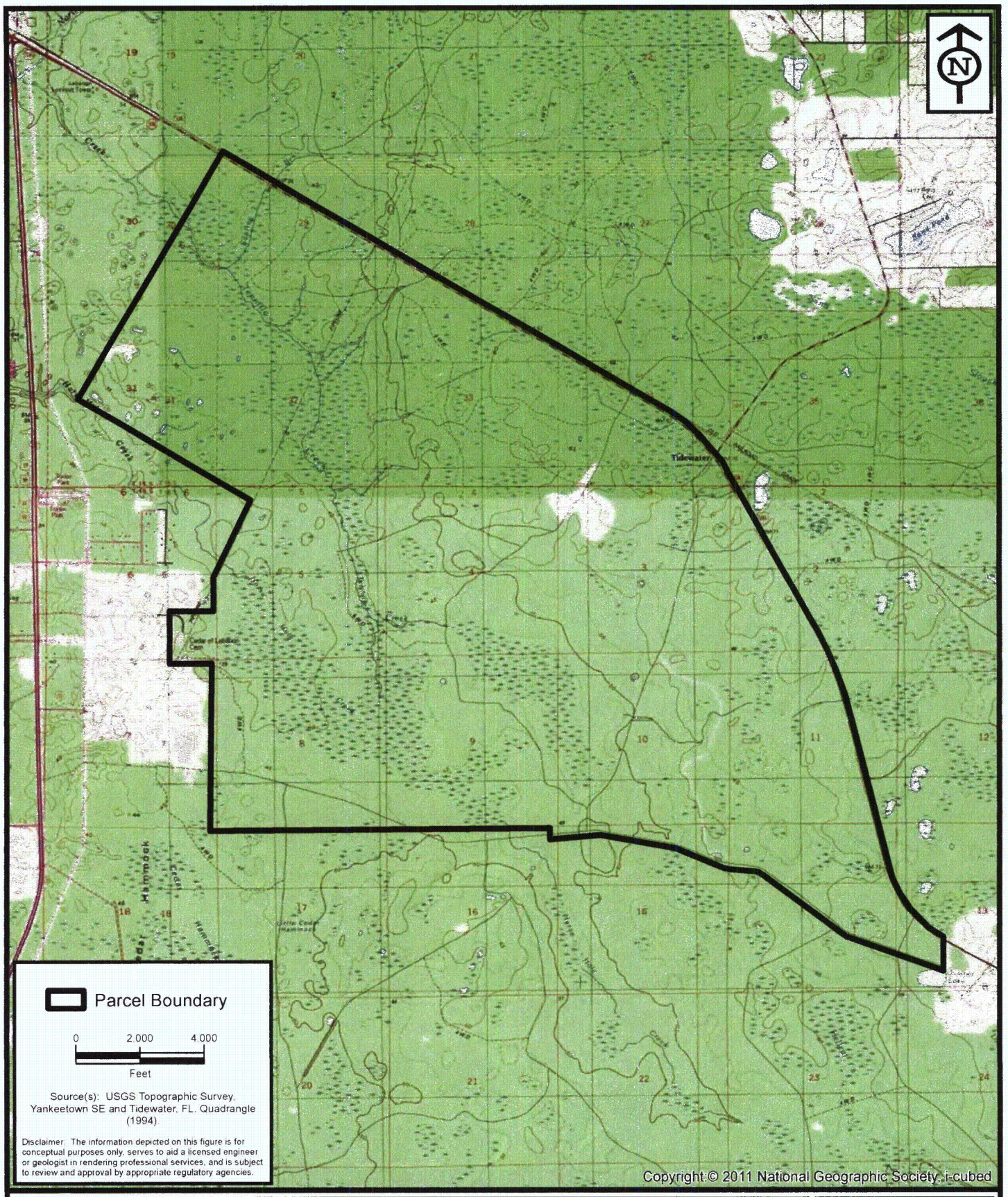
The Goethe site is located in Sections 32, 33, and 34 of Township 15 South, Range 17 East and Sections 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, and 17 in Range 17 East, Section 16 South. It is further located south of CR 336 and east of Gasline Road in Levy County, FL (Figure 2-3). The total area of the Goethe 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

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Figure:	**2-3**

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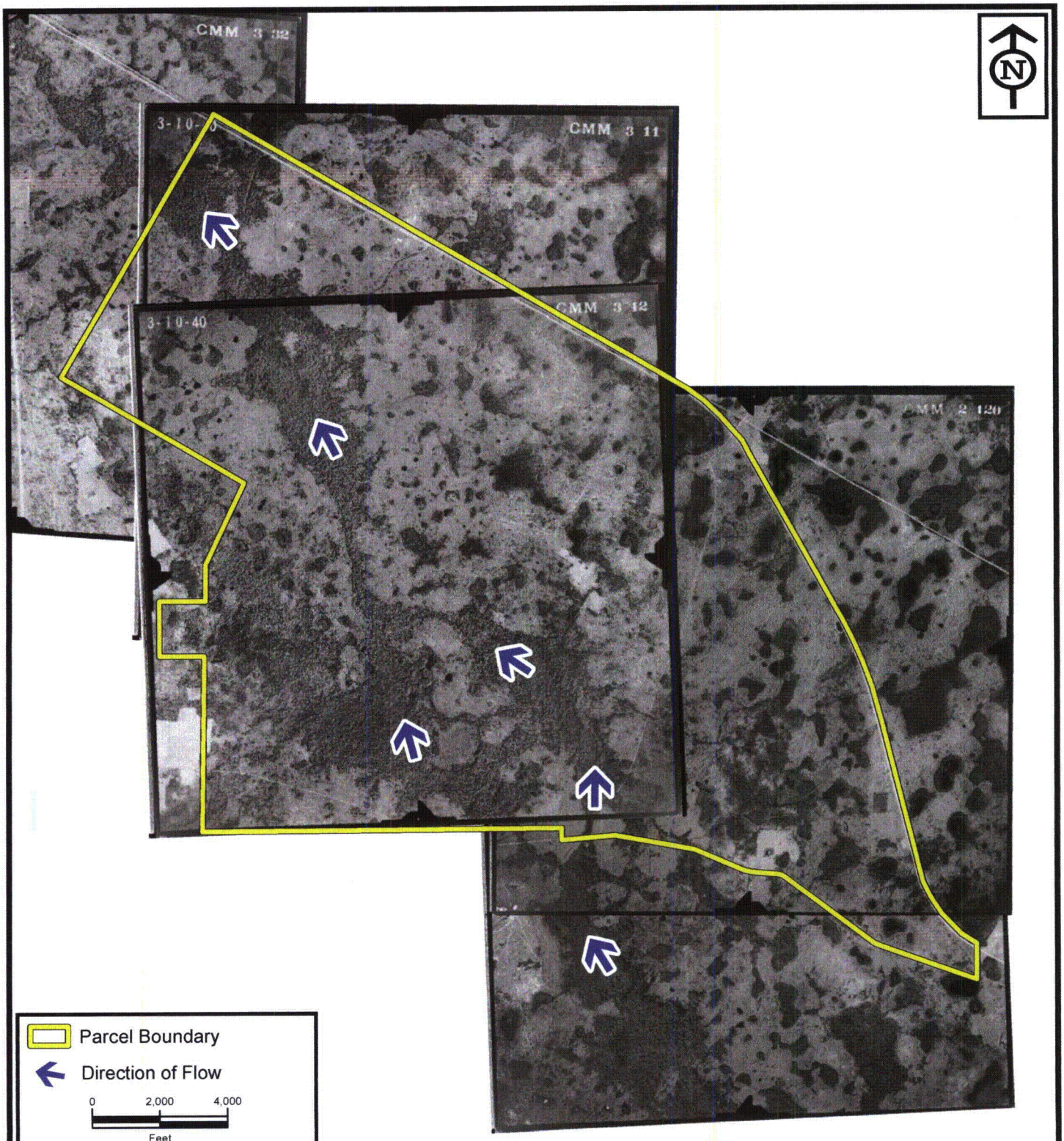

Parcel Boundary

Direction of Flow

0 2,000 4,000

Feet

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

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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1940 Historic Aerial Imagery

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.03
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Figure:	2-4

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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.

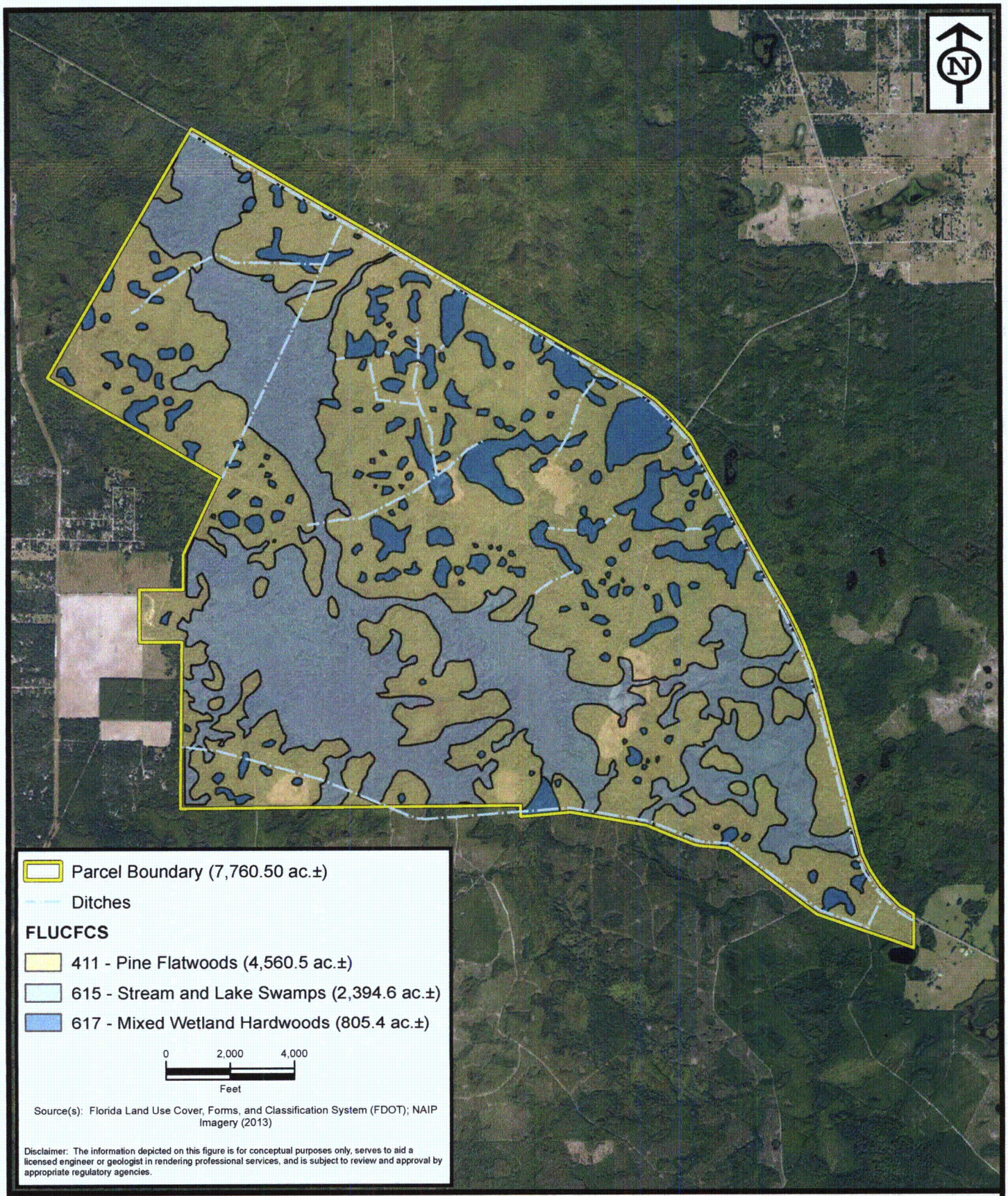
Uplands

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.).



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Mitigation Activity Area - Existing Community Map

Goethe State Forest Parcel

Levy County, Florida

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Date:	Sep. 2014
Drwn/Chkd:	MR/JRN
Figure:	2-5

Path: P:\GIS_Projects\EJ\2011\021\03\fig\Mitigation Update\Goethe\Existing Community.mxd Date: 9/25/2014 2:01:44 PM

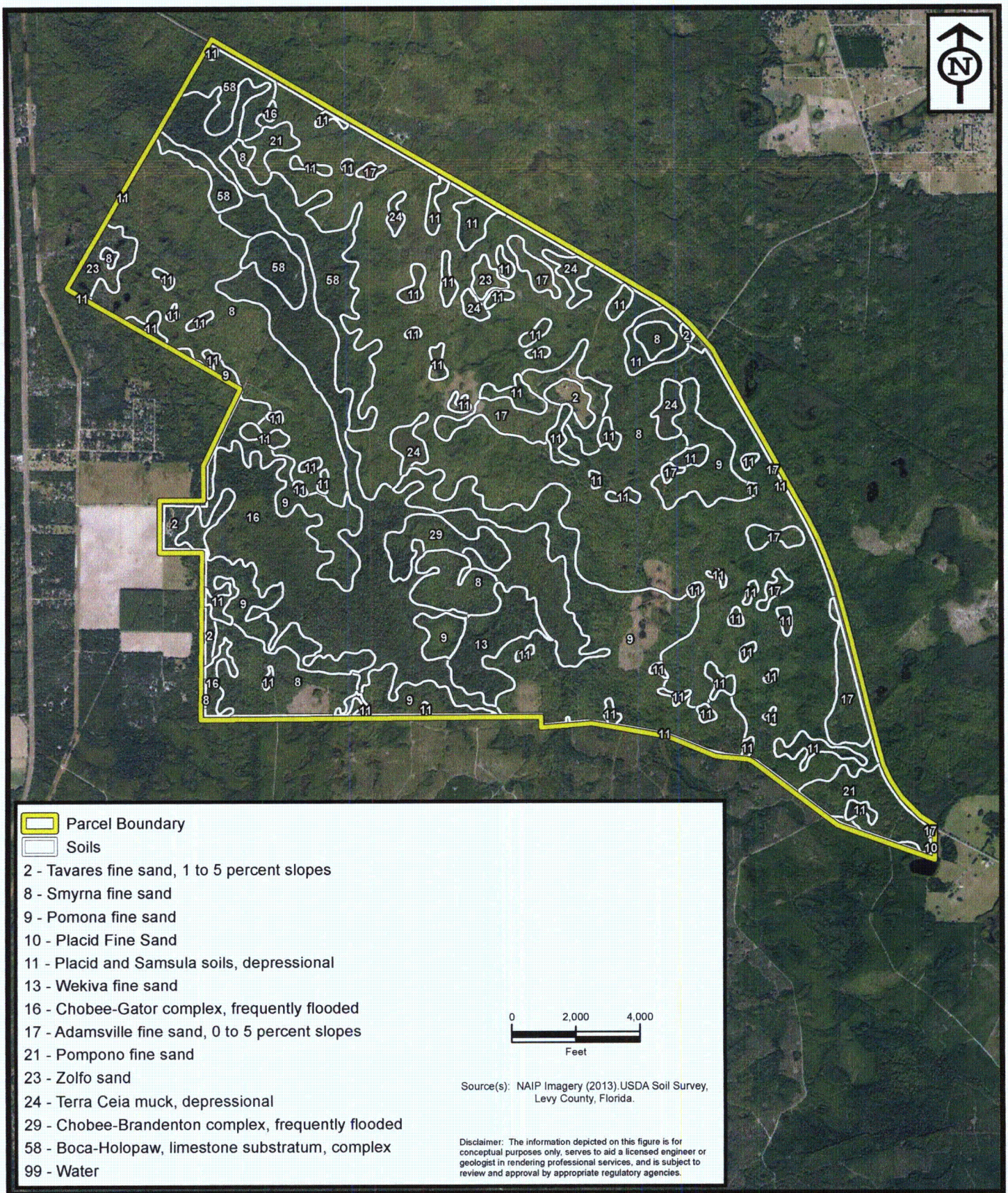
3. Stream and Lake Swamps (FLUCFCS 615). Wetlands associated with Ten Mile Creek, its tributaries, and associated naturalized ditches are dominated by bottomland hardwoods. Dominant species include sweetgum (*Liquidambar styraciflua*), sweetbay, bald cypress, and scattered water oak (*Q. nigra*). Smaller 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



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NRCS Soils

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.03
Date:	July 2014
Drwn/Chkd:	JGB/JRN
Figure:	2-6

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2.4 Mitigation Plan

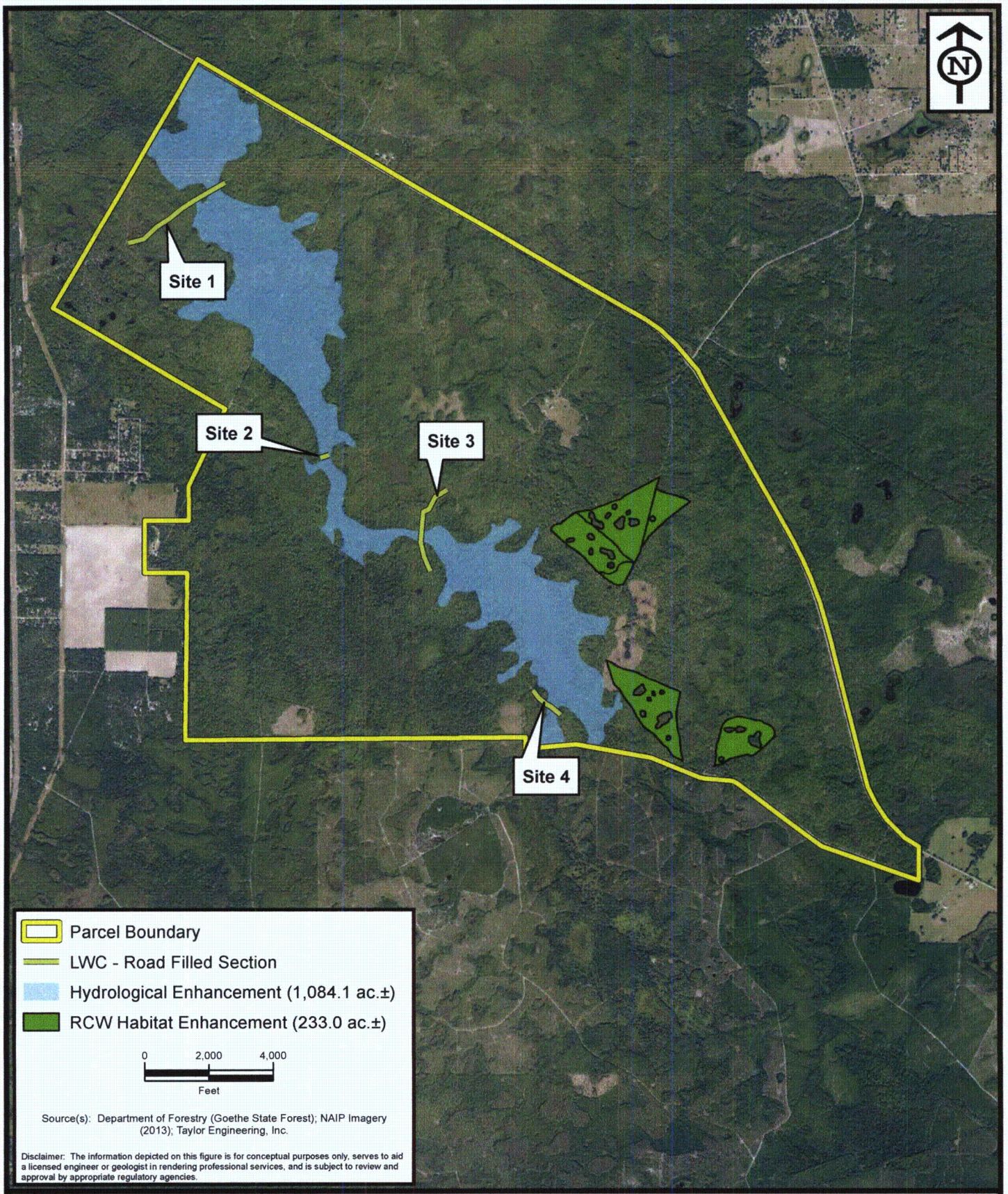
The two major components of the mitigation plan for Goethe are hydrologic restoration of approximately 1,084.1 acres of wetlands and approximately 233.0 acres of RCW habitat restoration (Figure 2-7). Currently, the land is being managed by the FFS for timber, wildlife, recreation, and ecological restoration. 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. Four activities are planned throughout the project area including the addition of a new LWC.

Sites 1 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. By grading the roadside berms down to the elevation of the surrounding wetlands, the natural flow will be restored. Currently, the berms prevent natural sheet flow across the road. Site 2 will consist of removing the existing culverts and installing a larger, stabilized culvert system which will allow for the necessary flow through that area.

The construction for Site 3 will include re-grading the existing road, LWC and roadside berms down to the elevation of the surrounding wetlands. Site 4 will consist of the removal of an existing culvert and the installation of a new LWC. Currently the culverted road is causing overflow of the road during significant storm events. The proposed LWC will be achieved by grading the roadside berms down to the elevation specified within the engineering plans.



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Mitigation Activity Area - Proposed Mitigation Activities

Goethe State Forest Parcel

Levy County, Florida

Project:	EJ11021.03
Date:	Sep. 2014
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Figure:	2-7

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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 included modeling rainfall and runoff to understand the conveyance and flow patterns in the forest. The objective of the modeling was to understand the existing conditions and see if structural improvements – including larger roadway culverts, grading of disturbed terrain, and culvert removal to establish low-water crossings of wetlands – at several sites could improve flow patterns. The hydrologic and hydraulic modeling analysis to demonstrate improved water movement is 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.

Sub-basin 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 sub-basins as shown in Figure 2.8. Notably, sub-basin 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 2.1 provides the calculated drainage area, curve number, and time of concentration for each sub-basin.

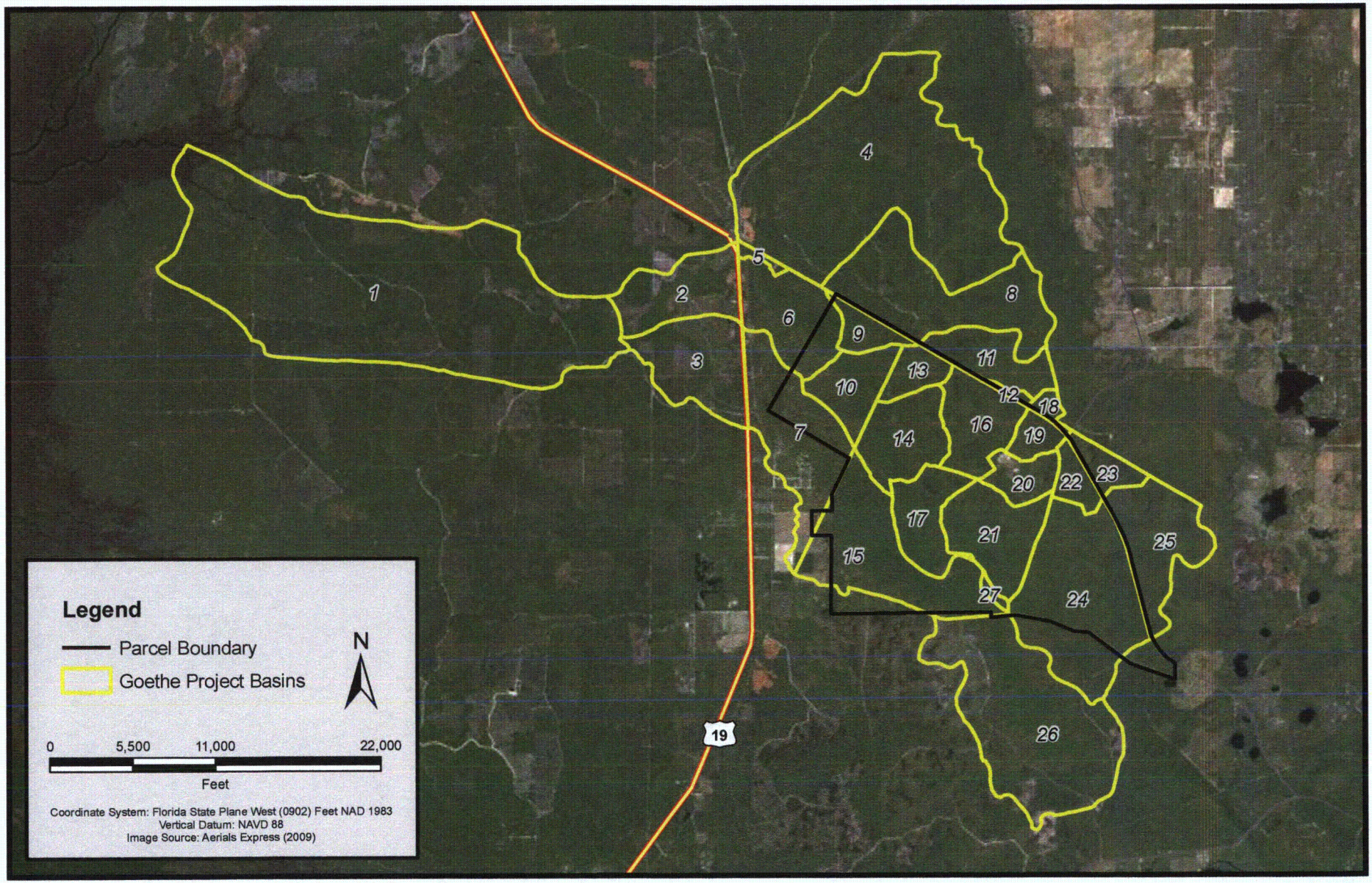

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Figure 2-8 - Goethe Drainage Subbasins
Goethe State Forest Parcel
Levy County, Florida

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

Table 2-3. Goethe ICPR Model Hydrologic Input Parameters

Sub-basin	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 sub-basin'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. GIS 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 sub-basin. It is a function of the sub-basin slope, length, and CN. For each sub-basin, 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.

Sub-basin Interconnectivity

The sub-basins 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 sub-basin, 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 sub-basin topography at one-foot vertical intervals. These relationships allow the ICPR model to simulate the rate at which each sub-basin 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 sub-basin 1). Consistent with FEMA 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.

The second boundary condition was rainfall (volume and temporal distribution) applied at each sub-basin. 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

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 water stage results immediately upstream of 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.

Table 2-5. Pre- and Post-Construction Peak Stages Upstream of Each Mitigation Site

Site	Upstream Basin	Pre-Construction Stage, ft		Post-Construction Stage, ft		Difference, ft	
		2.33YR	25YR	2.33YR	25YR	2.33YR	25YR
1	10	32.66	33.90	32.71	34.43	0.05	0.53
2	17	37.94	39.48	37.24	39.47	-0.70	-0.01
3	21	44.79	46.07	44.58	45.67	-0.21	-0.40
4	27	44.79	46.07	44.58	45.67	-0.21	-0.40

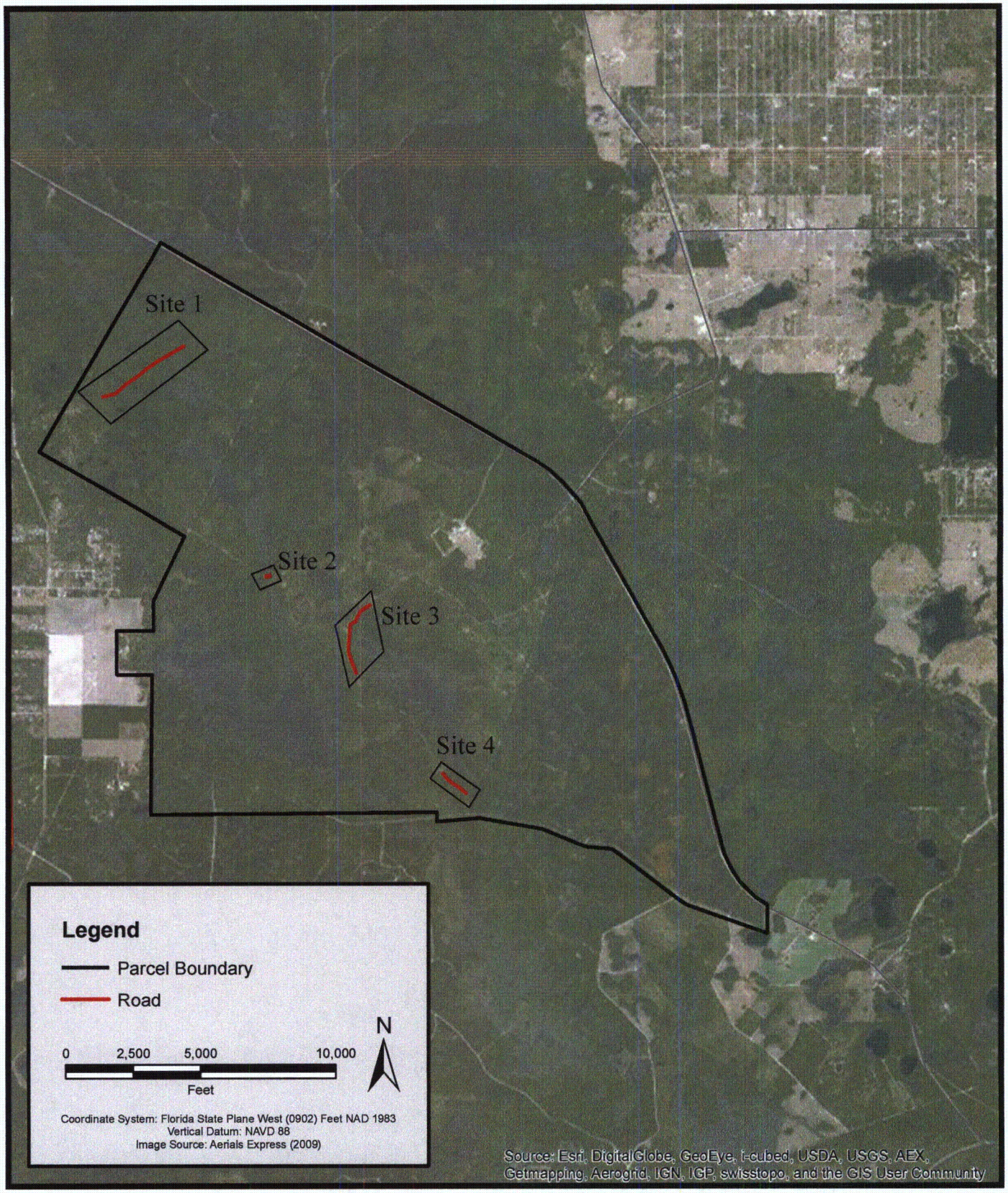

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Figure 2-9 - Progress Energy Mitigation Sites
Goethe State Forest Parcel
Levy County, Florida

PROJECT	C2013-057
FIGURE	2-9
DRAWN BY	JK
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Site 1

Modifications at Site 1 include grading of the terrain along a dirt road. Site 1 lies between sub-basins 10 and 6 and is represented in the model as a channel (in Ten Mile Creek) connecting the basins. 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 0.70 feet along the road to represent removal of the ridges. Comparison of pre- and post-construction model results indicates that the water surface elevation detained in Basin 10, immediately upstream of Site 1, increases by 0.05 feet for the mean annual event (2.33-yr storm) and by 0.53 feet during the 25-year storm.

The post construction water surface elevation in Basin 10 is influenced by the water that is staged in the downstream basins, Basins 6 and 7. While this tail water condition causes the water to rise in Basin 10, lowering the grade of the road at Site 1 allows for easier flow among these basins.

Site 2

Site 2 lies along the boundary of sub-basins 17 and 14. Currently, eight pipes (four 50" plastic and four 36" corrugated metal) pass through the dirt road at Site 2. No erosion control is apparent and it is understood that the existing pipes repetitively wash out and become dislodged. The road failure results in stream turbidity and sedimentation. Given that this system is not properly stabilized, nor is there enough cover over the pipes to distribute the truck loads, the pipes have repetitively required maintenance or replacement. In their present condition, the pipes are likely not operating at full capacity. The existing condition is simulated in the ICPR model as eight pipes: four plastic and four CMP. A weir is used to simulate the flow that could overtop the road.

The proposed modification at Site 2 entails replacement of the existing pipes with eight 36-inch, round, reinforced concrete pipes. Properly stabilized and buried with three feet of cover, this design will be robust enough to withstand

loads from large trucks. Comparison of pre- and post-construction model results indicates that the water surface elevation detained in Basin 17, immediately upstream of Site 2, decreases by 0.70 feet for the mean annual event (2.33-yr storm). The water surface in Basin 17 decreases slightly, by 0.01 feet, during the 25-year event. Given that, in this case, the water elevation has risen and is expected to pass over the road surface, additional pipe capacity, beyond the proposed amount, is not expected to further reduce the elevation of water held in Basin 17.

Site 3

Site 3 falls along the boundary of sub-basins 21 and 17. At Site 3, a gravel road blocks the natural flow. The pre-construction condition of this site is represented in the ICPR model by a short channel, the shape of which follows the profile of the road.

Proposed modifications at Site 3 include re-grading the road and thus widening the flowpath of the water contained within Basin 21. Comparison of pre- and post-construction model results indicates that the water surface elevation detained in Basin 21, immediately upstream of Site 6, decreases by 0.21 feet for the mean annual event (2.33-yr storm) and by 0.40 feet during the 25-year storm. It is noteworthy that the water contained within Basin 21 extends throughout a large portion of the basin and decreases the ability of water to leave Basin 27. Together with the proposed changes at Site 4, the reduced water surface in Basin 21 allows water to also exit Basin 27 more efficiently.

Site 4

Site 4 falls along the boundary of sub-basins 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 with 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 flow from the mean annual storm event to overtop the road by 0.29 feet.

Proposed modifications at Site 4 include removing the 12" CMP and grading the gravel road to add a low water crossing 50 feet in length. The low water crossing restores natural sheet flow and will lower the water surface in Basin 27, immediately upstream of Site 4. The water surface will decrease by 0.21 feet during the mean annual event (2.33-yr storm) and by 0.40 feet during the 25-

year storm event. After construction, 1.38 feet of water is expected to cross the road surface during the mean annual storm event.

It is noteworthy that the water surface in Basin 27 is also influenced by the water that is staged in the downstream basin, Basin 21. This tail water condition is described further in the discussion for Site 3.

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 78.0 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. The UMAM Sheets Part I & II for each mitigation activity are in Appendix A.

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 are 8 based on the proximity of the area to the proposed low water crossings. 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.

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	1,084.1	1.00	1.03	0.0647	68.7
RCW upland mowing	6	7	0	0	7	7	233.0	1.25	1.00	0.04	9.3
Total							**1,294.4**				**78.0**

[1]Relative Functional Gain
[2]Functional Gain

2.7 Engineering

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

Site 1 - The contractor will provide approximately 1000 cy of fill and re-grade approximately 3,500 linear feet of the existing dirt road to bring the road elevation up to the adjacent existing grade elevations (Section 2.11, Sheets 8, 9 and 11of 17).

Site 2 - The contractor will demolish four 50-inch diameter plastic pipe culverts and four 36-inch diameter reinforced concrete pipe culverts (Section 2.11, Sheet 5 of 17). The contractor will install eight 3-ft precast reinforced concrete culverts so as to provide North and South inverts of 33.0 feet (Section 2.11, Sheets 10 and 11 of 17). Before installation, the contractor will de-water and compact the subgrade beneath the culverts. Upon installation of the culverts, the contractor will backfill and provide a minimum of 36 inches of soil cover over the proposed culverts. Given that water is expected to cross over the road surface, the road should be reinforced to withstand vehicle loads during a rain event. Rock rip rap with #57 stone bedding and geotextile fabric along both sides of the road and around the pipe ends shall be installed to provide additional erosion control measures. A total of approximately 100 cy shall be removed upstream and downstream of the new culverts to allow water to easily flow through all pipes.

Site 3 - The contractor will excavate approximately 2,400 cy of soil and re-grade approximately 2,350 linear feet of dirt road in order to bring the road elevation down to the adjacent existing grade elevations (Section 2.11, Sheets 6, 12 and 13 of 17). The road elevations are roughly 6-12 inches above the existing adjacent grade. The plan anticipates the removal of those 6-12 inches and an additional 12-24 inches in some areas to meet conveyance requirements. The surrounding area should be graded as applicable to allow positive drainage such that water does not collect in the road right of way. It is not the intent of this modification to re-grade more than 10-15' from the road right of way. Given that water is expected to cross over the road surface, the road should be reinforced to withstand vehicle loads during a rain event.

Site 4 - The contractor will demolish the existing 12-inch diameter culvert and regrade the road to create a low water crossing 50-feet in length (Section 2.11, Sheets 7, 14 and 15). The surrounding area should be graded as applicable to allow positive drainage such that water does not collect in the road right of way. It is not the intent of this modification to regrade more than 10-15 feet from the road right of way. Given that water is expected to cross over the road surface, the road should be reinforced to withstand vehicle loads during a rain event.

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 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 crossing 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. 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 Area	Timeframe
Site 1	
Acquire local land disturbance permits for all restoration areas, mobilization of contractor and equipment	Week 1
Establish all turbidity/erosion control measures	Week 1
Re-grade roadway	Weeks 1-3
Generate and review as-built surveys	Weeks 4
Begin 5 year monitoring and maintenance period	Week 5
Site 2	
Mobilization of contractor and equipment	Week 5
Establish all turbidity/erosion control measures	Week 5
Replace culverts, reconstruct road and install signage	Weeks 6-13

Generate and review as-built surveys	Week 14
Begin 5 year monitoring and maintenance period	Week 15
Site 3	
Mobilization of contractor and equipment	Week 16
Establish all turbidity/erosion control measures	Week 17
Excavate elevated roadways	Weeks 17-19
Generate and review as-built surveys	Week 20
Begin 5 year monitoring and maintenance period	Week 21
Site 4	
Mobilization of contractor and equipment	Week 21
Establish all turbidity/erosion control measures	Week 22
Excavate elevated roadways	Week 23
Construct South-2 LWC, complete grading and install signage	Weeks 23-27
Generate and review as-built surveys	Week 28
Begin 5 year monitoring and maintenance period	Week 29
RCW Habitat Restoration	
Mobilize equipment for roller chopping and conduct roller chopping activity	Weeks 28-30

2.9 Monitoring and Maintenance Requirements

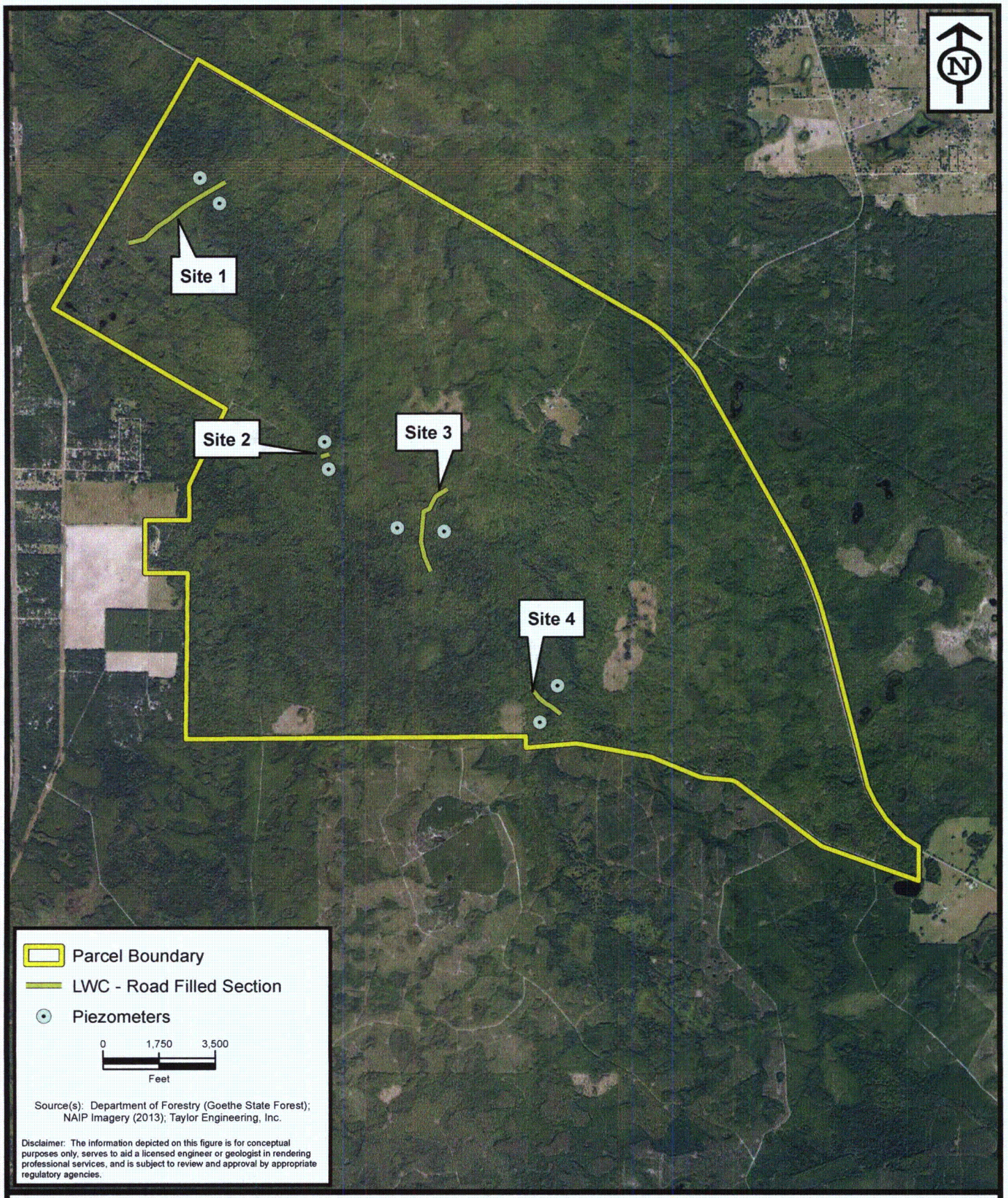
The hydrologic enhancement areas will be monitored continuously for five years to ensure their success. Monitoring will document that daily, monthly, and seasonal water levels are matching those proposed in the hydrologic modeling. In addition, wildlife utilization, hydrologic conditions, presence of invasive/exotic species and any other management issues will be noted and addressed.

The 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.

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.

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.



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

Mitigation Activity Area - Monitoring Activities

Goethe State Forest Parcel

Levy County, Florida

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Drwn/Chkd:	JRN/JGB
Figure:	**2-10**

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