



March 7, 2024

Ms. Cindy Mulkey
Program Administrator
Siting Coordination Office
Florida Department of Environmental Protection
3900 Commonwealth Blvd, MS 48
Tallahassee, FL 32399-2400

Subject: Timber Stand Monitoring and Mitigation Reports
Curtis H. Stanton Energy Center (PA 81-14M)

Dear Ms. Mulkey:

Please find enclosed the 2023 Annual Mitigation Monitoring and Palmetto & Exotic Vegetation Reports pertaining to the Orlando Utilities Commission (OUC) Curtis H. Stanton Energy Center (SEC). This submission is in accordance with the stipulations outlined by the Florida Department of Environmental Protection (FDEP) Conditions of Certification (COC) as delineated in the 1982 Site Certification Agreement, subsequently amended on August 30, 2017 (Supplemental Conditions of Certification PA 81-14M).

The report entitled 2023 Annual Monitoring of The Mitigation Areas and Timber Stands at The Stanton Energy Center," indicates that the monitoring results for the year 2023 demonstrate compliance with the Joint Agency Mitigation and Monitoring Plan (JAMMP) success criteria. **Per the report recommendation, OUC requests FDEP concurrence that Areas 3.1 and 3.2 have met the required success criteria and that monitoring activities in these areas can be discontinued.**

If you have any questions or comments concerning this submittal, please do not hesitate to contact me at 407-434-3091 or tgaboian@ouc.com.

Sincerely,

Tom
Gaboian

Digitally signed
by Tom Gaboian
Date: 2024.03.07
15:07:13 -05'00'

Tom Gaboian, P.E.
Senior Environmental Compliance Specialist
Orlando Utilities Commission

ORLANDO UTILITIES COMMISSION



Cc Mike Kyhos, Director of OUC Environmental Compliance – Power Generation
Ann Seiler, FDEP Environmental Specialist
Lindsey Troutman, FWS RCW Recovery Coordinator
Craig Faulhaber, FWC Avian Conservation Coordinator
Thomas Ostertag, FWC Listed Species Conservation Ecologist
FDEP Siting Coordination Office
Nigel Lewis, HSW Project Manager
Scott Emory, PhD, HSW Sr. Technical Consultant

**2023 ANNUAL MONITORING
OF THE MITIGATION AREAS AND TIMBER STANDS
AT THE STANTON ENERGY CENTER**

FINAL

FEBRUARY 2024

Prepared for:

Orlando Utilities Commission
100 W. Anderson St.
Orlando, FL 32801

Prepared by:

HSW Consulting, LLC.
15711 Mapledale Blvd., Ste. B
Tampa, FL 33624
HSW Project No: 1CH100805



Scott Emery, PhD
Senior Technical Consultant



Nigel Lewis, PE
Project Engineer



CONTENTS

1. INTRODUCTION.....	1
2. ANNUAL MITIGATION AREA MONITORING	5
2.1 Objective.....	5
2.2 Monitoring Methods.....	7
2.3 Results	8
2.3.1 Scope of Sampling	8
2.3.3 Individual Mitigation Area Sampling Results	11
2.3.3.1 Mitigation Area 3.1 LLP	11
2.3.3.2 Mitigation Area 3.1 PC	12
2.3.3.3 Mitigation Area 3.2 LLP	13
2.3.3.4 Mitigation Area 3.2 PC	14
2.3.3.5 Mitigation Area 3.3 LLP	15
2.3.3.6 Mitigation Area 3.5 LLP	16
2.3.3.7 Mitigation Area 3.6 LLP	17
2.4 Discussion	18
2.4.1 Individual Unit Discussion.....	19
2.5 Summary and Conclusions	20
2.5.1 Recommendations for Individual Mitigation Areas.....	21
3. ANNUAL TIMBER STAND MONITORING	24
3.1 Objectives	24
3.2 Monitoring Methods.....	24
3.3 Results	25
3.4 Summary and Conclusions	38
4. REFERENCES	40

TABLES

Table 1.1 Mitigation areas and current monitoring requirements
Table 2.1 Mitigation Area Sampling Plot Characteristics
Table 2.2 Monitoring Year 2023 Results Compared to JAMMP Success Criteria
Table 2.3 Vegetative species encountered at the SEC from 2017 to date
Table 2.4 Mitigation Area 3.1 LLP Survey Plot Data
Table 2.5 Mitigation Area 3.1 LLP Tree Height Summary

Table 2.6 Mitigation Area 3.1 PC Survey Plot Data
Table 2.7 Mitigation Area 3.1 PC Tree Height Summary
Table 2.8 Mitigation Area 3.2 LLP Survey Plot Data
Table 2.9 Mitigation Area 3.2 LLP Tree Height Summary
Table 2.10 Mitigation Area 3.2 PC Survey Plot Data
Table 2.11 Mitigation Area 3.2 PC Height Summary
Table 2.12 Mitigation Area 3.3 LLP Survey Plot Data
Table 2.13 Mitigation Area 3.3 LLP Tree Height Summary
Table 2.14 Mitigation Area 3.5 LLP Survey Plot Data
Table 2.15 Mitigation Area 3.5 LLP Tree Height Summary
Table 2.16 Mitigation Area 3.6 LLP Survey Plot Data
Table 2.17 Mitigation Area 3.6.LLP Tree Height Summary
Table 2.18 Mitigation Area Average Monitoring Plot Tree Densities For Monitoring Years 2012 – 2023
Table 3.1 Timber Stand A Summary Data
Table 3.2 Timber Stand B Summary Data
Table 3.3 Timber Stand C Summary Data
Table 3.4 Timber Stand D Summary Data
Table 3.5 Timber Stand E Summary Data
Table 3.6 Timber Stand F Summary Data
Table 3.7 Timber Stand G Summary Data
Table 3.8 Timber Stand H Summary Data
Table 3.9 Timber Stand I Summary Data
Table 3.10 Timber Stand J Summary Data
Table 3.11 Timber Stand K Summary Data
Table 3.12 Timber Stand L Summary Data
Table 3.13 Timber Stand M Summary Data
Table 3.14 Timber Stand N Summary Data
Table 3.15 Timber Stand O Summary Data
Table 3.16 Timber Stand P Summary Data
Table 3.17 Timber Stand Q Summary Data
Table 3.18 Recent Monitoring Year Timber Stand Tree Density Comparison
Table 3.19 Calculated Basal Area of Timber Stands
Table 3.20 USFWS Good Habitat Evaluation by Basal Area and Tree Density
Table 3.21 Summary of Timber Stand Surveyed Mature Living LLP Tree Heights
Table 3.22 Summary of Average Tree Stand Density and Ground Cover

FIGURES

1. Site Location
2. Project Area
3. Mitigation Area 3.1 Sampling Plots
4. Mitigation Areas 3.2 Sampling Plots
5. Mitigation Area 3.3 Sampling Plots
6. Mitigation Area 3.5 Sampling Plots
7. Mitigation Area 3.6 Sampling Plots
8. Timber Stand Sampling Locations

ATTACHMENTS

- A. JAMMP Specifications for Annual Monitoring and Mitigation Success Criteria
- B. RCW Habitat Management Plan and Monitoring Program
- C. FDEP Letter of Release
- D. Mitigation Area Permanent Location Photographs
- E. Mitigation Area Individual Site Photographs
- F. Mitigation Area Tree Density Trends
- G. Mitigation Area Tree Height Distributions
- H. Timber Stand Tree Counts
- I. Timber Stand Vegetative Cover Characteristics
- J. Timber Stand Individual Site Photographs

I. INTRODUCTION

HSW Consulting, LLC. (HSW) was retained by the Orlando Utilities Commission (OUC) to conduct the 2023 annual mitigation and timber stand monitoring for the 3,280-acre Curtis H. Stanton Energy Center (SEC), 5100 South Alafaya Trail, Orlando, Orange County, Florida (Site Location Figure 1). The SEC power plant facility began operating in 1987. OUC currently operates the following power-generating facilities on approximately 880 acres subject to conditions of certification:

- Two coal-fired generating units, designated Unit 1 and Unit 2, with capacities of 480 and 468 megawatts (MW), respectively;
- Two natural gas-fired combined cycle units designated Unit A and Unit B, with capacities of 633 and 300 MW, respectively; and
- Three solar plants which generate 5, 6, and 7 MW.

The remaining 2,400 acres of undeveloped land surrounding the facility (Project Area, Figure 2) is managed by OUC to provide habitat for the endangered red-cockaded woodpecker (*Picoides borealis*) population, a federally listed endangered species and state-listed species of special concern.

The conditions of certification have been modified or supplemented several times since the original certification. The current version, Modification M, is “Conditions of Certification, Orlando Utilities Commission Curtis H. Stanton Energy Center, PA 81-14M” dated August 30, 2017 (hereinafter COC). The following tracks the history of FDEP certification of SEC and modifications to the conditions of certification:

- Certification for Unit 1 was issued December 15, 1982.
- Conditions of Certification Modification A dated June 27, 1984 (railroad corridor, plant access road, fugitive dust control, water supply source and makeup/return pipelines).
- Certification for Unit 2 was issued December 17, 1991.
- Conditions of Certification Modifications:
 - B dated July 24, 1995 (Alafaya Trail Extension),
 - C dated December 24, 1997 (Units 1 and 2 operations), and
 - D dated August 7, 1998 (Units 1 and 2 air provisions).
- Supplemental certification for Unit A was issued September 21, 2001.
- Conditions of Certification Modifications:
 - E dated February 24, 2003 (Alafaya Trail Extension and red-cockaded woodpecker management agreements), and
 - F dated July 20, 2006 (Title V/air construction and operation permits, all units).
- Supplemental certification for Unit B was issued August 17, 2006.
- Conditions of Certification Modifications:
 - G dated January 17, 2007 (Magnolia Ranch substation, Title V all units, red-cockaded woodpecker habitat management),
 - H dated October 3, 2007 (rail car siding facility),
 - I dated February 6, 2008 (North substation and transmission line),
 - J dated February 20, 2008 (Title V, all units),
 - K dated July 24, 2008 (North substation and transmission line),
 - L dated March 8, 2016 (environmental resources, all units), and
 - M dated August 30, 2017 (incorporates a uniform set of general conditions consistent with recent site certifications, updates antiquated specific conditions that are no longer applicable or consistent with current regulations).

In 1982 OUC was granted a Certification Order for the construction and operation of the Curtis H. Stanton Energy Center, Unit 1, its associated facilities, and associated transmission lines. Construction and land clearing activities for Unit 1 occurred from 1983-1986. A red-cockaded woodpecker (RCW) management area was established in the undeveloped land surrounding the facility. Condition 31 of the Unit 1 Site Certification addressed both management and monitoring guidelines for the RCW management area, stipulating that the RCW habitat management plan will be implemented for the life of the facility. Current requirements regarding red-cockaded woodpecker, prescribed by COC Modification M, are listed in the COC Specific Conditions (Section B.IV.F).

A Supplemental Site Certification Application (SSCA) for the expansion of the Curtis H. Stanton Energy Center to include Unit 2 was provided in 1991. Wetland impacts resulting from the construction of Unit 2 and associated facilities included wetland filling and the conversion of forested wetlands to herbaceous wetlands primarily in the certified railroad/transmission line corridor. The mitigation projects for Unit 2 impacts occurred within the undeveloped land surrounding the facility and included both upland and wetland mitigation programs. Activities within the mitigation tracts included wetland expansion associated with ditch plugging operations and associated riparian planting areas for longleaf pine (*Pinus palustris*) and pond cypress (*Taxodium ascendens*).

As a requirement for the construction of SEC Unit 2, individual mitigation plans were prepared for and approved, in 1991, by the regulatory agencies having jurisdiction over wetlands: the Florida Department of Environmental Protection (FDEP), St. Johns River Water Management District (SJRWMD), and South Florida Water Management District (SFWMD). The individual mitigation plans were then combined in a single Joint Agency Mitigation and Monitoring Plan (JAMMP) that was developed to satisfy all regulatory agency requirements and to incorporate all mitigation and monitoring plans into one document. In 1993, the JAMMP and a revised RCW Habitat Management Plan were approved by FDEP requiring annual monitoring of the RCW population for the life of the facility and established mitigation areas until the vegetative success criteria are achieved.

The 1993 JAMMP described mitigation and monitoring plans associated with facility expansion (Unit 2) activities. The JAMMP designated seven Mitigation Areas, identified as Mitigation Areas 3.1 through 3.7 (Figure 2), to satisfy regulatory agency requirements and detailed the success criteria. Appendices A, B, C, and G of the JAMMP, provide the mitigation plan details and mitigation success criteria (Attachment A).

The SEC Red-cockaded Woodpecker Habitat Management Plan (RCW-HMP) was again updated on July 8, 2005 (revised March 2006) (Attachment B) to offset losses in mitigation areas from the gas pipeline installation in the southern utility corridor and from the removal of planted pine in mitigation unit 3.4 along the northern transmission line corridor between the substation and Pope Road. The RCW-HMP includes the following requirements: 1) construct artificial RCW cavities and translocate RCWs to the cavities if natural dispersal does not occur and 2) monitor and submit annual reports on the RCW population and SEC habitat set-aside for the RCWs.

The RCW- HMP describes procedures for timber management, longleaf pine - wire grass habitat monitoring, invasive species monitoring and management, RCW cluster and population studies, and general land management practices. Prescribed burning and mechanical treatment are common practices employed at the SEC site for controlling understory growth. OUC utilizes controlled (prescribed) burns as a tool (along with mechanical chopping and selective herbicide use) to manage longleaf pine habitats to foster tree germination, growth, and survival. OUC utilizes trained

personnel in all their controlled burns, and follows guidelines developed by the Florida Department of Agriculture and Consumer Services /Florida Forest Service. Back burning techniques are exclusively employed in the controlled burning operations to reduce the intensity of the fires and thereby maximize survival of all stages of LLPs to promote optimal RCW habitat management. Management is primarily focused on maintaining the long-term suitability of habitat and survival of RCWs at the SEC site in accordance with the USFWS RCW Recovery Plan.

In accordance with the RCW-HMP and with FDEP concurrence, OUC installed three artificial cavity clusters in 2008 to augment natural RCW dispersal. OUC is obligated to monitor RCW dispersal and translocate RCW if cavities are not used by dispersing RCWs onsite.

The RCW-HMP includes requirements for annual population and reproductive success monitoring studies, which are to continue over the life of the facility, to assess the status of the existing RCW groups. The monitoring studies include periodic inspections to determine if dispersing RCW are using any of the artificial clusters as roosting sites. If solitary birds are found living in these recruitment clusters, other RCWs of the opposite sex are to be translocated to potentially form a new breeding group in these clusters. No more than two birds from the surrounding area are to be translocated in any one year. No translocations from surrounding groups will be allowed during years of low reproduction. The three artificial cluster sites and cavities will be visited at least twice during each nesting season to determine occupancy, reproductive status, and reproductive success. Cluster creation and occupation shall be considered a success when a pair of RCWs have occupied the site for one complete year or have reproduced successfully. Reproduction is successful when eggs, nestlings, or fledglings from the new group are observed.

The JAMMP outlines success criteria for the seven mitigation areas established at the SEC. The longleaf pine trees in Mitigation Area 3.4 were removed because of interference with the overhead transmission lines. The RCW expansion requirements in the 2006 RCP-HMP were agreed-upon by OUC and FDEP as mitigation compensation for allowing Mitigation Area 3.4 to remain as an open natural wetland prairie with a tree buffer outside the transmission line borders. A small longleaf pine tree planting (0.28 acres) portion of Mitigation Area 3.1 was also removed from the mitigation units due to construction of a permitted gas pipeline along the southern access corridor. Section 1.4 of the RCW-HMP discusses these impacts and details the implementation of the artificial cavity and translocation requirements designed to offset them (Attachment B).

In 2004, the FDEP determined the following (Attachment C):

- The southern pond cypress planting area of Mitigation Area 3.1 met success criteria and was released from further monitoring. The remaining portions had not met success criteria.
- The north and south slash pine plantings of Mitigation Area 3.2 met success criteria and were released from further monitoring. The remaining portions had not met success criteria.
- The existing cypress domes and herbaceous wetlands of Mitigation Area 3.5 met success criteria and were released from further monitoring. The remaining portions had not met success criteria.
- The cypress seedling planting hydrologically enhanced existing cypress domes, and herbaceous wetland areas of Mitigation Area 3.6 met success criteria and were released from further monitoring. The remaining portions had not met success criteria.
- The entire Mitigation Area 3.7 met success criteria.

A summary of the mitigation areas and monitoring currently required is presented in Table 1.1.

Table 1.1 Mitigation areas and current monitoring requirements

Mitigation Feature	Area 3.1 (Railroad North)	Area 3.2 (Railroad South)	Area 3.3 (RCW West)	Area 3.4 (Transmission Line North)	Area 3.5 (East Prairies)	Area 3.6 (RCD)	Area 3.7 (Railroad Loop)
Cypress Seedling Planting	M (north) 0.4 acres	M 9.2 acres	---	---	---	R	R
Longleaf Pine Seedling Planting	M 11.1 acres	M 11.7 acres	M 15.6 acres	---	M 30.7 acres	M 3.4 acres	R
Longleaf Pine Tree Planting	M 0.28 acres	---	---	R	---	---	R
Slash Pine Seedling Planting	---	R	---	---	---	---	R
Herbaceous Wetland	---	---	---	---	R	R	R
Cypress Domes	---	---	---	---	R	R	R
Notation: M = Monitoring required R = Released from further monitoring (Attachment C) --- = Not applicable; success criteria not specified in JAMPP (Attachment A)							

The objectives of this report are to evaluate the performance of the mitigation areas and to characterize the timber stands at SEC as required by the Conditions of Certification. This report provides a review of the field data collected as it relates to the remaining applicable conditions of the JAMMP mitigation success and monitoring criteria and to the RCW-HMP.

2. ANNUAL MITIGATION AREA MONITORING

Of the 2,400-acre buffer area, about 1,700 acres are longleaf pine flatwoods with a dominant understory of saw palmetto (*Serenoa repens*), wiregrass (*Aristida stricta*), and gallberry (*Ilex glabra*). A diverse mix of ground cover species is present.

Interspersed among longleaf pine flatwoods are pond cypress (*Taxodium ascendens*) domes and strands, maidencane (*Panicum hemitomon*), St. John's wort (*Hypericum spp.*) marshes, hydric pond pine flatwoods, and willow/maple shrub swamps. Scrubby flatwoods, dominated by longleaf pine and myrtle oak (*Quercus myrtifolia*), occupy a few small areas of the Project Area.

Data collected as part of this assessment are evaluated to determine if the mitigation areas meet the success criteria for release from further monitoring. A list of vegetative species encountered as part of this effort from 2017 to date is provided in Table 2.3. Panoramic photographs were taken at prescribed permanent photographic locations for each mitigation area (Attachment D). Additional photographs of the mitigation areas are provided in Attachment E.

2.1 Objective

The objective of the mitigation area monitoring is to provide data that support an evaluation of the mitigation plan relative to the JAMMP success criteria. The following Annual Mitigation Areas (Figure 2) remain for field monitoring and analysis and were addressed during this reporting event:

- Mitigation Area 3.1 – Railroad North
- Mitigation Area 3.2 – Railroad South
- Mitigation Area 3.3 – RCW West
- Mitigation Area 3.5 – East Prairies
- Mitigation Area 3.6 – RCD

Mitigation Area 3.1 (Railroad North)

Mitigation Area 3.1 includes both a Longleaf Pine (LLP) component and a Pond Cypress (PC) component (Figures 3A and 3B). A small parcel of pond cypress seedling plantings in the southeast corner of the railroad loop was released from further monitoring in 2004. This released area continues to exhibit high pond cypress growth and survival (incidental observations by field team).

The remainder of Mitigation Area 3.1 that has not been released is in a triangular-shaped parcel between the alternate access road and the southern transmission line used for a laydown yard during the construction of the coal units. The parcel supports a cypress dome buffered by a 1.5-acre Riparian Habitat Protection Zone (RHPZ). The cypress dome is not part of the mitigation plan. Mitigation Area 3.1 includes a 0.4-acre pond cypress creation area (Mitigation Area 3.1 PC) and an 11.38-acre longleaf pine upland restoration area (Mitigation Area 3.1 LLP). The RHPZ area around the natural cypress dome is included in Mitigation Area 3.1 LLP. The area is mostly upland and was planted several times with longleaf pine seedlings to augment the existing set-aside RCW habitat.

A 0.4-acre area previously planted with pond cypress seedlings and saplings exists at the northwestern corner of Area 3.1. The 0.4-acre area was reconstructed at lower elevations to improve the wetland

hydroperiod and replanted with pond cypress saplings in the Fall of 2011 to replace those that had previously died due to lack of water.

Mitigation Area 3.2 (Railroad South)

Mitigation Area 3.2 includes longleaf pine, slash pine, and pond cypress components (Figures 4A and 4B). Mitigation Area 3.2 encompasses a narrow strip of land adjacent to the western side of the railroad bed, extending from the southern property boundary northward to the southern portion of the railroad loop. It includes a 7.6-acre pond cypress restoration area (Mitigation Area 3.2 PC) and 11.7-acre longleaf pine upland restoration area (3.2 LLP). Mitigation Area 3.2 PC runs adjacent to the toe of slope of the railroad berm through a pre-existing natural wetland system.

Mitigation Area 3.2 LLP is adjacent to Mitigation Area 3.2 PC and supports a pine flatwood habitat. Several cycles of longleaf pine seedlings were planted in the 11.7-acre RHPZ to augment the existing set-aside RCW habitat.

The mitigation area also includes a narrow strip of land on eastern side of the railroad bed for slash pine seedling plantings that FDEP released from monitoring in 2004 (Attachment C).

Mitigation Area 3.3 (RCW West)

Mitigation Area 3.3 is 15.6 acres located in the northwestern portion of the SEC property (Figures 5A and 5B). The area was cleared during construction at SEC and used for material storage (lay-down). Prior to construction, this area consisted of longleaf pine flatwoods with sparse tree cover. Longleaf pine seedling planting was prescribed for this area to augment the existing set-aside RCW habitat. It is the only mitigation activity prescribed in this area. Longleaf pine plantings occurred in 1993 and have been repeated several times.

Mitigation Area 3.5 (East Prairies)

Area 3.5 is a northerly-flowing series of interconnected wet prairies and cypress domes that encompass 30.7 acres (Figures 6A and 6B) formerly ditched and drained for the construction of a railroad used for logging access by mule-drawn rail cars; but, filled as part of the mitigation requirements for the SEC plant construction. FDEP released the cypress domes and herbaceous wetlands from further monitoring in 2004. The upland RHPZ buffer surrounding the cypress wetlands supports a longleaf pine flatwood community. Several cycles of longleaf pine seedling plantings were part of the mitigation activities in the RHPZ to augment the existing set-aside RCW habitat.

Mitigation Area 3.6 (RCD)

Area 3.6 is a series of interconnected wet prairies, formerly ditched and drained for the construction of a railroad used for logging access by mule-drawn rail cars, similar to Mitigation Area 3.5; but, on the east side of the south access road to the power plant (Figures 7A and 7B). The ditch was filled as part of the mitigation requirements for the SEC plant construction. Most of this area has already met success criteria and has been released from further monitoring by the FDEP. The only section of Area 3.6 that remains to be monitored for success is a 3.4-acre upland tract near the access road that has been planted several times with longleaf pine seedlings.

2.2 Monitoring Methods

Field teams accessed the Project Area targets through a network of paved and unpaved roads. Field surveys were conducted by teams of two field biologists. Sampling was conducted in the Spring 2023 using the same methodology as described in the previous monitoring year report. Sampling plot location coordinates were determined using a Geographic Information System (GIS) prior to conducting the field survey. The radii for circular sampling plots within the mitigation areas were typically 60 feet which results in a 0.26-acre plot being surveyed (Table 2.1). Rectangular plots were sampled in Mitigation Area 3.2 PC because the cypress planting area is narrow.

Table 2.1 Mitigation Area Sampling Plot Characteristics

Mitigation Area	3.1 LLP	3.1 PC	3.2 LLP	3.2 PC*	3.3 LLP	3.5 LLP	3.6 LLP
Plot Radius (ft)	60	60	60	150' x 30'	60	60	60
Plot Size (ac)	0.26	0.26	0.26	0.10	0.26	0.26	0.26
Number of Plots Sampled	10	1	10	10	10	10	10
Area Surveyed (ac)	2.60	0.26	2.60	1.00	2.60	2.60	2.60
*Rectangular plots used because planting area is narrow.							

Sampling plots were located in the field using a hand-held global positioning system (GPS) unit pre-loaded with the location coordinates determined using GIS. Field teams navigated to the approximate location of each pre-selected sampling plot and recorded the actual center point of the plot. The center point of each plot was temporarily staked with a metal rod, located with a GPS unit, and a photograph was taken. The centers of the sampling plots were overlain on the mitigation area boundaries using shapefiles provided by OUC during the field work.

Mitigation Areas 3.1 LLP, 3.1 PC, 3.2 LLP, 3.2 PC, 3.3 LLP, 3.5 LLP, and 3.6 LLP were monitored for success criteria according to the JAMMP success requirements including: longleaf or pond cypress densities and longleaf or pond cypress size class distribution. For the purpose of this study: seedlings are defined as trees less than 4 feet in height, saplings are less than a 4-inch diameter at breast height, dbh, (approximately 4 to 30 feet in height), and trees are those greater than or equal to a 4-inch dbh.

Longleaf pine and pond cypress seedlings, saplings, and mature trees were counted, and the heights measured. The height of seedlings was measured to the nearest 0.5-foot using a graduated rod. Sapling and mature tree heights were measured to the nearest 1.0-foot using one of the following: a range finder with clinometer; hypsometer; or survey rod.

During the 2017/18 monitoring event, one additional sampling plot was added to the Longleaf Pine area within Mitigation Area 3.1 to allow for a total of ten Longleaf Pine plots and one Pond Cypress plot. The Pond Cypress mitigation area within Site 3.1 is small. The 0.26-acre plot radius covered roughly 65% of the total Pond Cypress site. The data are an accurate representation of the entire pond Cypress site area within 3.1.

Ten plots were monitored within the Pond Cypress area in Mitigation Area 3.2 (Figure 4A and Figure 4B) for the 2023 Monitoring Year. The Pond Cypress planting area within the mitigation area is long and narrow, too narrow to utilize the standard 0.26-acre plot radius. Each sampling plot is a 30 ft x 150 ft rectangle. Combined, the ten rectangular plots represent roughly 13% of the total Pond cypress planting

area. The data are an accurate representation of the entire Pond Cypress site area within Mitigation Area 3.2 PC.

The data collected were summarized using common statistics to characterize frequency (mean, median), range (minimum and maximum), variability (standard deviation (SD)), and reliability (standard error of measurement (SEM)).

2.3 Results

Attachment E provides representative photographs taken at the sample plots within each of the monitored mitigation areas.

2.3.1 Scope of Sampling

The sampled tree density calculated for Mitigation Area 3.2 PC meets the JAMMP success criteria (Table 2.2). The success criteria for Mitigation Area 3.2 PC is 400 trees/ac, and the 2023 tree density was 855 trees/ac. Mitigation Area 3.1 PC also meets the success criteria of 400 trees/acre as the recent tree density was 492 trees/acre (Table 2.2). Details of the findings for each mitigation area are provided in the following sections.

Table 2.2 Monitoring Year 2023 Results Compared to JAMMP Success Criteria

Mitigation Area	Success Criterion (trees/ac)	Tree Density (trees/ac)	Criterion Met
3.1 LLP	300	0.4	No
3.1 PC	400	492	Yes
3.2 LLP	300	73.5	No
3.2 PC	400	855	Yes
3.3 LLP	150	23.8	No
3.5 LLP	300	98.5	No
3.6 LLP	300	40.4	No

2.3.2 Natural Communities and Habitat

Although low in percentage cover, exotic plants, most notably cogon grass (*Imperata cylindrical*), have been noted during recent monitoring events mainly near roads, construction areas, railroad tracks, and other disturbed areas. An exotic plant control program is in place at the SEC that consists of identification and treatment on a yearly basis.

Table 2.3 Vegetative species encountered at the SEC from 2017 to date.

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acer rubrum</i>	Red maple	<i>Lyonia ferruginea</i>	Rusty staggerbush
<i>Aletris</i>	Colic root	<i>Lygodium microphyllum</i>	Climbing fern
<i>Amphicarpum muehlenbergianum</i>	Blue maidencane	<i>Lyonia lucida</i>	Fetterbush
<i>Andropogon glomeratus</i>	Tall grass	<i>Mikania scandens</i>	Climbing hempweed
<i>Andropogon virginicus</i>	Broom-sedge	<i>Myrica cerifera</i>	Southern wax myrtle
<i>Andropogon</i>	Bluestem	<i>Opuntia humifusa</i>	Prickley-pear cactus

Scientific Name	Common Name	Scientific Name	Common Name
<i>Artemisia campestris</i>	Wormwood	<i>Osmundastrum cinnamomeum</i>	Cinnamon fern
<i>Asclepias syriaca</i>	Milkweed	<i>Oxypolis</i>	Dropwort
<i>Asimina triloba</i>	Pawpaw	<i>Panicum spp.</i>	Panic grasses
<i>Asritida stricta</i>	Wiregrass	<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Aster</i>	Aster	<i>Paspalum</i>	Paspalum
<i>Axonopus compressus</i>	Carpetgrass	<i>Passiflora incarnata</i>	Passion flower
<i>Baccharis halimifolia</i>	Saltbush	<i>Persea palustris</i>	Swamp bay
<i>Bejaria racemosa</i>	Tarflower	<i>Pinus ellioti</i>	Slash pine
<i>Bidens</i>	Beggar-ticks	<i>Pinus palustris</i>	Longleaf pine
<i>Balduina angustifolia</i>	Yellow buttons	<i>Pinus serotina</i>	Pond pine
<i>Baptisia australis</i>	False Indigo	<i>Phlox</i>	Phlox
<i>Calapogon</i>	Grass-pink	<i>Phoebanthus</i>	False sunflower
<i>Callicarpa americana</i>	Beautybush	<i>Phyla nodiflora</i>	Frog-fruit
<i>Carex</i>	Sedges	<i>Platanthera</i>	Orchid
<i>Centella asiatica</i>	Centella	<i>Pluchea rosea</i>	Rosey camphorweed
<i>Chrysopsis floridana</i>	Golden aster	<i>Polygala</i>	Bachelor's buttons
<i>Cirsium vulgare</i>	Thistle	<i>Polystichum munitum</i>	Sword fern
<i>Cladium jamaicense</i>	Sawgrass	<i>Pteridium aquilinum</i>	Bracken fern
<i>Clematis baldwinii</i>	Pine-hyacinth	<i>Pterocaulon pycnostachyum</i>	Blackroot
<i>Commeline</i>	Dayflower	<i>Ptilimnium capillaceum</i>	Mock Bishop's weed
<i>Coreopsis</i>	Tickseed	<i>Quercus</i>	Oaks
<i>Crotalaria spectabilis</i>	Rattlebox	<i>Quercus myrtifolia</i>	Myrtle oak
<i>Croton</i>	Croton	<i>Quercus pumila</i>	Runner oak
<i>Cyperus</i>	Flat sedge	<i>Ricinus communis</i>	Castor bean
<i>Dichanthelium clandestinum</i>	Deertongue	<i>Rhexia virginica</i>	Meadow beauty
<i>Digitaria serotina</i>	Dwarf crabgrass	<i>Rhynchospora</i>	Beakrush
<i>Diospyros virginiana</i>	Persimmon	<i>Rubus fruticosus L</i>	Blackberry
<i>Drosera, spp.</i>	Sundews	<i>Sabal palmetto</i>	Cabbage palm
<i>Echinochloa</i>	Barnyard grasses	<i>Sabatia</i>	Sabatia
<i>Elephantopus elatus</i>	Elephant's-foot	<i>Saccharum giganteum</i>	Plume grass
<i>Eragrostis</i>	Love grasses	<i>Sagittaria</i>	Arrowhead
<i>Erechtites hieracifolia</i>	Fireweed	<i>Sagittaria latifolia</i>	Duck potato
<i>Erechtites hieracifolius</i>	Burnweek	<i>Saleria</i>	Nut sedge
<i>Eriocaulon decangulare</i>	Hat pins	<i>Salix caroliniana</i>	Carolina willow
<i>Eryngium armatum</i>	Prickly coyote thistle	<i>Sambucus canadensis</i>	Elderberry
<i>Eryngium yuccifolium</i>	Rattlesnake master	<i>Sarracenia spp.</i>	Pitcher plants
<i>Eupatorium capillifolium</i>	Dog fennel	<i>Schinus terebinthifolius</i>	Brazilian pepper

Scientific Name	Common Name	Scientific Name	Common Name
<i>Eustachys floridana</i>	Florida finger grass	<i>Serenoa repens</i>	Saw palmetto
<i>Fimbristylis</i>	Fringebrush	<i>Sericocarpus tortifolius</i>	White top aster
<i>Galactia elliotii</i>	Elliot's milk pea	<i>Sesbania</i>	Rattlebox
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	<i>Smilax rotundifolia</i>	Cat briar
<i>Gratiola</i>	Hedgehyssops	<i>Solanum viarum</i>	Tropical soda apple
<i>Helianthus radula</i>	Rayless sunflower	<i>Solidago</i>	Goldenrod
<i>Hydrocotyle umbellata</i>	Marsh pennywort	<i>Syngonanthus flavidulus</i>	Hatpins
<i>Hypericum fasciculatum</i>	St. John's wort	<i>Taraxacum officinale</i>	Long seed head
<i>Hypoxis juncea</i>	Yellow star grass	<i>Taxodium ascendens</i>	Pond cypress
<i>Ilex glabra</i>	Gallberry	<i>Toxicodendron radicans</i>	Poison ivy
<i>Imperata cylindrica</i>	Cogon grass	<i>Triadica sebifera</i>	Chinese tallow
<i>Lachnanthes caroliniana</i>	Redroot	<i>Typha</i>	Cattail
<i>Lachnocaulon</i>	Bogbutton	<i>Vaccinium myrsinites</i>	Skinny blueberry
<i>Leersia</i>	Cut grasses	<i>Veronicastrum virginicum</i>	Blackroot
<i>Lilium catesbaei</i>	Pine lily	<i>Vitis shuttleworthii</i>	Calusa grape
<i>Ludwigia peruviana</i>	Primrose willow	<i>Woodwardia virginica</i>	Chain fern
<i>Lupinus</i>	Lupine	<i>Xyris elliotii</i>	Yellow eyed grass

2.3.3 Individual Mitigation Area Sampling Results

2.3.3.1 Mitigation Area 3.1 LLP

Ten plots were surveyed in Mitigation Area 3.1 LLP (Figures 3A and 3B). Sample plot data are summarized in Table 2.4.

Table 2.4 Mitigation Area 3.1 LLP Survey Plot Data

Plot Radius (ft)	60ft
Plot Size (ac)	0.26
Number of Plots	10
Area Surveyed (ac)	2.60
Number of Trees	1
Success Criteria (Trees / ac)	300
Mean Stems/ ac	0.4
Seedlings / ac	0
Saplings / ac	0.0
Mature Trees / ac	0.4
SD (Trees / ac)	1.2
SEM (Trees / ac)	0.38

Longleaf Pine Tree Height

The summary statistics for all size classes are presented in Table 2.5.

Table 2.5 Mitigation Area 3.1 LLP Tree Height Summary

LLP Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	0	0	1
Mean	-	-	-
Median	-	-	-
Minimum	-	-	-
Maximum	-	-	-
SD	-	-	-

2.3.3.2 Mitigation Area 3.1 PC

One plot was surveyed in Mitigation Area 3.1 PC (Figures 3A and 3B). Sample plot data are summarized in Table 2.6.

Table 2.6 Mitigation Area 3.1 PC Survey Plot Data

Plot Radius (ft)	60
Plot Size (ac)	0.26
Number of Plots	1
Area Surveyed (ac)	0.26
Number of Trees	128
Success Criteria (Trees / ac)	400
Mean Stems / ac	492.3
Seedlings / ac	273.1
Saplings / ac	196.2
Mature Trees / ac	23.1
SD (Trees / ac)	-
SEM (Trees / ac)	-

Pond Cypress Tree Height

The summary statistics for all size classes are presented in Table 2.7.

Table 2.7 Mitigation Area 3.1 PC Tree Height Summary

PC Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	71	51	6
Mean	2.8	6.2	23.7
Median	3	4	23
Minimum	1	4	20
Maximum	3.5	15	28
SD	0.7	3.7	3.2

2.3.3.3 Mitigation Area 3.2 LLP

Ten plots were surveyed in Mitigation Area 3.2 LLP (Figures 4A and 4B). Sample plot data are summarized in Table 2.8.

Table 2.8 Mitigation Area 3.2 LLP Survey Plot Data

Plot Radius (ft)	60
Plot Size (ac)	0.26
Number of Plots	10
Area Surveyed (ac)	2.60
Number of Trees	191
Success Criteria	300
Mean Stems / ac	73.5
Seedlings / ac	17.3
Saplings / ac	21.5
Mature Trees / ac	34.6
SD (Trees / ac)	56
SEM (Trees / ac)	17.8

Longleaf Pine Tree Height

The summary statistics for all size classes are presented in Table 2.9.

Table 2.9 Mitigation Area 3.2 LLP Tree Height Summary

LPP Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	45	56	90
Mean	1.7	14.8	34.9
Median	1.5	15.0	33.0
Minimum	0.5	4.5	20.0
Maximum	3.9	25.0	55.0
SD	1.0	5.4	9.0

2.3.3.4 Mitigation Area 3.2 PC

Ten plots were surveyed in Mitigation Area 3.2 PC (Figures 4A and 4B). Sample plot data are summarized in Table 2.10.

Table 2.10 Mitigation Area 3.2 PC Survey Plot Data

Plot Dimension (ft)	30'x150'
Plot Size (ac)	0.1
Number of Plots	10
Area Surveyed (ac)	1.00
Number of Trees	855
Success Criteria	400
Mean Trees / ac	855
Seedlings / ac	150
Saplings / ac	284
Mature Stems / ac	421
SD (Trees / ac)	30
SEM (Trees / ac)	9.4

Pond Cypress Tree Height

The summary statistics for all size classes are presented in Table 2.11.

Table 2.11 Mitigation Area 3.2 PC Height Summary

PC Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	150	284	421
Mean	2.6	14.7	28.4
Median	2.5	15.0	30.0
Minimum	1.0	4.0	12.0
Maximum	4.0	30.0	40.0
SD	0.6	6.9	4.9

2.3.3.5 Mitigation Area 3.3 LLP

Ten plots were surveyed in Mitigation Area 3.3 LLP (Figures 5A and 5B). Sample plot data are summarized in Table 2.12.

Table 2.12 Mitigation Area 3.3 LLP Survey Plot Data

Plot Radius (ft)	60ft
Plot Size (ac)	0.26
Number of Plots	10
Area Surveyed (ac)	2.60
Number of Trees	62
Success Criteria	150
Mean Stems / ac	23.8
Seedlings / ac	0.8
Saplings / ac	2.3
Mature Trees / ac	20.8
SD (Trees / ac)	18
SEM (Trees / ac)	5.6

Longleaf Pine Tree Height

Summary statistics for all size classes are presented in Table 2.13.

Table 2.13 Mitigation Area 3.3 LLP Tree Height Summary

Longleaf Pine Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	2	6	54
Mean	1	12.4	37.1
Median	1	12	35
Minimum	0.5	6	20
Maximum	1.5	20	56
SD	0.71	5.7	8.0

2.3.3.6 Mitigation Area 3.5 LLP

Ten plots were surveyed in Mitigation Area 3.5 LLP (Figures 6A and 6B). Sample plot data are summarized in Table 2.14.

Table 2.14 Mitigation Area 3.5 LLP Survey Plot Data

Plot Radius (ft)	60
Plot Size (ac)	0.26
Number of Plots	10
Area Surveyed (ac)	2.6
Number of Trees	256
Success Criteria	300
Mean Stems / ac	98.5
Seedlings / ac	14.2
Saplings / ac	43.1
Mature Trees / ac	41.2
SD (Trees / ac)	61.0
SEM (Trees / ac)	19.3

Longleaf Pine Tree Height

The summary statistics for all size classes are presented in Table 2.15.

Table 2.15 Mitigation Area 3.5 LLP Tree Height Summary

Longleaf Pine Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	37	112	107
Mean	1.8	12.4	35.5
Median	2.0	11.0	35.0
Minimum	0.5	4.0	18.0
Maximum	3.5	29.0	55.0
SD	0.8	5.7	8.8

2.3.3.7 Mitigation Area 3.6 LLP

Ten plots were surveyed in Mitigation Area 3.6 LLP (Figures 7A and 7B). Sample plot data are summarized in Table 2.16.

Table 2.16 Mitigation Area 3.6 LLP Survey Plot Data

Plot Radius (ft)	60ft
Plot Size (ac)	0.26
Number of Plots	10
Area Surveyed (ac)	2.60
Number of Trees	105
Success Criteria	300
Mean Stems / ac	40.4
Seedlings / ac	4.2
Saplings / ac	5.8
Mature Trees / ac	30.4
SD (Trees / ac)	33.9
SEM (Trees / ac)	10.7

Longleaf Pine Tree Height

The summary statistics for all size classes are presented in Table 2.17.

Table 2.17 Mitigation Area 3.6.LLP Tree Height Summary

Longleaf Pine Tree Height (feet)			
Metric	Seedlings	Saplings	Mature
Number of Trees	11	15	79
Mean	1.3	8.7	39.6
Median	1.0	6.0	38.0
Minimum	0.5	4.0	17.0
Maximum	3.0	22.0	58.0
SD	1.1	6.0	9.8

2.4 Discussion

A trend analysis of monitoring results from 2013 to late 2023 (Table 2.18, Attachment F) shows the following.

Pond cypress density has been met in both PC mitigation areas for the past seven years, as have the average tree densities for the past 10 years.

- In Mitigation Area 3.1 PC, the recently observed tree density meets the JAMMP Success Criteria of 400 trees/acre with 492 trees/ac.
- Mitigation Area 3.2 PC with a tree density of 855 trees/acre has met the success criteria of 400 trees/acre.

Longleaf pine densities have been variable over the past 10 years at all mitigation areas.

- The results for 2023 tree density for Mitigation Area 3.1 LLP were 0.4 trees/acre; with no trees observed in 2021 from the ten randomly selected survey plots.
- The LLP densities in Mitigation Area 3.2 LLP have been decreasing steadily from over 200 trees/ac in 2013 but have leveled out over the past few years.
- The LLP densities in Mitigation Area 3.3 LLP were steady within the past 10 years but decreased slightly based on the sampled plots during the 2023 event.
- The LLP density measured in 2023 in Mitigation Area 3.5 LLP is decreased by 27% from the preceding monitoring year. This sampled density is nearly half that sampled in 2021.
- The LLP density measured in 2023 in Mitigation Area 3.6 LLP has been relatively steady since 2013.

Table 2.18 Mitigation Area Average Monitoring Plot Tree Densities For Monitoring Years 2013 – 2023

Mitigation Area	Mitigation Area Trend Analysis (Trees/ acre) ¹										
	2013	2014	2016	2017	2018	2019	2020	2021	2022	2023	Average
3.1 PC	1170	2180	361	981	592	558	708	473	415	492	793
3.2 PC	395	567	515	1058	985	461	630	632	843	855	694
3.1 LLP	6	7	4.7	11.2	5	3.1	2.7	NTO	0.8	0.4	4.5
3.2 LLP	209	144	186	131	105	100	110	74.6	97.7	73.5	123
3.3 LLP	42	68	49.6	34.6	36.5	53.8	77.3	40.0	46.9	23.8	47.3
3.5 LLP	165	170	115	125	127	159	181	186	135	98.5	146
3.6 LLP	57	65	47.6	70.8	55.8	35.0	61.5	37.7	48.1	40.4	51.9

1. Shaded cells indicate that the mitigation area met its success criterion for that year.
2. NTO = No Trees Observed

According to data evaluated during the 2023 monitoring period, two portions of the five mitigation areas monitored continue to meet the success criteria since (Table 2.2) identified in the JAMMP since 2017. The LLP and PC tree density analyses of sample data from this monitoring period indicate that the PC portion of Mitigation Area 3.1 and Mitigation Area 3.2 meets the JAMMP success criteria.

Tree densities within Mitigation Areas 3.1 LLP, 3.2 LLP, 3.3 LLP, 3.5 LLP, and 3.6 LLP did not meet the JAMMP success criteria. Sampling areas within Mitigation Area 3.1 had the lowest tree densities and

contained no LLP seedlings or saplings. Overall maturation of LLP seedlings to saplings has slowed in Mitigation Areas 3.2, 3.3, and 3.6. Mitigation area 3.5 LLP continues to promote the most saplings, with approximately 43 saplings/acre (Table 2.19). A slight increase in sampling recruitment occurred within mitigation area 3.6 LLP up to 5.8 saplings/acre. The distributions of sampling and mature tree heights by various size classes for each mitigation area are provided in Attachment G.

Table 2.19 Mitigation Area Average Monitoring Plot Sapling Tree Densities for Monitoring Years 2016 - 2023

Mitigation Area	2016	2017	2018	2019	2020	2021	2022	2023	Average
3.1 PC	19	269.2	96.2	311.5	319.2	65.4	223.1	196.2	187.5
3.2 PC	219.2	521	546	177	280	252	370.0	284	331.2
3.1 LLP	0.4	2.3	0	0	0	0	0.0	0	0.3
3.2 LLP	82.5	51.5	41.5	30	42.7	26.5	33.1	21.5	41.2
3.3 LLP	15.0	7.3	6.9	4.2	16.5	5	6.2	2.3	7.9
3.5 LLP	29.6	43.1	43.1	63.5	78.1	70.4	71.9	43.1	55.4
3.6 LLP	17.3	13.8	5.4	3.5	10.8	2.7	3.1	5.8	7.8

2.4.1 Individual Unit Discussion

2.4.1.1 Area 3.1 – Railroad North

PC tree density (492 trees/acre) in the northern 0.4-acre wetland portion of Mitigation Area 3.1 (Figure 3A and 3B) has met the success criteria of (400 trees/acre) for the last five years and release from further monitoring is justifiable for Mitigation Area 3.1 PC.

LLP tree density in the 11.38-acre upland portion of Area 3.1 was below success criteria (300 trees/acre). Only one tree was observed during the 2023 field monitoring event. Most of the surviving trees are mature trees in the northeastern corner and along the perimeter of Area 3.1. The main reasons for lack of LLP survival appear to be competition by native grasses; dog fennel; invasive, exotic cogon grass (*Imperata cylindrica*); and possibly herbicide application for cogon grass control. The northern portion of the site was a former staging area and does contain fill material. This may have an inhibiting effect on LLP seedling survival.

Ongoing management activities including prescribed fire and the control of cogon grass through herbicide application appear to be beneficial but are causing mortality in all LLP classes (more so in seedlings and saplings). The upland component of this area has been planted with the LLP seedlings on several previous occasions, with minimal success. Despite these efforts and despite active management efforts, LLPs are not enjoying significant success. OUC has implemented an aggressive cogon grass-elimination program with follow-up FDOT seed mix planting at this location to promote tree growth.

2.4.1.2 Area 3.2 – Railroad South

The LLP community with a tree density (74 trees/acre) in this area (Figure 4A and 4B) did not meet the success criteria (300 trees/acre). The LLP community has a healthy stand structure with various size class presence and good structural health among individuals. LLP seedling count increased significantly from

6.2 seedlings/acre to 17.3 seedlings/acre. Sapling recruitment is still up but decreased slightly to 21.5 saplings/acre during the 2023 sampling event.

PC tree density (855 trees/acre) in the adjacent 9.2-acre mitigation area (Figure 4A and 4B) exceeded its success criterion (400 trees/acre) for the past 5+ years. A release from further monitoring of Mitigation Area 3.2 PC is justifiable. PC trees are growing well and are in good health, as per general conditions described in monitoring reports from previous years.

2.4.1.3 Area 3.3 – RCW West

LLP tree density (24 trees/acre) in this area (Figure 5A and 5B) did not meet its success criterion (150 trees/acre). The northern portion of Mitigation Area 3.3 displays a normal LLP tree community structure and is comprised of mostly mature LLP trees. However, the northern and southern portions of the area have a very different vegetation structure. The southern portion of the site was used as a laydown yard during the construction of the coal units and has a poor vegetative structure with sandy soils typically containing low soil moisture. OUC has implemented measures to plant the southern portion with a DOT seed mix to promote soil development and thereby better LLP seedling survival.

2.4.1.4 Area 3.5 – East Prairies

The LLP tree density (99 trees/acre) in this area (Figure 6A and 6B) did not meet its success criterion (300-trees/acre), however, this area shows a slight density decrease over the past couple years. Mixed age classes and abundant natural recruitment of LLP within an open mid-story and fire-maintained saw palmetto-wiregrass dominated ground cover are present throughout this well-functioning ecosystem. Natural recruitment of LLPs appeared strong and should be fostered in the future.

2.4.1.4 Area 3.6 – RCD

Most of this area met PC and herbaceous wetland success criteria in prior years and was released from further monitoring. Prior to 2009, field study plot data demonstrated a 3.4-acre area of LLP (Figure 7A and 7B) required additional monitoring. The recent 2023 monitoring event found LLP density (40 trees/acre) to be below the designated success criterion (300 trees/acre). The sapling category of LLPs appeared to be thriving, and mature trees exhibited low mortality. Natural recruitment in future years is expected to continue to increase, with continued active site management.

2.5 Summary and Conclusions

The JAMMP prescribes success criteria for each of the upland and wetland mitigation areas at the SEC. Success criteria are provided in Attachment A. Annual monitoring of the mitigation areas is required to collect data and evaluate each mitigation area for successful tree establishment.

Monitoring is required until a mitigation area/sub-area has achieved the success criteria. Once determined to be successful, no further monitoring will occur, and the mitigation area will then continue to be managed under the RCW Habitat Management Plan (Attachment B) as part of the 2,400-acre buffer preserve surrounding the SEC.

The 2023 monitoring results indicate that Mitigation Area 3.1 PC and Mitigation Area 3.2 PC met the JAMMP success criteria with two- and five-year average tree density greater than 400 trees per acre.

The remaining mitigation areas evaluated during this monitoring event are LLP with tree densities ranging between 0.4 and 98.5 trees/acre that did not meet the JAMMP success criteria (either 150 or 300 trees/acre). In comparison, the LLP tree densities associated with 120 plots surveyed in 17 onsite timber stands ranged between 30 and 231 trees/acre and averaged 103 trees/acre (see Section 3.4)

The LLP plantings required by the *Conditions of Certification* were designed to augment the RCW set-aside habitat. While the LLP mitigation areas 3.1, 3.2, 3.3, 3.5, & 3.6 do not exhibit LLP densities that equal or exceed the requirements established in 1993, two of these mitigation areas (3.2 and 3.5) exhibit healthy LLP populations of seedlings, saplings, and adult trees. Visually, the LLP populations within these two mitigation areas are indistinguishable from the immediately adjacent Timber Stand sites. In addition, Mitigation Areas 3.3 and 3.6 exhibit healthy percentages of seedling, sapling, and adult LLPs, though at lower densities than are seen in Mitigation Areas 3.2 and 3.5.

An evaluation of the LLP timber stand areas immediately adjacent to each mitigation area should be conducted and compared to the on-site mitigation areas. These results would be compared to the relevant USFWS RCW Recovery Plan recommendations to determine the appropriate site vegetation density under the fire-maintained sere required for RCW habitat management (i.e., what are the RCW-optimum DBH classes for LLP on this particular site under a 2-year rotation burning program). A plan should be implemented to ensure enhanced survival of seedlings in Mitigation Area 3.1 and the southern half of Mitigation Area 3.3. Initially, the areas will be planted with the FDOT seed mix to improve soil quality, increase soil moisture, and inhibit colonization by cogon grass.

2.5.1 Recommendations for Individual Mitigation Areas

2.5.1.1 Mitigation Area 3.1 (Railroad North)

Recently sampled PC (2017/18, 2018, 2019, 2020, 2021, 2022, and 2023) surpassed the JAMMP success criterion, as well as in 2013 and 2014. Multiple LLP planting efforts have not been overly successful, but an aggressive cogon grass-elimination program with follow-up FDOT seed mix planting to stabilize soil and inhibit the future growth of invasive / exotics has been implemented. Additional LLP plantings are an option.

An alternative approach to this mitigation area that could be negotiated with the FDEP, would be to enlarge the on-site wetland acreage and thereby create a viable wetland community instead of an extremely small, isolated wetland. If pursued, this negotiation could be included in negotiations detailed above for the implementation of vegetation coverage more attune to the USFWS RCW habitat guidelines. In lieu of these negotiations, the following recommendations are presented:

- Release of the PC sub-area from further monitoring.
- Monitoring of the LLP should be continued.

2.5.1.2 Mitigation Area 3.2 (Railroad South)

Recently sampled LLP density did not meet the JAMMP success criteria and has not over the past ten years. However, recruitment of seedlings and saplings is evident and suggests increasing LLP success going forward. It is questionable if the site will achieve the 300 trees per acre density success criteria required for mitigation monitoring completion under RCW habitat management program. Exotic vegetation was not present in large amounts in the area and does not appear to have impacted

recruitment and growth rates of longleaf pine seedlings. The LLP density and basal area data should be compared with the RCW success criteria concerning LLP size classes to better determine whether this mitigation area has been successful, and the success criteria could be negotiated with the FDEP to more closely align with the habitat recommendations in the USFWS RCW Recovery Plan.

For pond cypress (PC), the ten-year average tree density for Mitigation Area 3.2 PC is 694.1 trees per acre dating back to 2013. Seedling density is good in the wetland, and it is likely the mitigation area will continue to meet success criteria given current levels of recruitment. Recommendations for the unit are listed below:

- Release of the PC sub-area from further monitoring.
- Monitoring of LLP should be continued.

2.5.1.3 Mitigation Area 3.3 (RCW West)

The longleaf pine tree density measured recently in Migration Area 3.3 LLP did not meet the JAMMP success criterion (150 trees per acre). The tree density measured recently was consistent with previous measurements, although density has been less than 100 trees per acre since prior to 2012. The 5-year average over the past five monitoring years has remained around 48 trees/acre. Vegetative community structure varies from South to North. The northern portion of Mitigation Area 3.3 displays a normal LLP tree community structure and is comprised of mostly mature LLP trees. The southern portion of the site was used as a laydown yard during the construction of the coal units and has a poor vegetative structure with sandy soils typically containing low soil moisture. Recommendations for the unit are listed below:

- The northern portion of mitigation area 3.3 should continue to be monitored for increasing LLP tree counts.
- The southern portion of mitigation area 3.3 should be planted with a FDOT seed mix to improve soil quality, improve soil moisture, and inhibit invasive and exotic plant growth; thereby, making the site more conducive to LLP establishment.:
- Monitoring should be continued

2.5.1.4 Mitigation Area 3.5 (East Prairies)

With a recently measured tree density of 98.5 trees/ac, Mitigation Area 3.5 LLP did not meet success criteria. The Mitigation Area tree density was trending upward starting in 2016, with a slight decrease observed in recent monitoring years. Exotic and nuisance vegetation did not appear to be a problem in the area. Recommendations for the unit are listed below:

- LLP tree densities and basal areas should be compared against the RCW habitat criteria. If the Mitigation Area 3.5 LLP densities compare favorably with these RCW habitat criteria, this area should be considered as successful.
- Monitoring should be continued

2.5.1.5 Mitigation Area 3.6 (RCD)

With a recently measured tree density of 48.1 trees/ac, Mitigation Area 3.6 LLP did not meet success criteria. The Mitigation Area tree density is steady since 2013. Exotic and nuisance vegetation did not appear to be a problem in the area. This mitigation area appears to have the necessary soil and herbaceous layer species to facilitate LLP growth. Recommendations for the unit are listed below:

- • LLP tree densities should be compared against the RCW habitat criteria. If the Mitigation Area 3.6 LLP densities compare favorably with these RCW habitat criteria, this area should be considered as successful. Monitoring should be continued

3. ANNUAL TIMBER STAND MONITORING

3.1 Objectives

The objectives of the timber stand monitoring are to collect tree, shrub, and herbaceous data that characterize the vegetative layer and longleaf pine tree (seedling/sapling/mature) density and height and to support of OUC's land management practices. OUC prepared and implemented an RCW habitat management plan and monitoring program in 1981 to improve the chances of long-term survival of the species at the SEC site (DeLotelle and Guthrie 2006). Results of the 2023 monitoring are compared with the definition of "good quality" RCW foraging habitat as defined in the USFWS Recovery Plan for the Red-cockaded Woodpecker (*Picoides borealis*): Second Revision (USFWS 2003).

3.2 Monitoring Methods

The Project Area was divided into 17 timber stands for monitoring and management purposes (Figures 8A and 8B) as described in the Fish & Wildlife Annual Monitoring, Habitat Survey, and Red-Cockaded Woodpecker Monitoring Report (PSI 2008). HSW digitized the 14 timber-stand boundaries from maps provided in the 2012 Fish and Wildlife Annual Monitoring Report (Tetra Tech 2013) and adjusted boundaries to exclude mitigation areas that have not yet been released from monitoring. Timber stand adjustments were made during the 2019 Monitoring Event to break up larger stands using fire break roads, rail lines, and wetlands to increase the timber stands from 14 to 17.

The 2023 monitoring was conducted at 120 sampling plots. A randomized selection was conducted to provide a more equitable distribution of plots per acreage within each timber stand relative to its overall acreage. Each sampling plot was located in the field using GPS and a photograph was taken. The center point of the plot was temporarily marked with a bright orange metal rod, and a 7-meter (23-foot) tape was tied to the rod to delineate the perimeter of the area sampled for herbaceous and shrub cover and tree density. Field teams consisted of two biologists.

Herbaceous and Shrub Covers

Herbaceous and shrub cover was measured based on the vegetative cover sampling methodology described as follows. Three herbaceous plots (1 m², each) and three shrub plots (4 m², each) were sampled at each of 120 sites.

Samples were collected within 1 and 4 square meter (m²) quadrats established at the ends of three 7-m (meter) long transects emanating from the center of a sampling plot following the Objective-Based Vegetation Management (OBVM) Program, Vegetation Monitoring Standard Operating Procedure (VMSOP) prepared by the Florida Natural Areas Inventory (FNAI) and Florida Fish and Wildlife Commission (FWC) (FNAI, FWC 2007).

Parameters related to herbaceous vegetation were sampled in the lower-left 1 m² quadrat (as viewed from center point in the diagram above) at the ends of the three transects. A list of herbaceous species occurring within the 1 m² quadrat were recorded at the Community Level. Percent covers were estimated and noted for all species, wiry graminoids, weedy herbaceous species, and exotic herbaceous species.

Parameters related to shrub-layer vegetation were sampled within each 4 m² quadrat at the ends of the three transects. A list of woody species occurring within the 4 m² quadrat was recorded only at the

Quadrat Detail

- Each 4 m^2 quadrat is composed of four $1 \text{ m} \times 1 \text{ m}$ quadrats.
- Quadrats are parallel to the reach.
- The reach bisects the 4 m^2 quadrat.

Tree Density

LLP tree density was determined for three age classes within each timber stand. Plot tree counts were totaled for each age class and stand, and the average stand tree density was calculated by dividing the total tree count by the total acres monitored within a stand (typically 0.4 acres).

3.3 Results

Trees, shrubs, and herbaceous vegetation were sampled in 120 plots. Tree counts measured within the plots are provided in Attachment H. Vegetative species and cover data collected are provided in Attachment I. Representative photographs of sampling plots within each timber stand are provided in Attachment J.

Timber Stand A

The LLP tree density, and vegetative cover in Timber Stand A were sampled in 3 plots, each with a radius of 23 ft (0.04 acre). A total of 0.12 ac was sampled (Table 3.1).

Table 3.1 Timber Stand A Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	3 (#18, 32, 46)			
Total Plot Area Surveyed	0.12 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	0	1	4	5
Average Density (trees/ac)	0	8.3	33.3	41.7
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	53	27	21	
N	9	9	9	
Max	90	65	55	
Min	25	0	0	
SD	7	7	7	
SEM	13	28	33	

Timber Stand B

The LLP tree density, and vegetative cover in Timber Stand B were sampled in 3 plots, each with a radius of 23 ft (0.04 acre). A total of 0.12 ac of was sampled (Table 3.2).

Table 3.2 Timber Stand B Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	3 (#11, 22, 29)			
Total Plot Area Surveyed	0.12 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	0	0	9	9
Average Density (trees/ac)	0	0	75.0	75.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	50	48	2	
N	9	9	9	
Max	75	72	0	
Min	28	25	0	
SD	14	15	4	
SEM	5	5	1	

Timber Stand C

Five plots were surveyed within Timber Stand C to characterize LLP tree density, and vegetative cover. Each plot had a radius of 23 ft or 0.04 ac (Table 3.3). The surveyed area totaled 0.20 acre.

Table 3.3 Timber Stand C Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	5 (#25,28,30,48,51)			
Total Plot Area Surveyed	0.20 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	0	0	6	6
Average Density (trees/ac)	0.0	0.0	30.0	30.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	44	54	2	
N	15	15	15	
Max	90	90	15	
Min	0	10	0	
SD	25	23	5	
SEM	7	6	1	

Timber Stand D

Eight circular plots with a 23-ft radius were surveyed within Timber Stand D to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.32 acres (Table 3.4).

Table 3.4 Timber Stand D Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	8 (#6,26,30,52,68,81,85)			
Total Plot Area Surveyed	0.32 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	3	1	18	22
Average Density (trees/ac)	9.4	3.1	56.3	68.8
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	49	50	1	
N	24	24	24	
Max	95	100	10	
Min	0	5	0	
SD	29	29	2	
SEM	6	6	1	

Timber Stand E

Timber Stand E was sampled using 6 plots with a radius of 23ft (0.04 acres) to characterize LLP tree density, and vegetative cover. The surveyed area totaled 0.24 acres (Table 3.5).

Table 3.5 Timber Stand E Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	6 (#7,15,24,33,37,65)			
Total Plot Area Surveyed	0.24 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	1	2	20	23
Average Density (trees/ac)	4.2	8.3	83.3	95.8
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	55	36	9	
N	18	18	18	
Max	95	70	35	
Min	20	5	0	
SD	22	20	10	
SEM	5	5	2	

Timber Stand F

Timber Stand F was sampled using 8 plots with a radius of 23ft (0.04 acres) to characterize LLP tree density, and vegetative cover. The surveyed area totaled 0.32 acres (Table 3.6).

Table 3.6 Timber Stand F Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	8 (#3,29,41,61,63,77,96,108)			
Total Plot Area Surveyed	0.32 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	42	10	12	64
Average Density (trees/ac)	131.3	31.3	37.5	200.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	37	27	36	
N	24	24	24	
Max	65	65	55	
Min	17	0	5	
SD	12	14	15	
SEM	3	3	3	

Timber Stand G

Eight plots were surveyed within Timber Stand G to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.32 acres (Table 3.7).

Table 3.7 Timber Stand G Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	8 (#13,16,26,53,55,82,99,102)			
Total Plot Area Surveyed	0.32 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	2	4	23	29
Average Density (trees/ac)	6.3	12.5	71.9	90.6
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	23	33	43	
N	24	24	24	
Max	65	75	90	
Min	0	0	0	
SD	18	20	32	
SEM	4	4	7	

Timber Stand H

Nine plots were surveyed from Timber Stand H to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.36 acres (Table 3.8).

Table 3.8 Timber Stand H Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	9 (#19,30,40,55,80,87,95,111,116)			
Total Plot Area Surveyed	0.36 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	15	56	12	83
Average Density (trees/ac)	41.7	155.6	33.3	230.6
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	40	60	0	
N	0	0	0	
Max	0	0	0	
Min	0	0	0	
SD	0	0	0	
SEM	25	70	5	

Timber Stand I

Twelve plots were surveyed from Timber Stand I to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.48 acres (Table 3.9).

Table 3.9 Timber Stand I Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	12 (#11,17,26,60,62,84,105,109,125,138,155)			
Total Plot Area Surveyed	0.48 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	17	4	27	48
Average Density (trees/ac)	35.4	8.3	56.3	100.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	25	17	57	
N	33	33	33	
Max	72	45	85	
Min	1	0	0	
SD	18	13	20	
SEM	3	2	4	

Timber Stand J

Nine plots were surveyed from Timber Stand J to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.36 acres (Table 3.10).

Table 3.10 Timber Stand J Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	9 (#6,15,31,35,68,69,79,91,106)			
Total Plot Area Surveyed	0.36 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	5	1	21	27
Average Density (trees/ac)	13.9	2.8	58.3	75.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	22	15	63	
N	27	27	27	
Max	65	42	85	
Min	5	5	20	
SD	19	10	23	
SEM	4	2	4	

Timber Stand K

Five plots were surveyed from Timber Stand K to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.20 acres (Table 3.11).

Table 3.11 Timber Stand K Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	5 (#6,21,43,54,65)			
Total Plot Area Surveyed	0.20 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	2	3	15	20
Average Density (trees/ac)	10.0	15.0	75.0	100.00
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	44	22	34	
N	15	15	15	
Max	95	63	60	
Min	2	0	0	
SD	25	21	22	
SEM	7	5	6	

Timber Stand L

Eleven plots were surveyed from Timber Stand L to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.44 acres (Table 3.12).

Table 3.12 Timber Stand L Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	11 (#8,13,21,27,30,35,46,71,81,90,104,127)			
Total Plot Area Surveyed	0.44 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	2	1	51	54
Average Density (trees/ac)	4.5	2.3	115.9	122.7
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	35	20	45	
N	36	36	36	
Max	90	54	85	
Min	5	0	0	
SD	21	13	20	
SEM	4	2	3	

Timber Stand M

Seven plots were surveyed from Timber Stand M to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.28 acres (Table 3.13).

Table 3.13 Timber Stand M Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	7 (#10,17,52,66,70,77,83)			
Total Plot Area Surveyed	0.28 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	2	0	24	26
Average Density (trees/ac)	7.1	0.0	85.7	92.9
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	40	28	32	
N	21	21	21	
Max	65	85	50	
Min	13	0	0	
SD	15	21	14	
SEM	3	5	3	

Timber Stand N

Five plots were surveyed from Timber Stand N to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.20 acres (Table 3.14).

Table 3.14 Timber Stand N Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	5 (#10,17,23,33,43)			
Total Plot Area Surveyed	0.20 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	2	0	12	14
Average Density (trees/ac)	10.0	0.0	60.0	70.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	48	48	4	
N	15	15	15	
Max	67	65	35	
Min	17	33	0	
SD	14	10	9	
SEM	4	3	2	

Timber Stand O

Four plots were surveyed from Timber Stand O to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.16 acres (Table 3.15).

Table 3.15 Timber Stand O Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	4 (#23,27,38,42)			
Total Plot Area Surveyed	0.16 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	0	1	1	2
Average Density (trees/ac)	0.0	6.3	6.3	12.50
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	46	50	5	
N	12	12	12	
Max	90	90	25	
Min	5	10	0	
SD	24	26	8	
SEM	7	8	2	

Timber Stand P

Nine plots were surveyed from Timber Stand P to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.36 acres (Table 3.16).

Table 3.16 Timber Stand P Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	9 (#6,16,28,43,60,68,85,89,114)			
Total Plot Area Surveyed	0.36 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	16	2	8	26
Average Density (trees/ac)	44.4	5.6	22.2	72.2
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	39	38	23	
N	27	27	27	
Max	80	70	90	
Min	3	0	0	
SD	20	15	23	
SEM	4	3	5	

Timber Stand Q

Eight plots were surveyed from Timber Stand Q to characterize LLP tree density, and vegetative cover. The total surveyed area was 0.32 acres (Table 3.17).

Table 3.17 Timber Stand Q Summary Data

Plot Characteristics				
Plot radius	23 ft			
Plot size	0.04 ac			
No. of Plots (and Plot ID's)	8 (#14,27,40,57,84,87,102,104)			
Total Plot Area Surveyed	0.32 ac			
Metric	Live Tree Density			
	Seedlings	Saplings	Mature	Total
No. of Trees Counted	10	4	2	16
Average Density (trees/ac)	31.3	12.5	6.3	50.0
Metric	Percent Herbaceous and Shrub Cover			
	Herbaceous	Shrub	Open	
Mean	36	27	38	
N	24	24	24	
Max	100	80	75	
Min	0	0	0	
SD	26	24	21	
SEM	5	5	4	

Timber Stand Density Trends

Due to differences in monitoring site locations and a patchy distribution of LLP, variation in the results from past studies is to be expected (Table 3.18).

Table 3.18 Recent Monitoring Year Timber Stand Tree Density Comparison

Timber Stand (New Designation)	Average Tree Density (trees/acre)								
	2014	2016	2017	2018	2019	2020	2021	2022	2023
A	120	68	92.5	196	92	100	142	33.3	41.7
B	250	60	75.0	50	0	17	66.7	25.0	75.0
C	170	88	69.4	42.9	15	75	115	55.0	30.0
D	170	85	145	100	138	231	68.8	238	68.8
E	200	83	188	133	196	188	221	75.0	95.8
F	--	--	--	--	91	372	331	163	200
G	--	--	--	--	134	116	125	244	90.6
H	--	--	--	--	192	181	197	231	231
I	140	35	158	100	179	179	108	171	100.0
J	120	53	115	80.0	161	350	172	133	75.0
K	200	123	245	250	120	470	120	65.0	100
L	--	--	--	--	120	120	170	171	123
M	--	--	--	--	89	57	71.4	64.3	92.9
N	--	--	--	--	125	80	90.0	75.0	70.0
O	--	--	--	--	88	19	75.0	144	12.5
P	--	--	--	--	136	42	58.3	69.4	72.2
Q	--	--	--	--	203	69	113	116	50.0
Min					0	17	58.3	25	12.5
Max					231	470	331	244	231
Average					129	157	132	122	90

The timber stands shown above without historical data were originally part of larger timber stand units in previous reports. Figure Table 3.19 indicates the changes made to the timber stands. Therefore, the historical information provided may not accurately reflect the area represented by the new timber stand designations.

In addition to the tree count-based density, the basal areas of each timber stand were calculated based on the DBH of each sampled tree. The basal area approximates the overall tree stand biomass and is used extensively in the USFWS RCW Recovery Plan as a reliable measure of overall success of the timber stands in providing RCW habitat. The basal areas of the timber stands range from 9.3 ft²/acre to 65.1 ft²/acre, with an average of 36 ft²/acre across the 17 timber stands.

Table 3.19 Calculated Basal Area of Timber Stands

Timber Stand	Σ Tree Area	Sampled Acreage	Basal Area
	ft ²	ac	ft ² /ac
A	5.9	0.12	49.0
B	7.8	0.12	64.6
C	13.0	0.20	65.1
D	12.8	0.32	40.0
E	11.6	0.24	48.3
F	6.8	0.32	21.3
G	9.6	0.32	30.1
H	8.8	0.36	24.3
I	12.8	0.48	26.6
J	12.5	0.36	34.7
K	5.5	0.20	27.6
L	23.9	0.44	54.3
M	11.8	0.28	42.2
N	5.7	0.20	28.5
O	2.4	0.16	14.7
P	11.3	0.36	31.3
Q	3.0	0.32	9.3
Total	165.1	4.80	612.1
Min	2.4	0.12	9.3
Max	23.9	0.48	65.1
Mean	9.7	0.28	36.0

The USFWS RCW Recovery Plan defines specific criteria for “Good Quality Foraging Habitat” regarding basal area and tree density (USFWS 2003). This information is listed below in Table 3.20. The six included criteria are evaluated within DBH sub-categories for small, medium, and larger size trees to determine the distribution of LLPs within the RCW habitat. The criteria met by 11 of 17 of the timber stands is the $BA < 40 \text{ ft}^2/\text{ac}$ for medium-sized trees (Table 3.20). For small trees ($DBH < 10 \text{ in.}$), the basal area criterion was also met by 11 timber stands, and only Timber Stands B and P met the small tree pine density criteria ($< 20 \text{ pines/acre}$). Those timber stands which were not in compliance with these categories may have a larger population of small trees. Individually, no timber stands met all six criteria, with Timber Stands C the only timber stand to meet 4 out of 6 of the LLP criteria. However, in looking at the collective site timber stands in total, the sampling results demonstrate that the stands are growing towards the USFWS defined “Good Quality Foraging Habitat”, i.e., the smaller tree ($< 10''$ DBH) are well above the density criteria and the mid-size ($10''$ - $14''$ DBH) and small trees are within the basal area criteria. The success of meeting the large tree criteria may be delayed for a number of years due to poor soil quality and the existence of a hardpan layer 2'-3' below ground surface (BGS).

An evaluation of the LLP timber stand areas immediately adjacent to each mitigation area should be conducted and compared to the on-site mitigation areas. These results can be discussed as they relate to the USFWS RCW Recovery Plan recommendations to determine the preferred site vegetation density

under the fire-maintained sere required for RCW habitat management, i.e., what are the RCW-optimum DBH classes for LLP on this particular site under a 2-year rotation burning program. If SEC soil conditions are unable to support the larger class DBH stocking levels, alternative basal area guidelines may be justified.

Table 3.20 USFWS Good Habitat Evaluation by Basal Area and Tree Density

	DBH Class	<10 in	≥14 in	< 10 in	10≤ DBH <14 in	≥10 in	≥14 in	Count
	USFWS Recomm.	< 20 pines/ac	>18 pines/ac	BA <10	BA <40	BA >40	BA ≥20	
Timber Stands	A	58.33	8.33	8.73	48.96	40.24	9.16	2
	B	16.67	8.33	8.20	64.60	56.40	10.23	3
	C	25.00	20.00	8.18	65.15	56.97	33.16	4
	D	28.13	9.38	9.42	39.99	30.57	11.92	2
	E	62.50	16.67	14.37	48.33	33.96	21.35	1
	F	50.00		8.45	21.27	12.81		2
	G	68.75	3.13	18.00	30.05	12.05	3.83	1
	H	169.44		9.12	24.34	15.23		2
	I	52.08	2.08	8.49	26.61	18.12	3.09	2
	J	36.11	2.78	8.37	34.72	26.34	3.23	2
	K	85.00		18.27	27.63	9.36		1
	L	90.91	4.55	29.95	54.31	24.37	6.28	0
	M	60.71	3.57	16.25	42.24	25.99	4.56	0
	N	35.00		11.97	28.49	16.52		1
	O	31.25	6.25	2.86	14.70	11.84	8.08	2
	P	13.89	5.56	2.33	31.33	29.00	7.38	3
	Q	34.38		5.10	9.33	4.23		2
	Count	2	1	11	11	3	2	

Note: Blank/dark cells indicate a lack of trees within the Timber Stand that meet the DBH class.

Timber Stand Surveyed Mature Living LLP Tree Heights

Loblolly pine counts within timber stands fluctuate from year to year due to the random selection of timber stand sampling locations each year within each stand. A decrease in the overall count of LLPs within the surveyed timber stands is observed from 2022-2023 for this reason (Table 3.21).

Table 3.21 Summary of Timber Stand Surveyed Mature Living LLP Tree Heights

Height Class	Height Range (ft)	2017 Mature Live LLP Count	2018 Mature Live LLP Count	2019 Mature Live LLP Count	2020 Mature Live LLP Count	2021 Mature Live LLP Count	2022 Mature Live LLP Count	2023 Mature Live LLP Count	2023 Percentage of Total (%)
1	≤30'	108	63	53	140	38	84	28	10.57%
2	>30-40'	174	132	139	155	84	119	92	34.72%
3	>40-50'	44	78	125	19	115	117	91	34.34%
4	>50-60'	1	0	81	1	60	45	47	17.74%
5	>60'	0	0	6	0	15	4	7	2.64%

Height Class	Height Range (ft)	2017 Mature Live LLP Count	2018 Mature Live LLP Count	2019 Mature Live LLP Count	2020 Mature Live LLP Count	2021 Mature Live LLP Count	2022 Mature Live LLP Count	2023 Mature Live LLP Count	2023 Percentage of Total (%)
Total	---	327	273	404	315	312	369	265	100.00%

3.4 Summary and Conclusions

The estimated tree densities within Timber Stands A through Q range between 12.5 and 231 trees per acre (Table 3.18). The overall average density determined from monitoring 120 plots is 90 trees/ac, and most mature LLP trees are between 30 and 50-feet high (Table 3.21). Given the active management within timber stand sites, it is expected that the natural recruitment success will increase. Although the basal area for mature trees is one of the criteria listed in the USFWS RCW Recovery Plan, the presence of 40% bunchgrass coverage is a more dominating requirement for optimum RCW habitat (USFWS 2003). An evaluation of the LLP timber stand areas immediately adjacent to each mitigation area should be conducted and compared to the on-site mitigation areas. These results can be discussed as they relate to the USFWS RCW Recovery Plan recommendations to determine the preferred site vegetation density under the fire-maintained sere required for RCW habitat management, i.e., what are the RCW-optimal DBH classes for LLP on this particular site under a 2-year rotation burning program.

Estimates of percent herbaceous ground cover by native species of herbaceous plants within the 17 timber stands range between 22 and 55 percent, with 40 percent overall average (Table 3.22). Some sample plots contained variable percentages of dense herbaceous and dense shrub vegetation. The 2023 monitoring results indicate that overall timber stand herbaceous coverage is meeting USFWS recommendations for percent coverage (>40 percent) by “native bunchgrasses and forbs” present within “good quality” RCW foraging habitat (USFWS 2003).

Table 3.22 Summary of Average Tree Stand Density and Ground Cover

Timber Stand Letter	No. of Sites	Density (trees/ac)	Herbaceous Cover (%)	Shrub Cover (%)	Open (%)
A	3	41.7	53	27	21
B	3	75.0	50	48	2
C	5	30.0	44	54	2
D	8	68.8	49	50	1
E	6	95.8	55	36	9
F	8	200	37	27	36
G	8	90.6	23	33	43
H	9	231	40	60	0
I	12	100.0	25	17	57
J	9	75.0	22	15	63
K	5	100	44	22	34
L	11	123	35	20	45
M	7	92.9	40	28	32
N	5	70.0	48	48	4
O	4	12.5	46	50	5
P	9	72.2	39	38	23
Q	8	50.0	36	27	38
Total	120	---	---	---	---
Minimum	3	12.5	22	15	0
Maximum	12	231	55	60	63
Average	7	90	40	35	24

4. REFERENCES

- DeLotelle and Guthrie. 2006. "The Curtis H. Stanton Energy Center, Red-Cockaded Woodpecker Habitat Management Plan."
- FNAI, FWC. 2007. "Objective-Based Vegetation Management (OBVM) Program. Vegetation Monitoring Standard Operating Procedure."
- PSI. 2008. "USFWS Annual Monitoring, Habitat Survey, and Red-cockaded Woodpecker Monitoring Report."
- Tetra Tech. 2013. "2012 Fish & Wildlife Annual Monitoring Report Curtis H. Stanton Energy Center."
- USFWS. 2003. "Recovery Plan for the Red-cockaded Woodpecker (*Picoides borealis*): Second Revision."

FIGURES



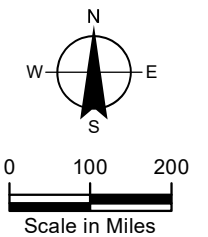
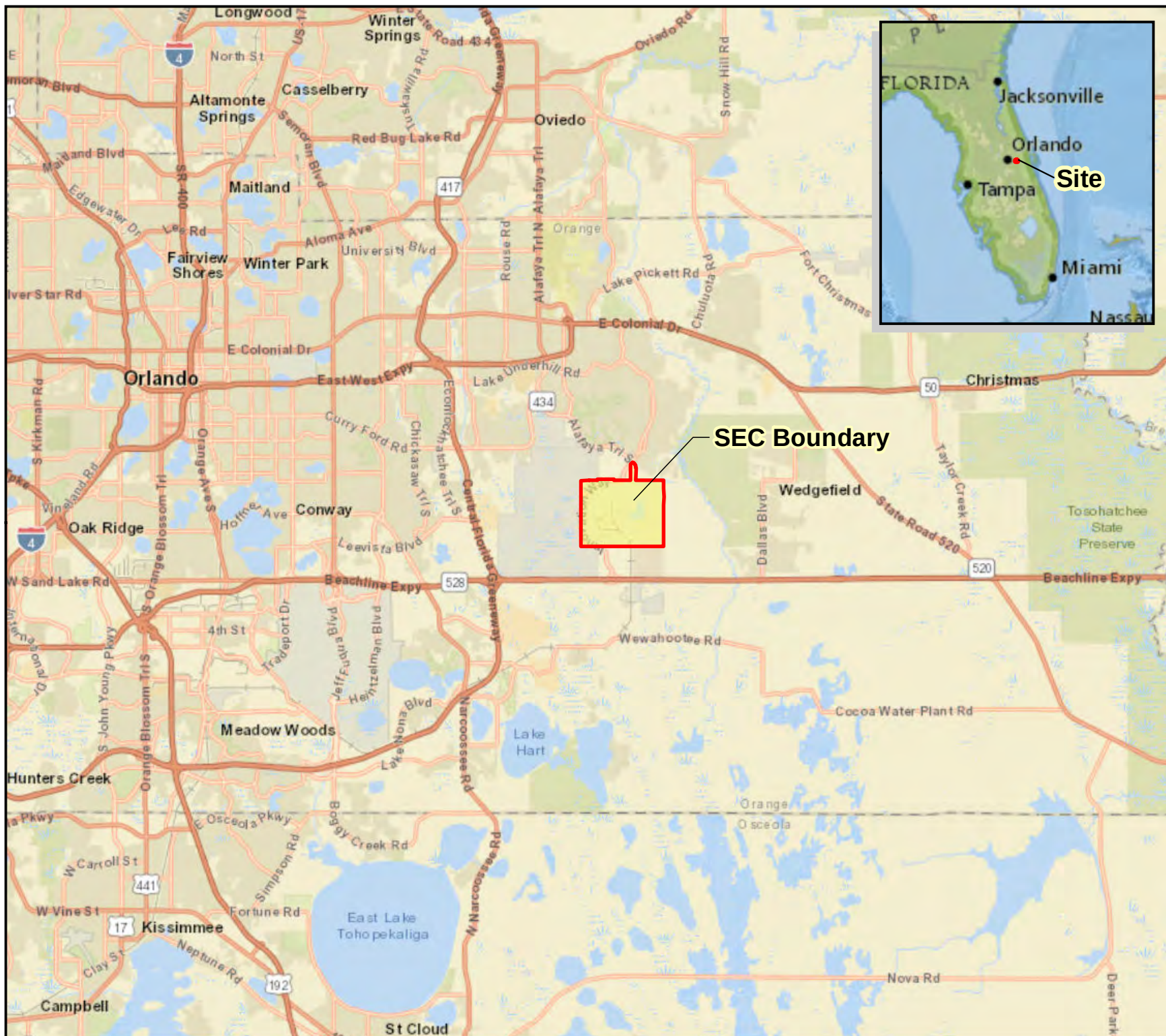


Figure 1
Site Location

Orlando Utilities Commission
The Curtis H Stanton
Energy Center
5100 South Alafaya Trail
Orlando, Florida

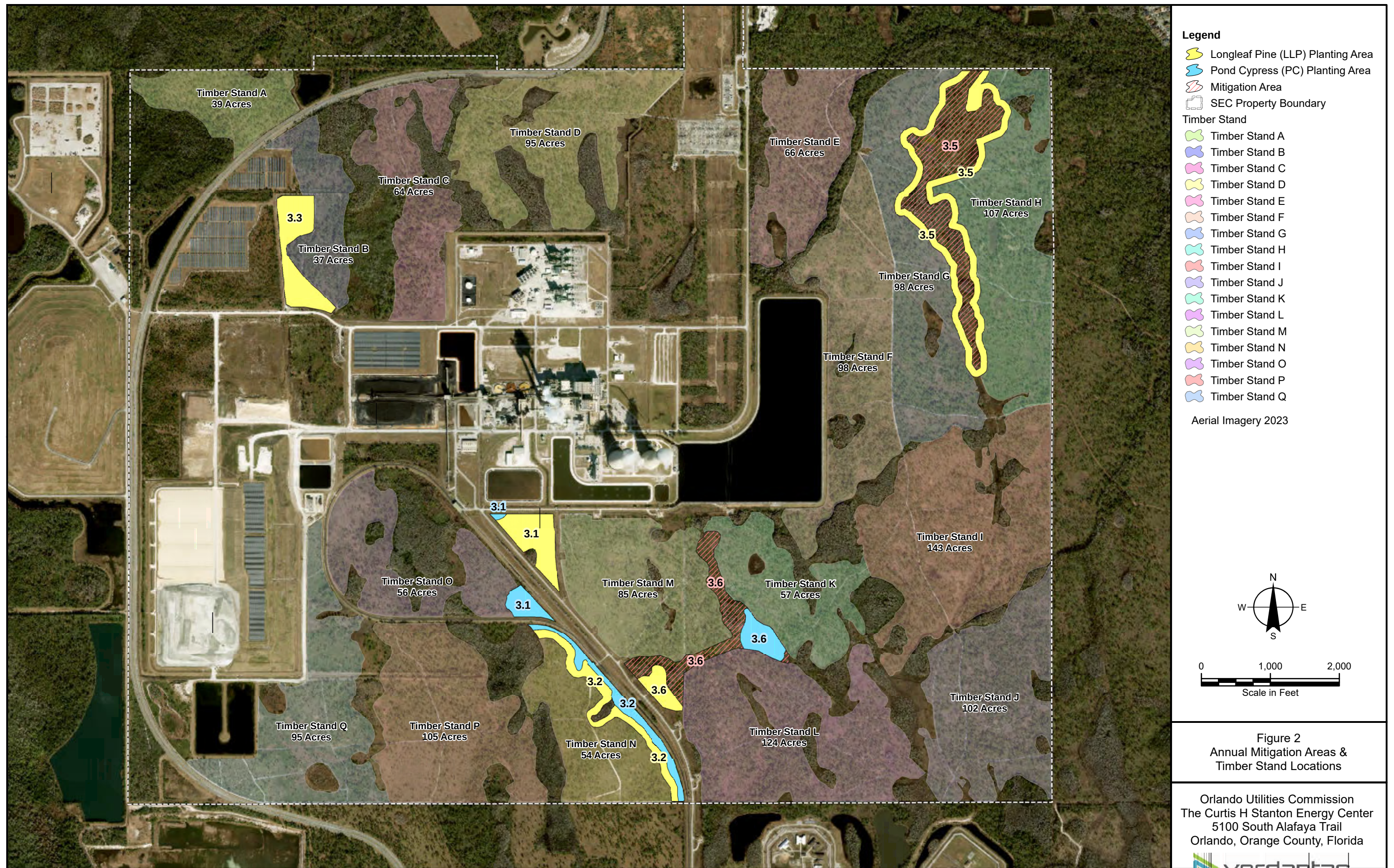


Figure 2
Annual Mitigation Areas &
Timber Stand Locations

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





- Legend**
- Longleaf Pine Planting Area
 - Pond Cypress Planting Area
 - 2023 Longleaf Pine Sampling Plot Location
 - 2018 - 2022 Longleaf Pine Sampling Plot Location

Aerial Imagery 2023

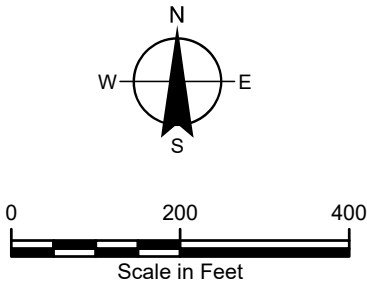
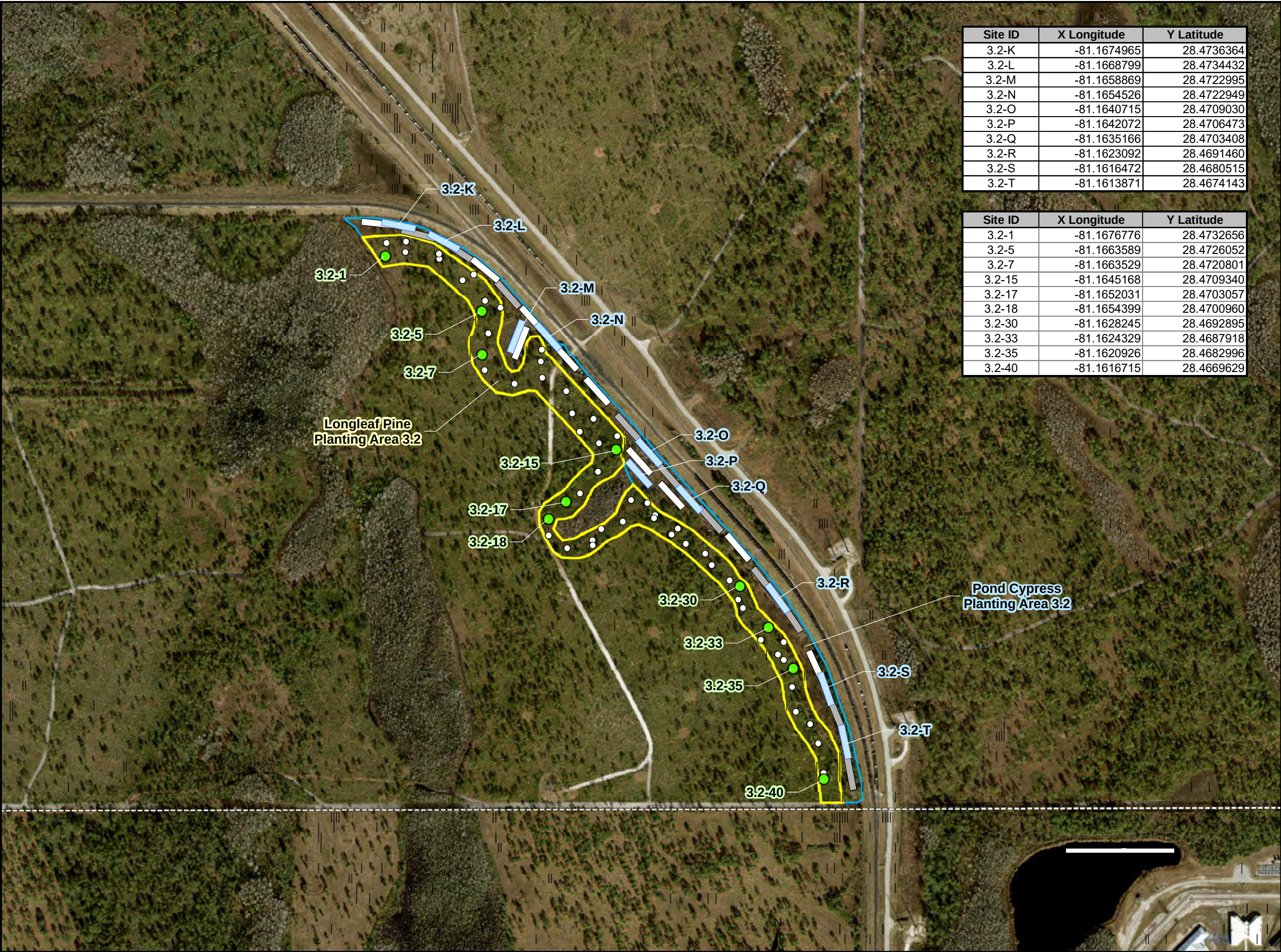


Figure 3
2023 Sample Plot Locations,
Mitigation Area 3.1

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





Site ID	X Longitude	Y Latitude
3.2-K	-81.1674965	28.4736364
3.2-L	-81.1668799	28.4734432
3.2-M	-81.1658869	28.4722995
3.2-N	-81.1654526	28.4722949
3.2-O	-81.1640715	28.4709030
3.2-P	-81.1642072	28.4706473
3.2-Q	-81.1635166	28.4703408
3.2-R	-81.1623092	28.4691460
3.2-S	-81.1616472	28.4680515
3.2-T	-81.1613871	28.4674143

Site ID	X Longitude	Y Latitude
3.2-1	-81.1676776	28.4732656
3.2-5	-81.1663589	28.4726052
3.2-7	-81.1663529	28.4720801
3.2-15	-81.1645168	28.4709340
3.2-17	-81.1652031	28.4703057
3.2-18	-81.1654399	28.4700960
3.2-30	-81.1628245	28.4692895
3.2-33	-81.1624329	28.4687918
3.2-35	-81.1620926	28.4682996
3.2-40	-81.1616715	28.4669629

Legend

- Longleaf Pine Planting Area
- Pond Cypress Planting Area
- 2023 Longleaf Pine Sampling Plot Location
- 2018 - 2022 Longleaf Pine Sampling Plot Location
- 2023 & 2020 Pond Cypress Sampling Plot Location
- 2022 & 2019 Pond Cypress Sampling Plot Location
- 2021 & 2018 Pond Cypress Sampling Plot Location
- SEC Property Boundary

Aerial Imagery 2023

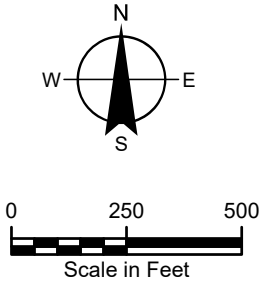
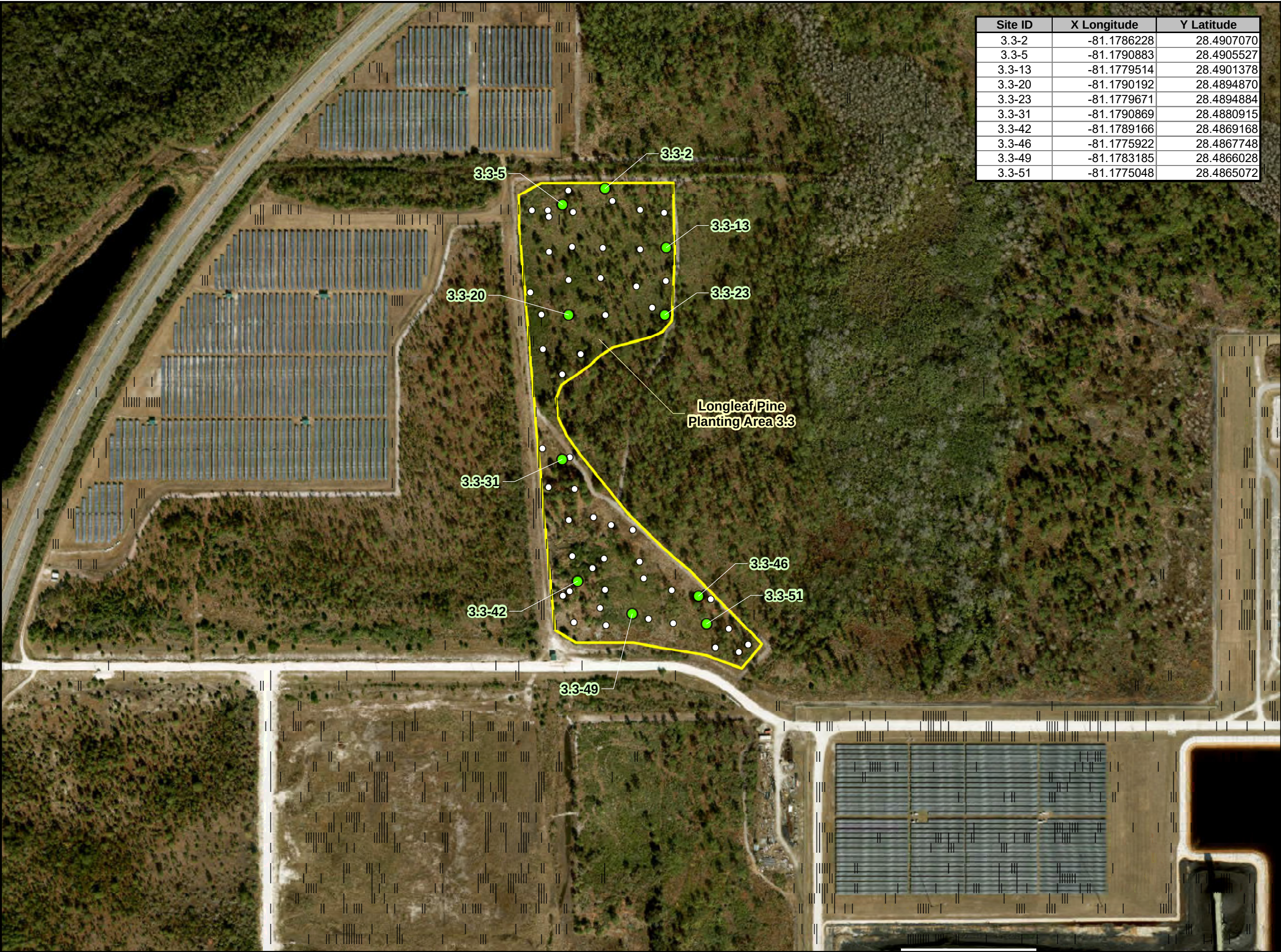


Figure 4
2023 Sample Plot Locations,
Mitigation Area 3.2

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





Site ID	X Longitude	Y Latitude
3.3-2	-81.1786228	28.4907070
3.3-5	-81.1790883	28.4905527
3.3-13	-81.1779514	28.4901378
3.3-20	-81.1790192	28.4894870
3.3-23	-81.1779671	28.4894884
3.3-31	-81.1790869	28.4880915
3.3-42	-81.1789166	28.4869168
3.3-46	-81.1775922	28.4867748
3.3-49	-81.1783185	28.4866028
3.3-51	-81.1775048	28.4865072

- Legend**
- Longleaf Pine Planting Area
 - 2023 Longleaf Pine Sampling Plot Location
 - 2018 - 2022 Longleaf Pine Sampling Plot Location

Aerial Imagery 2023

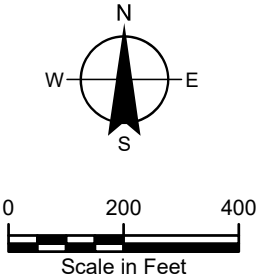
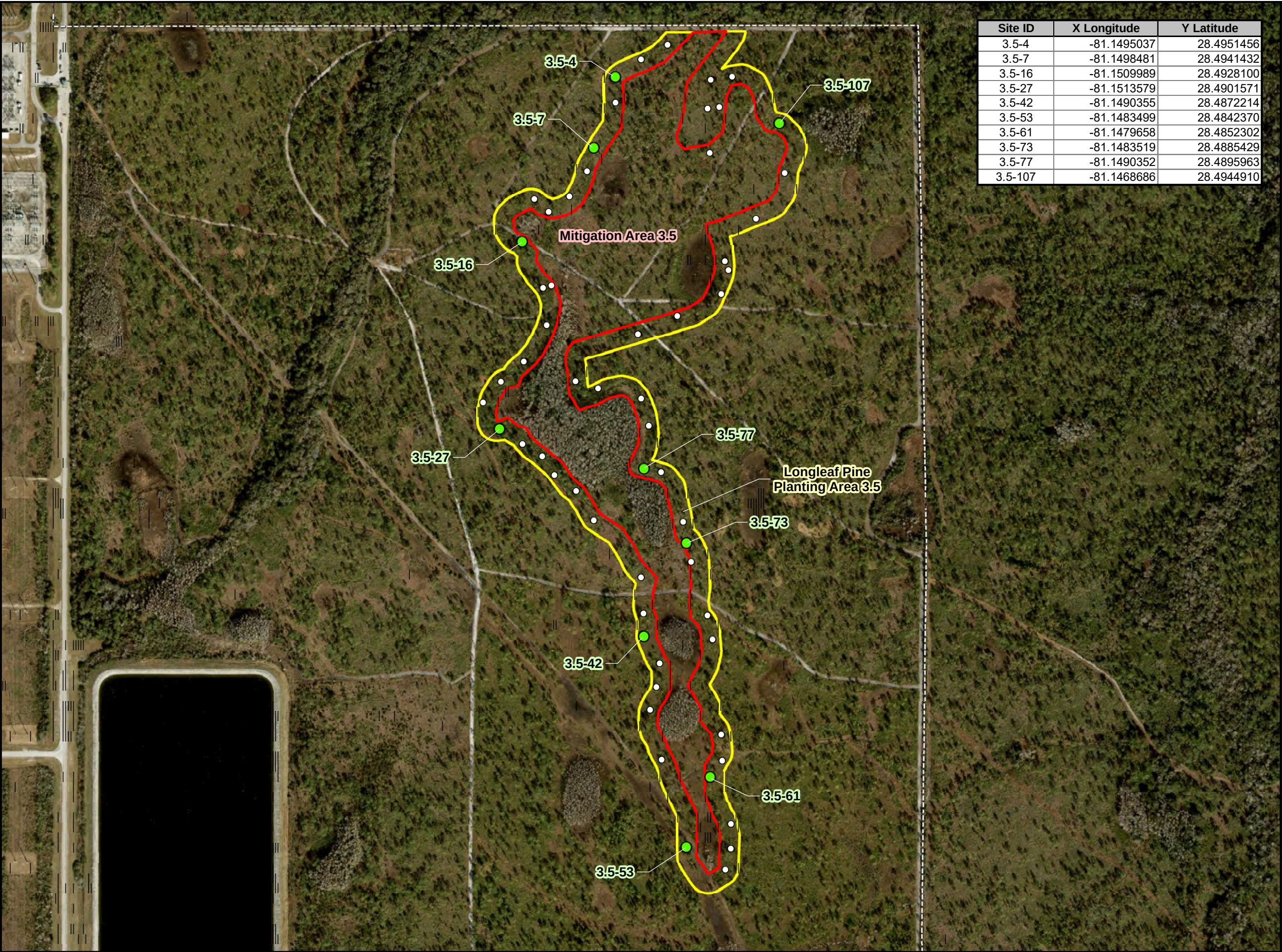


Figure 5
2023 Sample Plot Locations,
Mitigation Area 3.3

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





Site ID	X Longitude	Y Latitude
3.5-4	-81.1495037	28.4951456
3.5-7	-81.1498481	28.4941432
3.5-16	-81.1509989	28.4928100
3.5-27	-81.1513579	28.4901571
3.5-42	-81.1490355	28.4872214
3.5-53	-81.1483499	28.4842370
3.5-61	-81.1479658	28.4852302
3.5-73	-81.1483519	28.4885429
3.5-77	-81.1490352	28.4895963
3.5-107	-81.1468686	28.4944910

- Legend**
- Longleaf Pine Planting Area
 - Mitigation Area
 - 2023 Longleaf Pine Sampling Plot Location
 - 2018 - 2022 Longleaf Pine Sampling Plot Location
 - SEC Property Boundary

Aerial Imagery 2023

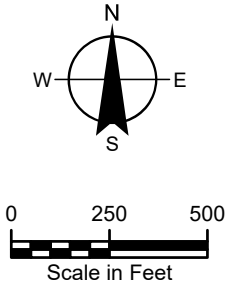
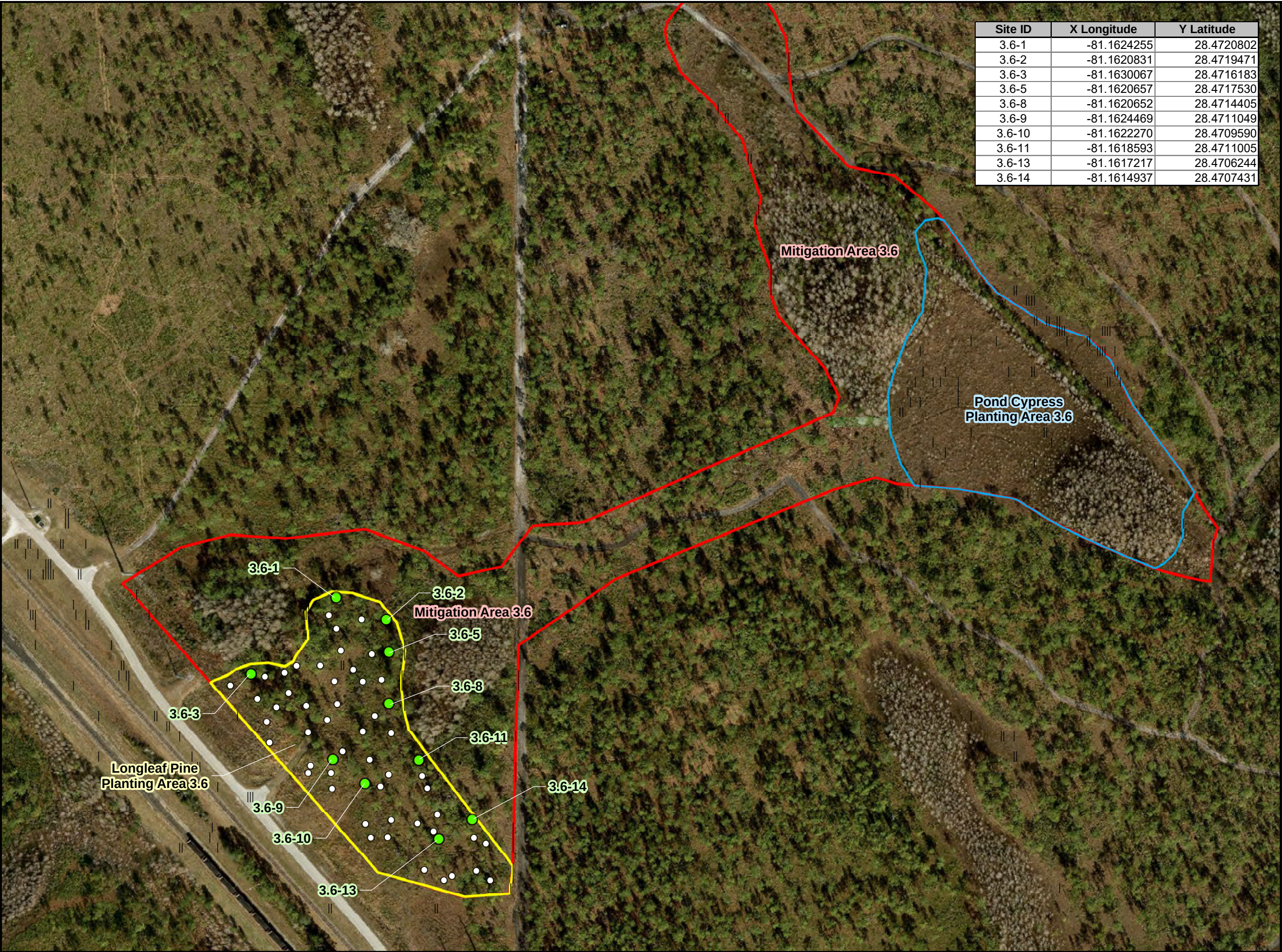


Figure 6
2023 Sample Plot Locations,
Mitigation Area 3.5

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





Legend

- Longleaf Pine Planting Area
- Pond Cypress Planting Area
- Mitigation Area
- 2023 Longleaf Pine Sampling Plot Location
- 2018 - 2022 Longleaf Pine Sampling Plot Location

Aerial Imagery 2023

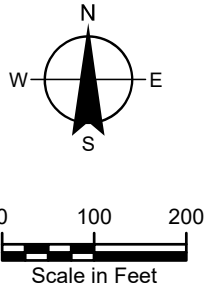
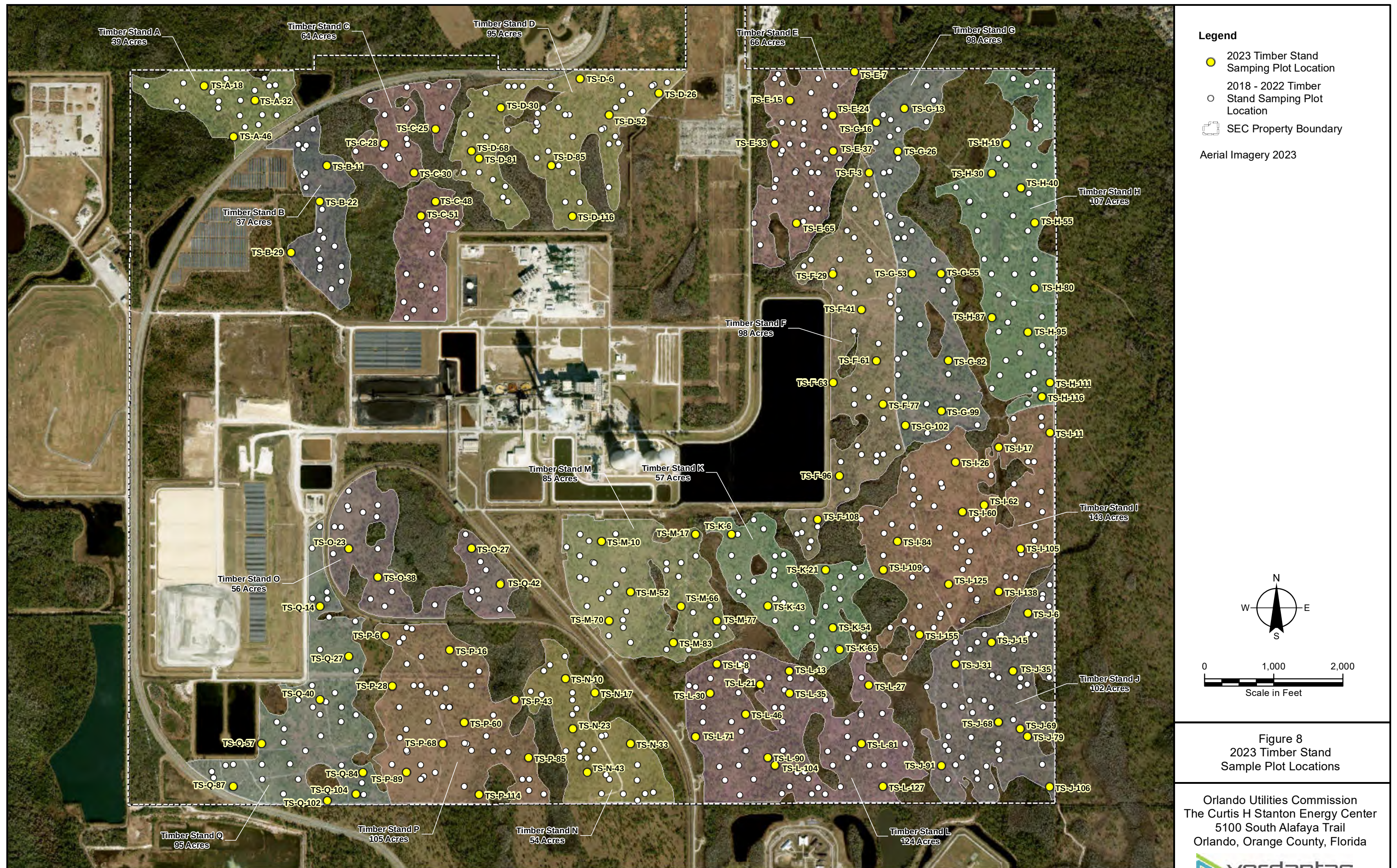


Figure 7
2023 Sample Plot Locations,
Mitigation Area 3.6

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





ATTACHMENT A
JAMMP SPECIFICATIONS FOR ANNUAL MONITORING AND
MITIGATION SUCCESS CRITERIA



ATTACHMENT A

**SPECIFICATIONS FOR ANNUAL MONITORING OF THE MITIGATION AREAS AT STANTON ENERGY CENTER
AND SPECIFICATIONS APPENDIXES A, B, C, AND G**

SPECIFICATIONS FOR ANNUAL MONITORING OF THE MITIGATION AREAS AT THE STANTON ENERGY CENTER

This report fulfills the annual monitoring requirements for both the SEC mitigation (*JAMMP Success Criteria for Wetland and Upland Mitigation Sites*) and the RCW habitat analysis (*Fish and Wildlife Annual Monitoring Report*).

Historical Background

In December 1991, under the Florida Electric Power Plant Siting Act, the Orlando Utilities Commission (OUC) received approval for the Supplemental Site Certification Application on the Unit II addition to the Curtis H. Stanton Energy Center (SEC). SEC II is located on previously disturbed land immediately north of SEC Unit I. Associated with Unit II are the construction of a 14-mile, 230 kV transmission line and a one-mile, alternate site access road; both of which were constructed in the OUC railroad corridor. As compensation for the unavoidable impacts of the transmission line and access road construction, the Conditions of Certification required individual mitigation plans to be presented by OUC and its consultants to the state regulatory agencies that have jurisdiction over wetlands: the Florida Department of Environmental Protection (FDEP), St. Johns River Water Management District (SJRWMD) and South Florida Water Management District (SFWMD). The individual mitigation plans were approved by FDEP and SJRWMD in September 1991 and by SFWMD in December 1991. Following approval of the individual mitigation plans, a Joint Agency Mitigation and Monitoring Plan (JAMMP) was prepared to combine the individual mitigation plans into a single document (Black & Veatch, Inc., 1992). Conditional approval of the JAMMP was received through the FDEP on June 9, 1993. The JAMMP requires yearly monitoring of the mitigation areas until the success criteria for all of the mitigation units is achieved. A baseline report was submitted to the agencies in the JAMMP and approved with it on June 9, 1993 with annual reports thereafter. In July, 2008 the SEC Conditions of Certification (COC) were revised and the July, 2005 Habitat Management Plan (RCW-HMP) for the on-site RCWs was incorporated. One of the requirements of the RCW-HMP is the submittal of an annual Fish and Wildlife Monitoring Report for the life of the facility. These reports have been combined and submitted on a yearly basis since 2006.

Mitigation Areas

A total of seven mitigation areas were established and detailed in the JAMMP; they are numbered consecutively from 3.1 to 3.7. Site specific maps are in Appendix A and tables outlining the planting specifications and

the success criteria for these areas are presented in Appendices B and C, respectively. Mitigation areas 3.4 and 3.7 have been released from further monitoring through negotiation and attainment of the success criteria, respectively. The cypress plantings in the southern pine area for area 3.1, the north and south slash pine plantings in area 3.2, and the cypress dome and wetland requirements for areas 3.5 and 3.6 have all achieved the success criteria and were released from further monitoring (see attach September 21st, 2004 FDEP letter).

Contractor Requirements & Submittals

This report fulfills the annual monitoring requirements for both the SEC mitigation and the RCW habitat. The contractor will comply with the following requirements:

Sampling Plan

The contractor will submit a sampling plan to the OUC engineer for review and written approval prior to the start of any work for the sampling of the designated mitigation areas as necessary to determine if the units are meeting the success criteria as indicated in the *JAMMP Success Criteria for Wetland and Upland Mitigation Sites*.

The contractor will submit a sampling plan to the OUC engineer for review and written approval prior to the start of any work for the sampling of all designated mitigation areas and the 12 previously delineated timber stands to determine trends in habitat composition. The sampling will quantify trends in the following on a yearly basis: 1) longleaf pine seedling regeneration, 2) longleaf pine sapling density, and 3) shrub density and Longleaf Pine basal area trends on a five-year basis. The timber classifications will be the same as those used in the latest version of the *USFWS Red-Cockaded Woodpecker Recovery Plan*.

Permanent Photographic Plots

Permanent photographic plots were established in September and October of 1992. A panoramic view from these locations was taken at that time for baseline information. In June, September, and December of 1993, another set of color panoramic photographs were taken from these established photograph plots. Annual, panoramic photographs have been taken from these same plots to determine the effect of the mitigation plan. A table in Appendix G provides the coordinate locations of the permanent photographic plots. The contractor will not take photographs for the mitigation areas that

have been released from further monitoring.

Aerial Photography

The aerial photography shall be flown with a low distortion precision aerial mapping camera and the aerial photography shall be adequate for production of the required high quality photographs suitable for vegetative interpretation. The aerial photography shall be flown in January and the photographs shall be delivered to the OUC engineer on or before January 31st. The contractor will provide the following aerial photographs:

1. An aerial photograph of the overall OUC property at the Stanton Energy Center
2. The following photographs shall be delivered to the OUC engineer for the mitigation areas that have not been released from further monitoring:
 - a. One color aerial photographic print of the mitigation site areas (scale 1" = 300').
 - b. One color aerial infrared photographic print of the mitigation site area (scale 1" = 300').
 - c. The contractor will incorporate a reduced-scale (1" = 2000') copy of these photographs in the final report and will provide an electronic version of the photographs in tiff on a flash-drive to the OUC engineer.

Data Analysis

The contractor will analyze the data with respect to the FDEP success requirements for the mitigation areas and determine if the designated mitigation units are meeting the JAMMP requirements necessary for the release of mitigation monitoring. The contractor will make an evaluation of the success or failure of each mitigation area in comparison to the success criteria listed in Appendix C.

The contractor will prepare a trend analysis for the mitigation areas and the previously delineated 12 timber stands to determine future suitability of the various areas habitat for RCW usage and the impact of burning and chopping on the habitat. The contractor may offer methodology for data analyses that differ from the plan presented in this contract; however, it must be offered in a timely manner and approved in writing by the OUC engineer prior to award of the purchase or work order. The data will be analyzed with reference to the USFWS RCW Recovery Plan and will include summarization

of the vegetative cover classes, measured progress towards the RCW habitat preferences as detailed in the USFWS RCW Recovery Plan, seedling and sapling analyses, and a description and map detailing the history of the land management and prescribed burn activities.

The contractor will arrange two meetings to discuss the data analysis with the OUC engineer: one prior to the sampling plan submittal to review the proposed data collection and analysis methodology and the second to review the initial draft report.

Appendices

The following reports will be included as additional appendices: Annual RCW Population Status Report, Five-year Summary Report for RCWs at the SEC site, Annual Saw Palmetto and Exotic Plant Report, JAMMP Success Criteria, and the September 21st, 2004 FDEP letter releasing some of the mitigation areas from further monitoring.

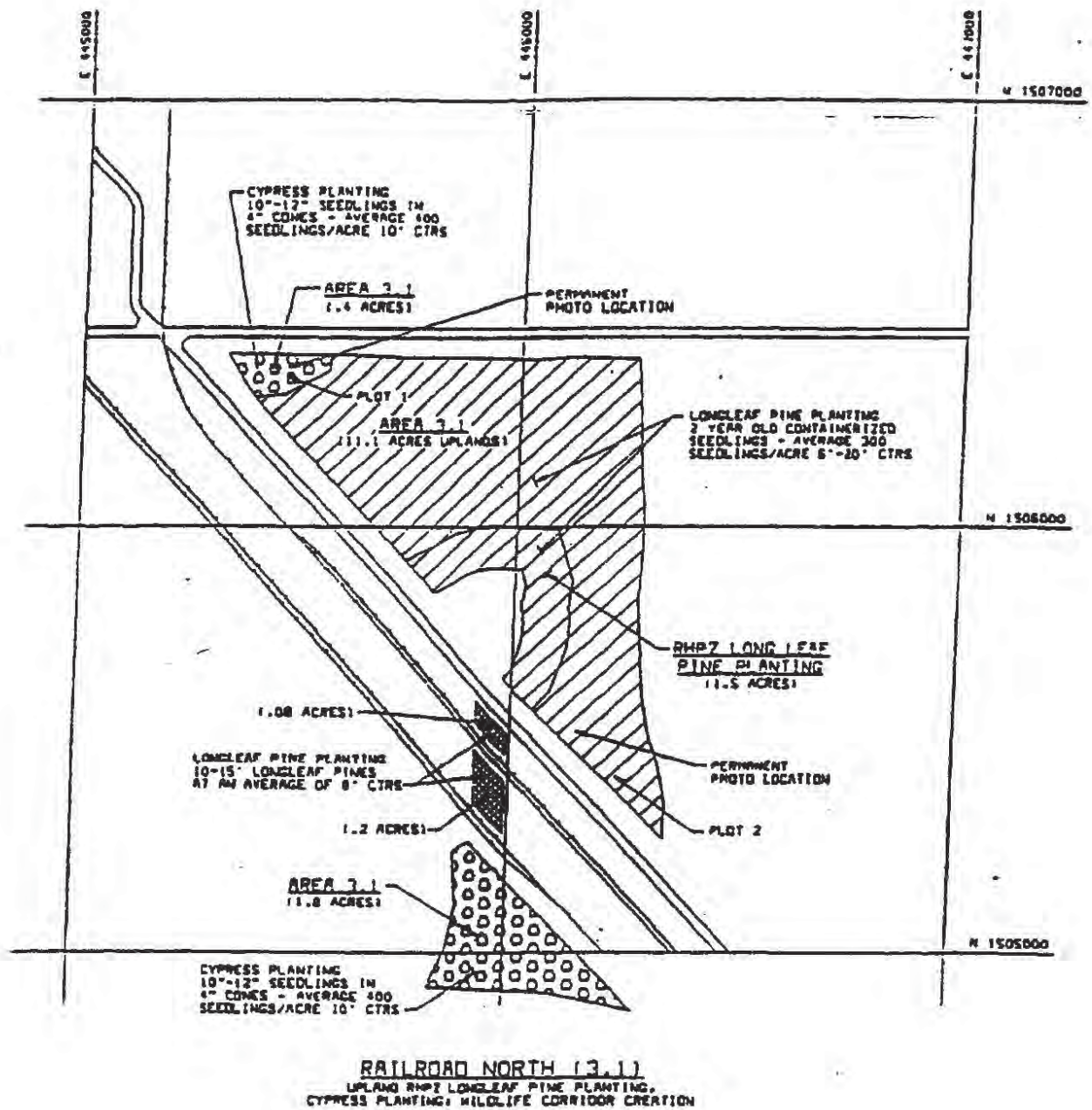
Report Requirements

The contractor will prepare a final report including the following components:

1. Executive summary
2. Introduction
3. Sampling Methods
4. Results
5. Data Analyses
6. Conclusions
7. Appendices

APPENDIX A

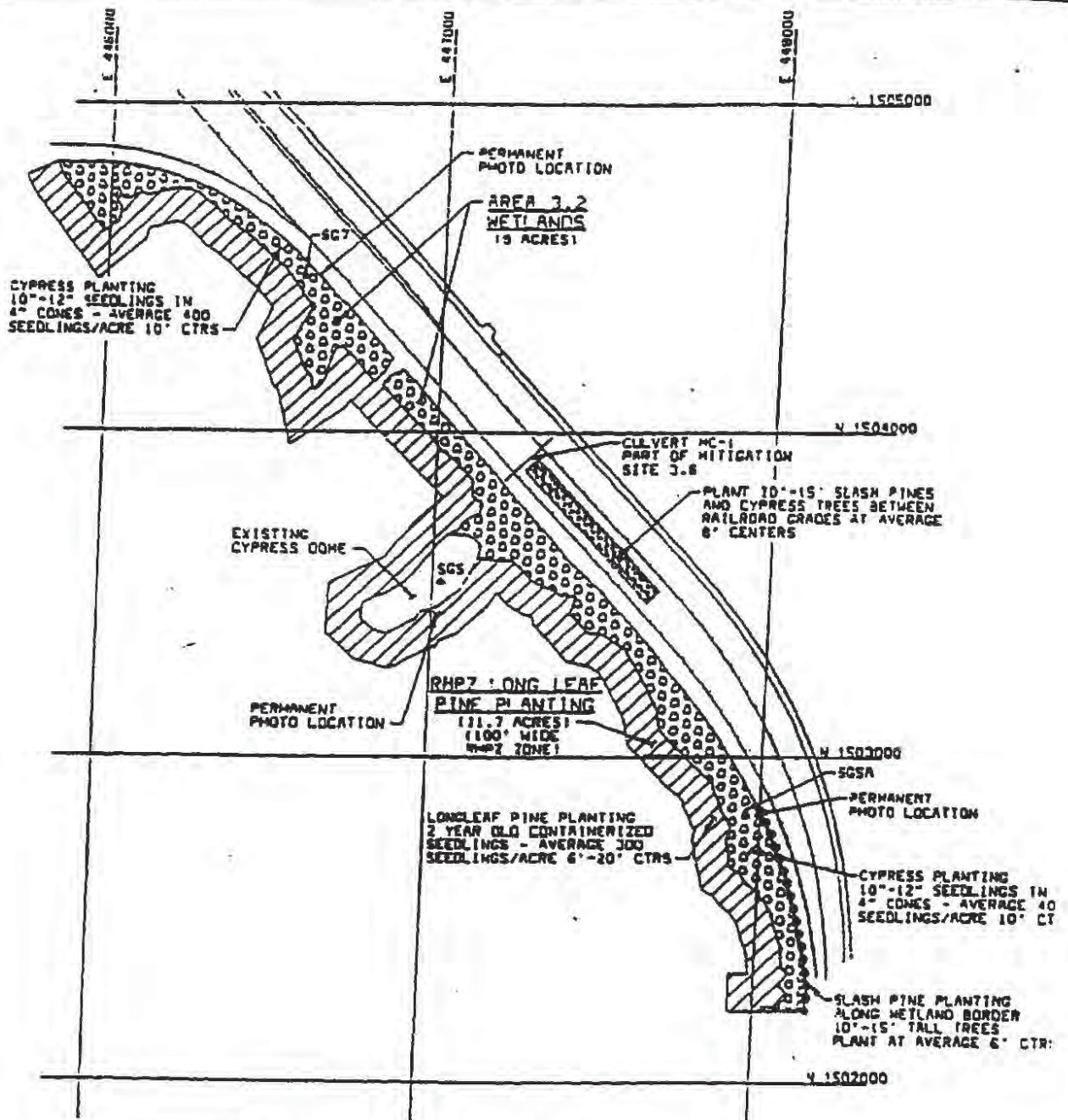
SITE SPECIFIC MAPS



ENGINEER		DRAWN		1	03-31-93	REVISED PER FDER COMMENTS				
CHECKED		DATE		0	02-22-93	INITIAL ISSUE				
				NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FL
ORLANDO UTILITIES COMMISSION STANTON ENERGY CENTER - UNIT 2							PROJECT		DRAWING NUMBER	
									1	
SITWORK - MITIGATION AREA 3.1							CODE			
							AREA			

12825RUMP
1015L002 A2 1=400
13/29/93 15:41:43

ACAD 10 c10a

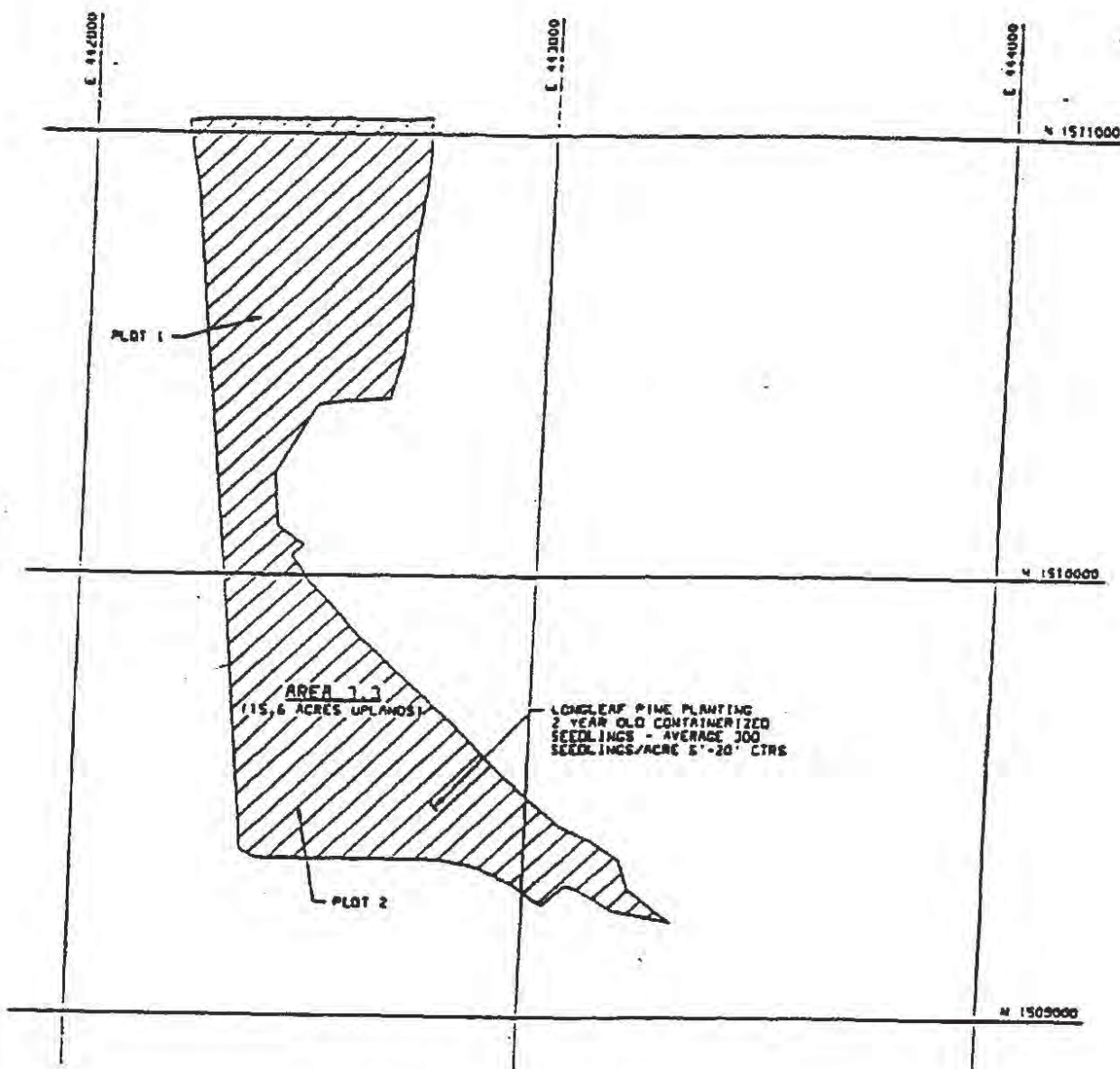


RAILROAD SOUTH (AREA 3.2)
 CYPRESS AND SLASH PINE PLANTING, HYDROLOGIC ENHANCEMENT,
 RHPZ LONG LEAF PINE PLANTING, SJRWMD MITIGATION SITE



ENGINEER		DRAWN		1 03-31-93		REVISED PER FDER COMMENTS					
CHECKED		DATE		0 02-22-93		INITIAL ISSUE					
NO		DATE		REVISIONS AND RECORD OF ISSUE		BY		CHK	APP	FL	
ORLANDO UTILITIES COMMISSION STANTON ENERGY CENTER - UNIT 2								PROJECT		DRAWING NUMBER	
SITEWORK - MITIGATION AREA 3.2								CODE		REVISION	
								AREA		1	

325RUMP ACAD 10 c10a
 15L002 A2 1=500
 /29/93 15:42:56

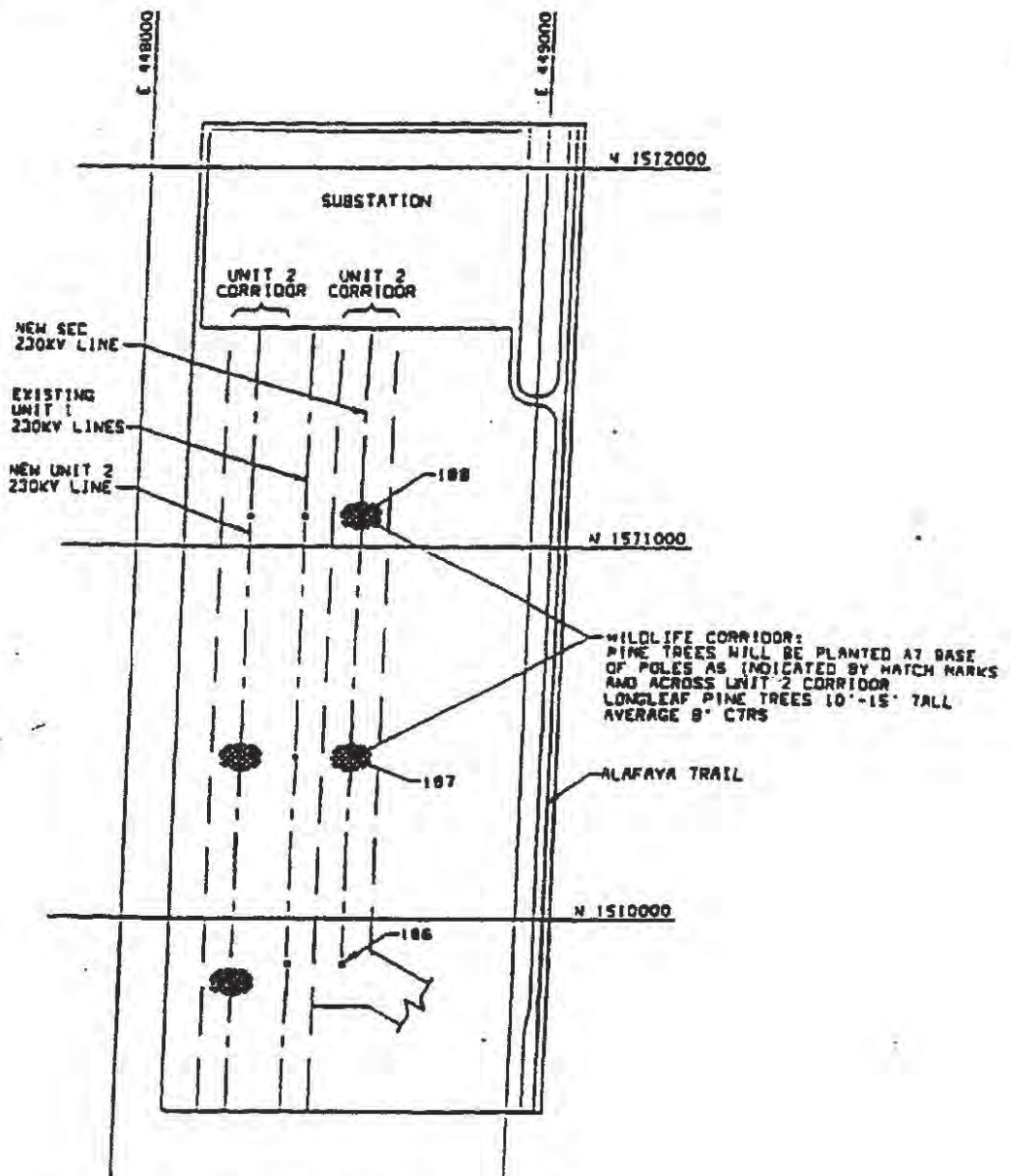


RCW WEST (AREA 3.3)
LONG LEAF PINE PLANTING



26...JMF ACW 10 Lind
015L002 A2 1=400
13/29/93 15:44:26

ENGINEER		DRAWN		JWS		1		03-31-93		REVISED PER FOER COMMENTS					
CHECKED		DATE				0		02-22-93		INITIAL ISSUE					
NO		DATE		REVISIONS AND RECORD OF ISSUE		BY		CHK		APP		FL			
ORLANDO UTILITIES COMMISSION STANTON ENERGY CENTER - UNIT 2										PROJECT		DRAWING NUMBER		REV	
SITework - MITIGATION AREA 3.3										CODE					
										AREA					
														1	

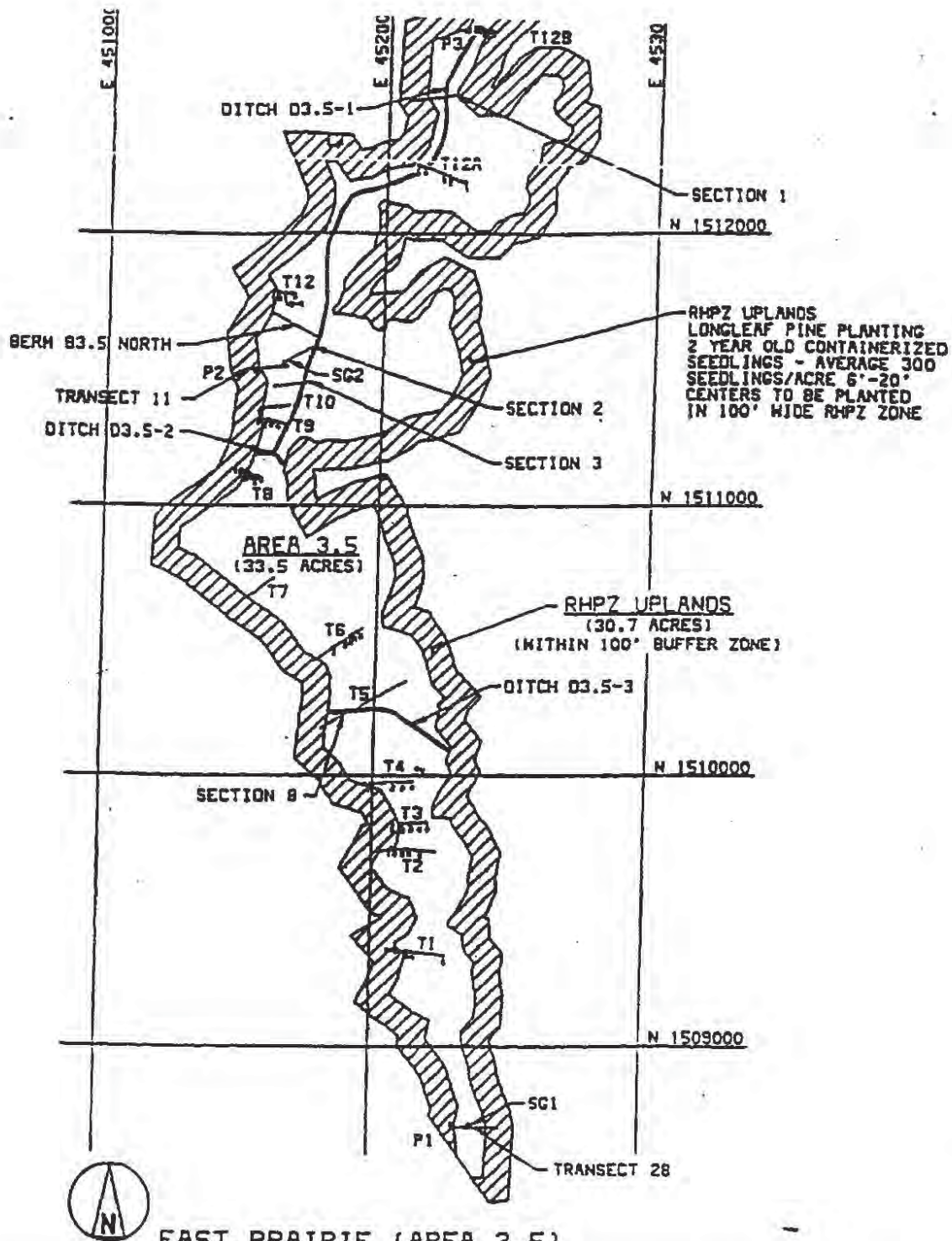


TRANSMISSION LINE NORTH (AREA 3.4)



2825RUMP
DISL002 A2 1=500
3/29/93 15:46:30

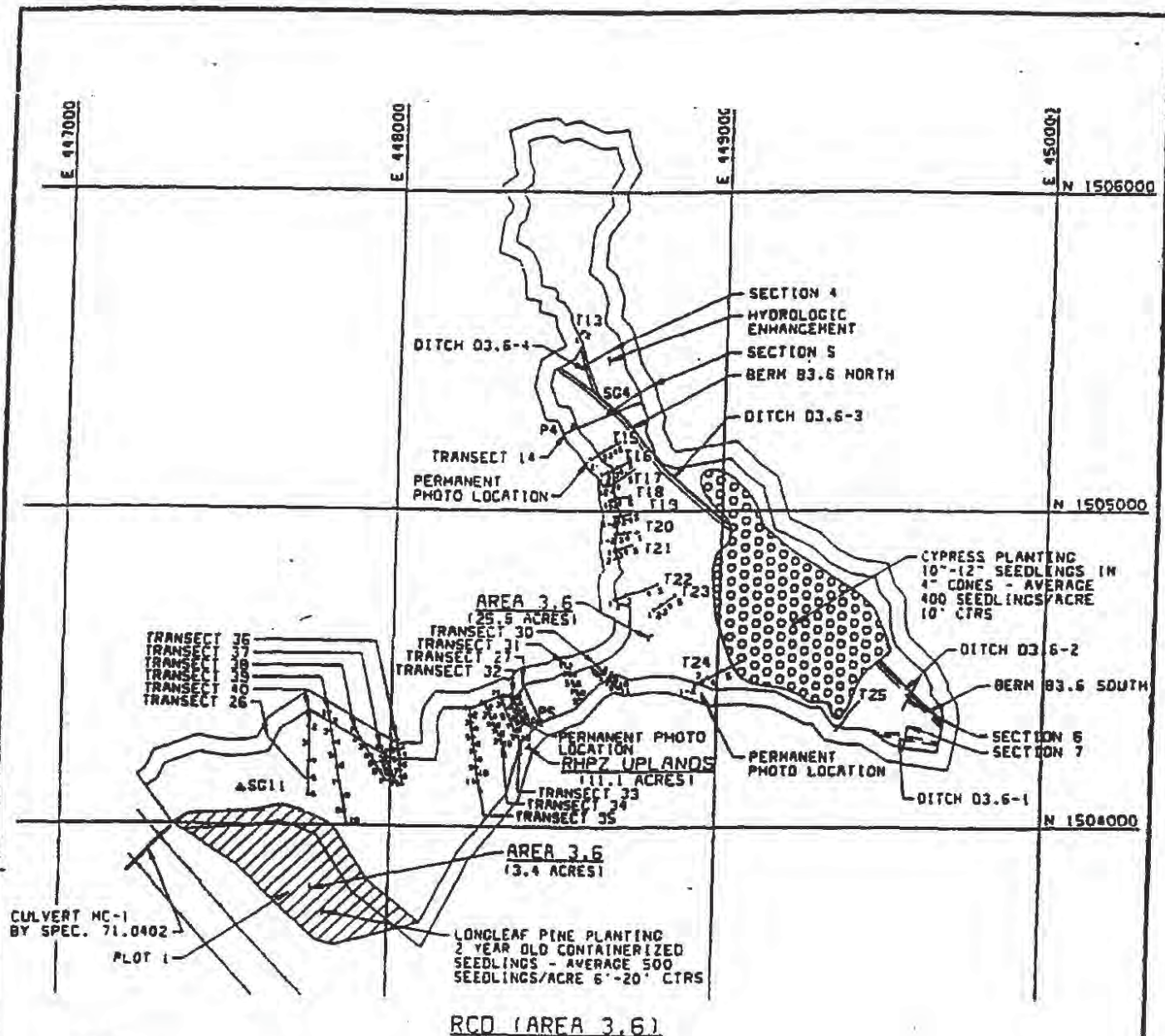
ENGINEER		DRAWN		JWS		1 03-31-93		REVISED PER FOER COMMENTS						
CHECKED		DATE				0 02-22-93		INITIAL ISSUE						
						NO		DATE		REVISIONS AND RECORD OF ISSUE		BY	CHK APP FL	
ORLANDO UTILITIES COMMISSION STANTON ENERGY CENTER - UNIT 2										PROJECT		DRAWING NUMBER		RE
														1
SITWORK - MITIGATION										CODE				
AREA 3.4										AREA				



EAST PRAIRIE (AREA 3.5)
WETLAND HYDROLOGIC ENHANCEMENT

ENGINEER		DRAWN		2 05-14-93		REVISED PER FOER COMMENTS									
CHECKED		DATE		1 04-05-93		REVISED PER FOER COMMENTS									
				0 02-22-93		INITIAL ISSUE									
NO				DATE				REVISIONS AND RECORD OF ISSUE				BY	CHK	APP	FL
ORLANDO UTILITIES COMMISSION STANTON ENERGY CENTER - UNIT 2								PROJECT		DRAWING NUMBER		REV			
												2			
SITWORK - MITIGATION AREA 3.5								CODE							
								AREA							

035805AILOR ACAD 10 c108
R01SL002 A2 1=600
04/06/93 09:22:33



NOTES:

ALL DITCHES SHOWN TO BE FILLED; ALL BERMS SHOWN TO BE REMOVED.



5	07-28-93	REVISED PER FDER COMMENTS				
4	05-11-93	REVISED PER FDER COMMENTS				
3	05-21-93	REVISED PER FDER COMMENTS				
2	05-14-93	REVISED PER FDER COMMENTS				
1	04-05-93	REVISED PER FDER COMMENTS				
0	02-22-93	INITIAL ISSUE				
NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM

ENGINEER _____ DRAWN _____
CHECKED _____ DATE _____

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER - UNIT 2

PROJECT _____ DRAWING NUMBER _____

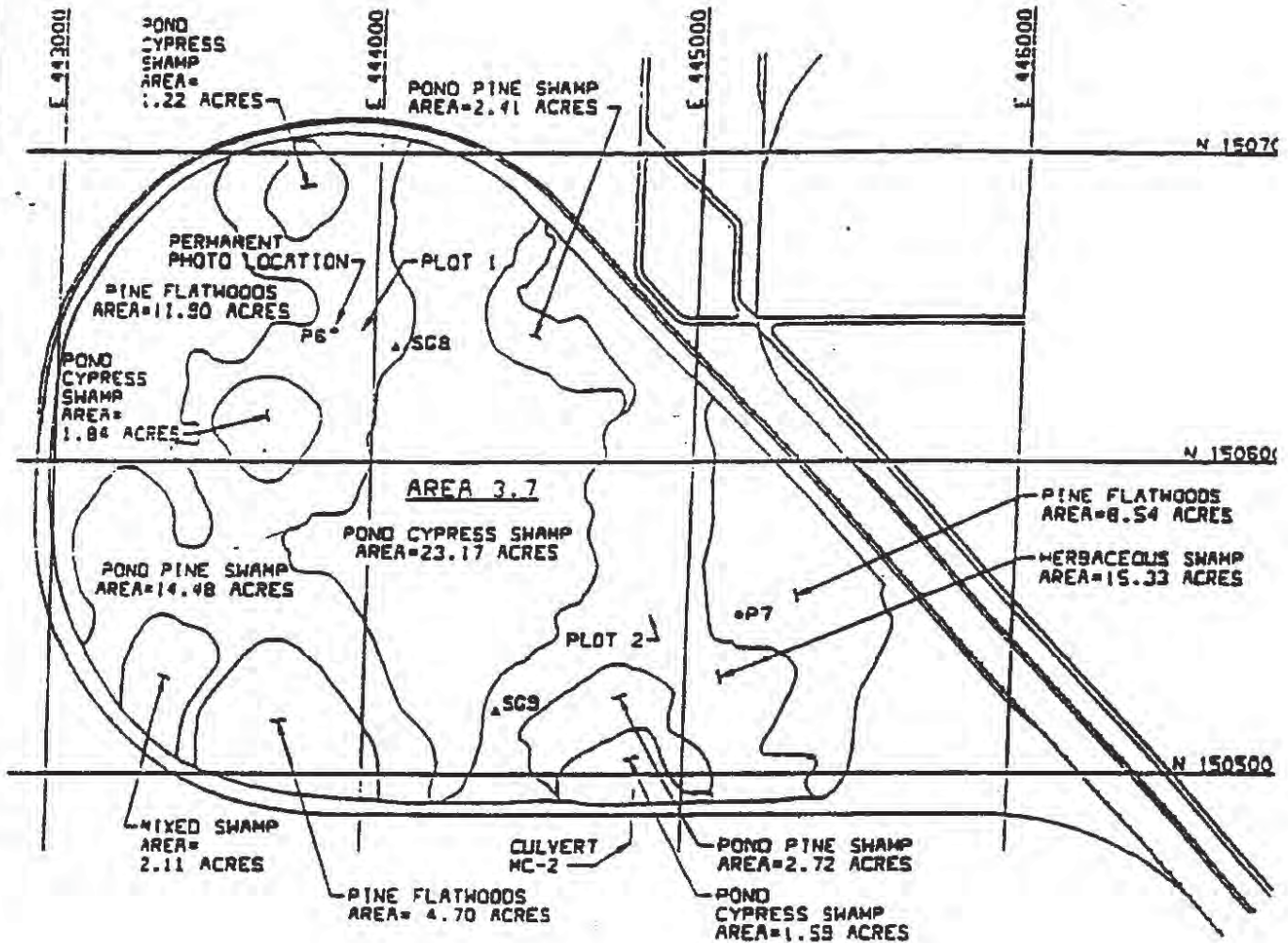
REV
5

SITWORK - MITIGATION

CODE _____

AREA _____

ISL002 A2 I=500
27-93 3:27 P



RAILROAD LOOP (AREA 3.7)

(HYDROLOGIC ENHANCEMENT)
SFHNO MITIGATION AREA



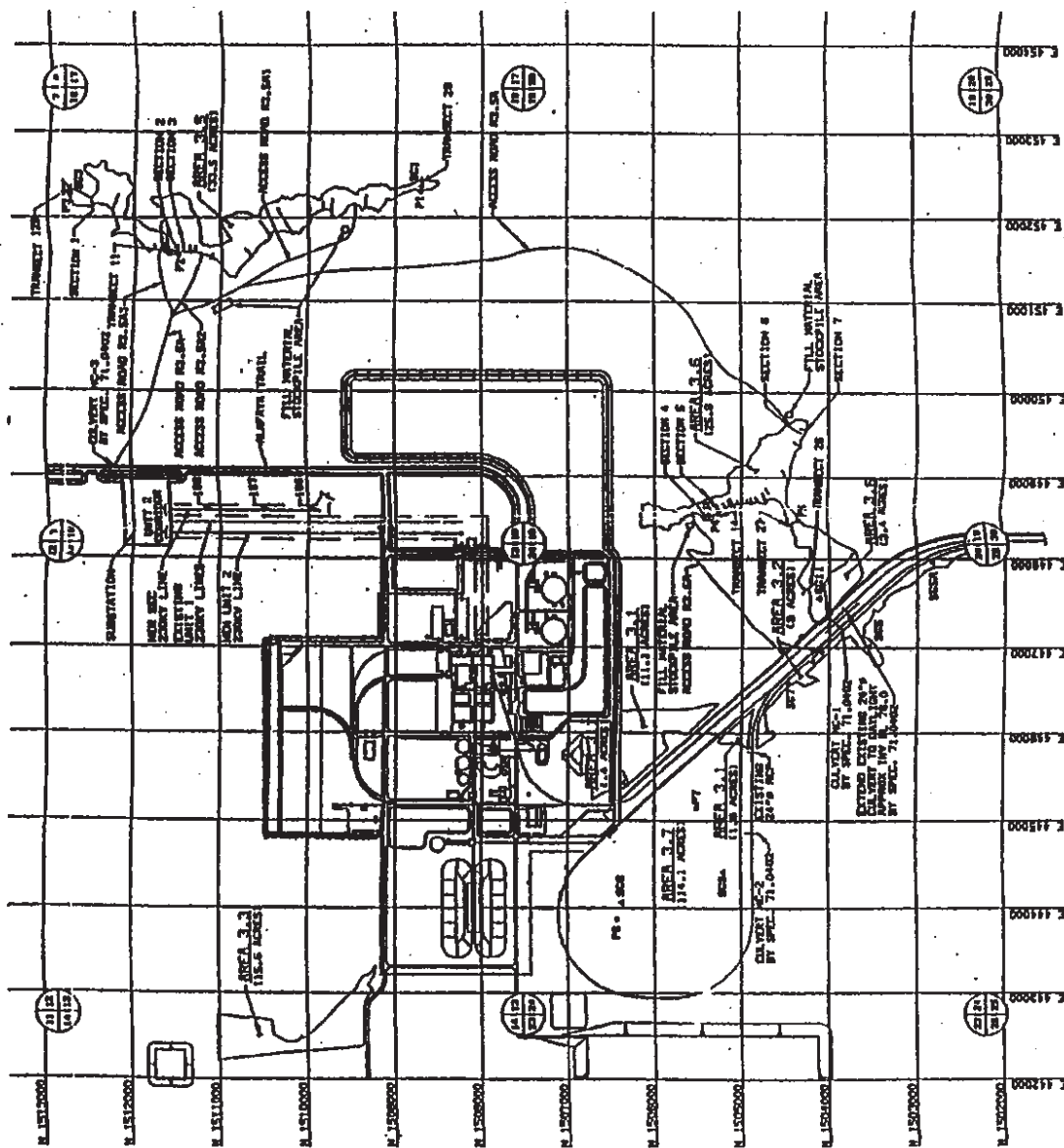
ENGINEER	DRAWN	1	03-31-93	REVISED PER FDER COMMENTS								
		0	02-22-93	INITIAL ISSUE								
CHECKED	DATE	NO	DATE	REVISIONS AND RECORD OF ISSUE				BY	CHK	APP	FL	
ORLANDO UTILITIES COMMISSION				PROJECT				DRAWING NUMBER				REV
STANTON ENERGY CENTER - UNIT 2												1

SITEWORK - MITIGATION
AREA 3.7

CODE

AREA

28C5KUMP
ACND 10 c10a
015L002 A2 1-600
3/29/93 15:47:36



MITIGATION SITE OVERALL PLAN

FIGURE 1

APPENDIX B

PLANTING SPECIFICATIONS FOR THE MITIGATION AREAS

Orlando Utilities Commission Stanton Energy Center Unit 2, Orlando Florida.
Planting Specifications for Mitigation Areas.
Summary of Mitigation Plan and Planting Schedule.

Mitigation Area	Planting	Planting Dates	Acreage	Site Description	Planting Information*	Comments
3.1 (Railroad North)	Longleaf Pine seedlings	11/93 - 2/94	11.1 Acres	Disturbed upland site. Owner will burn before planting.	2 year old containerized seedlings. Minimum average planting density of 500 seedlings/acre. Average 6'-20' centers.	
	Pond Cypress seedlings	11/93 - 2/94	2.2 Acres	Disturbed wet-lands. Owner will burn 0.4 acre site before planting.	Minimum average planting density: 400 seedlings/acre. Average 10' centers, 10-12" seedlings, minimum 4" containers.	Consists of 2 planting areas. Refer to drawings attached for planting specifications.
	Longleaf Pine trees	11/93 - 2/94	0.28 Acres	Mowed areas between road & east track, & between east & west tracks.	Minimum average planting density of 700 trees/acre with 10'-15' trees. Average 8' centers.	

Mitigation Area	Planting	Planting Dates	Acreage	Site Description	Planting Information	Comments
3.2 (Railroad South)	Longleaf Pine seedlings	11/93 - 2/94	11.7 Acres	Undisturbed Longleaf Pine Flatwoods. 100' wide buffer zone surrounding wetlands.	Minimum average planting density: 500 seedlings/acre. Average 6'-20' centers with 2-year old containerized seedlings.	Care must be taken to avoid vegetation disturbance in this legally protected, sensitive area. Vehicles restricted to existing roads and specifically designated areas.
	Pond Cypress seedlings	11/93 - 2/94	8.0 Acres	Disturbed herbaceous wetlands.	Minimum planting average: 400 seedlings/acre 10"-12" seedlings, minimum 4" containers.	Total acreage of this planting and following planting is 9 acres. Care must be taken to avoid damage to surrounding legally protected uplands. Access from railroad. Vehicles restricted to existing roads and specifically designated areas.
	Pond Cypress saplings	11/93- 2/94	1.0 Acre	Deeper wetlands at staff gauge 5A, located within the 8 acre cypress seedling planting area.	Minimum planting average 400 saplings/acre with 2'-3' tall containerized saplings.	Contractor to provide cost comparison of 1 acre saplings vs. 1 acre seedlings; requiring 1 complete replanting.
	Slash Pine trees	11/93- 2/94	663' long	Wetland border along the base of the railroad berm immediately adjacent to cypress seedling planting area.	Single row of 10'-15' tall trees with a 6' spacing. 110 trees total.	

Mitigation Area	Planting	Planting Dates	Acreage	Site Description	Planting Information	Comments
3.2 (Railroad South)	Slash Pine trees	11/93 - 2/94	0.2 Acre: 350' X 25'	Between railroad grades, immediately southeast of shell road crossing.	Minimum average planting density: 700 trees/acre with 10'-15' tall trees. Average 8' centers.	Mitigation site is 700' X 25'. Slash pine planting area is in northern (drier) 350' X 25" half.
	Pond Cypress trees	11/93 - 2/94	0.2 Acre: 350' X 25'	Between railroad grades, immediately southeast of slash pine planting area.	Minimum average planting density: 700 trees/acre with 10'-15' tall trees. Average 8' centers.	Cypress planting area is southern (wetter) 350' X 25' half of site.

Mitigation Area	Planting	Planting Dates	Acreage	Site Description	Planting Information	Comments
3.3 (RCW-West)	Longleaf Pine seedlings	11/93 - 2/94	15.6 Acres	Disturbed upland area.	Minimum average planting density: 300 seedlings/acre on 6'-20' centers. 2 year old containerized seedlings.	Stored material must be relocated and site must be burned by owner prior to planting.
3.4 (T-Line North)	Longleaf Pine trees	After installation of T-line: approx. 2/95.	1.4 Acres: 4 blocks of 150' X 100'.	Disturbed, mowed upland areas within Unit 2 transmission line corridor.	Minimum average planting density: 700 trees/acre with 10'-15' trees. Trees will be planted at 8' centers in a total of 1.4 acres divided equally into 4, 100' X 150' blocks around each of the 4 structures to be located in uplands.	Refer to drawings for structure locations.
3.5 (East Prairies)	Longleaf Pine seedlings	11/93 - 2/94	30.7 Acres	Undisturbed longleaf pine flatwoods. 100' wide upland buffer surrounding wetlands.	Minimum average planting density: 500 seedling/acre. Average 6'-20' centers. 2-year old containerized seedlings.	Care must be taken to prevent any damage to existing vegetation in this sensitive, legally protected area. Vehicles must remain on existing roads and in specifically designated areas.

Mitigation Area	Planting	Planting Dates	Acreage	Site Description	Planting Information	Comments
3.6 (RCD East & West)	Longleaf Pine seedlings	11/93 - 2/94	3.4 Acres	Disturbed upland area.	Minimum average planting density: 500 seedlings/ acre. Average 6'-20' centers. 2 year old containerized seedlings.	
	Pine Cypress seedlings	11/93 - 2/94	4.99 Acres	Herbaceous marsh.	Minimum planting average: 400 seedlings/acre with 10"-12" seedlings & minimum 4" containers.	Care must be taken to prevent any damage to the legally protected pine flatwoods and wet prairies which surround this site. Vehicles must be restricted to existing roads and specifically designated areas.

* Planting of seedlings and saplings must mimic natural recruitment as much as possible; no rows or geometric patterns except in Mitigation Site 3.4 (Transmission Line North).

APPENDIX C

SUCCESS CRITERIA TABLE

Table 3.3-1
Annual and Fifth Year Success Criteria

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
Railroad North						
Cypress Seedling Planting	Success	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds
	Remedy	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Reassess site and mitigation methods
Pine Seedling Planting	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (240/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
Pine Tree Planting	Success	100% survivability	100% survival	100% survival	100% survival	Same # of pines as originally planted
	Remedy	Replace each tree with 10" - 15' tree	Replace each tree with 10" - 15' tree	Replace each tree with 10" - 15' tree	Replace each tree with 10" - 15' tree	Reassess site; plant a different species of pine
Railroad South						
Cypress Seedlings	Success	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds
	Remedy	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Reassess site and mitigation methods

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
Railroad South (cont.)						
Longleaf Pine Seedlings	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (200/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
Slash Pine Seedlings	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (200/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
Staff Gauge # 5	Success	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation
	Remedy					Reassess: enhancement and success, partially block or deepen culvert.
Wet Prairies						
Herbaceous Wetlands	Success	Wetland indicator species # > "time zero", < 10% weeds	Wetland indicator species # > Year 1 or ≥ 50%, < 10% weeds	Wetland indicator species # > Year 2 or ≥ 50%, < 10% weeds	Wetland indicator species # > Year 3 or ≥ 50%, < 10% weeds	≥ 50% of species FDER wetland indicators, < 10% weeds
	Remedy	Apply herbicide	Apply herbicide	Plant with native wetland vegetation, apply herbicide	Plant with native wetland vegetation, apply herbicide	Reassess enhancement and success, apply herbicide

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
Wet Prairies (cont.)						
Cypress Domes	Success	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant over shrubs, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant over shrubs, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant over shrubs, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant over shrubs, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant over shrubs, < 10% weeds
	Remedy	Apply herbicide	Apply herbicide	Apply herbicide, remove live shrubs if dominant.	Apply herbicide, remove live shrubs if dominant.	Reassess or enhance and success, apply herbicide.
Longleaf Pine Seedlings	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (200/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
RCD (entire site)						
Herbaceous Wetlands	Success	Wetland indicator species # > "time zero", < 10% weeds	Wetland indicator species # > Year 1 or 50%, < 10% weeds	Wetland indicator species # > Year 2 or 50%, < 10% weeds	Wetland indicator species # > Year 3 or 50%, < 10% weeds	50% of species FDIER wetland indicators, < 10% weeds
	Remedy	Apply herbicide	Apply herbicide	Plant with native wetland vegetation, apply herbicide	Plant with native vegetation, apply herbicide	Reassess or enhance and success, apply herbicide

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
RCD (Entire Site) cont.						
	Cypress Domes	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant, < 10% weeds	30% cover of mature trees, cypress regeneration at dome edges, herbaceous groundcover dominant, < 10% weeds
	Remedy	Apply herbicide	Apply herbicide	Apply herbicide, remove live shrubs if dominant	Apply herbicide, remove live shrubs if dominant	Reassess enhancement and success, apply herbicide
Longleaf Pine Seedlings	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (210/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
Cypress Seedlings	Success	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds	30% cover, < 10% weeds
	Remedy	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 10" - 12" potted cypress seedlings to reach 30% cover. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Replant with 3' tall seedlings. Herbicide or hand clear weeds to < 10% cover	Reassess site and mitigation methods
Staff Gauge # 4	Success	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation	Seasonal water level fluctuation
	Remedy					Reassess enhancement and success, plug additional ditches if necessary

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
RCD (entire site) cont.						
Staff Gauge # 11	Success	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels
	Remedy					Reassess enhancement and success, partially block or deepen culverts
Piezometer # 5	Success	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite
	Remedy					Reassess enhancement and success, plug additional ditches if necessary
RCW-West						
Longleaf Pine Seedlings	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (280/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods

Success Criteria						
Mitigation Site	Year 1	Year 2	Year 3	Year 4	Year 5	
Transmission Line North						
Longleaf Pine Trees	Success	80% survival from planting	80% survival from Year 1 (240/acre)	85% survival from Year 2 (240/acre)	85% survival from Year 3 (175/acre)	Average density (150/acre)
	Remedy	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Replant to reach 80% survival, using two year old potted seedlings.	Reassess site and mitigation methods
Railroad Loop						
Staff Gauge #8	Success	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels
	Remedy		Adjust weir	Adjust weir	Adjust weir	Reassess enhancement and success, adjust weir
Staff Gauge #9	Success	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels	Average seasonal hydroperiods < pre-enhancement levels
	Remedy		Adjust weir	Adjust weir	Adjust weir	Reassess enhancement and success, adjust weir
Piezometer #6	Success	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite
	Remedy		Adjust weir	Adjust weir	Adjust weir	Reassess enhancement and success, adjust weir

Success Criteria						
Mitigation Site		Year 1	Year 2	Year 3	Year 4	Year 5
Railroad Loop (cont.)						
Piezometer # 7	Success	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite	Hydroperiod comparable to typical longleaf pine flatwoods onsite
	Remedy		Adjust weir	Adjust weir	Adjust weir	Reassess enhancement and success, adjust weir

*"Weeds" are defined as *Typha latifolia*, *Eupatorium capillifolium*, *Euthamia minor*, *Ludwigia peruviana*, *Eriochanthus giganteus*.

APPENDIX G

LOCATION OF

PERMANENT PHOTOGRAPHIC PLOTS

**Orlando Utilities Commission
Stanton Energy Center Unit 2
Mitigation Monitoring Permanent Photo Locations**

Mitigation Site	Location	Instructions
3.1 (North)	East end of cypress planting area; northern portion of area 20m south and 10m east of single mature pine tree	Panoramic photos including cypress planting area
3.1 (South)	Southern end of mitigation area, south of cypress dome; longleaf pine planting area	Panoramic photos including pine planting area
3.2 (North)	On RR berm, 13.5m east of staff gauge S7	Panoramic photos of cypress planting area
3.2 (Cypress Dome)	On wetland border aligned with transect across center of cypress dome, 23m south of staff gauge S2	Panoramic photos of pine planting area and cypress dome
3.2 (South)	On RR berm, 9m east-northeast of staff gauge 5A	Panoramic photos of cypress planting area
3.3	Northwest corner of site	Panoramic photos of pine planting area
3.3	Southwest corner of site	Panoramic photos of pine planting area
3.5 (North)	At transect 12B	Panoramic photos generally facing south, taken from filled ditch
3.5 (South)	At transect 5	Panoramic photos taken from west end of transect
3.6E (North)	At transect 15	Panoramic photos taken from west end of transect
3.6E (South)	At transect 24	Panoramic photos taken from west end of transect
3.6	Near piezometer 5	Panoramic photos facing into wetland enhancement area
3.7	Near piezometer 6	360° Panoramic photos
3.7	Near piezometer 7	360° Panoramic photos

ATTACHMENT B RCW HABITAT MANAGEMENT PLAN AND MONITORING PROGRAM



THE CURTIS H. STANTON ENERGY
CENTER,
RED-CKOADED WOODPECKERS
HABITAT MANAGEMENT PLAN



Prepared By:

DeLotelle and Guthrie, Inc.
1220 S. W. 96th Street
Gainesville, Florida 32607

July 8, 2005
Revised March 2006

TABLE OF CONTENTS

Section	<u>Title</u>	<u>Page</u>
	LIST OF TABLES	iv
	LIST OF FIGURES	v
	Executive Summary	vi
1.0	Introduction	1
	1.1 Overall Project History	2
	1.2 Unit I History	3
	1.3 Unit II Project Description	4
	1.4 Unit II Impacts and Further Habitat Loss	5
	1.5 Land Management and Population Monitoring Data	5
2.0	Habitat and Population Status	10
	2.1 Habitat	10
	2.2 Study Area	11
	2.3 Population Status	15
	2.4 Weather	16
3.0	Management Practices and Implementation	18
	3.1 Introduction	18
	3.2 Timber Management Goals	19
	3.3 Red-cockaded Woodpecker Management Area	23
	3.4 Management Objectives	23
	3.5 Implementation	24
	3.5.1 Controlling Disturbance	26
	3.5.2 Timber Management	26
	3.5.3 Fire Management	27
	3.5.3.1 Burn Schedule and Frequency	27
	3.5.3.2 Burn Conditions and Control of Wildfire	28
	3.5.4 Exotic Vegetation Control	28
	3.5.5 Cluster and Population Monitoring Studies	30
	3.5.6 Pine Habitat Condition Monitoring	30
	3.5.7 Ground Cover Enhancement Plan	31
	3.5.8 Vegetation Delineation, Mapping, and Eradication	32

TABLE OF CONTENTS - Continued

<u>Section</u>	<u>Title</u>	<u>Page</u>
4.0	Population Enhancements and Cluster Creation	34
	4.1 Cluster Creation	34
	4.2 Monitoring Activities	35
	4.3 Translocation Activities	36
	4.4 Implementation Schedule	36
5.0	Reports	38
	Literature Cited	39

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
1	Population and Habitat Characteristics for Eleven Groups of Red-cockaded Woodpeckers at SEC, 2005	11
2	Burn Preference According to Rank Order for Effects on Habitat Condition and Red-cockaded Woodpeckers at SEC, 2005	27
3	Criteria for the Institution of Mechanical Control of Saw Palmetto in Red-cockaded Woodpecker Habitats on the SEC Site	33
4	Artificial Cluster Sites for Cavity Inserts and Description of Surrounding Foraging Habitat, SEC, Orlando, Florida, 2003	35
5	Report Schedule for Management Plan Activities for the next 5-years and Beyond, SEC, 2005	38

LIST OF FIGURES

<u>Figures</u>	<u>Title</u>	<u>Page</u>
1.	Location of Red-cockaded Woodpecker Clusters in East Orange County at SEC, OUC, Orlando, Florida, 2005	7
2.	Location of Mitigation Areas and Pine Tree Planting Areas for Unit II Construction, SEC, OUC, Orlando, Florida, 2005	8
3.	Aerial Photograph Showing Waterways on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.	13
4.	Aerial Photograph Showing Cluster and Artificial Cluster Locations and Major Vegetation types on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.	14
5	Population Trends in the Red-cockaded Woodpecker Population in Eastern Orange County, OUC, Orlando, Florida, 2005	16
6	Summary of Average Monthly Rainfall on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.	17
7	The Red-cockaded Woodpecker Management Area and Projected Development Areas, including Units III and IV, for the SEC, OUC, Orlando, Florida, 2005	25

EXECUTIVE SUMMARY

The red-cockaded woodpecker (*Picoides borealis*), a state listed species of special concern and federally listed endangered species, was first observed on the proposed Curtis H. Stanton Energy Center (SEC site) in 1980. During the early 1980s, nine occupied clusters (roosting habitat) were found on the SEC site while 16 occupied clusters occurred in other areas north of the Bee Line Expressway. Presently, there are 13 occupied clusters remaining north of the Bee Line Expressway plus 10 other occupied clusters located on the TM-Ranch about 4 miles southeast of the SEC site. Six occupied clusters currently remain on the SEC site.

Orlando Utilities Commission (OUC) prepared and implemented a red-cockaded woodpecker management plan and monitoring program in 1981 to improve the chances of long-term survival of the species on the SEC site. The 1981 plan plus updates in the 1993 plan, consisted of both a regular prescribed burning program and monitoring activities studying red-cockaded woodpecker habitat use and demographics (DeLotelle and Guthrie and Black & Veatch, 1993 and DeLotelle and Epting 2000). In 1993 as part of the mitigation program for Unit II construction, the original 1981 Red-cockaded Woodpecker Management Plan was revised to incorporate new developments in management strategies for the mesic longleaf pine ecosystem (Black & Veatch and DeLotelle and Guthrie, Inc., 1992). The 1993 management plan contained most elements of the 1981 plan with additional plans for wetland restoration and planting of cypress trees (*Taxodium distichum*) in selected areas. Longleaf pine (*Pinus palustris*) was planted in selected upland areas for future foraging habitat. The revised monitoring plan of 1993 called for evaluating red-cockaded woodpecker survival, fledging success, and other demographic factors.

The following mitigation and enhancement plan is proposed to offset losses in mitigation areas from the gas pipeline installation in the southern utilities corridor and from the removal of planted pine along the northern transmission line corridor between the substation and Pope Road. OUC will be implementing additional measures above the practices outlined the 1981 and 1993 reports to aid in increasing the number of red-cockaded woodpecker clusters on the SEC site and ultimately to enhance the viability of the Orange County red-cockaded population. These actions include a cluster creation

project, exotic species removal, and bird translocation. Cluster creation will consist of constructing three artificial clusters each with four artificial cavities plus augmentation in each of six occupied clusters as needed. The artificial clusters will be developed in historic cluster sites and will have enhanced habitats after the removal of nuisance plants and mid-story shrubs. If natural dispersal is unsuccessful, bird translocations will be performed.

1.0 INTRODUCTION

As part of the Conditions of Unit I Site Certification Agreement (SCA), specifically conditions XXXI, Orlando Utilities Commission (OUC), Florida Municipal Power Agency (FMPA), and Kissimmee Utility Authority (KUA), agreed to manage approximately 2,000 acres of the Curtis H. Stanton Energy Center (SEC) for the benefit of the on-site, red-cockaded woodpeckers (*Picoides borealis*). These conditions were carried forward as a condition for the construction of Unit II. OUC prepared and implemented a management plan and monitoring program in 1981 and updated it in 1993, namely The Red-cockaded Woodpecker Management Plan, to improve the chances of long-term survival of the species on the SEC site (OUC, 1981 and 1993 update). In addition, OUC funded planting programs; as detailed in The Joint Agency Mitigation and Monitoring Plan (JAMMP), which were designed to mitigate wetland and upland impacts associated with the construction of the Unit II transmission line and alternate access road.

Since the development of these plans, advances have been made in the knowledge of on-site and regional red-cockaded woodpecker populations as a result of studies primarily supported by OUC. Other knowledge gained about the species requirements have led to changes in some management practices, e.g., the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Edition, 2003. Accordingly, the 1981 and 1993 Red-cockaded Woodpecker Management Plan will be revised to reflect these new management practices.

This following update reflects recent changes in red-cockaded woodpecker management strategies and addresses the mitigation requirements of the Unit 2 Conditions of Certification (COC) as provided in the JAMMP. This plan will also detail compensation measures for the loss of the mitigation pine planting areas of longleaf pine both in the certified north/south, associated, facilities corridor and under the transmission line between the substation and Pope Road. These actions include:

- (1) a statement of the habitat function and description provided for the managed area;
- (2) a schedule of fire management utilizing a Florida State Certified Burn Specialist, that includes a description of burn conditions, burn frequency, and measures taken to avoid the spread of wildfire;

- (3) measures to eradicate exotic vegetation from both wetlands and uplands;
- (4) other enhancement activities such as ground cover enhancement, artificial cavity augmentation, and bird translocations; and
- (5) persons and/or the company responsible for the management plan.

1.1 Overall Project History

Certification studies commencing in 1980 for the SEC site included the evaluation of endangered and threatened wildlife species. Several endangered and threatened wildlife species including the red-cockaded woodpecker occurred on-site and in surrounding habitats. During the initial field surveys, nine occupied clusters were observed on-site with an additional 16 occupied clusters located off-site in the northern area of the Big Econlockhatchee Basin (Big Econ). Prior to the initial SCA in 1982, red-cockaded woodpeckers were not known to occur in the area. In response to discussions with the Florida Fish and Wildlife Conservation Commission (FFWCC, formerly Florida Game and Fresh Water Fish Commission [FGFWFC]) and the U. S. Fish and Wildlife Service (FWS), a management plan and long-term monitoring program for red-cockaded woodpeckers were developed as part of the informal review for SEC I (DeLotelle and Newman 1981). Because of mitigation actions and new developments in management strategies for the mesic longleaf pine ecosystem, the original 1981 Red-cockaded Woodpecker Management Plan was revised in 1993 during the certification process for SEC II. On-site groups were studied continuously as part of the monitoring program with additional groups in surrounding areas studied during the certification process for SEC I & II and for other projects in the Big Econ basin.

1.2 Unit I History

OUC initiated discussions with the FGFWFC and FWS in 1980 to develop mitigation and management options that minimized impacts of Unit I construction on red-cockaded woodpeckers. OUC made major siting changes during the site design phase including both the 1) relocation of the make-up water supply pond and solid waste disposal area and 2) a complete rotation of the entire power block and associated facilities from a north to south orientation to an east-west alignment. These mitigation procedures were implemented to avoid cavity trees and to protect the higher quality pine habitat. Such actions resulted in increased cost; but, less impact on the red-cockaded woodpecker habitat.

In addition, the 1981 Red-cockaded Woodpecker Management Plan was developed in consultation with the FGFWFC and FWS as part of the Unit I SCA for the Florida Department of Environmental Regulation (FDER). The objectives of the 1981 management plan were to:

- (1) identify the distribution and abundance of red-cockaded woodpeckers in the area;
- (2) map and determine the status of existing clusters and cavity trees on-site as well as in the surrounding areas;
- (3) map potential cluster sites and foraging habitats on-site;
- (4) develop a fire management schedule for the mesic longleaf pine flatwoods ecosystem in the undeveloped portions of the site; and
- (5) propose a long-term monitoring plan for the site's red-cockaded woodpeckers.

As stipulated in Condition XXXI for the Certification of Unit I, the Red-cockaded Woodpecker Management Plan will be implemented for the life of the facility on about 2,000 acres of longleaf pine flatwoods. The life of the SEC site can be expected to extend well into this century. Approximately, 1100 acres of the site was dedicated to power plant related activities, including additional Units II, III, and IV.

1.3 Unit II Project Description

Unit II at the SEC site involved the construction of an additional coal-fired, steam electric generating unit and associated facilities. Unit II required nine acres of previously cleared and graded land located immediately north of the SEC Unit I facility. Unit II also included a 14-mile long, 230 kV transmission line and a two-mile long, alternate access road. Both the transmission line and alternate access road were located in the certified north/south associated facilities corridor. The selected route was chosen specifically to have as little impact as possible on both upland and wetland communities. The transmission line runs south from the on-site substation, parallels the northern, eastern and southern side of the make-up water supply pond, extends south across a cleared area, and then proceeds southeasterly along the railroad spur within the certified associated facilities corridor. The alternate access road parallels the eastern side of the existing railroad from the southern edge of the power block near the coal handling facility to the Bee Line Expressway, about 2 miles to the south.

The alternate access road was constructed first and had minor impacts on red-cockaded woodpecker habitat (DeLotelle and Guthrie, Inc and Black & Veatch, 1993). Together, the transmission line and alternate access road impacted about 80 longleaf pine trees in red-cockaded woodpecker territories on the SEC site; however, none of the impacts were to cavity trees.

As a result of anticipated impacts from Unit II construction to uplands and wetlands, the JAMMP was developed to enhance wetland and upland areas in the managed area on the SEC site (Black and Veatch and DeLotelle and Guthrie, Inc., 1992). The plan called for extensive planting of longleaf pine in upland habitats, planting of slash pine (*P. elliotii*) in the associated facilities corridor, and planting of pond cypress (*Taxodium distichum*) in wetlands. Longleaf pines were to be planted in selected areas to promote flight corridors for passage across cleared transmission line/railroad corridors. Ditch filling, contouring, and other restoration efforts restored the historical hydroperiods of several wetland systems. Several dirt roads were maintained to improve access to the mitigation sites. These mitigation access roads were selected so as not to impact mitigation sites, cavity trees, or the flatwoods ecosystem and ran along existing woods roads. Monitoring of the mitigation activities specified in the JAMMP was performed annually by OUC.

1.4 Unit II Impacts and Further Habitat Loss

Mitigation lands for Unit II construction included planting areas for longleaf pine and pond cypress, as well as ditch plugging areas for wetland enhancement on the SEC site. Mitigation for red-cockaded woodpeckers in the form of pine tree planting occurred in several areas, including strips along the transmission line corridor to the north and the access corridor south of the main facility at the SEC site (Figure 1). These tree-planting areas were created to provide pine habitat for crossing the access corridor by red-cockaded woodpeckers and other wildlife. Several of these pine tree-planting areas were removed during the construction of a permitted gas pipeline along the southern access corridor and (see Figures 2 and 4) all planted pine trees under the transmission line in the northern corridor were removed or are planned for removal. In the north corridor, the planted trees had grown to a height where OUC viewed the failure of the transmission line as imminent and had OUC maintenance department remove, on an emergency basis, several patches of planted trees that were the greatest threat. OUC determined that all planted pines along the northern corridor are potential hazards to the transmission lines and are to be removed. These areas were planted as a result of mitigation for loss of natural pine habitat from the construction activities for Unit II. The following update and enhancement activities are proposed to offset losses in mitigation areas from the existing and pending removal of planted pine in both the gas pipeline and the northern transmission line corridors.

1.5 Land Management Perspective

During the early-to-late 1900's the SEC site was managed for cattle, timber, and hunting. During this period, the local landowners or lessees conducted winter prescribed burns, including the years of 1980 and 1982. OUC's fire management schedule for the SEC site was implemented after construction of Unit I and included control burns over the entire site continuing through 2004. Six controlled burns have been conducted during this monitoring period by OUC. Since the property was purchased by OUC, other activities in most of the management area have generally been restricted; thus, good conditions have been maintained for continued development of the longleaf pine ecosystem and enhancement of red-cockaded woodpecker habitat.

Although still a problem during fire activities, saw palmetto (*Serenoa repens*) seems to be less abundant and the wiregrass community more extensive than during pre-construction monitoring. As a result of the fire management practices, several good recruitment classes have occurred since 1982 and longleaf pine regeneration in the managed area is greater than prior to 1984. Many former sparsely treed areas now include a well established, younger-age class of longleaf pine. Other areas on-site still have a much-reduced density of longleaf pine from historical timber management practices. Habitat conditions on the SEC site appear to be similar to other non-disturbed portions of the Big Econ basin (Brown et al., 1989); however, the site includes a much greater percentage of older aged longleaf pine than most of the surrounding areas. The TM-Ranch, about eight miles to the southeast, is the obvious exception and includes many old longleaf pines and consequently a red-cockaded woodpecker population similar to the SEC site.

In addition to habitat management, numerous monitoring studies have been conducted on the SEC site since 1980. To date, the following studies have been conducted:

- (1) reproductive studies, annually 1980-2004;
- (2) area wide population monitoring studies in addition to the above in 1981, 1983, 1986, 1988, and 1995-2004;
- (3) home range, habitat evaluation and use, and territory size studies in 1981-84 and 1986-87;
- (4) population turnover studies, annually from 1980-2004; and
- (5) cavity tree use studies, annually 1980-2004.
- (6) population status in areas north of the Beeline Expressway was determined through 2004.

FIGURE 1. Location of Red-cockaded Woodpecker Clusters in East Orange County, OUC, Orlando, Florida, 2005

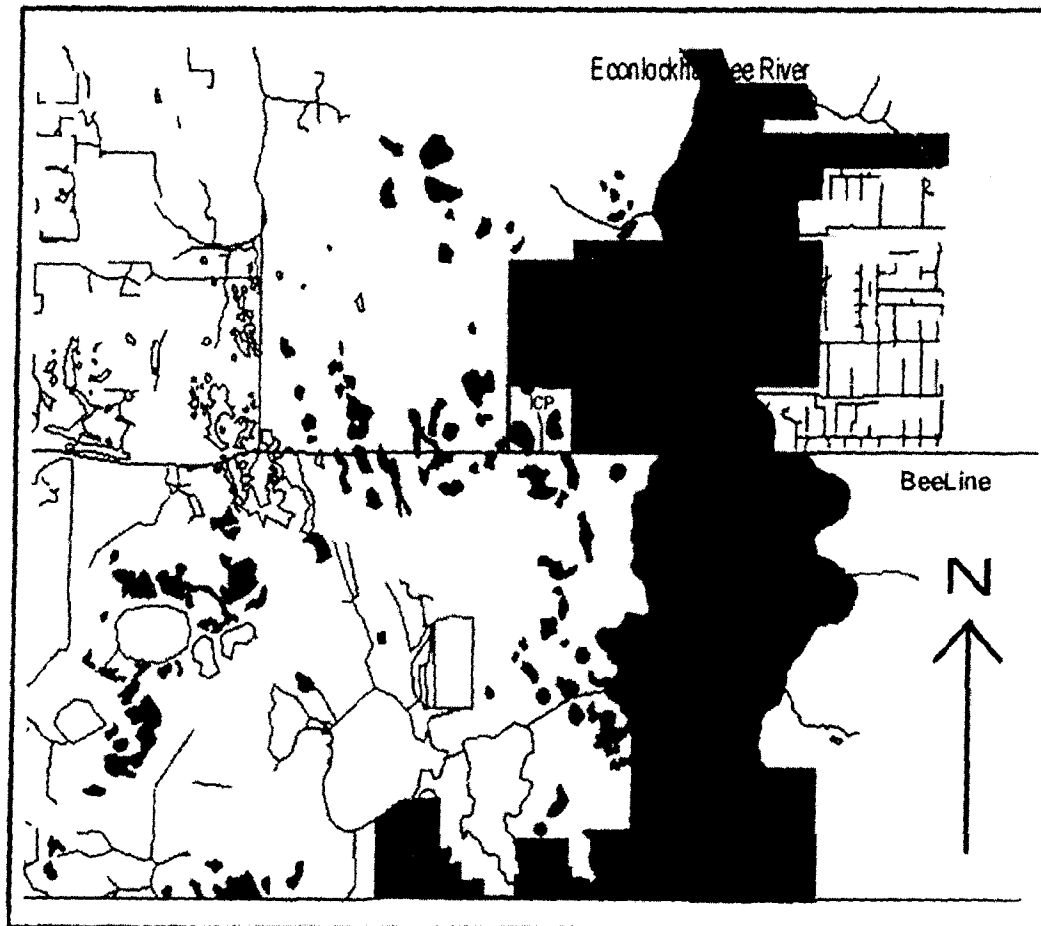
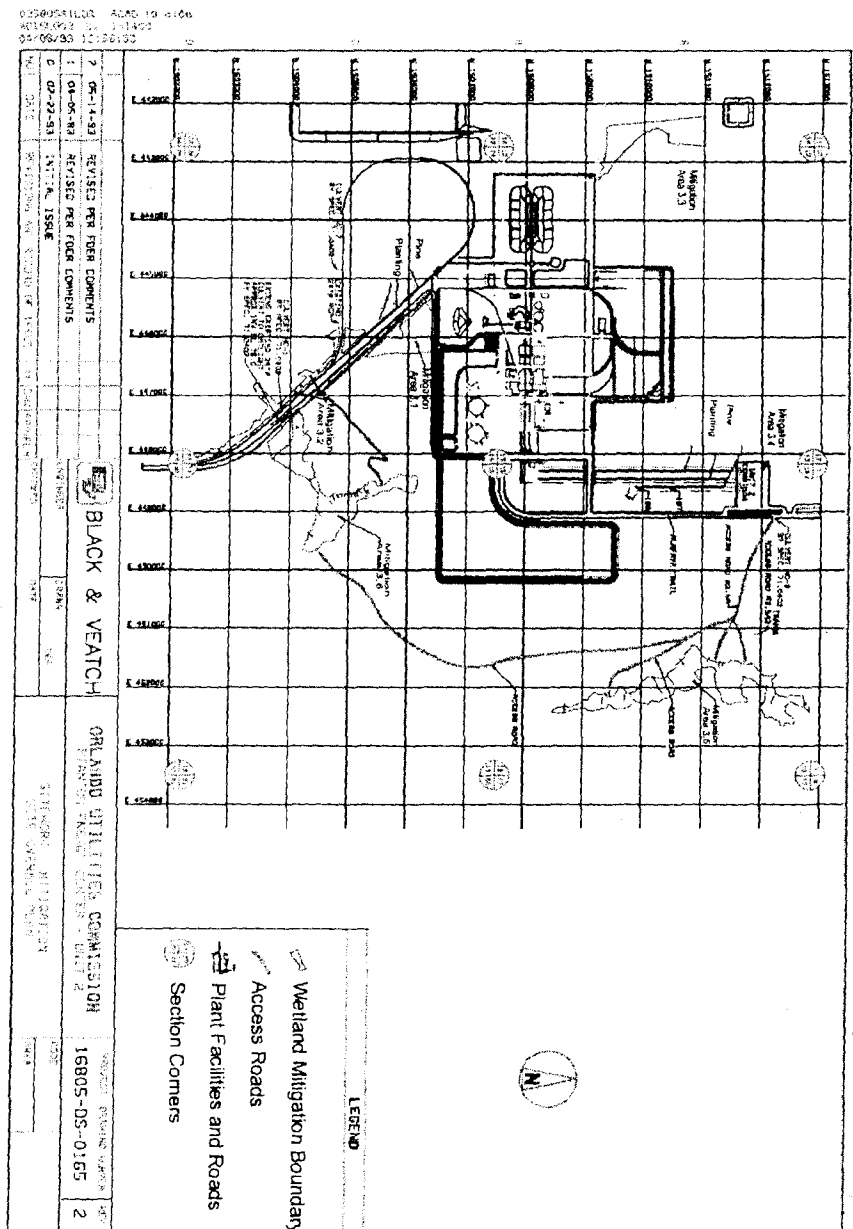


Figure 2. Location of Mitigation Areas and Pine Tree Planting Areas for Unit II Construction, SEC, OUC, Orlando, Florida, 2005



Data from these studies have contributed substantially to the knowledge of the biology and habitat requirements of the red-cockaded woodpecker. The findings and published literature from these studies have been used for development strategies on other projects in the area and by the FWS in the producing habitat protection guidelines for the red-cockaded woodpecker in the southeast United States and central Florida (See Red-cockaded Woodpecker Recovery Plan, 2003).

2.0 HABITAT AND POPULATION STATUS

The primary goal of the management and enhancement plan as described in Sections 3.0 and 4.0 of this report is to maintain and improve conditions capable of supporting red-cockaded woodpeckers on the SEC site. The following section describes the habitat within the red-cockaded woodpecker management area and provides a broad overview of the current population status on the SEC site in relation to the total red-cockaded woodpecker population in the area.

2.1 Habitat

Habitat within the red-cockaded woodpecker management area on the SEC site consists of mesic longleaf pine flatwoods, cypress domes and strands, bayheads, wet prairies and xeric oak scrub. Mesic longleaf pine flatwoods occur throughout north and central Florida southward to near Lake Okeechobee. Uplands within the management area have an overstory dominated by longleaf pine. The overstory in the wetter habitats often includes pond pine (*P. serotina*) and a few slash pines in scattered areas. The shrub layer in the flatwoods consists of saw palmetto, stagger bush (*Lyonia fruticosa*), fetterbush (*L. lucida*) and gallberry (*Ilex glabra*). The open pine canopy allows the development of a rich savannah-like ground cover of herbaceous species (Myers and Ewel, 1990) including wiregrass species (*Aristida stricta* and *A. spiciformis*), beakrush (*Rhynchospora fascicularis*), and bluestem (*Andropogon virginicus*) (DeLotelle and Guthrie 2000).

Longleaf pine density is generally low within the management area, averaging about 10,051 stems per territory (Table 1). Nesting home ranges contain a mean of 4,237 pine stems, with a mean diameter-at-breast-height (dbh) of 9 inches. Pine stands in territories average 50 stems/acre with a weighted mean age of 55 years. The average pine basal area per territory is 2,961 square feet, which includes about 3,401 stems with a minimal 9-inch, dbh. Tree heights reach up to 50 feet with those over 90 years-of-age averaging 38.4 feet. The most abundant age class (30-40 years) averages 31.5 feet in height. Although the data has been partially updated since 1980, no complete sampling of pine stand densities and age profiles has been conducted recently.

TABLE1. Population and Habitat Characteristics for Eleven Groups of Red-cockaded Woodpeckers on the 2,000-acre management area at the SEC site, Florida, 2005

Group ID	Group Size*	Mean Reproduction All Years	Mean Reproduction 2000-2004	N = Years	Pine Basal Area (FT ²)	Total Pine Stems**	Territory Size (Acres)
+A	2	1.33	0.00	3	3,551	14,709	383
+B	2	1.00	0.00	1	3,131	13,547	363
++C	3	0.80	0.00	4	2,195	8,818	251
++D	3	1.00	0.00	5	2,593	8,733	261
C/D	3	0.95	2.00	19	3,195	8,366	236
E	3	0.92	2.25	24	4,333	13,490	299
F	2	1.00	1.25	24	3,177	10,418	255
G	2	1.00	1.00	24	2,673	6,452	215
H	3	1.00	1.00	24	2,465	6,317	234
+I	3	1.30	0.00	9	3,778	10,961	239
#X	2	0.93	0.25	19	2,163	10,237	398
On-Site Average	2.55	1.02	1.38	14.3	3,023	10,211	285
Off-Site 13 Groups	2.44	1.11	1.34	6.1 45 Group Years	-	-	-

* Predominant group size during the breeding season for the study period.

** Includes all pine stems more than three inches in diameter at breast height in each territory.

+ Territories were abandoned prior to the end of the study period.

++ Territories and groups combined during 1986.

Territory abandoned in 1981 and occupied again in 1986.

2.2 Study Area

The OUC site is approximately 3,280 acres and is located 8.5 miles southeast of Orlando, Florida in the Floridian section of the Atlantic Coastal Plain. Approximately 1100 acres are dedicated to power generation and associated facilities while the remaining 2000 acres are set-aside for the RCW management area. Situated in eastern Orange County, the site is in the Big Econ Basin between the Little and Big Econ Rivers and south of U.S. Highway 50. The Big Econ Basin is approximately 950 square miles. The Big Econ flows from south to north and water quality is good while that of the Little Econ is poor (Brown *et al.* 1989). Surface drainage of the SEC site flows easterly toward the Big Econ via the Hart and Cowpen Branches and an unnamed tributary (Figure 3). These are head water streams to the Big Econ and have had portions of their drainage impacted by pre-SEC construction of swells, ditches, and fire lanes to promote more rapid drainage and to control both wild and prescription fires. Uplands

account for about 87 % and wetlands (Figure 4) about 13% of the 2000-acre red-cockaded woodpecker management area on the SEC site.

The 2000-acre management area on the SEC site occurs in the mesic longleaf pine flatwoods within the Big Econ Basin. Most central Florida flatwoods have lower pine densities than north Florida flatwoods (Shapiro 1983, DeLotelle *et al.* 1983, Bowman *et al.* 1997, Myers and Ewel 1990). Because of the flat topography and the underlying organic hardpan, these central Florida flatwoods often have standing water during most of the wet season. Numerous shallow depressions that retain much of the rainfall during the summer months are present. These interconnected depressions, aligned in a north-south direction provide natural drainage for the Basin during the wet season, although they are usually dry during the spring and fall. Hydroperiods of these depressions are sufficient to have allowed cypress (*Taxodium distichum* var. *nutans*) forests and wet prairie vegetation to develop. Scrubby flatwoods also occur in the Basin on slightly elevated ridges. These interspersed mesic longleaf pine and scrubby flatwoods along with scrub-oak communities are found in a southeasterly direction along an unnamed sand ridge from just past Yeehaw Junction down to within several miles of Fort Drum, Florida.

The over-story of these flatwoods consists almost entirely of longleaf pine. Many age classes are represented in the Econ Basin with several trees greater than 170 years of age. A few pond and slash pines occur near wetlands. The shrub layer includes saw palmetto, stagger bush, fetterbush, and gallberry. The open pine canopy promotes the development of a rich savannah-like ground cover of herbaceous species (Myers and Ewel, 1990) including wiregrass, lopsided Indian grass (*Sorghastrum secundum*), beakrush, and bluestem. The scrubby flatwoods includes a shrub layer of myrtle oak (*Quercus myrtifolia*), sand live oak (*Q. geminata*), and tarflower (*Befaria racemosa*) while the ground cover contains many of the same species as the pine flatwoods.

Figure 3. Aerial Photograph Showing Waterways on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.

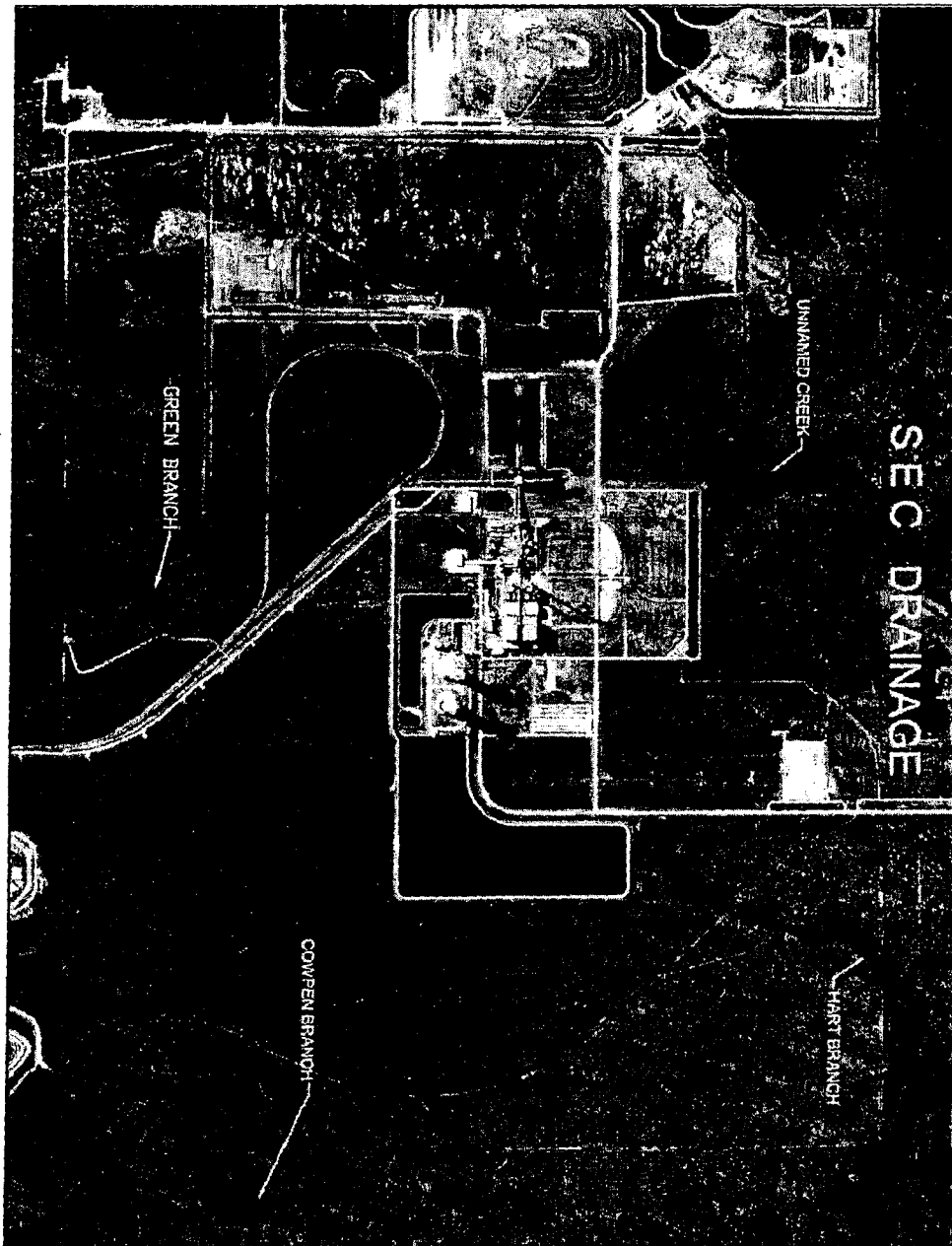


Figure 4. Aerial Photograph Showing Cluster and Artificial Cluster Locations and Major Vegetation types on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.



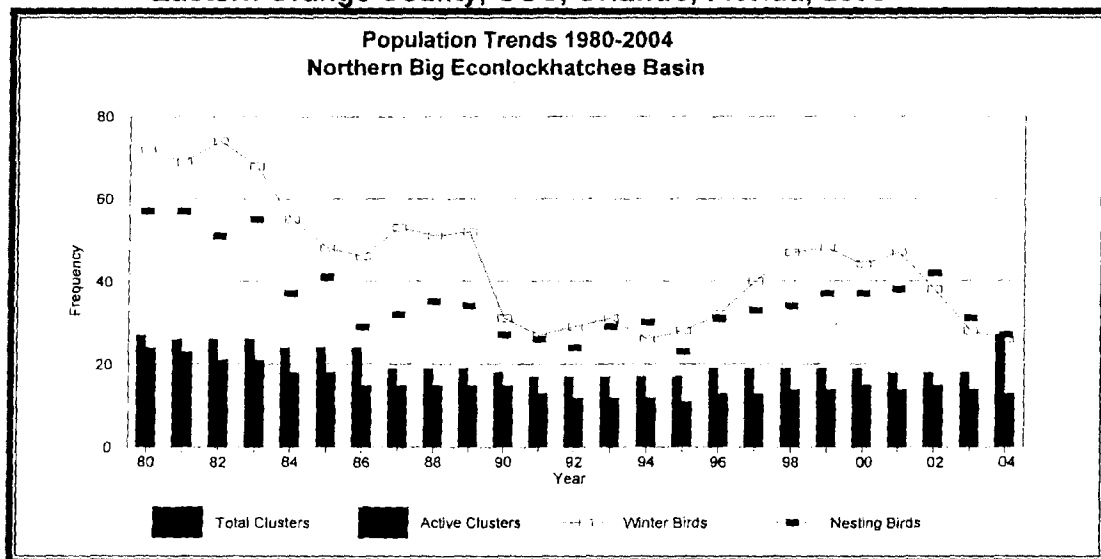
These central Florida flatwoods were historically used for timber, turpentine production, and cattle grazing (Myers and Ewel 1991). These activities had a profound and lasting affect on this ecosystem, mainly as a result of the alteration of natural fire regimes and removal of pine seed sources. Fires were set in the fall and winter to stimulate growth of herbaceous plants for the cattle. This fire schedule, used until the development of the SEC site and purchases of the Hal Scott Preserve by the St. Johns River Water Management District and Orange County, affected pine recruitment in two ways. First, fall and winter burns often destroyed the pine seeds before they germinated or killed the young seedlings prior to development of their fire-resistant grass stage. Second, pine seeds require bare soil to germinate; however, the fall and winter fires cleared the herbaceous ground cover when pines were not dropping seeds. These alterations apparently caused some areas to experience slow pine regeneration. One upland area in the northwest section of the SEC site has had little pine recruitment since 1969 and has maintained a very low pine density; however, this may be due to other agricultural and industrial activities on the site. In other sections, densities in unlogged areas ranged up to about 500 trees per acre near riparian areas with density generally reduced away from wetlands and in logged areas. Prior to power plant construction, winter burns were set during 2-to-3 year intervals for range management purposes.

2.3 Population Status

The core population north of the Bee Line Expressway, which includes the red-cockaded woodpeckers on the SEC site, declined from 25 occupied clusters in 1980 to 11 by 1995, increased to 15 by 2000, and declined to 13 occupied clusters by 2004 (Figure 5). On the SEC site only three clusters were abandoned during this period; a reduction from nine occupied clusters in 1980 to six occupied clusters in 1993. Of the eight clusters north of the Bee Line Expressway that were abandoned, five were clear-cut or the foraging habitat was eliminated, and three were abandoned. Three of the most recent abandonment's apparently resulted from demographic factors, namely low reproduction and high adult turnover. Excluding the recent addition of artificial clusters on the Hal Scott Preserve, the ratio of occupied to abandoned clusters in the entire core population north of the Beeline Expressway has declined from 92% in 1980 to 72% by 2004.

The number of red-cockaded woodpecker groups in the northern Basin (Figure 4) declined (54.4%) from the early 1980s through the mid-1990s, increased in the late 1990s, but has declined precipitously since 2001 (Figure 5). The midwinter population including adults, fledglings, floaters, and helpers, declined by 64% from 1982-1991, increased during the late 1990s, but likewise declined during the early 2000s. Territories in these down years primarily contained mostly the resident breeders. Reductions in the number of breeding groups occurred during most of these down years: in the mid-1980s, the early 1990s, and the early 2000s.

Figure 5. Population Trends in the Red-cockaded Woodpecker Population in Eastern Orange County, OUC, Orlando, Florida, 2005

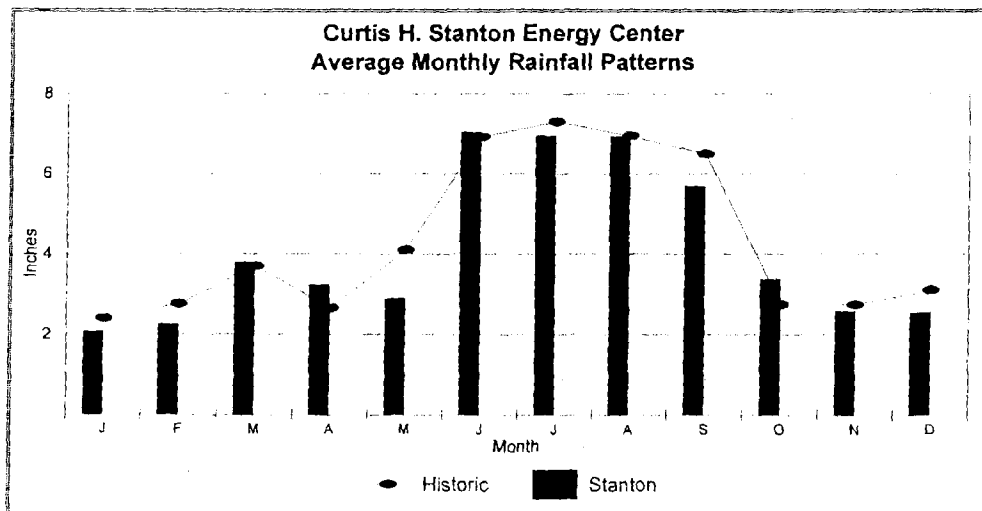


2.4 Weather

Central Florida has a humid, subtropical climate with an average rainfall of 51.2 inches per year. The interior, mid-peninsula of Florida often has more dry periods than north, south, or coastal areas (Jordan 1984). Yearly rainfall on the SEC site varied (range 37.4 to 64.5 inches per year) over the last 21 years averaging slightly less (50.03 inches) than the long-term yearly average. Ten of the 21 years were above the long-term average while 11 years were below historic averages. Slightly drier conditions (47.9 inches per year) existed from 1979 to 1990 while slightly wetter conditions

prevailed after 1990 (53.9 inches per year). Extremely dry years occurred in 1990 and 1993, and very wet years occurred in 1994 and 1997. More than half the annual rainfall (27.2 inches for the historic average and 27.0 inches for the SEC site) fell during the rainy season from June through September (Figure 6). Drought conditions often occurred during the early spring months (January through May, 14.5 inches of rain). Reviewing historic averages reveals the month of May was the most deficient in rainfall with April and October having the greatest surplus (Figure 6).

Figure 6. Summary of Average Monthly Rainfall on the SEC and Surrounding Areas, OUC, Orlando, Florida, 2005.



3.0 MANAGEMENT PRACTICES AND IMPLEMENTATION

3.1 Introduction

For the red-cockaded woodpeckers, restoration of good quality habitat is vital to the recovery of the species. Loss of habitat was primary among the original causes of decline. Generally, optimum habitat conditions for red-cockaded woodpeckers occur in open woodlands, which in the pine flatwoods of Central Florida equates to longleaf pine flatwoods/wire grass communities. The longleaf pine ecosystem is famous for its highly diverse groundcovers. In fact, this fire-dependent habitat contains nearly one quarter of all the plant species in North America. As the vegetation approaches the climax stage, the hardwood encroachment eventually results in the abandonment of clusters and population decline or extirpation. The longleaf pine ecosystem is a fire sub-climax stage maintained by regular fire intervals; frequent burning, regardless of the season, is paramount for continued maintenance of this community. Early to mid-growing season burning is optimum as it 1) promotes wiregrass, herbaceous flowering and seeding, and longleaf pine recruitment; 2) tends to decrease the abundance of hardwoods and shrub mid-story; and 3) has less damage to the herbaceous layer and soils than mechanical clearing. Late growing season (Oct. to Nov.) fire may have detrimental impacts on over-story pines and is not as effective in reducing mid-story rootstock or promoting native groundcovers as the early to mid-growing season burns. In fact, some research suggests that late dormant season (mid-Nov. to Jan.) burns may be more effective than late growing season burns in reducing hardwoods and restoring herbaceous groundcovers. When considering the establishment of the longleaf-wiregrass sere, it should be noted that as fuel loads accumulate, the intensity of the fire increases and optimum burning times are shifted towards the winter where cooler air temperatures and steadier weather patterns prevail thereby providing maximum fire control and minimal longleaf pine mortality.

This revision of the management procedures for the SEC site red-cockaded woodpecker management area is similar to the 1981 and 1993 management plans in that it focuses on protecting existing clusters and provides acceptable foraging areas within red-cockaded woodpecker habitats. The major activity necessary to promote a healthy red-cockaded woodpecker population is a burning program that maintains a vegetative structure of low grasses and herbaceous layer, little midstory, and a canopy

of longleaf pine. Exotic vegetation such as cogon grass (*Imperata cylindrica*) needs direct intervention for removal using herbicidal control. A species-specific control method will be developed to deal with the elimination of cogon grass and a report provided at the end of the second year of treatment. Patches with taller growth of saw palmetto will be controlled by mechanical means in selected areas and by a shortened burn rotation interval. A pine stand and habitat map will be developed based on aerial and field reconnaissance as described below. Following this assessment, an evaluation will be conducted every five years to assess all described habitat conditions and exotic species control. A yearly report on the red-cockaded woodpecker population and a five-year report will be provided to the agencies.

The habitat enhancement plan will be accomplished by implementing the following:

- (1) a burning program with a goal of maintaining a sub-climax stage of vegetation consisting of a wiregrass and herbaceous understory, a diminished shrub midstory, and an open canopy of longleaf pine;
- (2) an exotic species control program that consists of determining the distribution of the exotic encroachments and the ensuing eradication of the exotics by the application of applicable herbicide treatments; and
- (3) a saw palmetto control program consisting of the roller chopping or mowing of areas with excessive growth of saw palmetto.

3.2 Timber Management Goals

Timber management practices described in the 1981 plan and the planting program, described in the JAMMP have allowed pine stem density to increase in many portions of the management area; however, some areas still have low stem counts. Pine regeneration via natural recruitment should substantially increase during the next 20 to 30 years.

The 2003 USFWS Red-cockaded Woodpecker Recovery Plan (p. 188) describes optimum habitat as having the following longleaf pine densities: 1) longleaf pine greater than or equal to 14" dbh should have a minimum of 20 ft²/acre, 2) longleaf pine greater than or equal to 10" dbh and less than 14" dbh should have a maximum of 40 ft²/acre,

and 3) longleaf pine less than 10" dbh should have a maximum of 10 ft²/acre with less than 20 stems/acre. The burning program as detailed in this document, is intended to establish and maintain these densities for the longleaf pine-wiregrass community.

Timber surveys will be performed on a 5-year period to assess the longleaf pine/wiregrass densities and determine the effectiveness of the burning program.

Criteria that are more applicable to central Florida are under review and development to reflect conditions of the region (Costa and DeLotelle, unpublished analysis). To meet central Florida standards or achieve the minimum managed stability criteria and manage toward the desired future conditions for red-cockaded woodpecker habitat within the property, i.e., central Florida habitats, management activities will be undertaken as follows.

- (1) For the home range habitat, provide each group of red-cockaded woodpeckers a minimum of 3,000 ft² of pine basal area (BA), counting only those pine stands in suitable habitat that, for this standard only, have each of the following characteristics:
 - a) at least 2,000 ft² of BA in trees 9 in dbh or larger;
 - b) at least 1,000 ft² of BA in trees larger than four and less than nine inches dbh; and
 - c) open recruitment stands of pine. Dense stands of recruitment pine will be reduced should they become a problem; however, it is expected that the frequent burning program will naturally provide adequate thinning of small dbh pine.
- (2) Provide a minimum of 75 acres of foraging habitat. This minimum requires at least 40 ft² of BA/acre to achieve a total of 3,000 ft² of BA; however, if the BA per acre is less than 40 ft², additional acreage/territory (foraging partition) will be required to achieve 3,000 ft² total BA with the caveat that no more than 300 acres/red-cockaded woodpecker group may be designated as foraging habitat.
- (3) Pine stands that are suitable for foraging habitat must have all of the following characteristics:

- a) longleaf pine with 2,000 ft² BA for trees with an 9 inch minimum dbh, i.e., at least 30 years old; however, up to 1,000 ft² of BA of the total stand may be in trees 4 to less than 9 inches dbh (20-29 years old).
- b) an average pine BA of all 4-inch dbh and larger trees between 40 and 70 ft². Currently, stand BA in some areas of the south-central Florida Recovery Unit average less than 40 square feet of BA/acre in 4 to 9 dbh pines; with some as low as 10 ft² BA/acre. These low BA conditions are primarily a result of poor recruitment, i.e., few good seed crops and inadequate (frequency and season) prescribed burning programs. Even in good conditions, control fires may jump into the crown, which results in higher tree mortality than desired. During the past 15 years, several recruitment classes have become established, and sites with adequate prescribed burning stand BA are increasing throughout the region.
- c) no hardwood midstory or if a hardwood midstory is present it is sparse and less than 7 feet in height: the midstory will be controlled by fire or mechanical means.
- d) after the larger dbh class trees reach the optimum habitat levels as defined in the 2003 USFWS RCW Recovery Plan (p. 188), total stand BA above 100 ft²/acre will be reduced to a minimum 70 ft²/acre by the thinning of trees primarily with a dbh of 9 inches or less.
- e) foraging habitat stands will be within 0.50 miles of the cluster center and preferably within 0.25 miles. Foraging habitat stands cannot be separated from one another by more than 200 feet of non-foraging habitat, e.g., rights-of-way, clear-cut or forest stands less than 30 years of age, hardwood dominated stands, agricultural fields, etc.
- f) frequent prescribed burning of foraging habitat during the growing season will be applied. The development and protection of a herbaceous groundcover will facilitate the prescribed burning and will greatly benefit the red-cockaded woodpeckers.

The habitat characteristics that have been described, support a large meta-population of red-cockaded woodpeckers in the Big Econ Basin and additional isolated

populations throughout the central Florida area (DeLotelle *et al.* in press and Bowman *et al.* 1997). Research to date supports the designation of foraging habitat that will result in stable or increasing populations, as described above. The SEC site would be a further test of the applicability of these guidelines to expand existing populations with intensive cluster management. The RCW Recovery Plan stresses the importance of adequate stand structure. Pine stands cannot be considered suitable as foraging habitat unless they have an "open" character. A pine stand that is 20 years in age with open structure will qualify as suitable foraging habitat. If such a stand has not been prescribed burned or otherwise treated to control the hardwood mid-story and has not been thinned to a basal area of 70 ft²/acre or less, it will not satisfy the "open" condition criterion. At present, dense stands of young pine and pine/hardwood do not occur on-site and thus are not an issue of concern. Stand quality, as measured by an open structure, is a critical factor in determining the suitability and use of foraging habitat.

The desired future condition for red-cockaded woodpeckers foraging habitat stands is for the 3,000 ft² BA to be composed of 9-inch dbh tree and larger. Management activities should be implemented to achieve this goal. Most sites will be capable of growing trees this size, at least at moderate stand densities, e. g., 30-60 ft² BA /acre. In addition to the longleaf pine stands, foraging studies indicate that cypress domes constitute an important habitat for on-site red-cockaded woodpeckers. Prior to the construction of Unit I at the SEC site, wildfires sporadically resulted in extensive burning in the cypress domes. These hot fires made some cypress domes unsuitable as foraging sites for extended periods; however, now that a controlled fire program is in effect and natural site drainage has been restored in selected areas, the detrimental effects of the hot cypress dome burning have been reduced. Measures to restore natural site drainage in selected areas were described in the 1993 JAMMP and are now complete.

This revised management plan is expected to provide conditions favorable to maintaining a mesic longleaf pine ecosystem and thereby provide optimum habitat conditions for the red-cockaded woodpeckers as well as other wildlife that is characteristic of this habitat type.

3.3 Red-cockaded Woodpecker Management Area

The Red-cockaded Woodpecker Management Area consists of approximately 2,000 acres of undeveloped lands on the SEC site. The management area is defined, as stipulated in the SEC Unit II Conditions of Certification, as all lands depicted on Figure 4.2 of the August 1981 Red-cockaded Woodpecker Management Plan, except for the area specifically identified as "construction impact of proposed Units I, II, III, and IV. Figure 7 of this plan is identical to Figure 4.2 of the August 1981 Red-cockaded Woodpecker Management Plan. The roads shown in Figure 7 will be maintained for dry and wet season travel along with the access road to the Hall Scott Preserve on the east side and the weather station on the south end of the SEC site. These roads are necessary for access and fire control.

The Red-cockaded Woodpecker Management Area will continue to be managed for the benefit of the red-cockaded woodpecker, in accordance with Condition XXXI of the SCA granted to OUC by the FDER Sitting Board on December 14, 1982. If additional uses of the management area are required for the operation of the power plant, these uses will be approved in accordance with the procedures identified in the Florida Power Plant Siting Act and by the FWS prior to their implementation.

3.4 Management Objectives

OUC will implement the management activities described in Section 3.2 to achieve the following objectives:

- (1) prohibit unnecessary disturbances in areas managed for red-cockaded woodpeckers;
- (2) protect all existing, both occupied and abandoned, and new cavity trees;
- (3) protect clusters, including surrounding trees, to ensure future replacement cavity trees and to serve as a buffer zone to disturbances;
- (4) ensure that each occupied cluster has at least four suitable roost cavities;
- (5) where necessary, protect each nest cavity from climbing predators;
- (6) provide for future clusters in the remaining forest stands through appropriate timber management
- (7) maintain or improve foraging habitat through appropriate timber management and a controlled fire program;

- (8) provide contiguous habitat between clusters and foraging habitat with habitat breaks no larger than presently exist;
- (9) conduct a regular, prescribed burning program;
- (10) maintain the perimeter firebreak system to control prescribed burns and to prevent the spread of wildfire;
- (11) establish an exotic weed control program for the elimination of cogon grass, other exotic plant species, and possible future contamination by other exotic species;
- (12) allow all previously disturbed areas (those associated with pre-construction activities) not scheduled for tree planting within the management area to reseed naturally with pine;
- (13) conduct on-site monitoring of red-cockaded woodpecker survivorship, population status, and fledgling success; and
- (14) establish an enhancement plan for providing ground cover improvement by reducing tall patches of saw palmetto growth.

3.5 Implementation

OUC will be responsible for implementing the management practices discussed below. Qualified biologists will be retained to monitor the red-cockaded woodpecker population in accordance with the 2003 Red-cockaded Woodpecker Recovery Plan and monitor the success of the management plan and practices.

Figure 7. The Red-cockaded Woodpecker Management Area and Projected Development Areas, including Units 3 and 4 for the SEC, OUC, Orlando, Florida, 2005.



**CURTIS H. STANTON ENERGY CENTER
RED-COCKADED WOODPECKER MANAGEMENT AREA**

3.5.1 Controlling Disturbance

Construction contractors will be briefed as required on their legal obligations under the Endangered Species Act and regulations of the FGFWFC. This briefing will include information on the limits of construction, activities required to comply with stated construction plans, and construction constraints as described in the Mitigation Plan Construction Constraints (Appendix E of the JAMMP). OUC or their consultant will monitor construction activities.

All cluster areas and buffer zones will be conspicuously marked prior to any construction. Cavity trees close to construction activities will be fenced and marked with endangered species posters. Where possible, a 200-foot buffer zone will be established around each cavity tree close to construction activities. Some cavity trees are located immediately adjacent to unimproved dirt roads that will be used during mitigation activities or population monitoring; no adverse impacts are expected to occur. There are no known construction activities expected to occur within 200 feet of any RCW clusters on the Stanton site.

3.5.2 Timber Control

No timber will be harvested within the management area, unless required for improving habitat for the red-cockaded woodpeckers. Pine trees will be allowed to reach senescence and die. Any harvesting will be approved by the FGFWFC and FWS prior to the harvest.

Potential replacement cavity trees and cluster sites, as well as younger pines within each cluster area will be retained. Young pines may be removed to keep cavities clear of obstruction. Currently all cavity trees are located in open stands of pine with relatively few hardwoods; thus, there is no immediate need for stand improvement thinning in cluster sites. Abandoned cavity trees and snags in the management area will be retained to provide roosting and nesting sites for kleptoparasites. The burning program outlined in this document should promote pine regeneration by natural recruitment.

3.5.3 Fire Management

The burning program that will be implemented on the red-cockaded woodpecker management area is outlined in this section. It includes a description of the schedule, frequency of burns, burn conditions, and means of controlling wildfire. Burns, which have been conducted every three to five years, occurred in the mid 1980s, 1990-91, 1993, 1998, and 2003.

3.5.3.1 Burn Schedule and Frequency. The red-cockaded woodpecker management area will be divided into areas and alternately burned on a two-year rotation to reduce saw palmetto growth and provide optimum habitat conditions. Since the seasonality of the burn has an impact on the vegetation, Table 2 is provided to indicate the burn season preference. Burning will usually be performed during the optimum season as shown in the Table 2; however, some intentional variation will occur and other factors, e.g., short and long-term weather conditions, fuel loading, etc., may dictate burns during seasons other than the optimum listed above. New pine planting areas or recruitment areas will be burned on the same schedule as the remaining portions of the management area. Burns will be by ground ignition, primarily using backing fires to minimize vegetation mortality; however, variable conditions may dictate flanking or in extreme cases, head firing techniques.

Table 2. Burn Preference According to Rank Order for Effects on Habitat Condition and Red-cockaded Woodpeckers, SEC, 2005.

Burn Season Rating	Rank	Months	Comments
Optimum	1	February to April	Wiregrass & longleaf pine response is best in spring
Preferred	2	May to June	RCW nesting season ¹
Satisfactory	3	July to September	High water and heat
Least Satisfactory	4	October to mid-November	High stress on longleaf pines
Special Conditions	N/A	Mid-November to January	Heavy fuel loads

Note: Burning during the nesting season requires additional clearing around the cavity trees.

3.5.3.2 Burn Conditions and Control of Wildfire. A Florida State Certified Burn Specialist will conduct prescribed burns. Two of the most important factors that ensure a successful cool summer burn are soil moisture and relative humidity. Fuel moisture is a function of relative humidity, rainfall, and temperature (Mobeley et al. 1978). Burns will not be conducted when soils and leaf litter are completely dry. When possible, burns will be conducted as soon as possible (one to three days) following a storm event, preferably one producing a 0.5 to 1 inch rainfall. Likewise, relative humidity should be moderate to high and not lower than 20 percent. A moderate breeze is also desired to prevent the fire from reaching the tree crown. After initiation of this frequent burning program, fuel loads should be sufficiently reduced such that a cooler and more controllable burn is more easily achieved.

A fire break of about 20 feet in width, completely encircling the red-cockaded woodpecker management area and adjacent to the SEC site perimeter fence, is presently maintained by OUC. This firebreak will be disked annually and immediately prior to any controlled burn. Other unimproved roads exist within the interior of the management area and may serve as additional firebreaks. Because of drainage concerns, plantings within the Riparian Habitat Protection Areas, described in the JAMMP, will not be protected with firebreaks. Other measures, such as backfires, may be used to prevent seedling mortality in these areas. All vegetation around cavity trees will be mowed to a height of no greater than 1 foot for a radial distance of 20 feet. If the control burn is set during the nesting season, the clearing will be for a radial distance of 50 feet. All clearing will be performed by hand or by a low impact mower towed with a rubber-tired tractor.

3.5.4 Exotic Vegetation Control

Herbicides and pesticides toxic to wildlife will not be used in any part of the red-cockaded woodpecker territories. Spot applications of an approved herbicide may be used in the areas of pine tree plantings or wetlands, if necessary, to remove or control exotic or undesired invasive species.

The extensive invasion of cogon grass will ultimately replace most native ground cover species. Cogon grass occurs initially as spots of 1 meter or more in size, but later may occupy much larger areas as the plant spreads throughout the herbaceous ground

layer. The species out competes most other herbaceous species and promotes very hot fires when burned. To eliminate this exotic species, a program will be instituted to delineate, map, and eradicate the plants with appropriate herbicides. To determine major areas of cogon grass, a qualified biologist will review a recent aerial photograph of the site and follow-up with a field examination to refine the locations of this invasive grass. A final map will then be developed and a contractor will be retained to eliminate this species. The initial treatments during the first year will be made in the fall, if possible, with periodic treatments as needed. Inspections of each spot or area will be made to determine the necessity for retreatments during the second year. Annual inspections will occur until the species is eliminated; thereafter, re-inspections will be conducted every five years to further assess the success of the elimination plan. Retreatments will be conducted, if needed and a determination will be made as to the best assessment interval; however, the assessment interval will not be longer than every five years. At the end of the second year of treatment a report will be provided to the respective agencies. The five-year sampling and assessment report will include results and recommendation from the cogon grass evaluation.

Presently, to control cogon grass contractors will apply arsenal at 1% by volume from a low volume spray unit. This concentration is well under the max label rate of 6 pints per acre. In the thickest areas, 4 pints per acre max may be used. For the Chinese tallow and the Brazilian pepper (should it occur on-site), 79% high-grade oil, 20% Garlon 4, 1% Stalker will be used as a basal bark treatment.

3.5.5 Population Monitoring Studies

OUC will also continue the yearly red-cockaded woodpecker monitoring study using the guidelines established in the 2003 Red-cockaded Woodpecker Recovery Plan. Monitoring studies will include annual winter banding of all unbanded adults and juveniles that remain within the population. Annual inspections will also be made of nest trees each week during the nesting season to assess nesting and fledgling success. Nestlings will be banded at this time. Nest trees with low or insufficient resin flow will be wrapped with material to protect against climbing snakes. Population estimates will be determined for the winter and nesting season. Cavity trees and cavities will also be inspected to determine the number of suitable cavities in each

cluster. The location and status will be recorded using GPS coordinates. Based on these inspections, the consultant will determine the need for population enhancement translocations and the necessity for additional cavity inserts in these existing clusters. At least four usable cavities will be maintained in each cluster using artificial cavities, if necessary. Translocations of young birds to the site will be conducted as described below in Chapter 4.0.

3.5.6 Pine Habitat Condition Monitoring

An assessment of the habitat conditions on the entire site has not been made since the mid-1980s (DeLotelle et al 1987). Habitat conditions will be evaluated to determine pine stand age and densities across the management area using previously applied techniques (DeLotelle et al 1987, DeLotelle et al 1995, also see Hooper et al 1982). An aerial photograph will be used to determine new pine stands and will be compared to historic conditions (1980) of pine stands. Once the pine stands and other habitats are determined from aerial photographs for the SEC site, a field evaluation will be made. Data will be collected by placing one to five plots in each stand with the number of plots per stand based on the stand size. A 100 by 100 foot plot will be laid out to count all pine stems and take diameter measurements on 10% of the trees over three inches in diameter. Seedlings will be counted separately. Five increment cores will be taken in mature pines to evaluate age and ten-year growth of pines. This will be used to develop a report and pine stand map for the SEC site and provided to Florida Department of Environmental Protection (FDEP), USFWS, and FFWCC. This evaluation and report will be updated every five years and provided to these agencies.

3.5.7 Ground Cover Enhancement Plan

Overall, habitat conditions for the Red-cockaded Woodpecker have improved with the implementation of the fire management program and the addition of several recruitment classes of longleaf pine on the SEC site. While the ground cover on the SEC site is in reasonably good condition, it has deteriorated over the last 10-15 years compared to historic conditions. A healthy and extensive herbaceous ground cover is important for the support of the insect fauna. In order to maintain and improve conditions for red-cockaded woodpeckers several activities should be undertaken to enhance the ground cover conditions. The largest activity will be the establishment of an intensive fire program to maintain the seral longleaf pine and wiregrass community. Mechanical control of the saw palmetto will also be required, as the overgrowth and continued expansion of saw palmetto will diminish these aspects of the forest ecosystem.

The primary focus of the plan on mechanical control of palmetto growth will be to develop a map with the occurrence of problem areas, which will be treated as appropriate. These areas will be located on aerial photographs and followed-up with on-site inspections. All existing and artificial clusters will be inspected for palmetto growth. A map will be produced to denote each area that does not meet the criteria listed below and will then be used to evaluate the necessity of roller chopping the various pine habitats. It is recommended that an 18-inch diameter by 5.5 feet long roller chopper be used (Outcalt, pers.comm. 2005). No tandem choppers will be used on-site. A heavy-duty bush hog may be employed in place of the roller chopper provided there are no stumps. The initial treatment could include roller chopping or bush hogging in selected areas followed by a fire interval of every two years to reduce the buildup of saw palmetto. A suggested route for roller chopping will be provided that will involve the least damage to grasses and other components of the ground cover.

Mechanical control should occur in the fall of the year with one small roller chop as described above. A bush hog operation or cutover with a large mower behind a tractor should be undertaken in cluster areas with problems. No treaded equipment will be allowed in any cavity tree areas. Roller chopping or bush hogging in the remaining areas may be employed to reduce palmetto growth and promote the herbaceous growth. This is best accomplished in the fall or winter when conditions are relatively dry

in the foraging habitat areas. The path of the roller chopper should be circular or rounded at the ends so as not to damage ground cover by plowing into topsoil. Sharp angle turns must not be used in ground cover areas. Once again, conditions must be dry to meet this objective.

3.5.8 Vegetation Delineation, Mapping, and Eradication

The various habitats essential for the red-cockaded woodpeckers will be surveyed to determine the extent of encroachment by undesirable vegetation. First, an inventory of the management area (review of aerial photographs followed by field verification) will be undertaken to determine the locations and extent of the areas that require corrective action. Although not a major problem at this point, any areas with popcorn tree (*Sapium sebiferum*) should also be noted for elimination. Once the location and extent of the various encroaching species is determined, elimination and suppressing measures will be implemented. The height of saw palmetto in the various habitats will be the determining factor for its suppression as outlined in Table 3 below.

a) Cavity Tree Cluster areas:

prior to initiating ground surveys, aerial photographs of all areas will be reviewed, and then cavity tree cluster areas will be verified in the field to determine the extent of exotics and saw palmetto. Problem areas will be mapped and corrective action noted.

b) Foraging areas:

an approach similar to that used in cavity tree cluster sites will be employed in foraging habitat areas as well. Areas with a number of dead pines will be of particular interest and will be investigated.

c) Wetland fringes in Upland Habitats:

wetland fringe areas, which often have particularly high growth of saw palmetto, will also be investigated. If the areas are not extensive, no corrective action will be undertaken but a few areas are expected to need improvement.

d) Remainder of Property:

the remainder of the flatwoods will be treated in a similar fashion to the wetland fringe areas above.

Table 3. Criteria for the Institution of Mechanical Control of Saw Palmetto in Red-cockaded Woodpecker Habitats on the SEC Site

AREA	Maximum Stem Growth of Palmetto Above Ground Surface	Treatment Method
Cluster Areas	1.5 feet	Hand or bush hog
Foraging Areas	1.5 to 2 feet	Roller chopping
Wetland Fringe	2 to 3 feet	Roller chopping or fire frequency
Remainder of Property	2 to 3 feet	Roller chopping or fire frequency

4.0 POPULATION ENHANCEMENTS AND CLUSTER CREATION

The east Orange County red-cockaded woodpecker population was one of four within Florida identified by the FGFWFC as needing a conservation plan to ensure further protection (Cox *et al.*, 1995). The action described below will aid in increasing the number of groups on the SEC site and ultimately in enhancing the viability of the Orange County red-cockaded woodpecker population. This plan first includes a portion for the creation of a recruitment cluster followed by a translocation program with sub-adult birds. A comprehensive plan for the enhancement of foraging habitat was described in section 3.0 and will require a number of years to be successful. Other additional enhancement aspects of the management plan are intended to mitigate for losses of the planted pine trees associated with both the construction of the gas pipeline along the alternate access road corridor to the south and the transmission line maintenance operations in the corridor to the north between the substation and Pope road.

4.1 Cluster Creation for Recruitment of Sub-adults

Three cluster sites (A1, B1, and D1) will be provisioned each with four artificial cavities, in different segments of the population (Figure 1). Within each artificial cluster area, four cavity inserts will be installed in proximity to each other in trees ranging in age between 50 and 150 years and with a diameter of 14 inches or more (Table 4). These clusters will be inspected during seasonal surveys and any required maintenance will be performed. All recruitment cluster sites, except the C1 area, are abandoned clusters that were occupied by red-cockaded woodpeckers through the 1980s. These artificial cluster sites were selected based on the proximity of the surrounding groups of red-cockaded woodpeckers and the availability of potential cavity trees, i.e., those with diameters of 14 inches or more. Each cluster and the surrounding foraging habitat have been evaluated to determine if enough foraging resources were present to meet the needs of central Florida red-cockaded woodpeckers (See DeLotelle and Epting 1992 and DeLotelle *et al.* 1995, also see guidelines in Section 3.2). Additional artificial

cavities may be placed in any natural cluster that is deficient in usable cavities. Although four cluster sites are available only three were chosen: A1, B1, and D1, for artificial cavity augmentation.

Table 4. Artificial Cluster Sites for Cavity Inserts and Description of Surrounding Foraging Habitat, SEC, Orlando, Florida, 2003.

Cluster ID and Description	Old Trees*	Number of 60 to 80 Year Old Trees**	Age/Density of Foraging Habitat	Number of Pines and Basal Area in 200 Acres	Management Needed in Cluster Areas
A1 Artificial Site	Numerous old trees	6@14" dbh or larger trees	58 years & 59 per acre	12,400 pine trees 6,550 ft ²	Bush-hog near all cavity trees
B1 Artificial Site	14/ Many in 50 to 80 age class	12@14" dbh or larger trees	48 years & 82 per acre	13,400 pine trees 6,130 ft ²	Bush-hog near several cavity trees
C1 Abandoned Site	Numerous old trees	7@14" dbh or larger trees	39 years & 52 per acre	8,500 pine trees 3,682 ft ²	Hand clean around all cavity trees
D1 Abandoned Site	Numerous old trees	7@14" dbh or larger trees	41 years & 71 per acre	11,700 pine trees 5,082 ft ²	Bush-hog some pf cluster area, Hand clean remainder

*Old-remnant trees are easily identified by the presence of large flattop crown and few if any limbs on the bole of the tree. All trees exceed 100 years of age based on numerous increment core bores taken from these type trees in the Big Econ Basin.

** This is the primary age and size class of live pine trees used for artificial cavity inserts in the Big Econ Basin and other central Florida Flatwoods sites.

4.2 Monitoring Activities.

Annual monitoring studies and reproductive success will be used to assess the status of the existing red-cockaded woodpeckers groups. These studies will continue over the life of the facility. The monitoring studies will include periodic inspections to determine if dispersing red-cockaded woodpeckers are using any of the artificial clusters as roosting sites. Artificial cavities will also be inspected to ensure that there are no leaks and to clean any undesired nest material. If solitary birds are found living

in these recruitment clusters, other red-cockaded woodpeckers of the opposite sex will be translocated to potentially form a new breeding group in these clusters.

It is anticipated the new dispersing birds that take residency in these artificial clusters will primarily be young males; thus, a young female would be translocated to these sites. The bird will be placed in the new cavity on the night of its capture or free-released if captured and released on the same morning. Other combinations of translocation activities over the intervening monitoring years may occur. No more than two birds from the surrounding area will be translocated in any one year. No translocations from surrounding groups will occur during years of low reproduction. The three artificial cluster sites and cavities will be visited at least twice during each nesting season to determine occupancy, reproductive status, and reproductive success. Cluster creation and occupation shall be considered a success when a pair of red-cockaded woodpeckers have occupied the site for one complete year or have reproduced successfully. Reproduction is successful when eggs, nestlings, or fledglings from the new group are observed.

4.3 Translocation Activities

If at the end of the first year, no dispersals have occurred into the three artificial clusters, attempts will be made to obtain birds for translocation from other populations of red-cockaded woodpeckers in the southeast by attending the translocation meeting in Tallahassee, Florida with the purpose of securing bird(s) for translocation. Birds to be translocated will be placed in artificial cavities, screened, and released in the morning. If a bird is obtained for translocation, monitoring will occur as detailed in Section 4.2.

4.4 Implementation Schedule for Artificial Cavity Installations

The following schedule for artificial cluster sites is proposed to implement the procedures outlined above. Recruitment clusters with inserts will be constructed in three locations as previously described. All shrubs, including palmetto and wax-myrtle (*Myrica cerifera*), will be mowed for a minimum radius of 50 feet around all cavity trees within the artificial sites and all dead limbs or other dying vegetation will be removed from the vicinity of these cavity trees to ensure a low flame height during control burns. The following activities should be performed:

- (1) prescribed burns in these red-cockaded woodpeckers habitats should be conducted on a regular basis as in the remaining forest management fire schedule;
- (2) monitoring of artificial cavities to determine their continued suitability as roost sites for red-cockaded woodpeckers;
- (3) monitoring of remaining red-cockaded woodpeckers groups on the SEC site for reproduction and possible translocation of young-of-the-year;
- (4) annual monitoring and translocation activities until successful occupation and reproduction in the artificial cluster sites has occurred; and
- (5) inspection for debris, predators, or competitors of the roost cavities occupied by the breeding males and females prior to each year's inspections of artificial cavities during the spring.

5.0 REPORTS

The following reports will be provided for the duration of the plant. Copies will be furnished to each of the respective agencies as shown in Table 5.

Table 5 Report Schedule for Management Plan Activities for the next Five-Years and Beyond, Curtis H. Stanton Energy Center, 2005

Report Name	Frequency	Due Date	Duration	Comments
RCW monitoring	Annual	August 2005	Life of Plant	Demographics-reproduction, etc.
Exotic species Control	Annual ¹	July 2007	Two years, as needed	Success of control, reapplication
Habitat Survey	Five Year Intervals	March 2006	Updated Every 5 years	Comparison with historic data
Saw palmetto reduction	One-two year	July 2007	Two years, as needed	As needed
Five Monitoring	Every 5 years	August, 2010	Covers all data collected	Summary of all completed studies
Fish & Wildlife Annual Monitoring Report	Annually	January 31, each year	Life of Facility	Required

Notes:

A five-year summary report will cover red-cockaded woodpecker demographics, the status of exotic and nuisance plant or animal species, and pine habitat characteristics. This report will include a recommendation to maintain eradication of exotic species over the next five years.

1) Report frequency will be annual until exotics are eradicated; thereafter, frequency will be on a five-year interval.

LITERATURE CITED

Black & Veatch and DeLotelle & Guthrie, Inc. 1992. A Joint Agency Mitigation and Monitoring Plan and Report 1: Baseline Data. OUC. Orlando, Florida.

Brown, M.T., Luthin, C.S., Tucker, J., Hamamm, R., Schaefer, J., Wayne, L., and Dickson, M. 1989. Econlockhatchee River Basin Natural Resources Developmental and Protection Plan. St. Johns River Water Management District, Palatka, Florida.

Copeyon, C.K. 1990. A Technique for Constructing Cavities for the Red-cockaded Woodpecker. *Wildlife Society Bulletin*. 34:49-58.

Costa, R. and Escano, R.E.F. 1989. Red-cockaded Woodpecker Status and Management in the Southern Region in 1986. U.S. Forest Service, Southern Region, Atlanta, Georgia. 54 pp.

Costa, R. 1991. Personal Communication on Red-cockaded Woodpecker Movement Attempts. U.S. Fish and Wildlife Service, Atlanta, Georgia. 1991.

Cox, J., Baker, W.W., Wood, D. 1983. Distribution and Status of the Red-cockaded Woodpecker in Florida: 1992 Update. *Proceedings of the III Red-cockaded Woodpecker Symposium*. U.S. Fish and Wildlife Service. Charleston, South Carolina.

De Fazio, J.T., Hunnicutt, M.A., Lennartz, M.R., Chapman, G.L., and Jackson, J.A. 1987. Red-cockaded Woodpecker Translocation Experiments in South Carolina. *Proceedings Annual Conference of Southeastern Association of Fish and Wildlife Agencies*. 41:311-317.

DeLotelle & Guthrie, Inc. and Black & Veatch. 1993. Endangered and Threatened Wildlife Species Survey for the Curtis H. Stanton Energy Center. OUC. Orlando, Florida.

DeLotelle, R.S. and Newman, J.R. 1983. Possible Factors Influencing Red-cockaded Woodpecker Colony Abandonment's: a Case Study. Pages 104-106 in Wood, D.A. (ed) Proceedings Second Red-Cockaded Woodpecker Symposium. Florida Game and Fresh Water Commission, U.S. Fish and Wildlife Service, U.S. Forest Service. Tallahassee, Florida.

DeLotelle, R.S., Epting, R.J., and Newman, J.R. 1987. Habitat Use and Territory Characteristics of Red-cockaded Woodpeckers in Central Florida. *Wilson Bulletin*, 99:202-271.

DeLotelle, R.S. and Epting, R.J. 1988. Selection of Old Trees for Cavities by Red-cockaded Woodpeckers. *Wildlife Society Bulletin*, 16:48-52.

DeLotelle, R.S. and Epting, R.J. 1992. Reproduction of Red-cockaded Woodpeckers in Central Florida. *Wilson Bulletin* 104 (2), 285-294.

DeLotelle, R.S., Epting, R.J., and DeMuth, G.A. In Press. A 12-year Synopsis on Red-cockaded Woodpeckers in Central Florida. Proceedings of the III Red-cockaded Woodpecker Symposium. U. S. Fish and Wildlife Service. Charleston, South Carolina.

DeLotelle, R.S., J.R. Newman, and A.E. Jerauld. 1983. Habitat use by Red-cockaded Woodpeckers in central Florida. Pp. 59_67 in Red-cockaded Woodpecker Symposium II Proc. (Wood, D.A., ed.). Florida Game and Fresh Water Fish Comm., U.S.F.W.S., U.S.F.S. Tallahassee, Florida.

Griffith, B., Scott, J.M., Carpenter, J.W., and Reed, C. 1989. Translocation as a Species Conservation Tool: Status and Strategy. *Science* 245:477-480.

Hooper, R.G. 1991. Personal Communication on Red-cockaded Woodpecker Movement Studies. U.S. Forest Service, Charleston, South Carolina.

Lennartz, M.R., Hooper, R.G., and Harlow, R.F. 1987. Sociality and Cooperative Breeding of Red-cockaded Woodpeckers (*Picoides borealis*). Behavioral Ecology and Sociobiology. 20:77-78.

Lewin, R. 1989. Hidden Complexities in the Risks of Extinction. Science. 243:1294.

Mobley, H. E., Jackson, R. S., Balmer, W. E., Ruziska, W. E., and Hough, W. A. 1978. A Guide for Prescribed Fire in the Southern Forest. U. S. Forest Service, Southeastern area, Atlanta, Georgia.

Nesbitt, S.A., Jerauld, A.E., Harris, B.A., Skoog, P.J., Brownsmith, C.B., and Evink, G.L. 1983. Response of a Male Red-cockaded Woodpecker to Drastic Habitat Alteration. Pages 101-104 in Wood, D.A. (ed) Proceedings of Second Red-cockaded Woodpecker Symposium. Florida Game and Fresh Water Fish Commission, U.S. Fish and Wildlife Service, U.S. Forest Service. Tallahassee, Florida.

Odom, R.R. 1983. Georgia's Red-cockaded Woodpecker Relocation Experiment: a 1983 Update. Pages 106-108 in Wood, D.A. (ed) Proceedings of Second Red-cockaded Woodpecker Symposium. Florida Game and Fresh Water Fish Commission, U.S. Fish and Wildlife Service, U.S. Forest Service. Tallahassee, Florida.

OUC.1981. Management Plan for the Red-cockaded Woodpecker. Unpublished Manuscript. Prepared for Environmental Science and Engineering, Inc., Gainesville, Florida.

Palmer, D. 1992. Personal Communication on habitat at the Curtis H. Stanton Energy Center. U. S. Fish and Wildlife Service. Jacksonville, Florida.

Reinmann, J.P. 1984. Woodpeckers Receive Second Chance. Florida Naturalist 57:17.

Shaprio, A.E. 1983. Characteristics of Red-cockaded Woodpecker cavity trees and colony areas in southern Florida. Fla. Sci. 2:89-95.

Walters, J.R., Doer, P.D., and Carter, J.H., III. 1989. The Cooperative Breeding System of the Red-cockaded Woodpecker. Ethology. 78:275-305.

U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U.S. Fish and Wildlife Service, Atlanta, Georgia, USA.

Wood, D.A. and Wenner, A.S. 1983. Status of the Red-cockaded Woodpecker in Florida: 1983 Update. Pages 89-91 in Wood, D.A.(ed) Proceedings of Red-cockaded Woodpecker Symposium. Florida Game and Fresh Water Fish Commission, U.S. Fish and Wildlife Service, U.S. Forest Service. Tallahassee, Florida.

ATTACHMENT C FDEP LETTER OF RELEASE





Jeb Bush
Governor

Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Colleen M. Castille
Secretary

Charles Doud
Orlando Utilities Commission
P.O. Box 3193
Orlando, FL 32802

OCD-ERP-04-0588

Orange County - ERP
OUC Curtis H. Stanton Energy Center
Orlando Utilities Commission, Mitigation Areas to Release From Monitoring

Dear Mr. Doud:

The Department has received and reviewed the 2003 Annual Biological Monitoring of the Stanton Energy Center Mitigation Areas Report. Mark Langford of this Department has met on site with Charlie Doud of OUC and is in support of the conclusions in the report declaring success criteria is met on some of the mitigation areas on the property. The specific areas meeting success criteria are listed below: The areas not specifically listed are not released. Only the areas specifically listed may be released from further monitoring.

Mitigation Area 3.1. According to the monitoring report, the southern planting area of pond cypress is meeting success criteria and is released from further monitoring. The remaining portions of 3.1 have not yet met success criteria. These areas include the northern planting area of cypress, and the long leaf pine planted areas,

Mitigation Area 3.2. According to the monitoring report, the north and south slash pine plantings are meeting/exceeding success criteria and are released from further monitoring. The remaining portions of 3.2 have not yet met success criteria. These areas include the cypress seedling planting, the cypress tree planting, and the longleaf pine seedling planting.

Mitigation Area 3.5. According to the monitoring report, the existing cypress domes are meeting success criteria and are released from further monitoring. The herbaceous wetlands within this mitigation area also have adequately met success criteria and are released from further monitoring. The longleaf pine seedling planting area has not met success criteria at this time.

Mitigation Area 3.6. According to the monitoring report, the cypress seedling planting area is meeting success criteria and is released from further monitoring. Success criteria are also being met/exceeded for the hydrologically enhanced existing cypress domes. These also are released from further monitoring. The herbaceous wetlands within this mitigation area also are

"More Protection, Less Process"

Printed on recycled paper.

are considered to be meeting success criteria and are released from further monitoring. It is understood that the above-mentioned areas within this mitigation area have had some difficulty in reaching or maintaining the proper density of wetland herbaceous cover due to the documented drier conditions. The Department does agree with the report that these areas are jurisdictional and have increased in frequency of occurrence of wetland species according to the mitigation goal. The longleaf pine seedling planting area has not yet met success criteria.

Mitigation Area 3.7. According to the monitoring report, this area has met the success criteria for hydrologic enhancement as shown by rainfall and staff guage/piezometer well readings. This entire area is released from further monitoring.

The 2003 Annual Biological Monitoring Report shows there are some mitigation areas at the Stanton Energy Center that have not met success criteria. Seedling survival and tree density appear to be the main problem associated with these areas not reaching success. DEP and other regulatory agencies will discuss these issues with OUC and determine what further course of action needs to be taken to either reach the original success criteria, or to modify it in the interest of the red-cockaded woodpecker.

The Department thanks you for successfully completing the above-mentioned mitigation at your facility. Please contact Mark Langford at the above letterhead address, by e-mail at mark.langford@dep.state.fl.us, or by phone at 407-893-7867 with any questions or concerns.

Sincerely,



for
Angela K. Booker
Environmental Manager
Compliance and Enforcement
Submerged Lands and Environmental
Resources Permitting

Sept 21, 2004
Date

DC
AKB/ml/co
my

ATTACHMENT D MITIGATION AREA PERMANENT LOCATION PHOTOGRAPHS



MITIGATION AREA 3.1 (2 PHOTOS)



Northwest corner looking southeast - $28^{\circ}28'40.0332''$ N, $81^{\circ}10'10.8264''$ W



Southeast corner looking northwest - $28^{\circ}28'30.036''$ N, $81^{\circ}10'0.876''$ W

MITIGATION AREA 3.2 (3 PHOTOS)



North looking south - 28°28'23.7432" N, 81°09'57.7296" W



Middle looking northwest - 28°28'11.5356" N, 81°09'55.5156" W



South looking west - 28°28'5.178" N, 81°09'40.5288" W

MITIGATION AREA 3.3 (2 PHOTOS)



Southwest corner looking northeast - 28°29'12.066" N, 81°10'45.1992" W



Northwest corner looking southeast - 28°29'26.4084" N, 81°10'46.4196" W

MITIGATION AREA 3.5 (2 PHOTOS)



Looking south near north fence line at filled in ditch - 28°29'44.8296" N, 81°08'53.6352" W



Looking west - 28°29'17.1672" N, 81°08'54.9708" W

MITIGATION AREA 3.6 (3 PHOTOS)



Looking northeast near transect 15- 28°28'30.7956" N, 81°09'33.6744" W



Looking north near transect 24 - 28°28'22.1484" N, 81°09'33.5304" W



Looking west near wetland enhancement area - 28°28'19.7472" N, 81°09'43.374" W

ATTACHMENT E

MITIGATION AREA INDIVIDUAL SITE PHOTOGRAPHS



MITIGATION AREA 3.1



Latitude
28.47786
Longitude
-81.16897



Latitude
28.47736
Longitude
-81.16710



Latitude
28.47801
Longitude
-81.16820



Latitude
28.47688
Longitude
-81.16748



Latitude
28.47753
Longitude
-81.16843



Latitude
28.47637
Longitude
-81.16731



Latitude
28.47755
Longitude
-81.16734



Latitude
28.47605
Longitude
-81.16746



Latitude
28.47719
Longitude
-81.16823



Latitude
28.47469
Longitude
-81.16708

MITIGATION AREA 3.1 PC AREA



MITIGATION AREA 3.2



Latitude
28.47326
Longitude
-81.16767



Latitude
28.47009
Longitude
-81.16544



Latitude
28.47260
Longitude
-81.16635



Latitude
28.46929
Longitude
-81.16282



Latitude
28.47208
Longitude
-81.16635



Latitude
28.46879
Longitude
-81.16243



Latitude
28.47093
Longitude
-81.16451



Latitude
28.46830
Longitude
-81.16209



Latitude
28.47030
Longitude
-81.16520



Latitude
28.46696
Longitude
-81.16167

POND CYPRESS MITIGATION AREA 3.2



Latitude
28.47363
Longitude
-81.16749



Latitude
28.47064
Longitude
-81.16420



Latitude
28.47344
Longitude
-81.16688



Latitude
28.47079
Longitude
-81.16351



Latitude
28.47230
Longitude
-81.16588



Latitude
28.46914
Longitude
-81.16231



Latitude
28.47230
Longitude
-81.16545



Latitude
28.46805
Longitude
-81.16164



Latitude
28.47090
Longitude
-81.16407



Latitude
28.46741
Longitude
-81.16138

MITIGATION AREA 3.3



Latitude
28.49070
Longitude
-81.17862



Latitude
28.48809
Longitude
-81.17908



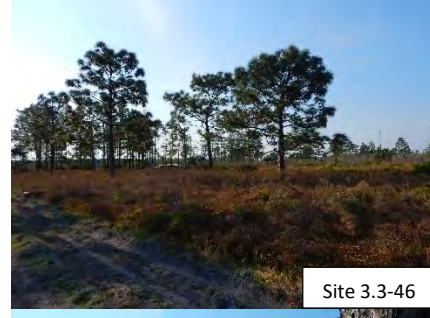
Latitude
28.49055
Longitude
-81.17908



Latitude
28.48691
Longitude
-81.17891



Latitude
28.49013
Longitude
-81.17795



Latitude
28.48677
Longitude
-81.17759



Latitude
28.48948
Longitude
-81.17901



Latitude
28.48660
Longitude
-81.17831



Latitude
28.48948
Longitude
-81.17796



Latitude
28.48650
Longitude
-81.17750

MITIGATION AREA 3.5



Latitude
28.49514
Longitude
-81.14950



Latitude
28.49414
Longitude
-81.14984



Latitude
28.49281
Longitude
-81.15099



Latitude
28.49015
Longitude
-81.15135



Latitude
28.48722
Longitude
-81.14903



Latitude
28.48423
Longitude
-81.14834



Latitude
28.48523
Longitude
-81.14796



Latitude
28.48854
Longitude
-81.14835



Latitude
28.48959
Longitude
-81.14903



Latitude
28.49449
Longitude
-81.14686

MITIGATION AREA 3.6



Latitude
28.47160
Longitude
-81.16291



Latitude
28.47110
Longitude
-81.16244



Latitude
28.47194
Longitude
-81.16208



Latitude
28.47095
Longitude
-81.16222



Latitude
28.47161
Longitude
-81.16300



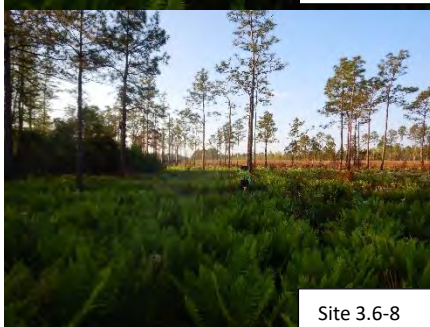
Latitude
28.47110
Longitude
-81.16186



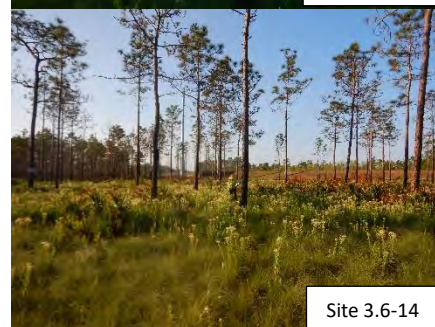
Latitude
28.47175
Longitude
-81.16206



Latitude
28.47062
Longitude
-81.16172



Latitude
28.47144
Longitude
-81.16206

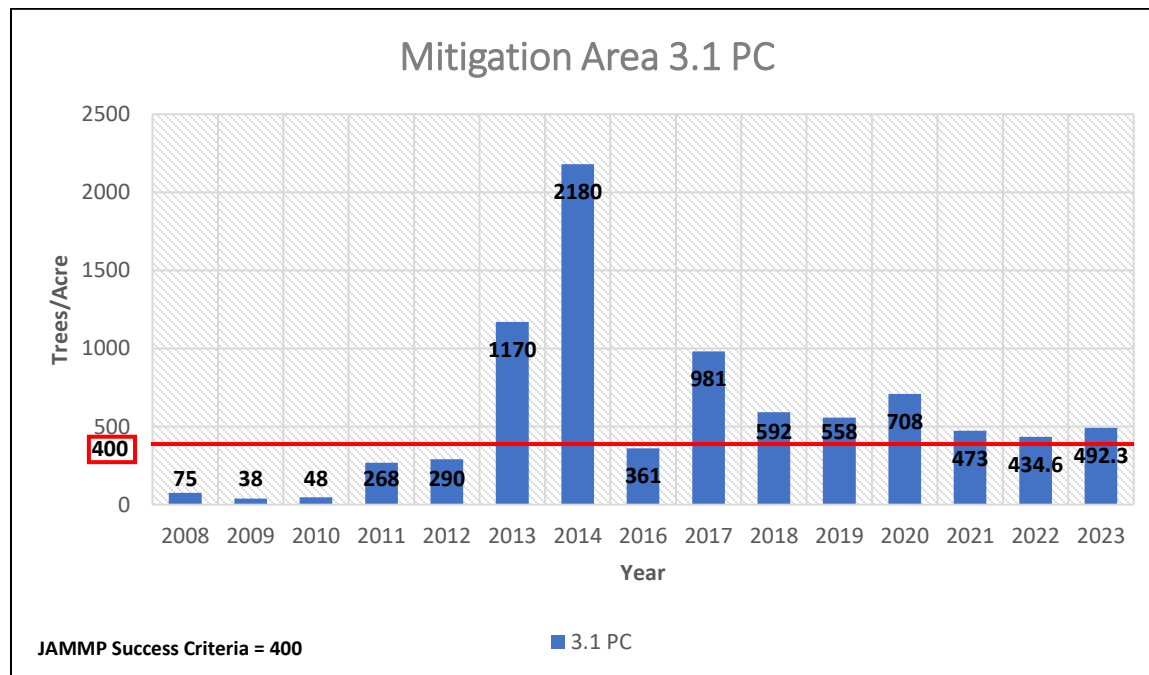
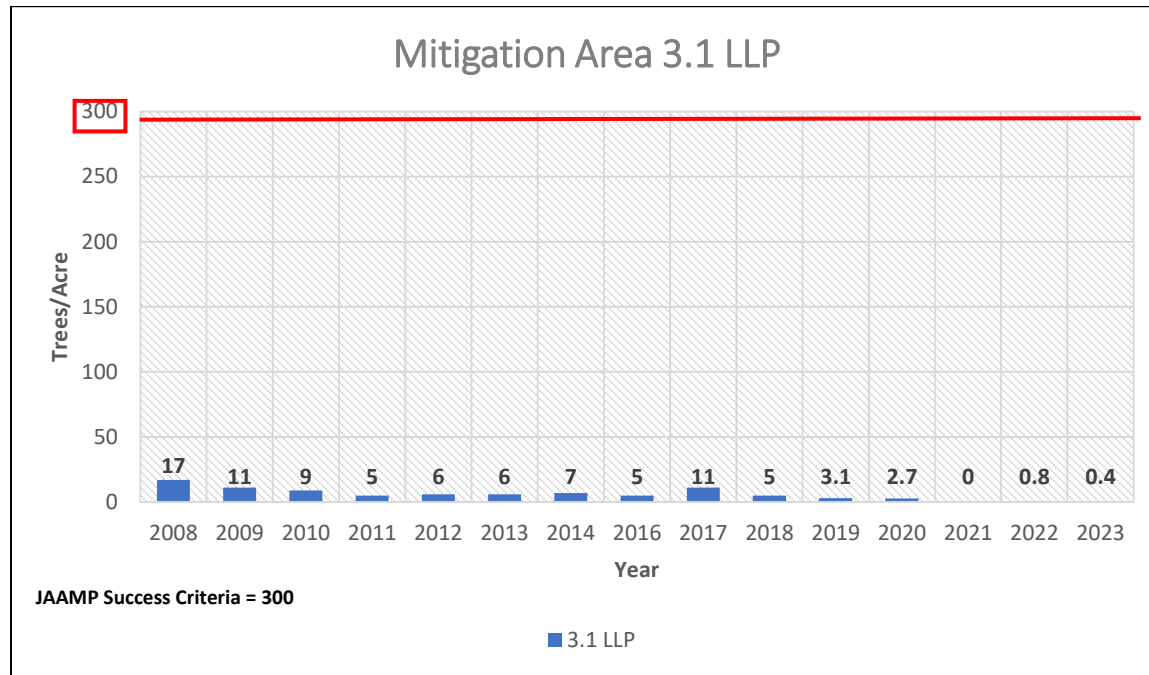


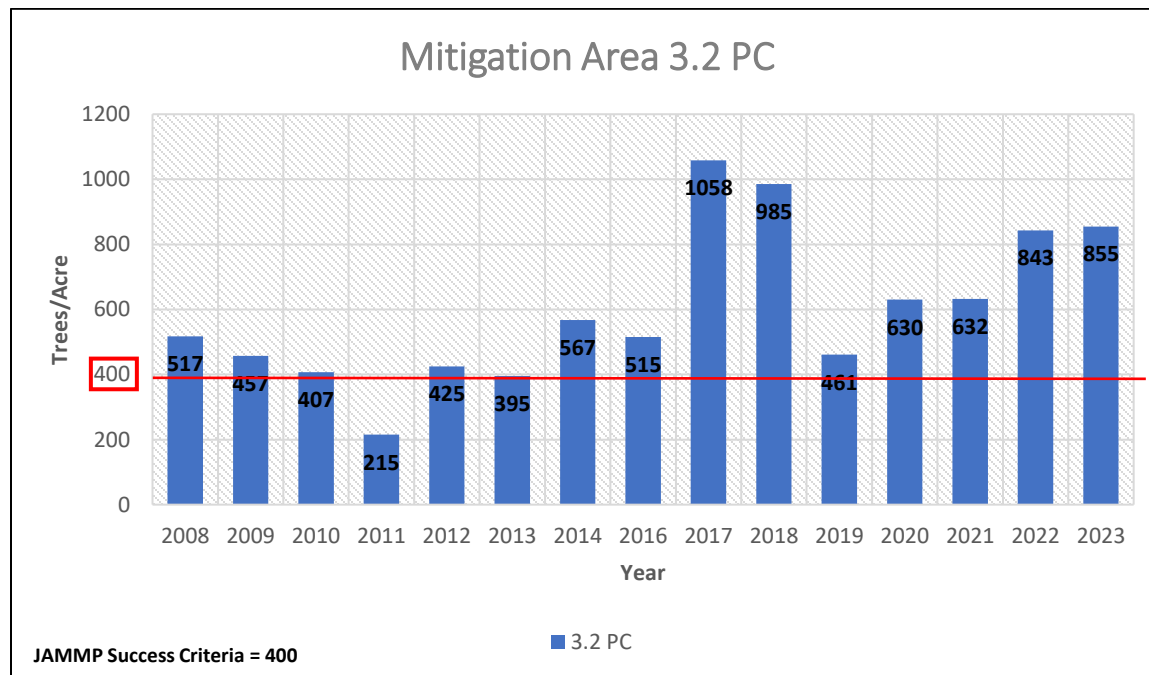
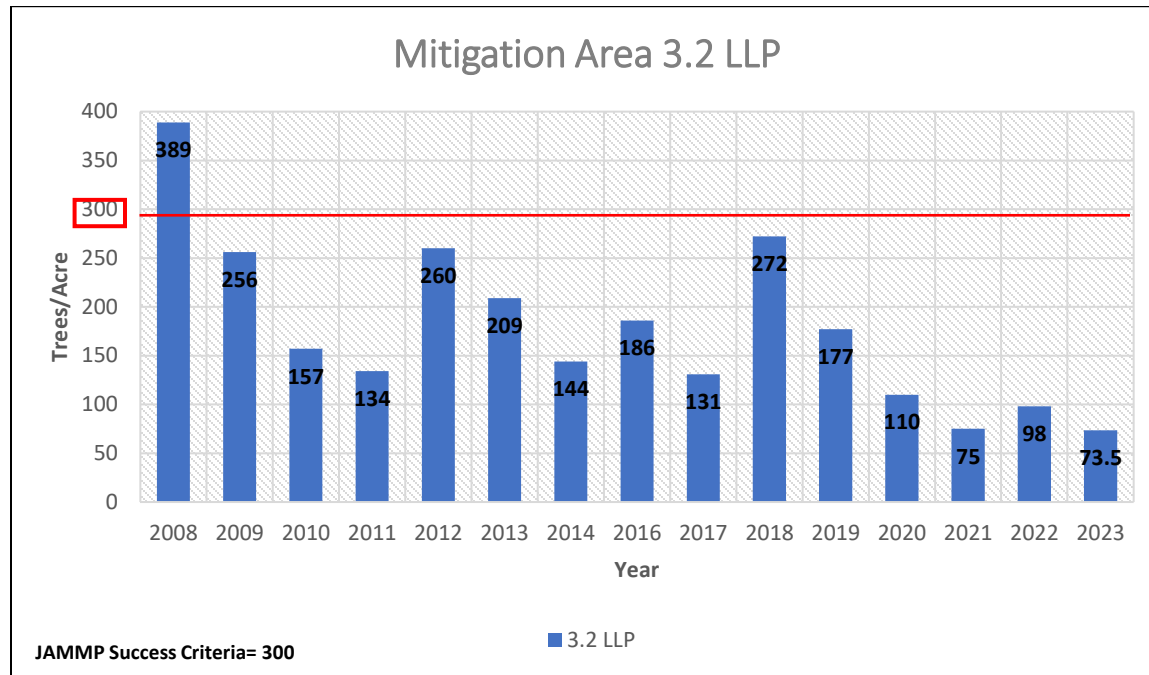
Latitude
28.47074
Longitude
-81.16149

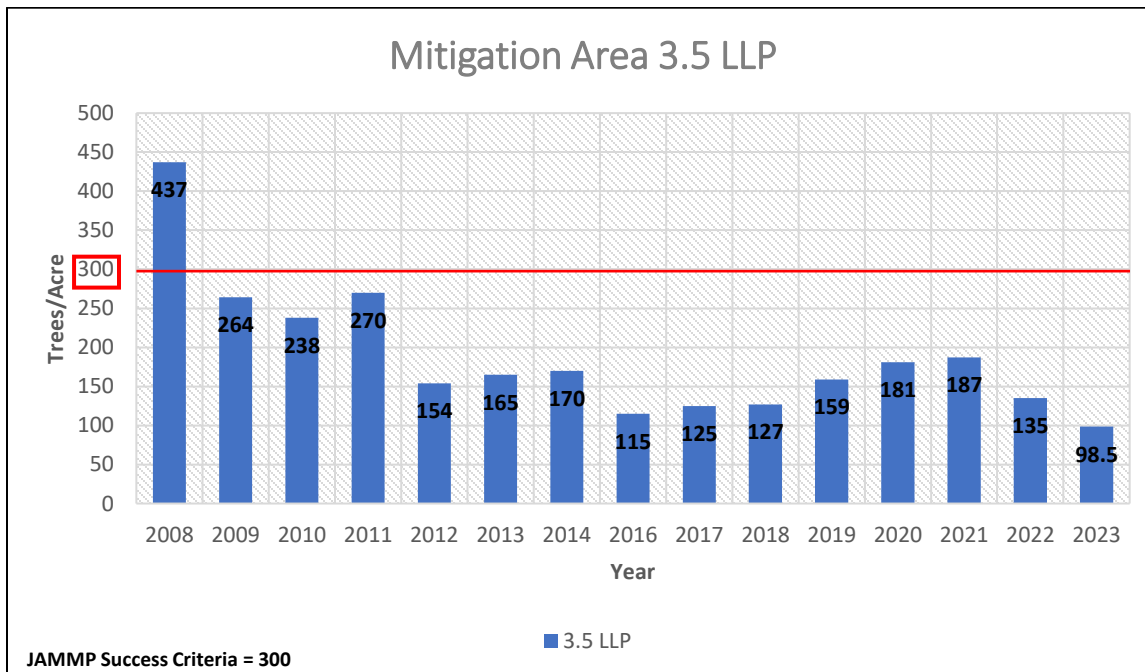
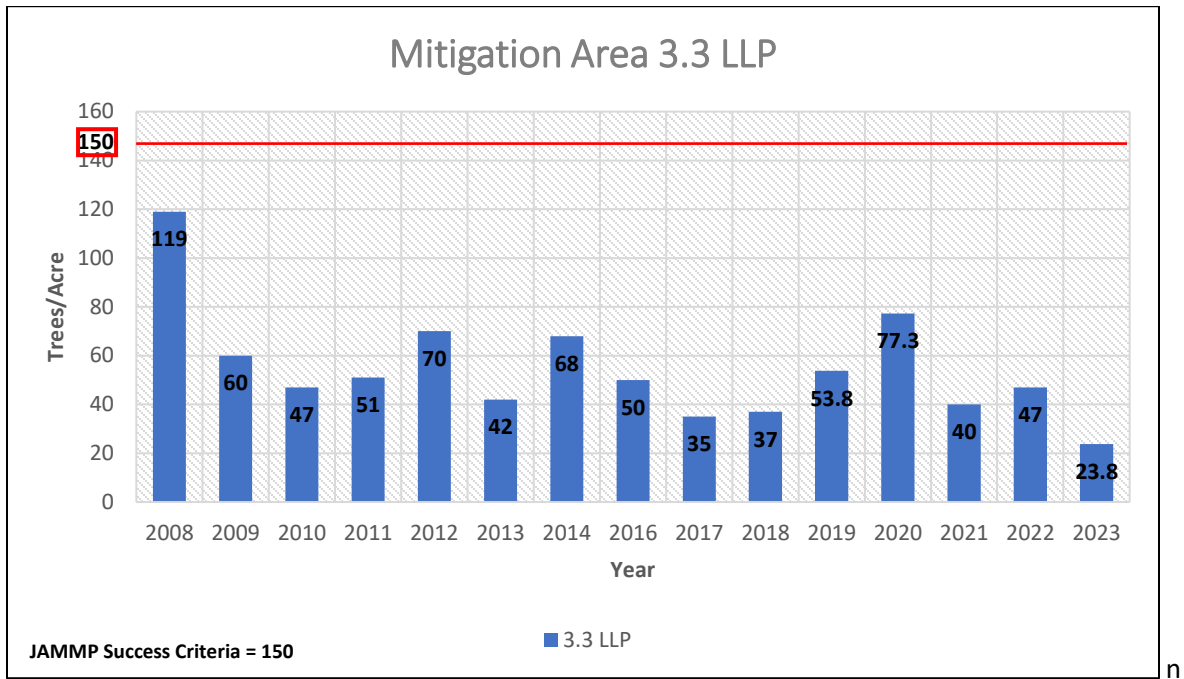
ATTACHMENT F MITIGATION AREA TREE DENSITY TRENDS

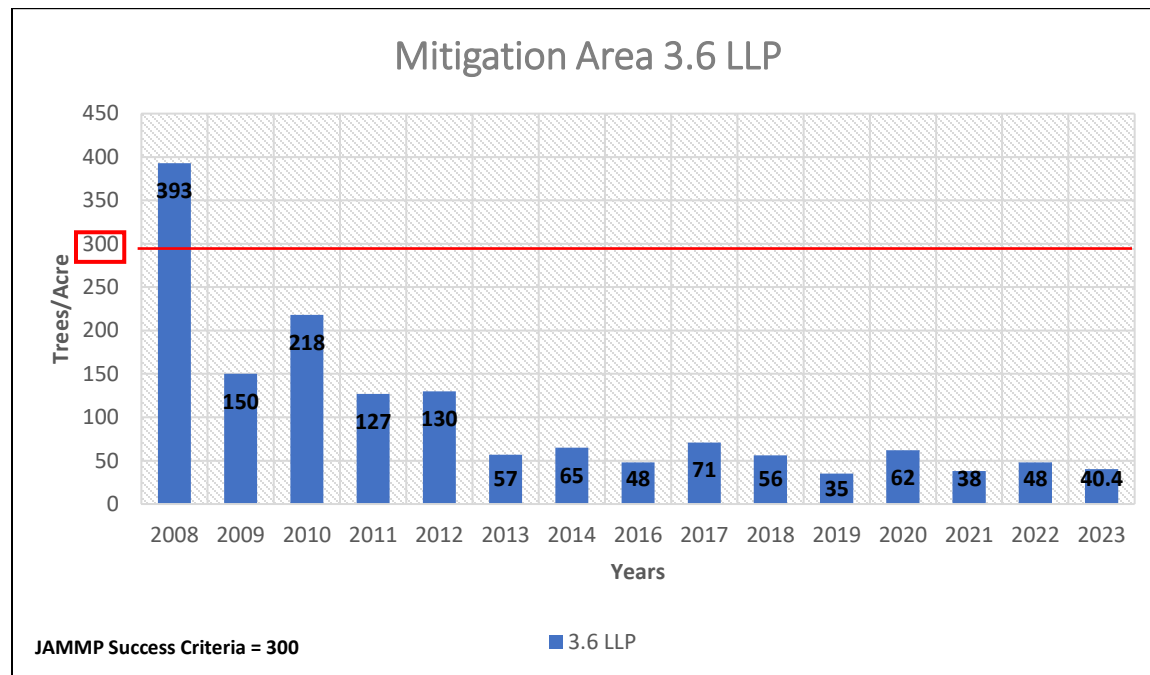


MITIGATION AREA TREND GRAPHS







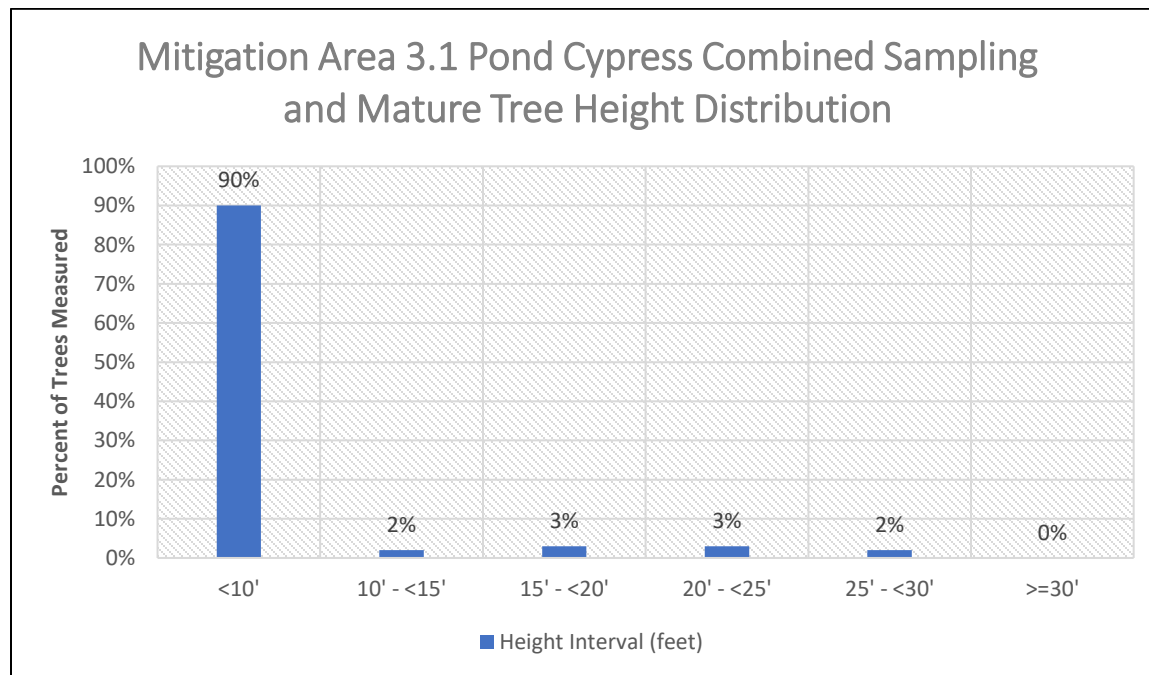
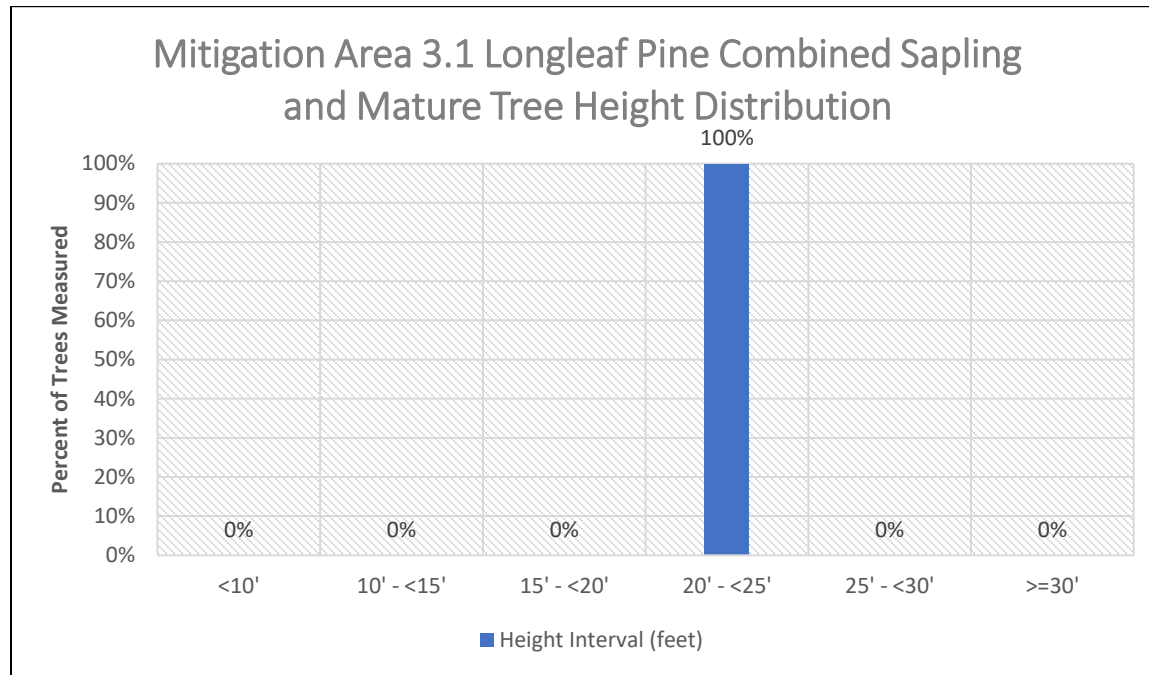


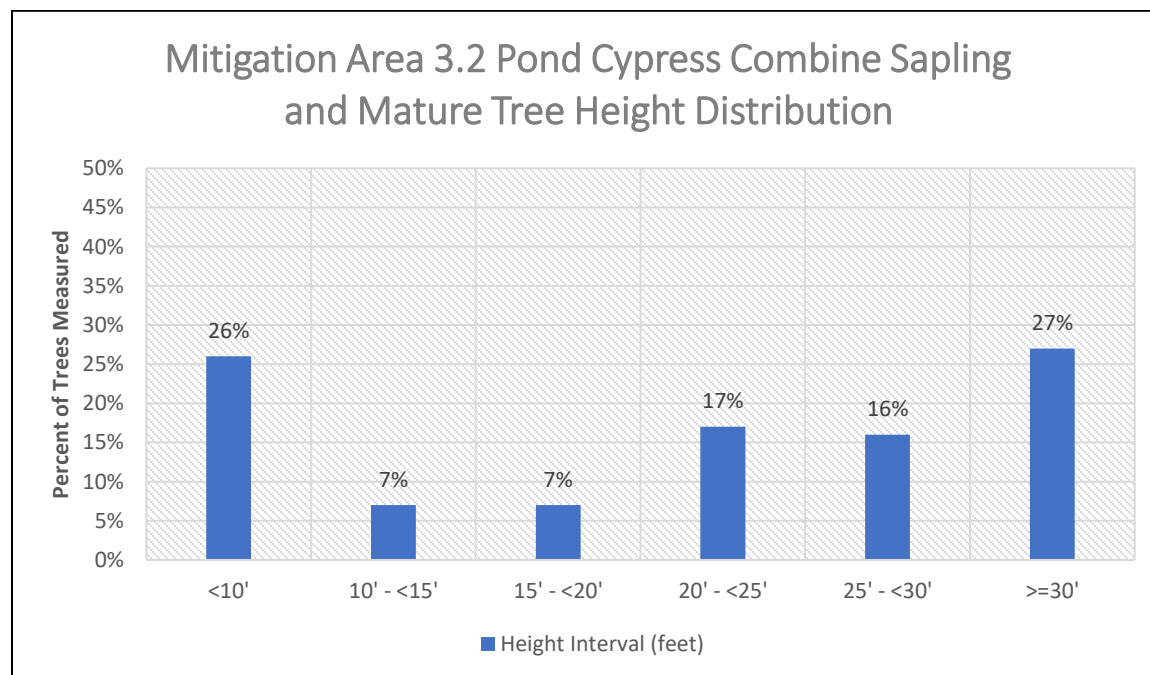
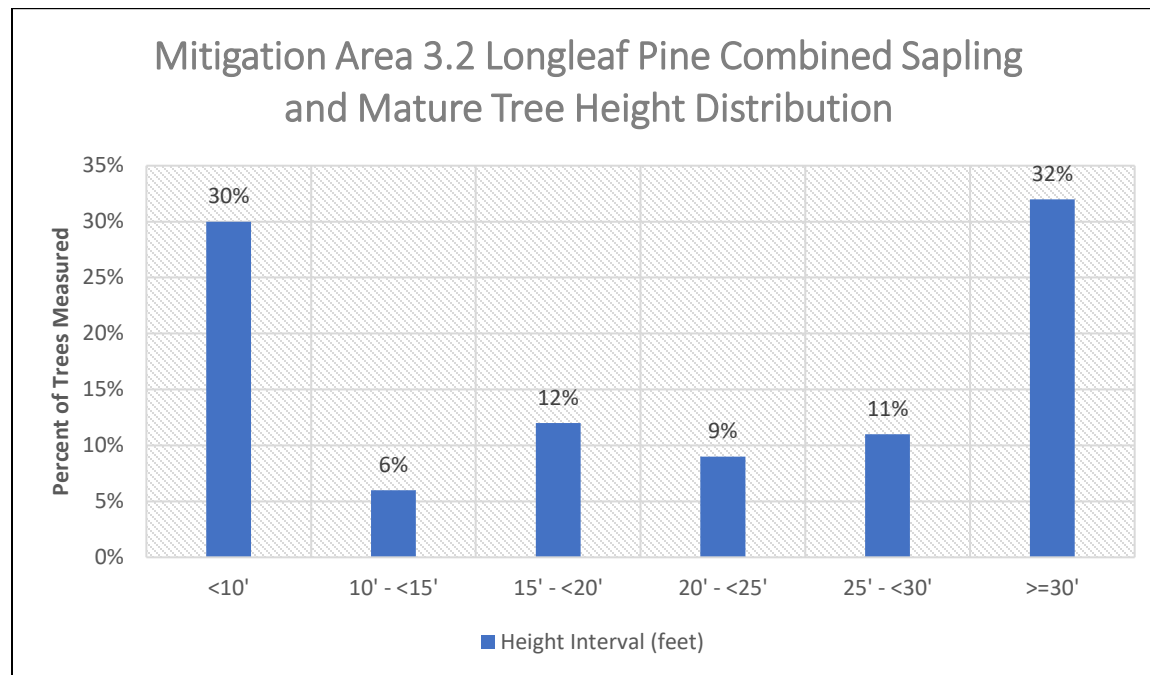
ATTACHMENT G

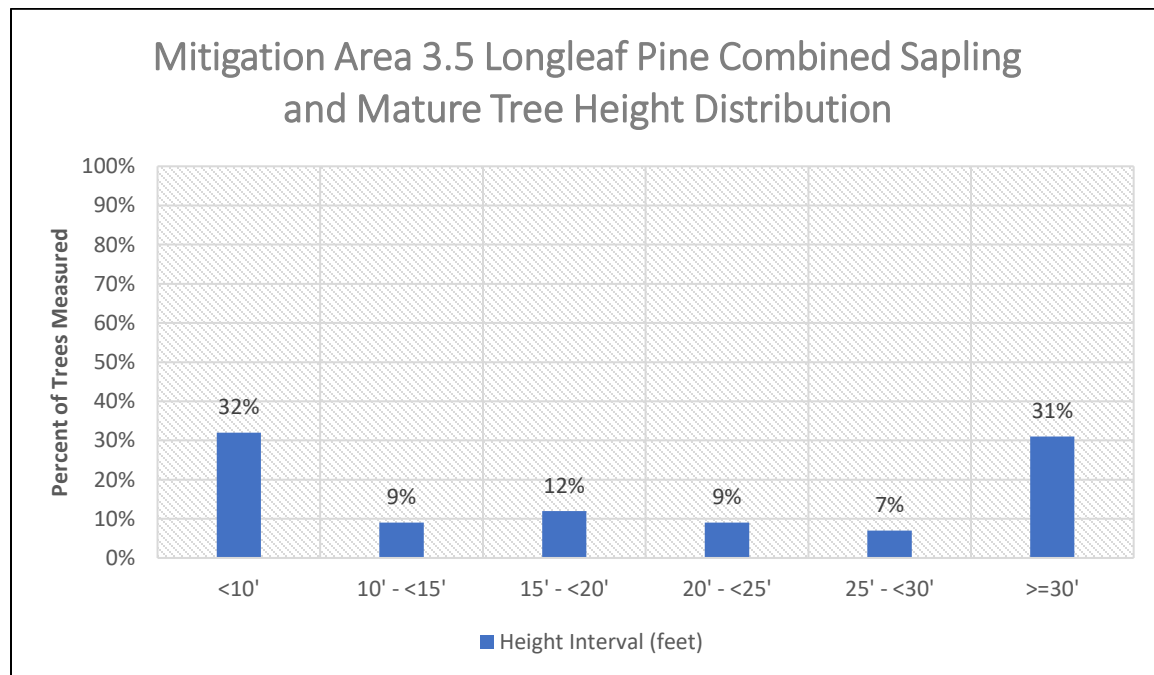
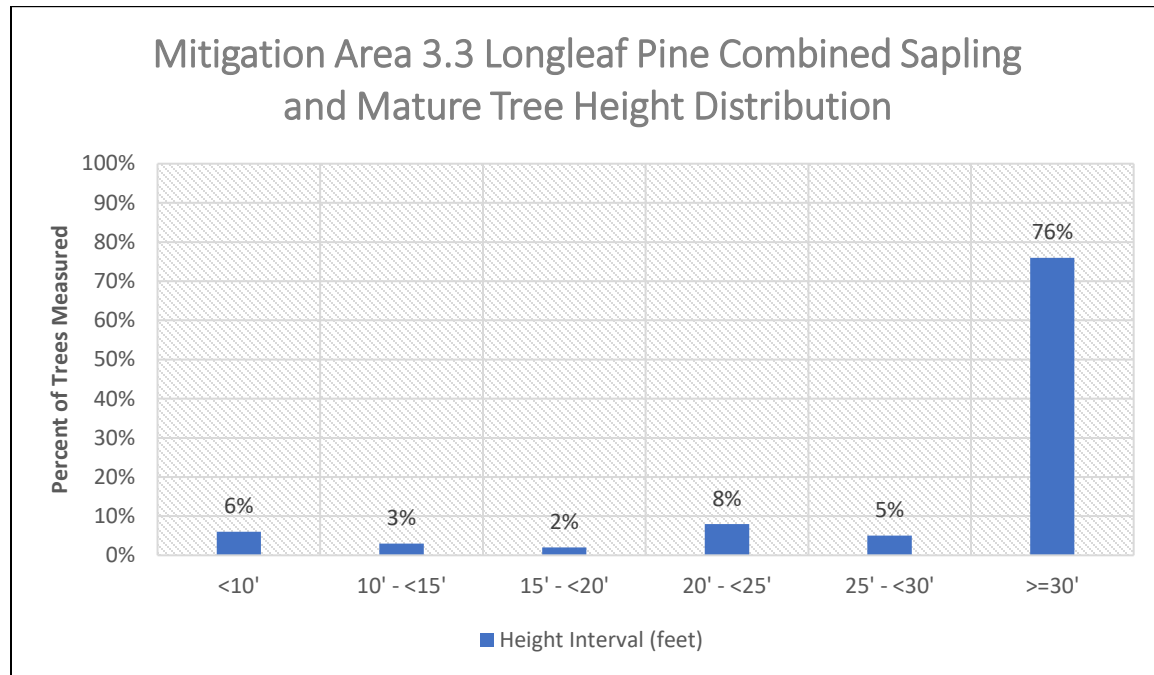
MITIGATION AREA TREE HEIGHT DISTRIBUTIONS

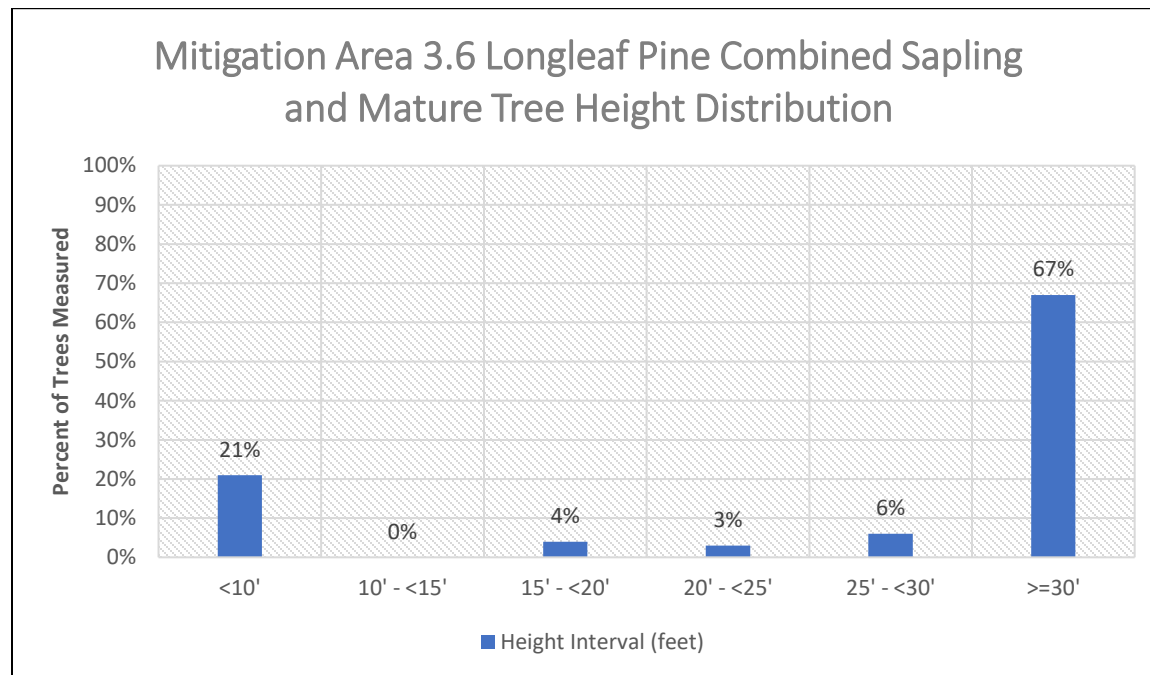


MITIGATION AREA TREE HEIGHT DISTRIBUTIONS









ATTACHMENT H TIMBER STAND TREE COUNTS



Site ID	Tree Count Within 23' Radius			
	Seedlings (<4" high)	Saplings (4" DBH; 4-30' height)	Mature Trees (≥4" DBH; >30' height)	Total
TS-A-18	0	0	3	3
TS-A-32	0	0	1	1
TS-A-46	0	1	0	1
TS-A Total	0	1	4	5
TS-B-11	0	0	6	6
TS-B-22	0	0	3	3
TS-B-29	0	0	0	0
TS-B Total	0	0	9	9
TS-C-25	0	0	3	3
TS-C-28	0	0	2	2
TS-C-30	0	0	0	0
TS-C-48	0	0	0	0
TS-C-51	0	0	1	1
TS-C Total	0	0	6	6
TS-D-6	1	0	2	3
TS-D-26	0	0	5	5
TS-D-30	0	0	1	1
TS-D-52	0	0	1	1
TS-D-68	1	0	1	2
TS-D-81	1	1	3	5
TS-D-85	0	0	1	1
TS-D-116	0	0	4	4
TS-D Total	3	1	18	22
TS-E-7	1	0	4	5
TE-E-15	0	0	7	7
TS-E-24	0	0	3	3
TS-E-33	0	2	2	4
TS-E-37	0	0	0	0
TS-E-65	0	0	4	4
TS-E Total	1	2	20	23
TS-F-3	4	2	1	7
TS-F-29	0	0	7	7
TS-F-41	8	1	0	9
TS-F-61	11	5	1	17
TS-F-63	4	0	1	5
TS-F-77	15	1	1	17
TS-F-96	0	0	2	2
TS-F-108	0	1	0	1
TS-F-Total	42	10	13	65
TS-G-13	0	0	0	0
TS-G-16	1	2	1	4
TS-G-26	0	0	1	1
TS-G-53	1	0	2	3
TS-G-55	0	0	0	0
TS-G-82	0	0	6	6
TS-G-99	0	0	5	5
TS-G-102	0	2	8	10
TS-G Total	2	4	23	29

Site ID	Tree Count Within 23' Radius			
	Seedlings (<4" high)	Saplings (4" DBH; 4-30' height)	Mature Trees (≥4" DBH; >30' height)	Total
TS-H-19	5	13	1	19
TS-H-30	2	1	1	4
TS-H-40	0	0	2	2
TS-H-55	0	0	4	4
TS-H-80	0	2	1	3
TS-H-87	4	37	2	43
TS-H-95	4	0	1	5
TS-H-111	0	2	0	2
TS-H-116	0	1	0	1
TS-H Total	15	56	12	83
TS-I-11	0	0	1	1
TS-I-17	2	0	3	5
TS-I-26	2	0	1	3
TS-I-60	0	0	4	4
TS-I-62	0	0	1	1
TS-I-84	0	0	7	7
TS-I-105	0	1	0	1
TS-I-109	7	0	3	10
TS-I-125	5	1	1	7
TS-I-138	0	0	3	3
TS-I-155	1	2	3	6
TS-I Total	17	4	27	53
TS-J-6	0	0	6	6
TS-J-15	0	1	0	1
TS-J-31	0	0	3	3
TS-J-35	0	0	2	2
TS-J-68	0	0	2	2
TS-J-69	2	0	2	4
TS-J-79	3	0	1	4
TS-J-91	0	0	4	4
TS-J-106	0	0	1	1
TS-J Total	5	1	21	27
TS-K-6	0	0	9	9
TS-K-21	0	3	2	5
TS-K-43	0	0	0	0
TS-K-54	1	0	3	4
TS-K-65	1	0	1	2
TS-K Total	2	3	15	20
TS-L-8	0	0	2	2
TS-L-13	0	0	10	10
TS-L-21	1	0	4	5
TS-L-27	0	0	0	0
TS-L-30	0	0	2	2
TS-L-35	0	0	6	6
TS-L-46	0	0	6	6
TS-L-71	0	0	5	5
TS-L-81	0	0	8	8
TS-L-90	0	0	4	4
TS-L-104	0	1	2	3
TS-L-127	1	0	2	3
TS-L-Total	2	1	51	54

Site ID	Tree Count Within 23' Radius			
	Seedlings (<4" high)	Saplings (4" DBH; 4-30' height)	Mature Trees (≥4" DBH; >30' height)	Total
TS-M-10	0	0	0	0
TS-M-17	0	0	3	3
TS-M-52	0	0	5	5
TS-M-66	0	0	5	5
TS-M-70	0	0	5	5
TS-M-77	0	0	2	2
TS-M-83	2	0	4	6
TS-M Total	2	0	24	26
TS-N-10	1	0	1	2
TS-N-17	1	0	2	3
TS-N-23	0	0	2	2
TS-N-33	0	0	1	1
TS-N-43	0	0	6	6
TS-N Total	2	0	12	14
TS-O-23	0	0	0	0
TS-O-27	0	1	1	2
TS-O-38	0	0	0	0
TS-O-42	0	0	0	0
TS-O Total	0	1	1	2
TS-P-6	0	1	1	2
TS-P-16	0	0	2	2
TS-P-28	10	0	2	12
TS-P-43	0	0	0	0
TS-P-60	5	1	0	6
TS-P-68	1	0	3	4
TS-P-85	0	0	0	0
TS-P-89	0	0	0	0
TS-P-114	0	0	0	0
TS-P Total	16	2	8	26
TS-Q-14	0	1	1	2
TS-Q-27	0	0	0	0
TS-Q-40	2	0	1	3
TS-Q-57	4	2	0	6
TS-Q-84	0	0	0	0
TS-Q-87	4	0	0	4
TS-Q-102	0	1	0	1
TS-Q-104	0	0	0	0
TS-Q Total	10	4	2	16
Live LLP Totals	119	90	266	475

ATTACHMENT I TIMBER STAND VEGETATIVE COVER CHARACTERISTICS



Attachment I
Timber Stand A
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
18	0°	"Andro" Broomsedge (Andropogon sp)	60	"SP" Saw palmetto (Serenoa repens)	30	2
		Black root (Pterocaulon sp)	1	"RO" Runner Oak (Quercus pumila)	2	
		Pawpaw (Asimina triloba)	1			
		Goldentop (Euthamia sp)	1			
		"WG" Wiregrass (Aristida stricta)	3			
	120°	"Andro" Broomsedge (Andropogon sp)	40	"RO" Runner Oak (Quercus pumila)	2	8
		"WG" Wiregrass (Aristida stricta)	40			
		Pawpaw (Asimina triloba)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	25	"SP" Saw palmetto (Serenoa repens)	30	15
		"WG" Wiregrass (Aristida stricta)	25			
		Pawpaw (Asimina triloba)	5			
32	0°	"Andro" Broomsedge (Andropogon sp)	35	"SP" Saw palmetto (Serenoa repens)	25	0
		"BF" Bracken Fern (Pteridium aquilinum)	25	"GB" Gallberry (Ilex glabra)	5	
		Burnweed (Erechtites hieraciifolius)	5			
		"WTA" Whitetop aster (Serilocarpus)	5			
	120°	"Andro" Broomsedge (Andropogon sp)	20			50
		"WTA" Whitetop aster (Serilocarpus)	15			
		"BF" Bracken Fern (Pteridium aquilinum)	15			
	240°	"Andro" Broomsedge (Andropogon sp)	35	"SP" Saw palmetto (Serenoa repens)	25	17
		Bogbutton (Lanchocaulon sp)	5	Fetterbush (Lyonia lucida)	15	
		"WTA" Whitetop aster (Serilocarpus)	3			

Attachment I
Timber Stand A
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
46	0°	"BR" Beakrush (Rhynchospora inundata)	5	"GB" Gallberry (Ilex glabra)	40	35
		Coinwort (Centella asiatica)	10			
		Red root (Lachnanthes caroliniana)	5			
		"HP" Hat pin (Eriocaulon sp)	5			
	120°	"BR" Beakrush (Rhynchospora inundata)	10			55
		"Andro" Broomsedge (Andropogon sp)	10			
		"BF" Bracken Fern (Pteridium aquilinum)	15			
		Pawpaw (Asimina triloba)	5			
		Red root (Lachnanthes caroliniana)	5			
	240°	Grapevine (Vitis sp)	5	"GB" Gallberry (Ilex glabra)	40	5
		"Andro" Broomsedge (Andropogon sp)	15	"WM" Wax Myrtle (Morella cerifera)	25	
		Cinnamon fern (Osmundastrum cinnamomeum)	5			
		Red root (Lachnanthes caroliniana)	5			

Attachment I
Timber Stand B
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
11	0°	"BF" Bracken Fern (Pteridium aquilinum)	45	"SP" Saw palmetto (Serenoa repens)	45	10
	120°	"Andro" Broomsedge (Andropogon sp)	5			5
		"BF" Bracken Fern (Pteridium aquilinum)	60	"SP" Saw palmetto (Serenoa repens)	30	
	240°	"BF" Bracken Fern (Pteridium aquilinum)	45	"SP" Saw palmetto (Serenoa repens)	40	5
		"Andro" Broomsedge (Andropogon sp)	10			
22	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	50	0
		"Andro" Broomsedge (Andropogon sp)	2	"GB" Gallberry (Ilex glabra)	8	
	120°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	10	0
				"GB" Gallberry (Ilex glabra)	50	
	240°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	35	0
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	10	

Attachment I
Timber Stand B
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
29	0°	"Andro" Broomsedge (Andropogon sp)	5	"BB" Black berry (Rubus allegheniensis)	5	0
		"CG" Cogon grass (Imperata cylindrica)	35	"SP" Saw palmetto (Serenoa repens)	50	
		Black root (Pterocaulon sp)	3	"GB" Gallberry (Ilex glabra)	2	
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	70	0
		"Andro" Broomsedge (Andropogon sp)	5	"BB" Black berry (Rubus allegheniensis)	2	
		"CG" Cogon grass (Imperata cylindrica)	3			
	240°	"DF" Dogfennel (Eupatorium capillifolium)	40	"SP" Saw palmetto (Serenoa repens)	25	0
		"CG" Cogon grass (Imperata cylindrica)	25			
		"CF" Climbing fern (Lygodium microphyllum)	5			
		Plume Thistle (Cirsium)	5			

Attachment I
Timber Stand C
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
25	0°	"Andro" Broomsedge (Andropogon sp)	30	"SP" Saw palmetto (Serenoa repens)	40	0
		"WTA" Whitetop aster (Sericocarpus)	3	"GB" Gallberry (Ilex glabra)	20	
		"BF" Bracken Fern (Pteridium aquilinum)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	2			
	120°	"Andro" Broomsedge (Andropogon sp)	10	"SP" Saw palmetto (Serenoa repens)	35	0
		"WTA" Whitetop aster (Sericocarpus)	30	"BB" Black berry (Rubus allegheniensis)	5	
		"BF" Bracken Fern (Pteridium aquilinum)	20			
	240°	"Andro" Broomsedge (Andropogon sp)	30	"SP" Saw palmetto (Serenoa repens)	50	0
		Chainfern (Woodwardia sp)	10			
		Grapevine (Vitis sp)	5			
		Sedge (Carex sp)	5			
28	0°	"WG" Wiregrass (Aristida stricta)	70	"SP" Saw palmetto (Serenoa repens)	10	0
		"Andro" Broomsedge (Andropogon sp)	20			
	120°	"WG" Wiregrass (Aristida stricta)	60	"SP" Saw palmetto (Serenoa repens)	10	0
				"GB" Gallberry (Ilex glabra)	30	
	240°	"WG" Wiregrass (Aristida stricta)	65	"SP" Saw palmetto (Serenoa repens)	10	0
		"Andro" Broomsedge (Andropogon sp)	20	"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand C
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
30	0°	"WG" Wiregrass (Aristida stricta)	2	"SP" Saw palmetto (Serenoa repens)	40	5
		"Andro" Broomsedge (Andropogon sp)	30	"BB" Black berry (Rubus allegheniensis)	10	
		"BF" Bracken Fern (Pteridium aquilinum)	5	Beautyberry (Callicarpa americana)	3	
		"CF" Climbing fern (Lygodium microphyllum)	5			
	120°	Chainfern (Woodwardia sp)	45	"BB" Black berry (Rubus allegheniensis)	45	0
		"Andro" Broomsedge (Andropogon sp)	5	Beautyberry (Callicarpa americana)	5	
	240°	"Andro" Broomsedge (Andropogon sp)	45	"SP" Saw palmetto (Serenoa repens)	40	0
		Chainfern (Woodwardia sp)	10	"BB" Black berry (Rubus allegheniensis)	5	
48	0°	"CF" Climbing fern (Lygodium microphyllum)	35	"BB" Black berry (Rubus allegheniensis)	55	10
	120°			"SP" Saw palmetto (Serenoa repens)	60	15
				"BB" Black berry (Rubus allegheniensis)	20	
				"GB" Gallberry (Ilex glabra)	5	
	240°	Grapevine (Vitis sp)	25	"BB" Black berry (Rubus allegheniensis)	50	0
		"CF" Climbing fern (Lygodium microphyllum)	25			

Attachment I
Timber Stand C
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
51	0°	Burnweed (<i>Erechtites hieraciifolius</i>)	10	"BB" Black berry (<i>Rubus allegheniensis</i>)	80	0
		"DF" Dogfennel (<i>Eupatorium capillifolium</i>)	10			
	120°	"CF" Climbing fern (<i>Lygodium microphyllum</i>)	10	"SP" Saw palmetto (<i>Serenoa repens</i>)	60	0
				"BB" Black berry (<i>Rubus allegheniensis</i>)	30	
	240°	"CF" Climbing fern (<i>Lygodium microphyllum</i>)	20	"SP" Saw palmetto (<i>Serenoa repens</i>)	60	0
				"BB" Black berry (<i>Rubus allegheniensis</i>)	20	

Attachment I
Timber Stand D
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
6	0°	Pawpaw (Asimina triloba)	5	"SP" Saw palmetto (Serenoa repens)	80	0
		Chainfern (Woodwardia sp)	3			
		Grapevine (Vitis sp)	5			
		"Andro" Broomsedge (Andropogon sp)	7			
	120°	"WG" Wiregrass (Aristida stricta)	80	"SP" Saw palmetto (Serenoa repens)	5	0
		"Andro" Broomsedge (Andropogon sp)	5			
		Grapevine (Vitis sp)	5			
		"WP" Woolly Panicum (Panicum scabriusculum)	5			
	240°	"WG" Wiregrass (Aristida stricta)	50	Eastern baccharis (Baccharis halimifolia)	3	0
		"Andro" Broomsedge (Andropogon sp)	7	"SP" Saw palmetto (Serenoa repens)	40	
26	0°	"WG" Wiregrass (Aristida stricta)	35	"SP" Saw palmetto (Serenoa repens)	35	0
		"Andro" Broomsedge (Andropogon sp)	25	"GB" Gallberry (Ilex glabra)	3	
				"RO" Runner Oak (Quercus pumila)	2	
	120°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	50	0
		"Andro" Broomsedge (Andropogon sp)	20			
	240°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	40	0
		"Andro" Broomsedge (Andropogon sp)	25	"RO" Runner Oak (Quercus pumila)	3	
		Black root (Pterocaulon sp)	2			

Attachment I
Timber Stand D
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
30	0°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	65	0
		Chainfern (Woodwardia sp)	5	"BB" Black berry (Rubus allegheniensis)	5	
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	35	"SP" Saw palmetto (Serenoa repens)	15	0
		"Andro" Broomsedge (Andropogon sp)	35			
		Chainfern (Woodwardia sp)	15			
	240°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	50	0
		"Andro" Broomsedge (Andropogon sp)	9			
		"WTA" Whitetop aster (Serilocarpus)	1			
52	0°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	65	6
		"WTA" Whitetop aster (Serilocarpus)	2	"GB" Gallberry (Ilex glabra)	2	
	120°	"WG" Wiregrass (Aristida stricta)	40	"WM" Wax Myrtle (Morella cerifera)	30	5
		"WP" Wooly Panicum (Panicum scabriusculum)	5	"SP" Saw palmetto (Serenoa repens)	10	
		Rosy Camphorweed (Pluchea rosea)	5	St. John's Wort (Hypericum sp)	5	
	240°	"WG" Wiregrass (Aristida stricta)	65	"WM" Wax Myrtle (Morella cerifera)	20	0
		"WP" Wooly Panicum (Panicum scabriusculum)	7			
		Rosy Camphorweed (Pluchea rosea)	3			
		"Andro" Broomsedge (Andropogon sp)	5			

Attachment I
Timber Stand D
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
68	0°	"WG" Wiregrass (Aristida stricta)	75	"SP" Saw palmetto (Serenoa repens)	20	0
		"WTA" Whitetop aster (Sericocarpus)	1	"BB" Black berry (Rubus allegheniensis)	1	
		"Andro" Broomsedge (Andropogon sp)	3			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	75	0
		"WTA" Whitetop aster (Sericocarpus)	5			
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	70	0
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
81	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	80	0
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	20	0
		"Andro" Broomsedge (Andropogon sp)	15	LLP, Sapling (Pinus palustris)	5	
		"WTA" Whitetop aster (Sericocarpus)	10			
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	70	0
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	2	
		Pawpaw (Asimina triloba)	1			
		"BF" Bracken Fern (Pteridium aquilinum)	1			
		"WTA" Whitetop aster (Sericocarpus)	1			

Attachment I
Timber Stand D
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
85	0°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	20	10
		"Andro" Broomsedge (Andropogon sp)	35	"RO" Runner Oak (Quercus pumila)	2	
		Goldentop (Euthamia sp)	3			
	120°	"WG" Wiregrass (Aristida stricta)	65	"SP" Saw palmetto (Serenoa repens)	10	0
		"Andro" Broomsedge (Andropogon sp)	20			
		Rosy Camphorweed (Pluchea rosea)	5			
	240°	"WG" Wiregrass (Aristida stricta)	75	"SP" Saw palmetto (Serenoa repens)	20	0
		"Andro" Broomsedge (Andropogon sp)	5			
116	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	75	0
		"Andro" Broomsedge (Andropogon sp)	7			
		"WTA" Whitetop aster (Seriocarpus)	3			
	120°			"SP" Saw palmetto (Serenoa repens)	75	0
				"WM" Wax Myrtle (Morella cerifera)	25	
	240°			"SP" Saw palmetto (Serenoa repens)	80	0
				"WM" Wax Myrtle (Morella cerifera)	20	

Attachment I
Timber Stand E
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
7	0°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	35	10
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	35	
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	25	15
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	25	
		Pawpaw (Asimina triloba)	10			
		"HP" Hat pin (Eriocaulon sp)	5			
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	25	0
		"Andro" Broomsedge (Andropogon sp)	20	"GB" Gallberry (Ilex glabra)	35	
		Aster (Aster sp)	5	Rusty lyonia (Lyonia ferruginea)	5	
15	0°	"Andro" Broomsedge (Andropogon sp)	20	"SP" Saw palmetto (Serenoa repens)	45	20
				"RO" Runner Oak (Quercus pumila)	10	
				"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	35	0
		"Andro" Broomsedge (Andropogon sp)	30	"GB" Gallberry (Ilex glabra)	10	
				St. John's Wort (Hypericum sp)	5	
	240°	"WG" Wiregrass (Aristida stricta)	45	"SP" Saw palmetto (Serenoa repens)	35	3
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	5	
		Pawpaw (Asimina triloba)	2			

Attachment I
Timber Stand E
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
24	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	40	5
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	15	15
		"Andro" Broomsedge (Andropogon sp)	10	"RO" Runner Oak (Quercus pumila)	5	
		Pawpaw (Asimina triloba)	5			
	240°	"WG" Wiregrass (Aristida stricta)	35	Tarflower (Bejaria racemosa)	1	0
		"Andro" Broomsedge (Andropogon sp)	25	"SP" Saw palmetto (Serenoa repens)	25	
		"WTA" Whitetop aster (Seriocarpus)	1	Rusty lyonia (Lyonia ferruginea)	3	
				"GB" Gallberry (Ilex glabra)	10	
33	0°	Blue maidencane (Amphicarpum purshii)	30	"WM" Wax Myrtle (Morella cerifera)	10	10
		Aster (Aster sp)	10	St. John's Wort (Hypericum sp)	10	
		"Andro" Broomsedge (Andropogon sp)	10			
		Goldentop (Euthamia sp)	15			
		Elliott's yelloweyed grass (Xyris elliotii)	5			
	120°	"WG" Wiregrass (Aristida stricta)	40	"GB" Gallberry (Ilex glabra)	5	35
		"Andro" Broomsedge (Andropogon sp)	5			
		Aster (Aster sp)	5			
		Goldentop (Euthamia sp)	5			
		"HP" Hat pin (Eriocaulon sp)	5			
	240°	Aster (Aster sp)	10	"SP" Saw palmetto (Serenoa repens)	30	10
		"Andro" Broomsedge (Andropogon sp)	30	"GB" Gallberry (Ilex glabra)	15	
				St. John's Wort (Hypericum sp)	5	

Attachment I
Timber Stand E
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
37	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	10	5
		"Andro" Broomsedge (Andropogon sp)	30	"GB" Gallberry (Ilex glabra)	10	
		Pawpaw (Asimina triloba)	3	Rusty lyonia (Lyonia ferruginea)	2	
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	27
		"Andro" Broomsedge (Andropogon sp)	15	"RO" Runner Oak (Quercus pumila)	15	
		Black root (Pterocaulon sp)	3	"GB" Gallberry (Ilex glabra)	15	
	240°	"WG" Wiregrass (Aristida stricta)	35	"SP" Saw palmetto (Serenoa repens)	10	11
		"Andro" Broomsedge (Andropogon sp)	25	"GB" Gallberry (Ilex glabra)	10	
		"DT" Deertongue (Dichantherium clandestinum)	3	Rusty lyonia (Lyonia ferruginea)	3	
		Black root (Pterocaulon sp)	3			
65	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	5	0
		"Andro" Broomsedge (Andropogon sp)	30			
		"DT" Deertongue (Dichantherium clandestinum)	5			
		"WTA" Whitetop aster (Serilocarpus)	3			
		"DF" Dogfennel (Eupatorium capillifolium)	2			
		Goldentop (Euthamia sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	20	0
		"Andro" Broomsedge (Andropogon sp)	35	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Serilocarpus)	5			
		"EMP" Elliott's Milkpea (Galactia elliotii)	2			
		Bachelor Button (Centaurea cyanus)	3			
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	10	0
		"Andro" Broomsedge (Andropogon sp)	35			
		"WTA" Whitetop aster (Serilocarpus)	3			
		"BF" Bracken Fern (Pteridium aquilinum)	40			
		Bachelor Button (Centaurea cyanus)	2			
		"EMP" Elliott's Milkpea (Galactia elliotii)	3			
		Sedge (Carex sp)	2			

Attachment I
Timber Stand F
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
3	0°	Goldentop (Euthamia sp)	15	"GB" Gallberry (Ilex glabra)	5	30
		"Andro" Broomsedge (Andropogon sp)	20	"SP" Saw palmetto (Serenoa repens)	10	
		"WTA" Whitetop aster (Serilocarpus)	5			
		"EMP" Elliott's Milkpea (Galactia elliottii)	5			
		"WG" Wiregrass (Aristida stricta)	10			
	120°	Goldentop (Euthamia sp)	5	"GB" Gallberry (Ilex glabra)	15	30
		"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	
		"Andro" Broomsedge (Andropogon sp)	20			
	240°	"WG" Wiregrass (Aristida stricta)	15	"GB" Gallberry (Ilex glabra)	25	30
		Goldentop (Euthamia sp)	10	"SP" Saw palmetto (Serenoa repens)	8	
		"EMP" Elliott's Milkpea (Galactia elliottii)	5			
		"WTA" Whitetop aster (Serilocarpus)	5			
		Black root (Pterocaulon sp)	2			
29	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	45
		"WTA" Whitetop aster (Serilocarpus)	5	"RO" Runner Oak (Quercus pumila)	10	
		"Andro" Broomsedge (Andropogon sp)	10			
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	50
		"WTA" Whitetop aster (Serilocarpus)	15			
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	15	50
		"WTA" Whitetop aster (Serilocarpus)	10	"RO" Runner Oak (Quercus pumila)	5	
		Black root (Pterocaulon sp)	5			

Attachment I
Timber Stand F
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
41	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	49
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	15	
		Pawpaw (Asimina triloba)	1			
	120°	"WG" Wiregrass (Aristida stricta)	15	"RO" Runner Oak (Quercus pumila)	60	5
		"Andro" Broomsedge (Andropogon sp)	10	"SP" Saw palmetto (Serenoa repens)	5	
		"WTA" Whitetop aster (Sericocarpus)	5			
	240°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	20	48
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	15	
61	0°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	35	25
		"WTA" Whitetop aster (Sericocarpus)	8	"GB" Gallberry (Ilex glabra)	2	
				"RO" Runner Oak (Quercus pumila)	5	
	120°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	30	25
		"WTA" Whitetop aster (Sericocarpus)	10	"GB" Gallberry (Ilex glabra)	5	
				"RO" Runner Oak (Quercus pumila)	5	
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	15	40
		"WTA" Whitetop aster (Sericocarpus)	10	"RO" Runner Oak (Quercus pumila)	5	
		"HP" Hat pin (Eriocaulon sp)	5			

Attachment I
Timber Stand F
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
63	0°	Black root (Pterocaulon sp)	5	"SP" Saw palmetto (Serenoa repens)	40	20
		Cinnamon fern (Osmundastrum cinnamomeum)	10	"GB" Gallberry (Ilex glabra)	10	
		"Andro" Broomsedge (Andropogon sp)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
		"WTA" Whitetop aster (Sericocarpus)	5			
	120°	"Andro" Broomsedge (Andropogon sp)	20	"GB" Gallberry (Ilex glabra)	5	30
		"WTA" Whitetop aster (Sericocarpus)	15	"SP" Saw palmetto (Serenoa repens)	10	
		Cinnamon fern (Osmundastrum cinnamomeum)	10	"BB" Black berry (Rubus allegheniensis)	5	
		"DT" Deertongue (Dichanthelium clandestinum)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	25	"GB" Gallberry (Ilex glabra)	20	20
		"DT" Deertongue (Dichanthelium clandestinum)	10	"WM" Wax Myrtle (Morella cerifera)	10	
		Climbing hempweed (Mikania scandens)	3	Groundsel bush (Baccharis halimifolia)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			
77	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	55
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Sericocarpus)	5			
		Pawpaw (Asimina triloba)	2			
		Black root (Pterocaulon sp)	3			
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	10	50
		"WTA" Whitetop aster (Sericocarpus)	15	LLP, Seedling (Pinus palustris)	5	
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	15	55
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	15			

Attachment I
Timber Stand F
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
96	0°	"WTA" Whitetop aster (Sericocarpus)	10	"SP" Saw palmetto (Serenoa repens)	15	15
		Climbing hempweed (Mikania scandens)	10	"WM" Wax Myrtle (Morella cerifera)	20	
		"Andro" Broomsedge (Andropogon sp)	10			
		Coinwort (Centella asiatica)	10			
		"BR" Beakrush (Rhynchospora inundata)	10			
	120°	"EMP" Elliott's Milkpea (Galactia elliptii)	20	"GB" Gallberry (Ilex glabra)	5	40
		Coinwort (Centella asiatica)	15			
		Cinnamon fern (Osmundastrum cinnamomeum)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
		"FF" False Fennel (Eupatorium leptophyllum)	10			
	240°	Cinnamon fern (Osmundastrum cinnamomeum)	10	"WM" Wax Myrtle (Morella cerifera)	20	45
		"SF" Swamp fern (Blechnum serrulatum)	5			
		"Andro" Broomsedge (Andropogon sp)	10			
		Bogbutton (Lanchochaulon sp)	5			
		"EMP" Elliott's Milkpea (Galactia elliptii)	2			
		"FF" False Fennel (Eupatorium leptophyllum)	3			
108	0°	"WG" Wiregrass (Aristida stricta)	5	"WM" Wax Myrtle (Morella cerifera)	20	50
		"WTA" Whitetop aster (Sericocarpus)	5			
		"Andro" Broomsedge (Andropogon sp)	10			
		Carpetgrass (Axonopus sp)	5			
		Coinwort (Centella asiatica)	3			
		"BR" Beakrush (Rhynchospora inundata)	2			
	120°	"DT" Deertongue (Dichanthelium clandestinum)	5			35
		"WTA" Whitetop aster (Sericocarpus)	15			
		Carpetgrass (Axonopus sp)	15			
		"WG" Wiregrass (Aristida stricta)	25			
		"EMP" Elliott's Milkpea (Galactia elliptii)	5			
	240°	Grapevine (Vitis sp)	40	St. John's Wort (Hypericum sp)	5	10
		"WTA" Whitetop aster (Sericocarpus)	5	"BB" Black berry (Rubus allegheniensis)	5	
		"WP" Wooly Panicum (Panicum scabriusculum)	5	"WM" Wax Myrtle (Morella cerifera)	10	
		Cinnamon fern (Osmundastrum cinnamomeum)	5	"SP" Saw palmetto (Serenoa repens)	15	

Attachment I
Timber Stand G
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
13	0°	"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	25	29
		Milkweed (Asclepias sp)	5	"GB" Gallberry (Ilex glabra)	12	
		"WG" Wiregrass (Aristida stricta)	20			
		Black root (Pterocaulon sp)	3			
		"DT" Deertongue (Dichanthelium clandestinum)	1			
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	5	55
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	15	
		"WTA" Whitetop aster (Sericocarpus)	10			
	240°	"WTA" Whitetop aster (Sericocarpus)	20	"GB" Gallberry (Ilex glabra)	25	20
		"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	
		Milkweed (Asclepias sp)	2	Rusty lyonia (Lyonia ferruginea)	3	
16	0°	"EMP" Elliott's Milkpea (Galactia elliottii)	5	"GB" Gallberry (Ilex glabra)	15	30
		Black root (Pterocaulon sp)	2	"SP" Saw palmetto (Serenoa repens)	15	
		"WG" Wiregrass (Aristida stricta)	8	"RO" Runner Oak (Quercus pumila)	15	
		"BF" Bracken Fern (Pteridium aquilinum)	10			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	5	40
		"EMP" Elliott's Milkpea (Galactia elliottii)	5	"GB" Gallberry (Ilex glabra)	10	
				"RO" Runner Oak (Quercus pumila)	20	
	240°	"Andro" Broomsedge (Andropogon sp)	10	"SP" Saw palmetto (Serenoa repens)	15	25
		Black root (Pterocaulon sp)	5	"RO" Runner Oak (Quercus pumila)	20	
		"BF" Bracken Fern (Pteridium aquilinum)	10	"GB" Gallberry (Ilex glabra)	15	

Attachment I
Timber Stand G
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
26	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	10	28
		"EMP" Elliott's Milkpea (Galactia elliotii)	2	"RO" Runner Oak (Quercus pumila)	30	
		"Andro" Broomsedge (Andropogon sp)	15			
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	10	45
				"RO" Runner Oak (Quercus pumila)	25	
				"GB" Gallberry (Ilex glabra)	10	
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	35
		"Andro" Broomsedge (Andropogon sp)	5	"RO" Runner Oak (Quercus pumila)	35	
53	0°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	35	0
		"WG" Wiregrass (Aristida stricta)	40	"RO" Runner Oak (Quercus pumila)	5	
		Goldentop (Euthamia sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	15	15
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	10	
				St. John's Wort (Hypericum sp)	5	
				"RO" Runner Oak (Quercus pumila)	15	
	240°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	40	0
		"Andro" Broomsedge (Andropogon sp)	25	"RO" Runner Oak (Quercus pumila)	3	
		"WTA" Whitetop aster (Serilocarpus)	2			

Attachment I
Timber Stand G
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
55	0°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	70	5
		"BF" Bracken Fern (Pteridium aquilinum)	5	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	15	0
		"Andro" Broomsedge (Andropogon sp)	20	"RO" Runner Oak (Quercus pumila)	10	
		"BF" Bracken Fern (Pteridium aquilinum)	5	"GB" Gallberry (Ilex glabra)	10	
		Grapevine (Vitis sp)	5			
		Black root (Pterocaulon sp)	5			
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	70	0
		"Andro" Broomsedge (Andropogon sp)	5	"RO" Runner Oak (Quercus pumila)	5	
82	0°	"WG" Wiregrass (Aristida stricta)	10	"GB" Gallberry (Ilex glabra)	5	80
				"SP" Saw palmetto (Serenoa repens)	5	
	120°			"SP" Saw palmetto (Serenoa repens)	10	90
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	5	85

Attachment I
Timber Stand G
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
99	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	10	85
	120°			"SP" Saw palmetto (Serenoa repens)	5	90
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	80
102	0°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	20	50
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	15	
				"RO" Runner Oak (Quercus pumila)	5	
	120°	"WG" Wiregrass (Aristida stricta)	5			85
		"WTA" Whitetop aster (Sericocarpus)	5			
		Black root (Pterocaulon sp)	2			
		"Andro" Broomsedge (Andropogon sp)	3			
	240°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	20	63
		"WG" Wiregrass (Aristida stricta)	5	"RO" Runner Oak (Quercus pumila)	5	
		"WTA" Whitetop aster (Sericocarpus)	2			

Attachment I
Timber Stand H
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
19	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
				"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
				"GB" Gallberry (Ilex glabra)	5	
30	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
				"GB" Gallberry (Ilex glabra)	5	
	120°			"SP" Saw palmetto (Serenoa repens)	10	85
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	75
				"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand H
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
40	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	80
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	90
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	20	70
				"GB" Gallberry (Ilex glabra)	5	
55	0°	"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	85
				"SP" Saw palmetto (Serenoa repens)	5	
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	75
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	80
				"SP" Saw palmetto (Serenoa repens)	10	

Attachment I
Timber Stand H
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
80	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	65
		Black root (Pterocaulon sp)	2	"RO" Runner Oak (Quercus pumila)	5	
		"WTA" Whitetop aster (Sericocarpus)	3	"GB" Gallberry (Ilex glabra)	5	
	120°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	10	70
		Milkweed (Asclepias sp)	2	"GB" Gallberry (Ilex glabra)	10	
		"WG" Wiregrass (Aristida stricta)	3			
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	55
		"WTA" Whitetop aster (Sericocarpus)	3	"RO" Runner Oak (Quercus pumila)	15	
		Black root (Pterocaulon sp)	2			
87	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	30	0
		"Andro" Broomsedge (Andropogon sp)	20	"RO" Runner Oak (Quercus pumila)	5	
				"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	35	"SP" Saw palmetto (Serenoa repens)	30	5
				"GB" Gallberry (Ilex glabra)	10	
				"RO" Runner Oak (Quercus pumila)	10	
				LLP, Adult (Pinus palustris)	5	
	240°	"WG" Wiregrass (Aristida stricta)	45	"SP" Saw palmetto (Serenoa repens)	30	0
		"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	2	
		Pawpaw (Asimina triloba)	3	"RO" Runner Oak (Quercus pumila)	2	
		"DT" Deertongue (Dichanthelium clandestinum)	3			

Attachment I
Timber Stand H
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
95	0°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	30	2
		"Andro" Broomsedge (Andropogon sp)	35	"RO" Runner Oak (Quercus pumila)	5	
		Rayless sunflower (Helianthus radula)	3	"GB" Gallberry (Ilex glabra)		
	120°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	25	5
		"Andro" Broomsedge (Andropogon sp)	30	"RO" Runner Oak (Quercus pumila)	5	
		Pawpaw (Asimina triloba)	5	St. John's Wort (Hypericum sp)	5	
	240°	"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	20	0
		"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	25	
		Rayless sunflower (Helianthus radula)	5	"RO" Runner Oak (Quercus pumila)	5	
111	0°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	55	5
		"WG" Wiregrass (Aristida stricta)	15	"GB" Gallberry (Ilex glabra)	10	
	120°	"WG" Wiregrass (Aristida stricta)	60	"WM" Wax Myrtle (Morella cerifera)	15	5
		Goldentop (Euthamia sp)	15			
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	40	5
		"Andro" Broomsedge (Andropogon sp)	5	"WM" Wax Myrtle (Morella cerifera)	5	
				"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand H
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
116	0°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	60	0
		"DT" Deertongue (Dichanthelium clandestinum)	2			
		"Andro" Broomsedge (Andropogon sp)	13			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	60	5
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
				"WM" Wax Myrtle (Morella cerifera)	5	
	240°	"Andro" Broomsedge (Andropogon sp)	25	"SP" Saw palmetto (Serenoa repens)	55	0
		"WG" Wiregrass (Aristida stricta)	15	"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
11	0°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	20	55
				"GB" Gallberry (Ilex glabra)	15	
				St. John's Wort (Hypericum sp)	5	
	120°	"Andro" Broomsedge (Andropogon sp)	5	St. John's Wort (Hypericum sp)	25	50
				"SP" Saw palmetto (Serenoa repens)	20	
	240°	"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	20	50
		"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	15	
				"RO" Runner Oak (Quercus pumila)	5	
17	0°	"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	15	70
		Black root (Pterocaulon sp)	10			
	120°	"EMP" Elliott's Milkpea (Galactia elliottii)	5	"GB" Gallberry (Ilex glabra)	1	85
		"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	1	
				St. John's Wort (Hypericum sp)	3	
	240°	Rosy Camphorweed (Pluchea rosea)	5	St. John's Wort (Hypericum sp)	10	70
		Blue maidencane (Amphicarpum purshii)	10			
		"Andro" Broomsedge (Andropogon sp)	5			

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
26	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	5	50
		"WTA" Whitetop aster (Sericocarpus)	5			
	120°	"WG" Wiregrass (Aristida stricta)	30	"RO" Runner Oak (Quercus pumila)	5	60
		"WTA" Whitetop aster (Sericocarpus)	5			
	240°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	10	55
		"WTA" Whitetop aster (Sericocarpus)	3			
		Black root (Pterocaulon sp)	2			
60	0°	"WTA" Whitetop aster (Sericocarpus)	3	"SP" Saw palmetto (Serenoa repens)	30	55
		"WG" Wiregrass (Aristida stricta)	5	"RO" Runner Oak (Quercus pumila)	5	
				"GB" Gallberry (Ilex glabra)	2	
	120°	"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	10	80
		"WG" Wiregrass (Aristida stricta)	5			
	240°	"WG" Wiregrass (Aristida stricta)	15	"RO" Runner Oak (Quercus pumila)	10	63
		"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	5	
		"WTA" Whitetop aster (Sericocarpus)	2			

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
62	0°	"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	15	45
		"WTA" Whitetop aster (Sericocarpus)	30	"SP" Saw palmetto (Serenoa repens)	5	
	120°	"Andro" Broomsedge (Andropogon sp)	15	"RO" Runner Oak (Quercus pumila)	15	50
		"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	
		"WTA" Whitetop aster (Sericocarpus)	10			
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	5	50
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	10	
		"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	5	
84	0°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	10	65
		"WG" Wiregrass (Aristida stricta)	10	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	5			
	120°	"WG" Wiregrass (Aristida stricta)	10			80
		"Andro" Broomsedge (Andropogon sp)	5			
		"WTA" Whitetop aster (Sericocarpus)	5			
	240°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	5	70
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
105	0°	"WG" Wiregrass (Aristida stricta)	40			60
	120°	"WG" Wiregrass (Aristida stricta)	40			55
		Blue maidencane (Amphicarpum purshii)	5			
	240°	"WG" Wiregrass (Aristida stricta)	40	"WM" Wax Myrtle (Morella cerifera)	5	53
		"WTA" Whitetop aster (Sericocarpus)	2			
109	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	10	65
		"Andro" Broomsedge (Andropogon sp)	3	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	5	
	120°	"WTA" Whitetop aster (Sericocarpus)	10	"SP" Saw palmetto (Serenoa repens)	5	78
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	2	
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	10	70
		"WTA" Whitetop aster (Sericocarpus)	2	"GB" Gallberry (Ilex glabra)	3	
		"Andro" Broomsedge (Andropogon sp)	5			

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
125	0°	"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	5	0
		"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	30	
		Pawpaw (Asimina triloba)	1	Rusty lyonia (Lyonia ferruginea)	4	
	120°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	5	13
		"Andro" Broomsedge (Andropogon sp)	20	"RO" Runner Oak (Quercus pumila)	10	
		Black root (Pterocaulon sp)	2			
	240°	"Andro" Broomsedge (Andropogon sp)	50	"SP" Saw palmetto (Serenoa repens)	20	0
		"WG" Wiregrass (Aristida stricta)	10	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Serilocarpus)	2	Rusty lyonia (Lyonia ferruginea)	5	
		"EMP" Elliott's Milkpea (Galactia elliottii)	3			
138	0°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	20	60
		"EMP" Elliott's Milkpea (Galactia elliottii)	1	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Serilocarpus)	4			
	120°	"WTA" Whitetop aster (Serilocarpus)	1	"SP" Saw palmetto (Serenoa repens)	4	85
				"RO" Runner Oak (Quercus pumila)	10	
	240°	"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	15	65
		"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	5	
		Black root (Pterocaulon sp)	2			
		"WTA" Whitetop aster (Serilocarpus)	3			

Attachment I
Timber Stand I
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
155	0°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	10	60
		Black root (Pterocaulon sp)	3	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	5	75
		"WTA" Whitetop aster (Sericocarpus)	5			
		"EMP" Elliott's Milkpea (Galactia elliotii)	2			
		Cinnamon fern (Osmundastrum cinnamomeum)	3			
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	55
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
		Cinnamon fern (Osmundastrum cinnamomeum)	5			
		Black root (Pterocaulon sp)	1			
		"EMP" Elliott's Milkpea (Galactia elliotii)	2			
		"WTA" Whitetop aster (Sericocarpus)	2			

Attachment I
Timber Stand J
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
6	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	65
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
				"RO" Runner Oak (Quercus pumila)	5	
	120°	"WG" Wiregrass (Aristida stricta)	5	"RO" Runner Oak (Quercus pumila)	5	85
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	78
		"WG" Wiregrass (Aristida stricta)	5	"RO" Runner Oak (Quercus pumila)	5	
				"SP" Saw palmetto (Serenoa repens)	2	
15	0°	"WG" Wiregrass (Aristida stricta)	60	"SP" Saw palmetto (Serenoa repens)	5	30
		Black root (Pterocaulon sp)	1			
		"WTA" Whitetop aster (Serilocarpus)	1			
		"Andro" Broomsedge (Andropogon sp)	3			
	120°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	5	80
				"GB" Gallberry (Ilex glabra)	5	
				"RO" Runner Oak (Quercus pumila)	5	
	240°	"WG" Wiregrass (Aristida stricta)	30	"GB" Gallberry (Ilex glabra)	5	65

Attachment I
Timber Stand J
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
31	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	80
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	80
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
		"Andro" Broomsedge (Andropogon sp)	3	"GB" Gallberry (Ilex glabra)	2	
35	0°	"Andro" Broomsedge (Andropogon sp)	3	"SP" Saw palmetto (Serenoa repens)	10	75
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	
		Black root (Pterocaulon sp)	1			
		"WTA" Whitetop aster (Sericocarpus)	1			
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	10	80
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	20	65
		Black root (Pterocaulon sp)	1	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	1			
		"Andro" Broomsedge (Andropogon sp)	3			

Attachment I
Timber Stand J
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
68	0°	"WTA" Whitetop aster (Sericocarpus)	2	"SP" Saw palmetto (Serenoa repens)	5	85
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	3	
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	3	85
		"Andro" Broomsedge (Andropogon sp)	2	"RO" Runner Oak (Quercus pumila)	2	
				"GB" Gallberry (Ilex glabra)	3	
	240°	"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	10	80
		"Andro" Broomsedge (Andropogon sp)	5			
69	0°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	60
		"WTA" Whitetop aster (Sericocarpus)	15	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	10	"RO" Runner Oak (Quercus pumila)	10	70
		"WTA" Whitetop aster (Sericocarpus)	10			
	240°	"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	5	85
				"SP" Saw palmetto (Serenoa repens)	5	

Attachment I
Timber Stand J
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
79	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	5	60
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	5	
				"GB" Gallberry (Ilex glabra)	5	
	120°	"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	15	70
		"WG" Wiregrass (Aristida stricta)	10			
	240°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	80
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	3	
		"Andro" Broomsedge (Andropogon sp)	2			
91	0°	"WG" Wiregrass (Aristida stricta)	55	"BB" Black berry (Rubus allegheniensis)	2	30
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
				St. John's Wort (Hypericum sp)	3	
	120°	"WG" Wiregrass (Aristida stricta)	60	"SP" Saw palmetto (Serenoa repens)	10	20
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	10	30
		"WTA" Whitetop aster (Sericocarpus)	2	"GB" Gallberry (Ilex glabra)	5	
				"RO" Runner Oak (Quercus pumila)	3	

Attachment I
Timber Stand J
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
106	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	20	35
		"WTA" Whitetop aster (Sericocarpus)	20	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	20	20
		"WTA" Whitetop aster (Sericocarpus)	20	"GB" Gallberry (Ilex glabra)	20	
	240°	"WTA" Whitetop aster (Sericocarpus)	20	"SP" Saw palmetto (Serenoa repens)	20	35
		"EMP" Elliott's Milkpea (Galactia elliotii)	2	"GB" Gallberry (Ilex glabra)	20	
		Cat greenbriar (Smilax glauca)	1	Fetterbush (Lyonia lucida)	2	

Attachment I
Timber Stand K
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
6	0°	"WG" Wiregrass (Aristida stricta)	15	"GB" Gallberry (Ilex glabra)	5	35
		"Andro" Broomsedge (Andropogon sp)	25	"SP" Saw palmetto (Serenoa repens)	10	
		"DT" Deertongue (Dichanthelium clandestinum)	3			
		"WTA" Whitetop aster (Sericocarpus)	2			
		"FF" False Fennel (Eupatorium leptophyllum)	3			
		Bogbutton (Lanchocaulon sp)	2			
	120°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	40	15
		"WTA" Whitetop aster (Sericocarpus)	25			
		"FF" False Fennel (Eupatorium leptophyllum)	5			
	240°					45
		"WG" Wiregrass (Aristida stricta)	35			
		"Andro" Broomsedge (Andropogon sp)	10			
		"FF" False Fennel (Eupatorium leptophyllum)	5			
		"WTA" Whitetop aster (Sericocarpus)	3			
		Cinnamon fern (Osmundastrum cinnamomeum)	2			
21	0°	"WTA" Whitetop aster (Sericocarpus)	2	"SP" Saw palmetto (Serenoa repens)	60	35
				"GB" Gallberry (Ilex glabra)	3	
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	50	20
		"Andro" Broomsedge (Andropogon sp)	8	"GB" Gallberry (Ilex glabra)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			
	240°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	20	25
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	10	

Attachment I
Timber Stand K
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
43	0°	"WG" Wiregrass (Aristida stricta)	75	"WM" Wax Myrtle (Morella cerifera)	3	0
		"Andro" Broomsedge (Andropogon sp)	15	St. John's Wort (Hypericum sp)	2	
		Elliott's yelloweyed grass (Xyris elliotii)	3			
		"HP" Hat pin (Eriocaulon sp)	2			
	120°	"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	0
		"Andro" Broomsedge (Andropogon sp)	90			
	240°	"Andro" Broomsedge (Andropogon sp)	30	"SP" Saw palmetto (Serenoa repens)	40	0
		"WG" Wiregrass (Aristida stricta)	20	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Serilocarpus)	3			
		"DT" Deertongue (Dichanthelium clandestinum)	2			
54	0°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	50
		"WTA" Whitetop aster (Serilocarpus)	15	"GB" Gallberry (Ilex glabra)	5	
		"DT" Deertongue (Dichanthelium clandestinum)	5			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	5	55
		"WTA" Whitetop aster (Serilocarpus)	10	"RO" Runner Oak (Quercus pumila)	3	
		Black root (Pterocaulon sp)	2			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
	240°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	10	55
		"WTA" Whitetop aster (Serilocarpus)	10			
		Black root (Pterocaulon sp)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	5			

Attachment I
Timber Stand K
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
65	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	60
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	5	
	120°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	10	60
		"WTA" Whitetop aster (Sericocarpus)	10			
		"Andro" Broomsedge (Andropogon sp)	5			
		Cinnamon fern (Osmundastrum cinnamomeum)	5			
	240°	"WG" Wiregrass (Aristida stricta)	35	"SP" Saw palmetto (Serenoa repens)	5	50
		"Andro" Broomsedge (Andropogon sp)	5			
		"WTA" Whitetop aster (Sericocarpus)	5			

Attachment I
Timber Stand P
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
6	0°	"PF" Passion flower (<i>Passiflora</i> sp)	3	"SP" Saw palmetto (<i>Serenoa repens</i>)	30	65
				"GB" Gallberry (<i>Ilex glabra</i>)	2	
	120°	"Andro" Broomsedge (<i>Andropogon</i> sp)	5			90
		"PF" Passion flower (<i>Passiflora</i> sp)	3			
		"FF" False Fennel (<i>Eupatorium leptophyllum</i>)	2			
	240°	"PF" Passion flower (<i>Passiflora</i> sp)	5	"SP" Saw palmetto (<i>Serenoa repens</i>)	30	55
		"Andro" Broomsedge (<i>Andropogon</i> sp)	5	"GB" Gallberry (<i>Ilex glabra</i>)	5	
16	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	30	"SP" Saw palmetto (<i>Serenoa repens</i>)	30	0
		"Andro" Broomsedge (<i>Andropogon</i> sp)	30	"GB" Gallberry (<i>Ilex glabra</i>)	8	
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	2			
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	40	"SP" Saw palmetto (<i>Serenoa repens</i>)	20	5
		"Andro" Broomsedge (<i>Andropogon</i> sp)	10	"GB" Gallberry (<i>Ilex glabra</i>)	15	
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	5	<i>St. John's Wort (Hypericum sp)</i>	5	
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	50	"SP" Saw palmetto (<i>Serenoa repens</i>)	30	0
		"Andro" Broomsedge (<i>Andropogon</i> sp)	15			
		Goldentop (<i>Euthamia</i> sp)	5			

Attachment I
Timber Stand P
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
28	0°	"WG" Wiregrass (Aristida stricta)	55	"SP" Saw palmetto (Serenoa repens)	25	0
		"Andro" Broomsedge (Andropogon sp)	5	"RO" Runner Oak (Quercus pumila)	15	
	120°	"Andro" Broomsedge (Andropogon sp)	20	"RO" Runner Oak (Quercus pumila)	30	10
		"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	20	
	240°	"Andro" Broomsedge (Andropogon sp)	25	"SP" Saw palmetto (Serenoa repens)	35	0
		"WG" Wiregrass (Aristida stricta)	15	"RO" Runner Oak (Quercus pumila)	15	
		Goldentop (Euthamia sp)	5	Fetterbush (Lyonia lucida)	5	
43	0°	"Andro" Broomsedge (Andropogon sp)	30	"SP" Saw palmetto (Serenoa repens)	45	10
		"WG" Wiregrass (Aristida stricta)	5			
		"CF" Climbing fern (Lygodium microphyllum)	5			
		Cinnamon fern (Osmundastrum cinnamomeum)	5			
	120°	"WG" Wiregrass (Aristida stricta)	30	"WM" Wax Myrtle (Morella cerifera)	15	5
		"Andro" Broomsedge (Andropogon sp)	40			
		"EMP" Elliott's Milkpea (Galactia elliottii)	10			
	240°	"Andro" Broomsedge (Andropogon sp)	30	"SP" Saw palmetto (Serenoa repens)	50	0
		"BF" Bracken Fern (Pteridium aquilinum)	5	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	5			
		"EMP" Elliott's Milkpea (Galactia elliottii)	5			

Attachment I
Timber Stand P
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
60	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	50	"SP" Saw palmetto (<i>Serenoa repens</i>)	20	5
		"Andro" Broomsedge (<i>Andropogon</i> sp)	5	"RO" Runner Oak (<i>Quercus pumila</i>)	10	
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	5	
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	40	"SP" Saw palmetto (<i>Serenoa repens</i>)	15	5
		"Andro" Broomsedge (<i>Andropogon</i> sp)	10	"RO" Runner Oak (<i>Quercus pumila</i>)	15	
				"GB" Gallberry (<i>Ilex glabra</i>)	15	
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	30	"SP" Saw palmetto (<i>Serenoa repens</i>)	20	5
		"Andro" Broomsedge (<i>Andropogon</i> sp)	20	"GB" Gallberry (<i>Ilex glabra</i>)	10	
				"WM" Wax Myrtle (<i>Morella cerifera</i>)	5	
				"RO" Runner Oak (<i>Quercus pumila</i>)	10	
68	0°	Black root (<i>Pterocaulon</i> sp)	2	"GB" Gallberry (<i>Ilex glabra</i>)	15	50
		"Andro" Broomsedge (<i>Andropogon</i> sp)	10	"RO" Runner Oak (<i>Quercus pumila</i>)	10	
		"WG" Wiregrass (<i>Aristida stricta</i>)	10			
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	2			
		Pawpaw (<i>Asimina triloba</i>)	1			
	120°	"EMP" Elliott's Milkpea (<i>Galactia elliottii</i>)	5	"SP" Saw palmetto (<i>Serenoa repens</i>)	40	20
		Black root (<i>Pterocaulon</i> sp)	5	"RO" Runner Oak (<i>Quercus pumila</i>)	30	
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	15	"RO" Runner Oak (<i>Quercus pumila</i>)	15	50
		"Andro" Broomsedge (<i>Andropogon</i> sp)	5	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	
		Black root (<i>Pterocaulon</i> sp)	5			

Attachment I
Timber Stand P
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
85	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	35	"SP" Saw palmetto (<i>Serenoa repens</i>)	15	35
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	5	
		<i>Bogbutton (Lanchocaulon sp)</i>	5			
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	15	"GB" Gallberry (<i>Ilex glabra</i>)	20	25
		"Andro" Broomsedge (<i>Andropogon</i> sp)	10	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	20			
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	10	"SP" Saw palmetto (<i>Serenoa repens</i>)	25	40
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	5	
		"Andro" Broomsedge (<i>Andropogon</i> sp)	15			
89	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	5	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	37
		<i>Black root (Pterocaulon sp)</i>	5	"RO" Runner Oak (<i>Quercus pumila</i>)	25	
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	3	"GB" Gallberry (<i>Ilex glabra</i>)	10	
		"WP" Wooly Panicum (<i>Panicum scabriusculum</i>)	5			
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	10	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	15
		<i>Black root (Pterocaulon sp)</i>	5	"RO" Runner Oak (<i>Quercus pumila</i>)	50	
		"WP" Wooly Panicum (<i>Panicum scabriusculum</i>)	10			
	240°	<i>Black root (Pterocaulon sp)</i>	5	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	30
		"WP" Wooly Panicum (<i>Panicum scabriusculum</i>)	5	"RO" Runner Oak (<i>Quercus pumila</i>)	40	
		"WG" Wiregrass (<i>Aristida stricta</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	5	

Attachment I
Timber Stand P
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
114	0°	Cinnamon fern (<i>Osmundastrum cinnamomeum</i>)	25	"SP" Saw palmetto (<i>Serenoa repens</i>)	25	20
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	10			
		"EMP" Elliott's Milkpea (<i>Galactia elliottii</i>)	10			
		"WG" Wiregrass (<i>Aristida stricta</i>)	10			
	120°	Cinnamon fern (<i>Osmundastrum cinnamomeum</i>)	15	"SP" Saw palmetto (<i>Serenoa repens</i>)	50	13
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	5	"BB" Black berry (<i>Rubus allegheniensis</i>)	2	
		Climbing hempweed (<i>Mikania scandens</i>)	10			
		"EMP" Elliott's Milkpea (<i>Galactia elliottii</i>)	5			
	240°	Poison Ivy (<i>Toxicodendron radicans</i>)	20	"SP" Saw palmetto (<i>Serenoa repens</i>)	35	18
		"WTA" Whitetop aster (<i>Sericocarpus</i>)	3			
		"EMP" Elliott's Milkpea (<i>Galactia elliottii</i>)	3			
		"CF" Climbing fern (<i>Lygodium microphyllum</i>)	2			
		"BF" Bracken Fern (<i>Pteridium aquilinum</i>)	2			
		"Andro" Broomsedge (<i>Andropogon</i> sp)	5			
		Climbing hempweed (<i>Mikania scandens</i>)	2			
		Cinnamon fern (<i>Osmundastrum cinnamomeum</i>)	10			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
8	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	15	40
		"WTA" Whitetop aster (Sericocarpus)	3	"GB" Gallberry (Ilex glabra)	15	
		Black root (Pterocaulon sp)	2			
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	5	55
		"WTA" Whitetop aster (Sericocarpus)	5			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
		"EMP" Elliott's Milkpea (Galactia elliottii)	5			
		"Andro" Broomsedge (Andropogon sp)	5			
		Pawpaw (Asimina triloba)	5			
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	10	49
		"WTA" Whitetop aster (Sericocarpus)	10			
		"Andro" Broomsedge (Andropogon sp)	5			
		Pawpaw (Asimina triloba)	1			
13	0°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	50	0
		Three-awn (Aristida sp)	10	"GB" Gallberry (Ilex glabra)	4	
		"Andro" Broomsedge (Andropogon sp)	5			
		"WTA" Whitetop aster (Sericocarpus)	1			
	120°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	5	0
		"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	5	
		Black root (Pterocaulon sp)	5	"RO" Runner Oak (Quercus pumila)	5	
		Three-awn (Aristida sp)	5			
		"EMP" Elliott's Milkpea (Galactia elliottii)	10			
	240°	"WG" Wiregrass (Aristida stricta)	45	"SP" Saw palmetto (Serenoa repens)	50	0
		Three-awn (Aristida sp)	5			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
21	0°	"DT" Deertongue (Dichanthelium clandestinum)	3	"SP" Saw palmetto (Serenoa repens)	20	55
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	10	
		"WG" Wiregrass (Aristida stricta)	10			
	120°	"WTA" Whitetop aster (Sericocarpus)	10	"SP" Saw palmetto (Serenoa repens)	5	75
		"WG" Wiregrass (Aristida stricta)	5	"RO" Runner Oak (Quercus pumila)	5	
	240°	"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	15	50
		"WG" Wiregrass (Aristida stricta)	25	"GB" Gallberry (Ilex glabra)	5	
27	0°	"WG" Wiregrass (Aristida stricta)	60	St. John's Wort (Hypericum sp)	2	30
		"WTA" Whitetop aster (Sericocarpus)	3	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	75	St. John's Wort (Hypericum sp)	5	5
		"WTA" Whitetop aster (Sericocarpus)	15			
	240°	"WG" Wiregrass (Aristida stricta)	65	St. John's Wort (Hypericum sp)	2	32
		"WTA" Whitetop aster (Sericocarpus)	1			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
30	0°	"WG" Wiregrass (Aristida stricta)	20	"GB" Gallberry (Ilex glabra)	5	60
		"EMP" Elliott's Milkpea (Galactia elliottii)	1	"SP" Saw palmetto (Serenoa repens)	10	
		"WTA" Whitetop aster (Sericocarpus)	1			
		Pawpaw (Asimina triloba)	1			
		Black root (Pterocaulon sp)	2			
	120°	"WG" Wiregrass (Aristida stricta)	20	"RO" Runner Oak (Quercus pumila)	10	45
		Black root (Pterocaulon sp)	5	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	10			
		"DT" Deertongue (Dichanthelium clandestinum)	5			
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	10	52
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	10	
		Black root (Pterocaulon sp)	2	"GB" Gallberry (Ilex glabra)	3	
		"EMP" Elliott's Milkpea (Galactia elliottii)	1			
		"DT" Deertongue (Dichanthelium clandestinum)	2			
		"Andro" Broomsedge (Andropogon sp)	5			
35	0°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	5	60
		Black root (Pterocaulon sp)	2			
		"WTA" Whitetop aster (Sericocarpus)	3			
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	85
				"RO" Runner Oak (Quercus pumila)	5	
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	10	54
		"WTA" Whitetop aster (Sericocarpus)	5	"RO" Runner Oak (Quercus pumila)	5	
		Black root (Pterocaulon sp)	1			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
46	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	15	45
		"Andro" Broomsedge (Andropogon sp)	10	"RO" Runner Oak (Quercus pumila)	2	
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	2	
		"EMP" Elliott's Milkpea (Galactia elliottii)	1			
	120°	"WG" Wiregrass (Aristida stricta)	70			15
		"EMP" Elliott's Milkpea (Galactia elliottii)	10			
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	5	48
		"Andro" Broomsedge (Andropogon sp)	10			
		"WTA" Whitetop aster (Sericocarpus)	5			
		Black root (Pterocaulon sp)	2			
71	0°	"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	20	65
		"WG" Wiregrass (Aristida stricta)	5	"BB" Black berry (Rubus allegheniensis)	3	
				"GB" Gallberry (Ilex glabra)	2	
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	20
		"WTA" Whitetop aster (Sericocarpus)	15	"GB" Gallberry (Ilex glabra)	15	
		"BF" Bracken Fern (Pteridium aquilinum)	10	"RO" Runner Oak (Quercus pumila)	10	
	240°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	5	47
		"WTA" Whitetop aster (Sericocarpus)	5			
		Black root (Pterocaulon sp)	1			
		Pitcher plant (Sarracenia sp)	1			
		"BF" Bracken Fern (Pteridium aquilinum)	1			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
81	0°	"WG" Wiregrass (Aristida stricta)	25	"RO" Runner Oak (Quercus pumila)	15	45
		Black root (Pterocaulon sp)	2	"SP" Saw palmetto (Serenoa repens)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			
		"Andro" Broomsedge (Andropogon sp)	1			
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	5	70
		Black root (Pterocaulon sp)	5	"RO" Runner Oak (Quercus pumila)	5	
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	40
		Black root (Pterocaulon sp)	2	"RO" Runner Oak (Quercus pumila)	20	
		"WTA" Whitetop aster (Sericocarpus)	3			
		"Andro" Broomsedge (Andropogon sp)	5			
90	0°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	55
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	5	
		"BF" Bracken Fern (Pteridium aquilinum)	2	"RO" Runner Oak (Quercus pumila)	5	
		"WTA" Whitetop aster (Sericocarpus)	3			
	120°	Chainfern (Woodwardia sp)	10	"SP" Saw palmetto (Serenoa repens)	25	55
				"BB" Black berry (Rubus allegheniensis)	10	
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	15	60
		"Andro" Broomsedge (Andropogon sp)	3	"RO" Runner Oak (Quercus pumila)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			

Attachment I
Timber Stand L
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
104	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	55
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	10	
		Black root (Pterocaulon sp)	3			
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	25	40
		"WTA" Whitetop aster (Sericocarpus)	10	"RO" Runner Oak (Quercus pumila)	10	
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	49
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	10	
		Black root (Pterocaulon sp)	2			
		Pawpaw (Asimina triloba)	2			
127	0°	"WG" Wiregrass (Aristida stricta)	22	"SP" Saw palmetto (Serenoa repens)	10	46
		"Andro" Broomsedge (Andropogon sp)	10	"RO" Runner Oak (Quercus pumila)	10	
		"WTA" Whitetop aster (Sericocarpus)	2			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	45
				LLP, Adult (Pinus palustris)	10	
				"RO" Runner Oak (Quercus pumila)	5	
				"GB" Gallberry (Ilex glabra)	10	
	240°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	20	55
		"WTA" Whitetop aster (Sericocarpus)	2	"RO" Runner Oak (Quercus pumila)	10	
		"Andro" Broomsedge (Andropogon sp)	3			

Attachment I
Timber Stand M
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
10	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	10	30
		"Andro" Broomsedge (Andropogon sp)	3	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	2			
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	10	45
		"CG" Cogon grass (Imperata cylindrica)	25	"GB" Gallberry (Ilex glabra)	2	
		Goldentop (Euthamia sp)	5			
		"DF" Dogfennel (Eupatorium capillifolium)	3			
		"BF" Bracken Fern (Pteridium aquilinum)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	10	"SP" Saw palmetto (Serenoa repens)	10	35
		"WG" Wiregrass (Aristida stricta)	5	"GB" Gallberry (Ilex glabra)	5	
		"CG" Cogon grass (Imperata cylindrica)	30			
		"BF" Bracken Fern (Pteridium aquilinum)	3			
		"DF" Dogfennel (Eupatorium capillifolium)	2			
17	0°	"BF" Bracken Fern (Pteridium aquilinum)	10	"SP" Saw palmetto (Serenoa repens)	25	40
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	15	
				Beautyberry (Callicarpa americana)	5	
	120°	"WTA" Whitetop aster (Sericocarpus)	15	"SP" Saw palmetto (Serenoa repens)	25	30
		"BF" Bracken Fern (Pteridium aquilinum)	10	"GB" Gallberry (Ilex glabra)	5	
		Chainfern (Woodwardia sp)	10			
		"Andro" Broomsedge (Andropogon sp)	5			
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	20	40
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	5	
		"Andro" Broomsedge (Andropogon sp)	3			
		Black root (Pterocaulon sp)	2			

Attachment I
Timber Stand M
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
52	0°	"WG" Wiregrass (Aristida stricta)	38	"SP" Saw palmetto (Serenoa repens)	20	30
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	5	
		"DT" Deertongue (Dichanthelium clandestinum)	2			
	120°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	20	35
		"WTA" Whitetop aster (Sericocarpus)	5			
	240°	"WG" Wiregrass (Aristida stricta)	60			35
		"WTA" Whitetop aster (Sericocarpus)	5			
66	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	5	40
		"WTA" Whitetop aster (Sericocarpus)	3	"RO" Runner Oak (Quercus pumila)	2	
	120°	"WG" Wiregrass (Aristida stricta)	50			40
		"WTA" Whitetop aster (Sericocarpus)	10			
	240°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	20	25
		"WTA" Whitetop aster (Sericocarpus)	1	"RO" Runner Oak (Quercus pumila)	4	

Attachment I
Timber Stand M
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
70	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	12	35
		"Andro" Broomsedge (Andropogon sp)	15	"RO" Runner Oak (Quercus pumila)	15	
		Black root (Pterocaulon sp)	3			
	120°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	15	35
		"Andro" Broomsedge (Andropogon sp)	5	"RO" Runner Oak (Quercus pumila)	20	
		Black root (Pterocaulon sp)	2			
		"WTA" Whitetop aster (Sericocarpus)	2			
		"DT" Deertongue (Dichanthelium clandestinum)	1			
	240°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	45
				"GB" Gallberry (Ilex glabra)	5	
				"RO" Runner Oak (Quercus pumila)	20	
77	0°	"EMP" Elliott's Milkpea (Galactia elliottii)	3	"SP" Saw palmetto (Serenoa repens)	80	2
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	30	5
		"EMP" Elliott's Milkpea (Galactia elliottii)	25	"GB" Gallberry (Ilex glabra)	5	
		"Andro" Broomsedge (Andropogon sp)	5	"WM" Wax Myrtle (Morella cerifera)	5	
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	65	0
		"EMP" Elliott's Milkpea (Galactia elliottii)	5	"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand M
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
83	0°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	15	50
		"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	10	
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	10	"GB" Gallberry (Ilex glabra)	20	35
		"Andro" Broomsedge (Andropogon sp)	10	"RO" Runner Oak (Quercus pumila)	10	
		"DT" Deertongue (Dichanthelium clandestinum)	5	St. John's Wort (Hypericum sp)	5	
				"SP" Saw palmetto (Serenoa repens)	5	
	240°	"WTA" Whitetop aster (Sericocarpus)	25	"GB" Gallberry (Ilex glabra)	10	30
		"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	5	
		"Andro" Broomsedge (Andropogon sp)	5			
		"EMP" Elliott's Milkpea (Galactia elliottii)	2			
		"DT" Deertongue (Dichanthelium clandestinum)	3			

Attachment I
Timber Stand N
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
10	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	35	"SP" Saw palmetto (<i>Serenoa repens</i>)	35	3
		"Andro" Broomsedge (<i>Andropogon</i> sp)	20	"GB" Gallberry (<i>Ilex glabra</i>)	5	
				Rusty lyonia (<i>Lyonia ferruginea</i>)	2	
				"RO" Runner Oak (<i>Quercus pumila</i>)		
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	35	"SP" Saw palmetto (<i>Serenoa repens</i>)	20	5
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	1	"GB" Gallberry (<i>Ilex glabra</i>)	20	
		"Andro" Broomsedge (<i>Andropogon</i> sp)	4	"RO" Runner Oak (<i>Quercus pumila</i>)	15	
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	35	"SP" Saw palmetto (<i>Serenoa repens</i>)	40	0
				"RO" Runner Oak (<i>Quercus pumila</i>)	10	
				Rusty lyonia (<i>Lyonia ferruginea</i>)	5	
				"GB" Gallberry (<i>Ilex glabra</i>)	10	
17	0°	"WG" Wiregrass (<i>Aristida stricta</i>)	30	"SP" Saw palmetto (<i>Serenoa repens</i>)	30	0
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	5	"RO" Runner Oak (<i>Quercus pumila</i>)	20	
		"Andro" Broomsedge (<i>Andropogon</i> sp)	15			
	120°	"WG" Wiregrass (<i>Aristida stricta</i>)	30	"SP" Saw palmetto (<i>Serenoa repens</i>)	15	10
		"Andro" Broomsedge (<i>Andropogon</i> sp)	10	"RO" Runner Oak (<i>Quercus pumila</i>)	20	
				"GB" Gallberry (<i>Ilex glabra</i>)	5	
				St. John's Wort (<i>Hypericum</i> sp)	10	
	240°	"WG" Wiregrass (<i>Aristida stricta</i>)	15	"SP" Saw palmetto (<i>Serenoa repens</i>)	50	2
		"Andro" Broomsedge (<i>Andropogon</i> sp)	15	"RO" Runner Oak (<i>Quercus pumila</i>)	15	
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	3			

Attachment I
Timber Stand N
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
23	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	20	0
		"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	10	
		Pawpaw (Asimina triloba)	2	Rusty lyonia (Lyonia ferruginea)	3	
	120°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	20	0
		Pawpaw (Asimina triloba)	5	"GB" Gallberry (Ilex glabra)	30	
				St. John's Wort (Hypericum sp)	5	
	240°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	30	0
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	7	
		Pawpaw (Asimina triloba)	2			
		"WTA" Whitetop aster (Seriocarpus)	1			
33	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	30	0
		"Andro" Broomsedge (Andropogon sp)	15	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	45	"SP" Saw palmetto (Serenoa repens)	45	5
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	40	0
		"Andro" Broomsedge (Andropogon sp)	8	"RO" Runner Oak (Quercus pumila)	1	
		"DT" Deertongue (Dichanthelium clandestinum)	1			

Attachment I
Timber Stand N
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
43	0°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	40	0
		"DT" Deertongue (Dichanthelium clandestinum)	3	"GB" Gallberry (Ilex glabra)	3	
		"Andro" Broomsedge (Andropogon sp)	3			
		Pawpaw (Asimina triloba)	1			
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	20	35
		"DT" Deertongue (Dichanthelium clandestinum)	2	"GB" Gallberry (Ilex glabra)	10	
				"RO" Runner Oak (Quercus pumila)	15	
				St. John's Wort (Hypericum sp)	3	
	240°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	40	1
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	2	
		"DT" Deertongue (Dichanthelium clandestinum)	3	"RO" Runner Oak (Quercus pumila)	2	
		Black root (Pterocaulon sp)	2			

Attachment I

Timber Stand O



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
23	0°	"CG" Cogon grass (<i>Imperata cylindrica</i>)	45	"SP" Saw palmetto (<i>Serenoa repens</i>)	45	0
		"BF" Bracken Fern (<i>Pteridium aquilinum</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	3	
		"EMP" Elliott's Milkpea (<i>Galactia elliptica</i>)	2			
	120°	"BF" Bracken Fern (<i>Pteridium aquilinum</i>)	35	"SP" Saw palmetto (<i>Serenoa repens</i>)	15	25
		"EMP" Elliott's Milkpea (<i>Galactia elliptica</i>)	5	"GB" Gallberry (<i>Ilex glabra</i>)	10	
		"Andro" Broomsedge (<i>Andropogon</i> sp)	5			
		Chainfern (<i>Woodwardia</i> sp)	5			
	240°	"BF" Bracken Fern (<i>Pteridium aquilinum</i>)	3	"SP" Saw palmetto (<i>Serenoa repens</i>)	65	5
		Chainfern (<i>Woodwardia</i> sp)	2	"GB" Gallberry (<i>Ilex glabra</i>)	25	
27	0°	"CG" Cogon grass (<i>Imperata cylindrica</i>)	90	"SP" Saw palmetto (<i>Serenoa repens</i>)	10	0
	120°	"CG" Cogon grass (<i>Imperata cylindrica</i>)	45	"SP" Saw palmetto (<i>Serenoa repens</i>)	55	0
	240°	"Andro" Broomsedge (<i>Andropogon</i> sp)	25	"SP" Saw palmetto (<i>Serenoa repens</i>)	60	0
		Pawpaw (<i>Asimina triloba</i>)	2	Beautyberry (<i>Callicarpa americana</i>)	1	
		"CG" Cogon grass (<i>Imperata cylindrica</i>)	10			
		"DT" Deertongue (<i>Dichanthelium clandestinum</i>)	2			

Attachment I
Timber Stand O



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
38	0°	"Andro" Broomsedge (Andropogon sp)	40	St. John's Wort (Hypericum sp)	10	10
		"WP" Wooly Panicum (Panicum scabriusculum)	40			
	120°	"Andro" Broomsedge (Andropogon sp)	45	"GB" Gallberry (Ilex glabra)	20	15
		Goldentop (Euthamia sp)	10	"PP" Pond pine (Pinus serotina)	10	
	240°	"Andro" Broomsedge (Andropogon sp)	15	"SP" Saw palmetto (Serenoa repens)	80	0
		"WG" Wiregrass (Aristida stricta)	5			
42	0°	"Andro" Broomsedge (Andropogon sp)	5	"SP" Saw palmetto (Serenoa repens)	65	0
		"CG" Cogon grass (Imperata cylindrica)	25	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	50	"SP" Saw palmetto (Serenoa repens)	35	0
		"Andro" Broomsedge (Andropogon sp)	5	"GB" Gallberry (Ilex glabra)	10	
	240°	"WG" Wiregrass (Aristida stricta)	30	"SP" Saw palmetto (Serenoa repens)	55	0
				"GB" Gallberry (Ilex glabra)	15	

Attachment I
Timber Stand Q
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
14	0°	"EMP" Elliott's Milkpea (Galactia elliottii)	35			0
		Carpetgrass (Axonopus sp)	20			
		Blue maidencane (Amphicarpum purshii)	35			
		Rosy Camphorweed (Pluchea rosea)	5			
		"Andro" Broomsedge (Andropogon sp)	3			
		Black root (Pterocaulon sp)	2			
	120°	"EMP" Elliott's Milkpea (Galactia elliottii)	45			0
		"DF" Dogfennel (Eupatorium capillifolium)	45			
		Black root (Pterocaulon sp)	5			
		"PF" Passion flower (Passiflora sp)	5			
	240°	Black root (Pterocaulon sp)	5			25
		"EMP" Elliott's Milkpea (Galactia elliottii)	25			
		Rosy Camphorweed (Pluchea rosea)	15			
		"DF" Dogfennel (Eupatorium capillifolium)	10			
		"PF" Passion flower (Passiflora sp)	15			
		Climbing hempweed (Mikania scandens)	5			
27	0°	"WG" Wiregrass (Aristida stricta)	40	"SP" Saw palmetto (Serenoa repens)	10	35
		"WTA" Whitetop aster (Sericocarpus)	10	"GB" Gallberry (Ilex glabra)	5	
	120°	"WG" Wiregrass (Aristida stricta)	15	"SP" Saw palmetto (Serenoa repens)	20	35
		"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	5	
		"WTA" Whitetop aster (Sericocarpus)	15			
	240°	"WG" Wiregrass (Aristida stricta)	25	"GB" Gallberry (Ilex glabra)	15	50
		"WTA" Whitetop aster (Sericocarpus)	5	"SP" Saw palmetto (Serenoa repens)	5	

Attachment I
Timber Stand Q
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
40	0°	"WG" Wiregrass (Aristida stricta)	20	"SP" Saw palmetto (Serenoa repens)	10	60
		"WTA" Whitetop aster (Sericocarpus)	3	"GB" Gallberry (Ilex glabra)	2	
		"Andro" Broomsedge (Andropogon sp)	5			
	120°	"WG" Wiregrass (Aristida stricta)	5	"SP" Saw palmetto (Serenoa repens)	15	75
				"GB" Gallberry (Ilex glabra)	5	
	240°	"WG" Wiregrass (Aristida stricta)	25	"SP" Saw palmetto (Serenoa repens)	10	58
		"Andro" Broomsedge (Andropogon sp)	5			
		"WTA" Whitetop aster (Sericocarpus)	2			
57	0°	"BF" Bracken Fern (Pteridium aquilinum)	40	"SP" Saw palmetto (Serenoa repens)	10	40
				"GB" Gallberry (Ilex glabra)	10	
	120°	"BF" Bracken Fern (Pteridium aquilinum)	45	"SP" Saw palmetto (Serenoa repens)	20	20
		"EMP" Elliott's Milkpea (Galactia elliottii)	5	"GB" Gallberry (Ilex glabra)	5	
		Rosy Camphorweed (Pluchea rosea)	5			
	240°	"BF" Bracken Fern (Pteridium aquilinum)	30	"SP" Saw palmetto (Serenoa repens)	15	39
		Black root (Pterocaulon sp)	1	"GB" Gallberry (Ilex glabra)	15	

Attachment I
Timber Stand Q
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
84	0°	Chainfern (Woodwardia sp)	5	"GB" Gallberry (Ilex glabra)	10	63
		"EMP" Elliott's Milkpea (Galactia elliottii)	5			
		"DF" Dogfennel (Eupatorium capillifolium)	15			
		"WTA" Whitetop aster (Sericocarpus)	2			
	120°	"WTA" Whitetop aster (Sericocarpus)	5	"GB" Gallberry (Ilex glabra)	20	50
		"EMP" Elliott's Milkpea (Galactia elliottii)	20			
		"DF" Dogfennel (Eupatorium capillifolium)	5			
	240°	"Andro" Broomsedge (Andropogon sp)	10	"GB" Gallberry (Ilex glabra)	20	50
		"WTA" Whitetop aster (Sericocarpus)	5			
		"DF" Dogfennel (Eupatorium capillifolium)	10			
		Goldentop (Euthamia sp)	5			
87	0°	"WG" Wiregrass (Aristida stricta)	10	"SP" Saw palmetto (Serenoa repens)	35	10
				"GB" Gallberry (Ilex glabra)	10	
				Myrtle Oak (Quercus myrtifolia)	35	
	120°	"WG" Wiregrass (Aristida stricta)	15	Myrtle Oak (Quercus myrtifolia)	45	5
				"SP" Saw palmetto (Serenoa repens)	25	
				"GB" Gallberry (Ilex glabra)	10	
	240°	"WG" Wiregrass (Aristida stricta)	10	Myrtle Oak (Quercus myrtifolia)	35	15
				"SP" Saw palmetto (Serenoa repens)	25	
				Sand live oak (Quercus geminata)	10	
				"GB" Gallberry (Ilex glabra)	5	

Attachment I
Timber Stand Q
Vegetation Cover Statistics



Site ID	Transects	Herbaceous Cover		Shrub Cover		Base Ground
		Species	% Cover	Species	% Cover	% Cover
102	0°	"BF" Bracken Fern (Pteridium aquilinum)	25			53
		"Andro" Broomsedge (Andropogon sp)	10			
		Black root (Pterocaulon sp)	5			
		"EMP" Elliott's Milkpea (Galactia elliotii)	3			
		Goldentop (Euthamia sp)	3			
		"WTA" Whitetop aster (Sericocarpus)	1			
	120°	"BF" Bracken Fern (Pteridium aquilinum)	30	"GB" Gallberry (Ilex glabra)	30	35
				"SP" Saw palmetto (Serenoa repens)	5	
	240°	"BF" Bracken Fern (Pteridium aquilinum)	30	"GB" Gallberry (Ilex glabra)	30	40
104	0°	"WG" Wiregrass (Aristida stricta)	20	"GB" Gallberry (Ilex glabra)	30	50
	120°			"SP" Saw palmetto (Serenoa repens)	25	50
				"GB" Gallberry (Ilex glabra)	25	
	240°	"WG" Wiregrass (Aristida stricta)	20	"GB" Gallberry (Ilex glabra)	35	45

ATTACHMENT J

TIMBER STAND INDIVIDUAL SITE PHOTOGRAPHS



TIMBER STAND SITE PHOTOS



Latitude
28.49513
Longitude
-81.18287

TS-A-18



Latitude
28.49454
Longitude
-81.18058

TS-A-32



Latitude
28.49310
Longitude
-81.18155

TS-A-46



Latitude
28.49197
Longitude
-81.17735

TS-B-11



Latitude
28.49053
Longitude
-81.17767

TS-B-22



Latitude
28.48851
Longitude
-81.17896

TS-B-29



Latitude
28.49342
Longitude
-81.17245

TS-C-25



Latitude
28.49284
Longitude
-81.17476

TS-C-28



Latitude
28.49168
Longitude
-81.17343

TS-C-30



Latitude
28.49053
Longitude
-81.17245

TS-C-48



Latitude
28.48997
Longitude
-81.17310

TS-C-51



Latitude
28.49255
Longitude
-81.17085

TS-D-68



Latitude
28.49543
Longitude
-81.16595

TS-D-6



Latitude
28.49225
Longitude
-81.17050

TS-D-81



Latitude
28.49486
Longitude
-81.16240

TS-D-26



Latitude
28.49198
Longitude
-81.16725

TS-D-85



Latitude
28.49427
Longitude
-81.16952

TS-D-30



Latitude
28.48996
Longitude
-81.16629

TS-D-116



Latitude
28.49399
Longitude
-81.16465

TS-D-52



Latitude
28.49573
Longitude
-81.15360

TS-E-7



Latitude
28.49456
Longitude
-81.15651



Latitude
28.49171
Longitude
-81.15293



Latitude
28.49399
Longitude
-81.15458



Latitude
28.48768
Longitude
-81.15457



Latitude
28.49285
Longitude
-81.15719



Latitude
28.48626
Longitude
-81.15328



Latitude
28.49258
Longitude
-81.15456



Latitude
28.48423
Longitude
-81.15260



Latitude
28.48969
Longitude
-81.15620



Latitude
28.48337
Longitude
-81.15455



Latitude
28.48249
Longitude
-81.15230



Latitude
28.49257
Longitude
-81.15166



Latitude
28.47965
Longitude
-81.15426



Latitude
28.48769
Longitude
-81.15101



Latitude
28.47791
Longitude
-81.15523



Latitude
28.48769
Longitude
-81.14970



Latitude
28.49427
Longitude
-81.15136



Latitude
28.48424
Longitude
-81.14937



Latitude
28.49372
Longitude
-81.15262



Latitude
28.48224
Longitude
-81.14967



Latitude
28.48166
Longitude
-81.15129



Latitude
28.48712
Longitude
-81.14547



Latitude
28.49285
Longitude
-81.14676



Latitude
28.48596
Longitude
-81.14741



Latitude
28.49169
Longitude
-81.14742



Latitude
28.48538
Longitude
-81.14579



Latitude
28.49111
Longitude
-81.14611



Latitude
28.48337
Longitude
-81.14479



Latitude
28.48972
Longitude
-81.14548



Latitude
28.48281
Longitude
-81.14514



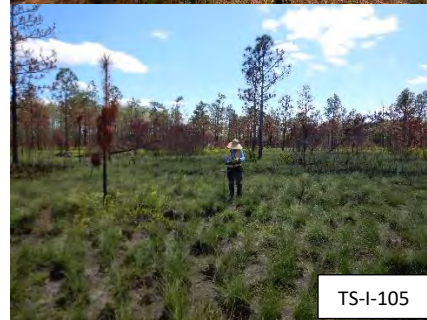
Latitude
28.48138
Longitude
-81.14479



Latitude
28.47706
Longitude
-81.15164



Latitude
28.48080
Longitude
-81.14708



Latitude
28.47678
Longitude
-81.14610



Latitude
28.48020
Longitude
-81.14904



Latitude
28.47561
Longitude
-81.15228



Latitude
28.47823
Longitude
-81.14871



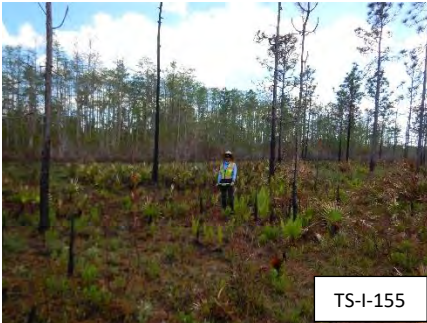
Latitude
28.47535
Longitude
-81.14934



Latitude
28.47850
Longitude
-81.14774



Latitude
28.47506
Longitude
-81.14707



Latitude
28.47334
Longitude
-81.15064



Latitude
28.46986
Longitude
-81.14708



Latitude
28.47420
Longitude
-81.14578



Latitude
28.46960
Longitude
-81.14611



Latitude
28.47304
Longitude
-81.14741



Latitude
28.46930
Longitude
-81.14579



Latitude
28.47217
Longitude
-81.14903



Latitude
28.46813
Longitude
-81.14965



Latitude
28.47190
Longitude
-81.14644



Latitude
28.46729
Longitude
-81.14478



Latitude
28.47732
Longitude
-81.15911



Latitude
28.47217
Longitude
-81.15976



Latitude
28.47591
Longitude
-81.15488



Latitude
28.47188
Longitude
-81.15650



Latitude
28.47361
Longitude
-81.15454



Latitude
28.47135
Longitude
-81.15780



Latitude
28.47447
Longitude
-81.15747



Latitude
28.47132
Longitude
-81.15292



Latitude
28.47275
Longitude
-81.15423



Latitude
28.47101
Longitude
-81.16007



Latitude
28.47101
Longitude
-81.15649



Latitude
28.46813
Longitude
-81.15714



Latitude
28.47017
Longitude
-81.15846



Latitude
28.46730
Longitude
-81.15227



Latitude
28.46927
Longitude
-81.16072



Latitude
28.47704
Longitude
-81.16496



Latitude
28.46901
Longitude
-81.15325



Latitude
28.47731
Longitude
-81.16072



Latitude
28.46843
Longitude
-81.15747



Latitude
28.47503
Longitude
-81.16366



Latitude
28.47446
Longitude
-81.16138



Latitude
28.47101
Longitude
-81.16525



Latitude
28.47388
Longitude
-81.16462



Latitude
28.46959
Longitude
-81.16624



Latitude
28.47389
Longitude
-81.15975



Latitude
28.46900
Longitude
-81.16364



Latitude
28.47301
Longitude
-81.16172



Latitude
28.46785
Longitude
-81.16559



Latitude
28.47158
Longitude
-81.16657



Latitude
28.47673
Longitude
-81.17635



Latitude
28.47675
Longitude
-81.17081



Latitude
28.47127
Longitude
-81.17437



Latitude
28.47560
Longitude
-81.17504



Latitude
28.47073
Longitude
-81.16885



Latitude
28.47533
Longitude
-81.16952



Latitude
28.46983
Longitude
-81.17113



Latitude
28.47329
Longitude
-81.17469



Latitude
28.46898
Longitude
-81.17210



Latitude
28.47270
Longitude
-81.17179



Latitude
28.46843
Longitude
-81.16824



Latitude
28.4783
Longitude
-81.17373

TS-P-89



Latitude
28.46697
Longitude
-81.17045

TS-P-114



Latitude
28.47444
Longitude
-81.17763

TS-Q-14



Latitude
28.47244
Longitude
-81.17633

TS-Q-27



Latitude
28.47072
Longitude
-81.17762

TS-Q-40



Latitude
28.46897
Longitude
-81.18024

TS-Q-57



Latitude
28.46783
Longitude
-81.17568

TS-Q-84



Latitude
28.46726
Longitude
-81.18152

TS-Q-87



Latitude
28.46670
Longitude
-81.17729

TS-Q-102



Latitude
28.46697
Longitude
-81.17600

TS-Q-104

2023 NUISANCE/EXOTICS AND SAW PALMETTO SURVEYS AT THE CURTIS H. STANTON ENERGY CENTER

FINAL

FEBRUARY 2024

Prepared for:

Orlando Utilities Commission
100 W. Anderson St.
Orlando, FL 32801

Prepared by:

HSW Engineering, Inc.
15711 Mapledale Blvd., Ste. B
Tampa, FL 33624
HSW Project No: 14991



Scott Emery, PhD
Senior Technical Consultant



Nigel Lewis, PE
Project Engineer



CONTENTS

1. INTRODUCTION.....	1
2. SAW PALMETTO SURVEY.....	3
2.1 Objective.....	3
2.2 Monitoring Site Selection	3
2.3 Survey Methodology.....	3
3. INCIDENTAL OBSERVATIONS ON OTHER SITE VEGETATION WITHIN THE PINE FLATWOODS	5
4. SAW PALMETTO DATA ANALYSIS	6
4.1 Saw Palmetto Survey Summary	6
4.2 Year-over-Year Trend Comparison.....	7
4.3 Saw Palmetto Density Management.....	8
5. NUISANCE AND EXOTIC VEGETATION MONITORING	9
5.1 Objective.....	9
5.2 Nuisance/Exotics Search	9
5.3 Approximate Acreage with Invasive Plant Species.....	10
6. REFERENCES.....	13

TABLES

1. Saw Palmetto Coverage and Dominant Height Class Summary

FIGURES

1. Site Location Map
2. Saw Palmetto Survey Monitoring Overview Map
- 3A. Saw Palmetto Survey Monitoring Sites, Northwest Quadrant
- 3B. Saw Palmetto Survey Monitoring Sites, Northeast Quadrant
- 3C. Saw Palmetto Survey Monitoring Sites, Southwest Quadrant
- 3D. Saw Palmetto Survey Monitoring Sites, Southeast Quadrant
4. Monitoring Site Survey Route
5. Monitoring Year-Over Year Saw Palmetto Coverage Density Comparison
6. Estimated Prescribed Burn/Wildfire Site Locations

- 7. Recommended Roller Chopped Locations
- 8. Nuisance/Exotic Plant Survey Overview Map
- 9A. Nuisance/Exotic Species Survey Sites, Northwest Quadrant
- 9B. Nuisance/Exotic Species Survey Sites, Northeast Quadrant
- 9C. Nuisance/Exotic Species Survey Sites, Southeast Quadrant
- 9D. Nuisance/Exotic Species Survey Sites, Southwest Quadrant

APPENDIXES

- A. Field Data and Sampling Site Calculations
- B. Monitoring Site Summaries
- C. Florida Administrative Code 5B-57.007 Noxious Weed List

I. INTRODUCTION

HSW Consulting, LLC. (HSW) was retained by the Orlando Utilities Commission (OUC) to conduct the 2023 monitoring year surveys of the height and percent coverage by saw palmetto (*Serenoa repens*) and the presence and extent of nuisance/exotic vegetation on undeveloped land surrounding the operating footprint of the Curtis H. Stanton Energy Center (SEC) power plant and supporting facilities (project site). The SEC is located at 5100 South Alafaya Trail, Orlando, Orange County, Florida (**Figure 1**).

The entire SEC covers approximately 3,280 acres of which about 2,400 undeveloped acres have been preserved in accordance with the Florida Department of Environmental Protection (FDEP) conditions of certification per the 1982 Site Certification Application (SCA) for project development and subsequent supplements and modifications. OUC, as the licensee of the certification, operates the following power-generating facilities subject to the conditions of certification:

- Two coal-fired generating units, designated Unit 1 and Unit 2, with capacities of 480 and 468 megawatts (MW), respectively;
- Two natural gas-fired combined cycle units, designated Unit A and Unit B, with capacities of 633 and 300 MW, respectively; and
- Three solar plants which generate 5, 6, and 7 MW; dedicated at the SEC site in December 2011.

The conditions of certification have been modified or supplemented a number of times since the original certification. The current version, which incorporates Modification M, is “Conditions of Certification, Orlando Utilities Commission Curtis H. Stanton Energy Center, PA 81-14M” dated August 30, 2017 (hereinafter COC). The following tracks the history of FDEP certification of SEC and modifications to the conditions of certification:

- Certification for Unit 1 was issued December 15, 1982.
- Conditions of Certification Modification A dated June 27, 1984 (railroad corridor, plant access road, fugitive dust control, water supply source and makeup/return pipelines).
- Certification for Unit 2 was issued December 17, 1991.
- Conditions of Certification Modifications:
 - o B dated July 24, 1995 (Alafaya Trail Extension),
 - o C dated December 24, 1997 (Units 1 and 2 operations), and
 - o D dated August 7, 1998 (Units 1 and 2 air provisions).
- Supplemental certification for Unit A was issued September 21, 2001.
- Conditions of Certification Modifications:
 - o E dated February 24, 2003 (Alafaya Trail Extension and red-cockaded woodpecker management agreements), and
 - o F dated July 20, 2006 (Title V/air construction and operation permits, all units).
- Supplemental certification for Unit B was issued August 17, 2006.
- Conditions of Certification Modifications:
 - o G dated January 17, 2007 (Magnolia Ranch substation, Title V all units, red-cockaded woodpecker management),
 - o H dated October 3, 2007 (rail car siding facility),
 - o I dated February 6, 2008 (North substation and transmission line),
 - o J dated February 20, 2008 (Title V, all units),
 - o K dated July 24, 2008 (North substation and transmission line),
 - o L dated March 8, 2016 (environmental resources, all units), and

- o M dated August 30, 2017 (incorporates a uniform set of general conditions consistent with recent site certifications, updates antiquated specific conditions that are no longer applicable or consistent with current regulations).

Conditions of the FDEP permit for constructing Unit 1 required OUC to develop a management and monitoring plan for the federally endangered red-cockaded woodpecker (*Picoides borealis*) to improve the chance of long-term survival of the species on the SEC site. The original *Red-cockaded Woodpecker Management Plan* was prepared in 1981 and revised in 1993. The current version (dated July 8, 2005) is provided in the COC Appendix D. Each revision implemented changes required by modifications of the conditions of certification and new management practices based on research published or otherwise documented since the original management plan was developed. The current requirements regarding red-cockaded woodpecker (RCW) are prescribed by COC Modification M and listed in the COC Specific Conditions (Section B.IV.F).

RCW habitat enhancement is currently accomplished by:

1. a burning program with a goal of maintaining a sub-climax stage of vegetation consisting of a wiregrass and herbaceous understory, a diminished shrub mid-story, and an open canopy of longleaf pine;
2. an exotic species control program that consists of determining the distribution of the exotic encroachments and the ensuing eradication of the exotics by the application of applicable herbicide treatments; and
3. a saw palmetto control program consisting of roller chopping or mowing of areas with excessive growth of saw palmetto.

A requirement of the RCW Management Plan related to the exotic species and saw palmetto control programs is the annual monitoring and reporting of saw palmetto and exotic vegetation species within the undeveloped land surrounding the operating footprint of the SEC power plant and supporting facilities.

The saw palmetto survey and nuisance/exotics vegetation monitoring methods described herein were developed by HSW in 2017 based on a request from OUC staff to: (1) develop a thorough saw palmetto vegetation sampling methodology to evaluate the saw palmetto management program; (2) and record the location and type of nuisance/exotic plant species encountered within the project site.

2. SAW PALMETTO SURVEY

2.1 Objective

OUC seeks to limit the percent coverage by saw palmetto and to maintain records on height classes within the various pine palmetto flatwoods areas of its property through land management activities such as control burns and roller chopping. The objective of the saw palmetto survey is to provide OUC with quantitative data from multiple large, representative samples within the project site, so that OUC can plan land-management activities and compare height classes and coverages of saw palmetto before and after land-management activities.

2.2 Monitoring Site Selection

Publicly available aerial photography, National Wetlands Inventory (NWI), and the National Resources Conservation Service (formerly Soil Conservation Service) soil survey data for Orange County shapefiles were reviewed with ArcGIS to determine the general accuracy and reliability of maps produced in previous years with respect to the delineation of the general limits of wetlands and saw palmetto areas throughout the project site.

HSW examined all natural areas within the project site by a combination of extensive on-site field work performed in Spring 2023, in addition to the study of the above-described photos and maps. From these efforts, HSW selected a total of 42 monitoring sites for quantitative assessment (**Table 1** and **Figures 2A, 3A, 3B, 3C and 3D**). Each monitoring site is a circle with 250-foot (ft) radius, i.e., 4.5 acres in size; thus 194 acres total were examined quantitatively. All sites were surveyed as representative samples of the surrounding area. Hence the data obtained from each of these 4.5-acre sites can be considered to represent a larger area surrounding each 4.5-acre circle. The data collectively can be used by OUC land managers to determine which portions of the pine flatwood areas are in greatest need of actions to manage/reduce saw palmetto.

In 2020, an alternating schedule of saw palmetto survey sites was instituted. A total of 85 sites are evaluated in alternating years. This brings the total acreage of saw palmetto physically surveyed to nearly 400 acres, and the total acreage visually monitored to about 800 acres. Moving forward, 42 sites will be physically surveyed in even calendar years and 43 sites will be physically surveyed in odd calendar years. In addition, every year we will provide OUC with locations of any other areas of saw palmetto that may fall outside of these 800 acres but that may require a prescribed burn and/or roller chopping. Note that most, if not all outlier clumps of saw palmetto occur along the edges of the wetlands.

2.3 Survey Methodology

The center of each monitoring site (see START location in **Figure 4**) was marked in the field with bright colored flagging, and GPS coordinates were collected to enable future return to the same location. Photographs were taken of this center point, as well as each cardinal direction relative to this center point. Photographs were taken of noteworthy subjects within/adjacent to each circle, and GPS locations provided. Noteworthy subjects included: nuisance/exotic species, saw palmetto clusters greater than 6 feet in height, impressive areas of wire grass, gopher tortoise burrows, etc. Monitoring site identifiers shown in tables and figures are represented by the saw palmetto monitoring site area ID followed by a sequence number (e.g., SPA-95-1).

Saw palmetto heights were compared against a survey rod in feet and tenths of feet along the entire length of the 4.5-acre area traversed (see survey route depicted in **Figure 4**). HSW's ecologist recorded the saw palmetto heights which were categorized according to the following four height classes: (1) 0- 2 feet, (2) 2-4 feet, (3) 4-6 feet, and (4) >6 feet. The coverage percentages by saw palmetto corresponding to the four height classes were recorded on the field data sheet.

At the center of each monitoring site, the ecologist made a set of initial observations regarding height classes and coverages in all directions, then walked the route shown in **Figure 4**. The ecologist measured saw palmetto heights along the way and noted coverages on both sides of the route. At the end point of each segment, the ecologist noted information on coverage in all directions.

This approach enables the entire 4.5 acres to be visually observed, plus height classes and coverage percentages to be quantified by quartile slices of the circle. The measurements and observations beyond the 250-foot perimeter also assist in assuring that the heights and coverages quantified within the 4.5-acre circle are representative of the larger area surrounding each 4.5-acre circle.

Percent coverage by saw palmetto was estimated within the quadrants of each 4.5-acre monitoring site by visual observations made at each stopping point on the survey route. Per request from OUC, and to be consistent with the 2013 baseline report, percent coverage was recorded using four coverage classes (0-25%, 26-50%, 51-75% and 76-100%). An average of the four quadrant estimates was calculated to represent the total coverage within a monitoring site.

The U.S. Fish & Wildlife Service's (USFWS) Recovery Plan for red-cockaded woodpecker (USFWS, 2003) indicates that the ideal percent coverage by saw palmetto for optimal RCW habitat is 60% or less. This report also states that optimal RCW habitat consists of a minimum of 40% herbaceous groundcover. A separate monitoring study conducted annually by OUC (Annual Mitigation and Timber Stand Surveys Report) focuses on percent covers of herbaceous, shrub and tree canopy. Accordingly, this saw palmetto survey focused on saw palmetto coverage, with incidental observations on the dominant herbaceous species in areas not covered by saw palmetto.

3. INCIDENTAL OBSERVATIONS ON OTHER SITE VEGETATION WITHIN THE PINE FLATWOODS

Longleaf pine (*Pinus palustris*) is common in the canopy, and saw palmetto is abundant in the groundcover. Although the SEC property is relatively flat, topographically lower areas of the flatwoods contain slash pine (*Pinus elliottii*) and pond pine (*Pinus serotina*) in the canopy.

In addition to saw palmetto, vegetation observed within the groundcover of the mesic pine flatwoods includes, but is not limited to: wiregrass (*Aristida stricta* var. *beyrichiana*), fetterbush (*Lyonia lucida*), gallberry (*Ilex glabra*), broomsedge bluestem (*Andropogon virginicus*), bushy bluestem (*Andropogon glomeratus*), splitbeard bluestem (*Andropogon ternarius*), American beautyberry (*Callicarpa americana*), maidencane (*Panicum hemitomon*), sugarcane plumegrass (*Saccharum giganteum*), flattop goldenrod (*Euthamia caroliniana*), shortleaf sabatia (*Sabatia brevifolia*), goldenrod (*Solidago* spp.), St. John's wort (*Hypericum* spp.), yellow milkwort (*Polygala rugelii*), coastalplain milkwort (*Polygala setacea*), hooded pitcher plant (*Sarracenia minor*), toothache grass (*Cteniu maromaticum*), roughhair witchgrass (*Dichanthelium strigosum* var. *glabrescens*), beaksedge (*Rhynchospora inundata*), lovegrass (*Eragrostis* sp.), pawpaw (*Asimina* sp.), blueberry (*Vaccinium* sp.), nutrush (*Scleria* sp.), elephantsfoot (*Elephantopus elatus*), tarflower (*Befaria racemosa*), white-topped aster (*Aster reticulatus*), wild coco (*Eulophia alta*), blackroot (*Pterocaulon pycnostachyum*), lopsided indiagrass (*Sorghastrum secundum*), yellow hatpins (*Syngonanthus flavidulus*), yellow-eyed grass (*Xyris* sp.), cinnamon fern (*Osmunda cinnamomea*), and Virginia chain fern (*Woodwardia virginica*).

Additional groundcover vegetation observed in topographically higher areas of the pine flatwoods included: dwarf live oak (*Quercus minima*), runner oak (*Quercus pumila*), myrtle oak (*Quercus myrtifolia*), bracken fern (*Pteridium aquilinum*).

The dominant herbaceous species of plants observed within the pine flatwoods areas was wiregrass. The dominant shrub layer plants were saw palmetto and gallberry.

4. SAW PALMETTO DATA ANALYSIS

The large number of monitoring sites, the substantial acreage of each site, and the fact that each of the sites was selected to be representative of the larger landscape around it, provide reliable data that can be utilized by OUC land managers to determine what portions of the pine flatwoods community are in most need of saw palmetto management/control/reduction. The data analysis examines previous reports and provides qualitative comparisons between saw palmetto heights and coverages measured in 2023 compared with results from previous monitoring years.

4.1 Saw Palmetto Survey Summary

All 43 of the 4.5-acre monitoring sites are described using the following criteria:

- GPS data on the center of each monitoring site;
- Saw Palmetto Coverage by quadrant for each monitoring site;
- Within each quadrant, coverage by height class and total coverage;
- Overall Total (for the entire 4.5-acre monitoring site) coverage by height class and total coverage.

The dominant saw palmetto height observed during the survey was in the 2-4' height class (**Table 1**). Average coverage by saw palmetto within the monitoring sites ranged between 5 and 51%. The collected field data are presented in **Appendix A**. Out of the 43 monitoring sites:

- 1 exhibited Total saw palmetto coverage of greater than 75%;
- 7 exhibited Total saw palmetto coverage from 51% to 75%;
- 20 exhibited Total saw palmetto coverage of from 26% to 50%; and
- 15 exhibited Total saw palmetto coverage of 25% or less.

Out of the 43 monitoring sites:

- The mean percent coverage was 33.8% (range 0.375% to 78.75%);
- The dominant height class was 2-4' (27 of 43 sites);
- The second most dominant height class was 4-6' (13 of 43 sites);

A primary objective of this work is to provide OUC land managers and their contractors with site-specific data on those areas where saw palmetto coverage density are approaching or in excess of 50% coverage and where the dominant height class is 4-6' or higher (see below). Sixteen of the 43 monitoring sites had total saw palmetto densities greater than or equal to 40%. Two sites had densities surveyed greater than (60%). Two sites were equal to 60% saw palmetto coverage.

Table 4.1 Saw Palmetto Survey Areas Greater Than or Equal to 40% Coverage Density

Monitoring Site ID	Total saw palmetto coverage density (%)	Dominant height class	General Site Location (quadrant) Within SEC Property
SPA-20-1	58.8	4-6'	Northwest
SPA-20-2	60	4-6'	Northwest
SPA-30-1	55	2-4'	Northeast
SPA-40-1	53.75	4-6'	Northeast
SPA-45-1	60	4-6'	Northeast
SPA-50-1	61.25	4-6'	Northeast
SPA-55-1	40	4-6'	Northeast
SPA-55-2	41.25	2-4'	Northeast
SPA-85-1	41.25	2-4'	Southeast
SPA-120-1	43.8	4-6'	Southeast
SPA-125-1	46.3	4-6'	Southeast
SPA-160-1	41	2-4'	Southwest
SPA-180-1	46.3	4-6'	Southwest
SPA-180-2	78.75	4-6'	Southwest
SPA-185-1	45	2-4'	Southwest
SPA-185-2	53.8	2-4'	Southwest

Site-by-site summaries are provided in **Appendix B** in a format that allows land managers to easily:

- locate each area;
- examine the basic data at each location; and
- readily prioritize areas for saw palmetto management actions.

4.2 Year-over-Year Trend Comparison

The same field methodology and general locations were utilized during the fieldwork performed for monitoring years 2016 - 2023. Compared to monitoring years prior to 2016, the 4.5-acre size of the sites surveyed over the past five monitoring events is more than 10-times larger than the 0.1- and 0.25-acre sites surveyed for preceding monitoring years.

Almost half of the sites surveyed had an average coverage density in the range of 26-50% (**Figure 5**). A comparison of saw palmetto densities reported for monitoring years 2016 - 2023 (see below) indicates a large range in coverage density ranging between a minimum of 0.375 and 78.75 % (see below). The proportion of monitoring sites with densities exceeding 60% (the upper limit considered optimal for RCW habitat) was 4.7%, an increase from the lower proportions starting in 2019. The relative proportion of sites surveyed with coverage density between 51 – 75% percent increased slightly from 7% to 16% this year. Additionally, this monitoring year is the first year with a coverage greater than 75% (**Figures 3A, 3B, 3C, 3D**).

Table 4.2 Year-over-Year Summary of Saw Palmetto Coverage Density

Statistic	2014	2016	2017	2018	2019	2020	2021	2022	2023
Number of Survey Sites	32	41	42	43	43	42	43	42	43
Minimum Density (%)	2.5	0.50	0.25	0.50	0.25	11.25	0.25	5	0.375
Maximum Density (%)	68.3	67.8	60.0	62.5	63.75	63.75	66.25	51.25	78.75
Average Density (%)	38.1	30.7	32.9	33.6	31.6	30.4	30.1	28.4	33.8
Proportion with Density >60%	6.3%	4.9%	0.0%	4.7%	2.3%	2.4%	2.3%	0%	4.7%

4.3 Saw Palmetto Density Management

OUC controls saw palmetto densities at the Stanton facility by planned use of prescribed (controlled) burns and roller chopping. A combination of these management methods has been shown to be effective in controlling the densities and heights of saw palmetto (Willcox & Giuliano, 2010). At OUC, prescribed burns are undertaken in winter to early spring (multiple weather-related factors, such as rainfall and wind, influence timing of burns and amount of acreage burned). These controlled burns are managed by an experienced, licensed, State of Florida Certified Burner. Areas are burned on a 2-year rotation (vegetative growth will not support more frequent burns). Roller chopping of palmetto is based upon field data on saw palmetto height and densities. **Figure 6** illustrates an estimate of areas burned in 2023 based on field observations.

In addition to periodic prescribed burns, OUC employs roller chopping of dense/tall areas of saw palmetto. Roller chopping has been shown to be effective in the control/reduction of saw palmetto (Willcox & Giuliano, 2010). The OUC contractor chops areas of saw palmetto to sever as many stems and rhizomes as possible; however, a balance must be struck because chopping also covers the saplings and seedlings, i.e., all regeneration is removed in chopped areas. Care is taken to avoid areas with LLP seedlings, as well as areas dominated by wire grass. Areas recommended for roller chopping were prepared for the land management team (**Figure 7**).

5. NUISANCE AND EXOTIC VEGETATION MONITORING

5.1 Objective

The objective of the nuisance/exotics species location and identification survey is to provide OUC the ability to rapidly locate significant threats to the native vegetation so that these nuisance/exotics may be effectively treated and controlled (ideally eradicated).

5.2 Nuisance/Exotics Search

Approximately 600 total acres of pine palmetto flatwoods and adjacent wetlands were intensively examined for nuisance/exotic species (Florida Department of State, 2020). All the 43, 4.5-acre saw palmetto monitoring sites were examined within and adjacent to the interior and perimeters of the sites. Nuisance/exotic species encountered beyond the perimeter of the circle were noted and GPS locations recorded. Wetlands located adjacent to the circles were visited and examined for nuisance/exotic species. Roughly another 1,000 acres were examined for the presence of invasives during the annual mitigation monitoring, timber stand sites monitoring, and saw palmetto monitoring. In all, about 67% of the total 2,400 acres were covered in 2023. This was a lower than usual percentage due to very wet conditions throughout the entire SEC property.

Field work separate from saw palmetto work involved:

- Field visit to over 50% of wetlands identified in the National Wetland Inventory (NWI), and small wetlands not identified in the NWI. Noting and recording the location of all nuisance/exotic species encountered.
- Use of 4x4 and RTV vehicles to traverse all jeep trails and fire breaks. Noting and recording the location of all nuisance/exotic species encountered.
- Hikes along zones of mesic pine flatwoods/wetland edges that might support climbing fern (a species that likes moist areas and can climb over and cover saw palmetto).
- Hikes along centerlines of large areas of pine palmetto flatwoods to locate sheltered clusters of nuisance/exotics.
- Hikes within areas of the SEC property that have pines but minimal palmettos, as these areas exhibited small clusters of cogon grass and Rattlebox.
- Elevated view observations atop the cooling pond berm. Looking toward the undeveloped portions of the SEC property to provide greater lines of sight to locate cogon grass, Brazilian pepper and old world climbing fern clusters.
- Examinations of pond banks, ditches, swales, as well as exterior berms of large ponds, which provide fertile ground for cattail and Primrose willow.

During the examinations, nuisance/exotic species that pose the greatest threats to the natural vegetative communities at the SEC property were monitored closely, so that those species can be targeted and controlled/eradicated. The nuisance/exotic species with the greatest potential to adversely impact native habitats on-site (**Figure 8**) are:

- Old world climbing fern (*Lygodium microphyllum*)
- Cogon grass (*Imperata cylindrica*)
- Chinese tallow (*Triadica sebifera*)
- Brazilian pepper (*Schinus terebinthifolius*)

Old world climbing fern is the plant species with the greatest coverage and is increasing rapidly (**Figure 8**). Chinese tallow is also increasing, especially in the northwest and southwest quadrants (**Figures 9A and 9D**). Cogon grass remains present around the property, but aggressive treatment efforts have reduced the total acreage affected by this species. Cattail and primrose willow are found along man-made pond edges and within on-site ditches mainly on the west side of property but cleaning out of vegetation within these ditches in 2021 has reduced their spread (**Figures 9A and 9D**). Brazilian pepper coverage is increasing along many fence lines and road edges. (**Figures 9A, 9B and 9D**).

Other nuisance/exotic species located during our surveys include rattlebox (*Sesbania punicea*), castor bean (*Ricinus communis*), and punk tree (*Melaleuca quinquenervia*). Also noted, but not mapped due to small infestations are: centella (*Centella asiatica*), lantana (*Lantana camara*), guinea grass (*Panicum maximum*), natal grass (*Rhynchelytrum repens*), and torpedo grass (*Panicum repens*). Most are outlined in the SEC RCW Habitat Management Plan (DeLotelle and Guthrie, 2006). However, Verdantas surveyed plant species listed on the State of Florida's statutory "Noxious Weed List" (**Appendix C**) as per Chapter 5B-57.007, F.A.C., administered by the Florida Department of Agriculture and Consumer Services (FDACS).

The findings of the field effort are depicted in **Figures 8, 9A, 9B, 9C, and 9D**. The maps provide OUC land managers and contractors with general locations of different nuisance species.

5.3 Approximate Acreage with Invasive Plant Species

Though OUC has implemented an aggressive eradication program for 2023, many areas are still seeing increases in nuisance/exotic species. Continued treatment of invasives to reduce the coverage and spread of the noted species is recommended.

Northwest quadrant (Figure 9A): The northwest quadrant of the SEC property contains the largest number of invasive species and is estimated at 116 acres, an increase of 23 acres since 2022. Most of the cogon grass in this area has been eradicated. Unfortunately, this has caused the old world climbing fern to colonize much faster in the mesic area between wetlands NW-04b and NW-08. Wetlands NW-04a,b,c,d and MW-07a contain the highest concentration of old world climbing fern in this quadrant. A small area of climbing ferns discovered in 2021 between wetlands NW-05 and NW-06 have grown considerably and now consist of multiple patches. The same situation is happening at wetland NW-09. These fern patches should be aggressively controlled before the northern end of wetland NW-07a and wetland NW-09 get infested. There are also areas of Brazilian pepper and rattlebox north of Pope Street near Innovation Way, along fence lines, and the main entrance road at South Alafaya Trail. A large colony of Brazilian pepper has been growing near the adjacent landfill entrance. Brazilian pepper has been successfully eradicated along the entire fence line along the south end of wetlands NW-10 and NW-11. Cattail clusters have been increasing within edges of the two ponds along the Northwest side of South Alafaya Trail. Smaller clumps of Chinese tallow are evident in mesic areas but seem to be under

control. Rattlebox and primrose willow are also present in very small clumps and are also under control. Multiple small punk trees are continuing to grow in one area at wetland NW-12. Active control/eradication efforts in 2021 and 2022 treated multiple patches of invasives throughout the northwest quadrant, mostly cogon grass and Brazilian pepper. Unfortunately, the climbing fern's coverage has been expanding into the wetlands with a significant increase of climbing fern density since 2021.

Northeast quadrant (Figure 9B): The northeast quadrant of the SEC property contains the least amount of invasives approximately 2.5 acres, a decrease of 0.5 acres since 2022. There are scattered areas of cogon grass, cattail, and Brazilian pepper mostly around the base and slope of the cooling pond and along the main entry road ditch. There are also a few small, scattered areas of cogon grass within the timber stands. One such area was treated in 2022 and looks to have been eradicated. An area of old world climbing fern patches was discovered in 2020 east of wetland SE-24. These patches have been spot treated/uprooted and now look to be successfully eradicated. Isolated climbing ferns at edge of wetlands NE-02 and NE-04a have been observed to be spreading. Continued aggressive treating and monitoring around these two fern areas is critical to preserve the natural condition of the northeast quadrant.

Southeast quadrant (Figure 9C): The southeast quadrant of the SEC property contains approximately 7.5 acres of invasives, an increase of 0.5 acres since 2022. There are 3 areas of concern in this quadrant. 1 - Wetlands SE-11 and SE-12. These wetlands are totally infested with old world climbing ferns. Previous attempts at eradication have failed within these wetlands mostly due to very wet conditions. The edge of these wetlands also contains small clusters of ferns that are slowly spreading. 2 - The "triangle" area has seen a reemergence of cogon grass clusters. Prescribed burn in this triangle in 2021 has reduced its growth but they seem to be reemerging in some areas and spreading to the east. 3 - The area near the culvert to wetland SE-29. This area has had invasive's growing here for years. Even though it has been thoroughly treated in 2021, it seems that climbing ferns and cogon grass have reemerged once again. Other areas of invasive growth are cogon and cattails spotted all along the eastern edge of the south exit road and two small patches of climbing ferns at wetlands SE-04 and SE-06. Overall, this quadrant is largely devoid of invasives except for the listed areas above. Aggressively treating the colonizing invasives in this quadrant will continue to preserve its pristine natural condition.

Southwest quadrant (Figure 9D): The southwest quadrant of the SEC property contains the second-largest acreage of invasive species, approximately 45 acres, a decrease of 3 acres since 2022. This quadrant contains a substantial number of trails, railroad bed embankments, ditches, and ponds, all of which are good breeding grounds for invasives. Old world climbing fern is thick within the northern portion of wetland SW-07a and the area north of the railroad loop. Wetland SW-12a has had substantial spreading of ferns that have now infested most of this large wetland. This area is responsible for most of the newly infested acreage. For the first time two small clusters of ferns have been spotted at the southern edge of the SEC property just west of wetland SW-13b. Aggressive treatment should be undertaken quickly before this wetland gets infested. Wetland SW-01 was treated in 2022 and shows signs of eradication especially cogon grass. Caster bean have been spotted on the dirt mounds to the northeast of this wetland. Large clusters of cogon grass west of wetland SW-07b within the railroad loop has been successfully eradicated. Tallow within wetlands SW-02 and SW-03 have also been eradicated. There are still several areas of cogon grass infestations in both upland and mesic areas. Multiple patches of cogon grass have been observed on both sides of the outlet ditch heading to wetland SW-12a. Some of these clumps are new and some are re-growth. An effort to clear out this outlet ditch and the perimeter ditch around the ash piles in 2021 has successfully removed the cattails

and willow, however, cattails are still emerging from seeds. Rattlebox is also getting a foothold in this area. Tallow is also present in this quadrant and scattered throughout but seems to be not spreading. Active control/eradication efforts in 2022 treated multiple patches of invasives and should be continued.

There are approximately 171 acres total of invasives within the SEC property as observed during the 2023 Monitoring Year inspection (**Figures 8, 9A, 9B, 9C, 9D**). This is roughly a 20 acre increase from 2022. Of these 171 acres, about 65 acres have been treated and roughly 20 acres have been successfully eradicated. This estimate is based upon a thorough on-site visual inspection of the entire SEC facility. Though inspection within the core of many of the large wetlands has not been undertaken because of difficulty and danger. Perimeter observations of these wetlands have determined that the old world climbing fern is growing deep within these wetlands. No attempts to eradicate these areas have been attempted yet. This is why the total treated area within SEC property does not exceed 65 acres as of 2023.

The presence of climbing ferns in most recent field inspections appears to have increased significantly on the fringes and within many wetlands, and a rapid increase of this species was observed over the time frame 2017 to 2023. However, an aggressive treatment program for cogon grass, cattails, tallow, and willow has resulted in a large decrease in coverage of these species. OUC continues to aggressively treat areas with invasive/exotics. It is important to realize the greater difficulty in controlling/eradicating climbing fern contrasted to controlling/eradicating upland species such as cogon grass, Chinese tallow, etc. Every cypress tree with climbing fern attached to its bark requires individual treatment by first cutting single strands of the climbing fern from around the trunk then carefully treating the climbing fern around the tree base. This effort may then need to be repeated in subsequent years.

6. SUMMARY AND RECOMMENDATIONS

The over 2,400 acres of the SEC require active management to maintain and improve habitat quality for the RCW. This annual field survey identified 16 survey locations with coverage density of saw palmetto greater than or equal to 40% (Table 4.1). This table is designed to guide control burn and roller chop activities within the RCW habitat areas. Reduction of saw palmetto below 50% is recommended to promote groundcover of native bunchgrasses identified in the RCW Recovery Plan (USFWS, 2003). Roller chopping is recommended in those areas where LLP seedlings are minimal and can be avoided. Roller chopping is not feasible in areas of dense, mature LLP.

Continued annual surveys for the presence of nuisance-exotic species is recommended to locate, identify, and treat active clusters for eradication. Active nuisance species seed sources exist beyond the OUC property boundary adjacent to the northern, western, and southern areas of the SEC property. This reality will make total on-site eradication difficult to achieve. The actively managed Hal Scott Preserve on the eastern boundary of the SEC, is relatively free from nuisance exotic species; therefore, the eastern side of the SEC has a lower percentage of nuisance species present.

7. REFERENCES

- DeLotelle and Guthrie. (2006). *The Curtis H. Stanton Energy Center, Red-Cockaded Woodpecker Habitat Management Plan*.
- Florida Department of State. (2020, September 28). Noxious Weed List. *Introduction or Release of Plant Pests, Noxious Weeds, Arthropods, and Biological Control Agents*. Florida: Division of Plant Industry.
- USFWS. (2003). *Recovery Plan for the Red-cockaded Woodpecker (Picoides borealis): Second Revision*.
- Willcox, E. V., & Giuliano, W. M. (2010). Seasonal effect of prescribed burning and roller chopping on saw palmetto in flatwoods. *Forest Ecology and Management*, 259(8), 1580-1585.

TABLES

Table 1. Saw palmetto cover and dominant height class

Date	Site #	Site ID	Overall % cover	Mean of 4 quadrants	Dominant height class
2/27/2023	1	SPA 160-1	26-50	41.25	2-4'
	2	SPA 155-1	0-25	13.75	2-4'
	3	SPA 150-1	0-25	12.5	2-4'
	4	SPA 145-1	26-50	38.75	4-6'
	5	SPA 115-1	26-50	30	2-4'
	6	SPA 120-1	26-50	43.75	4-6'
	7	SPA 100-1	0-25	4.75	0-2', 2-4'
	8	SPA 110-1	26-50	36.25	2-4'
	9	SPA 105-1	0-25	10	0-2'
	10	SPA 125-1	26-50	46.25	4-6'
	11	SPA 130-1	0-25	12.5	2-4'
	12	SPA 135-1	0-25	15	2-4'
	13	SPA 140-1	0-25	17.5	2-4'
	14	SPA 175-1	26-50	36.25	2-4'
	15	SPA 170-1	26-50	26.25	2-4'
	16	SPA 165-1	26-50	26.25	2-4'
2/28/2023	1	SPA 60-1	26-50	32.5	2-4'
	2	SPA 65-1	0-25	17.5	2-4'
	3	SPA 70-1	26-50	35	2-4'
	4	SPA 75-1	0-25	21.25	2-4'
	5	SPA 90-1	0-25	18.75	0-2'
	6	SPA 85-1	26-50	41.25	2-4'
	7	SPA 85-2	26-50	38.75	2-4'
	8	SPA 95-1	0-25	20	2-4'
	9	SPA 80-1	0-25	23.75	2-4'
	10	SPA 180-2	51-75	78.75	4-6'
	11	SPA 180-1	26-50	46.25	4-6'
	12	SPA 185-2	51-75	53.75	2-4'
	13	SPA 185-1	26-50	45	2-4'
	14	SPA 10-1	0-25	0.375	4-6'
	15	SPA 15-1	0-25	2	>6'
	16	SPA 20-1	51-75	58.75	4-6'
3/1/2023	1	SPA 25-1	26-50	38.75	2-4'
	2	SPA 20-2	51-75	60	4-6'
	3	SPA 35-1	26-50	38.75	4-6'
	4	SPA 55-2	26-50	41.25	2-4'
	5	SPA 55-1	26-50	40	4-6'
	6	SPA 50-1	51-75	61.25	4-6'
	7	SPA 50-2	26-50	37.5	2-4'
	8	SPA 45-1	51-75	60	4-6'
	9	SPA 40-1	51-75	53.75	4-6'
	10	SPA 30-1	51-75	55	2-4'
4/1/2023	1	SPA 5-1	0-25	22.5	2-4'

* co-dominant heights rounded up

FIGURES



APPENDIX A

Field Data and Sampling Site Calculations



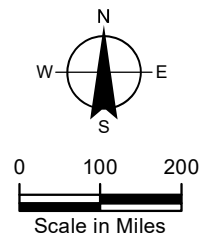
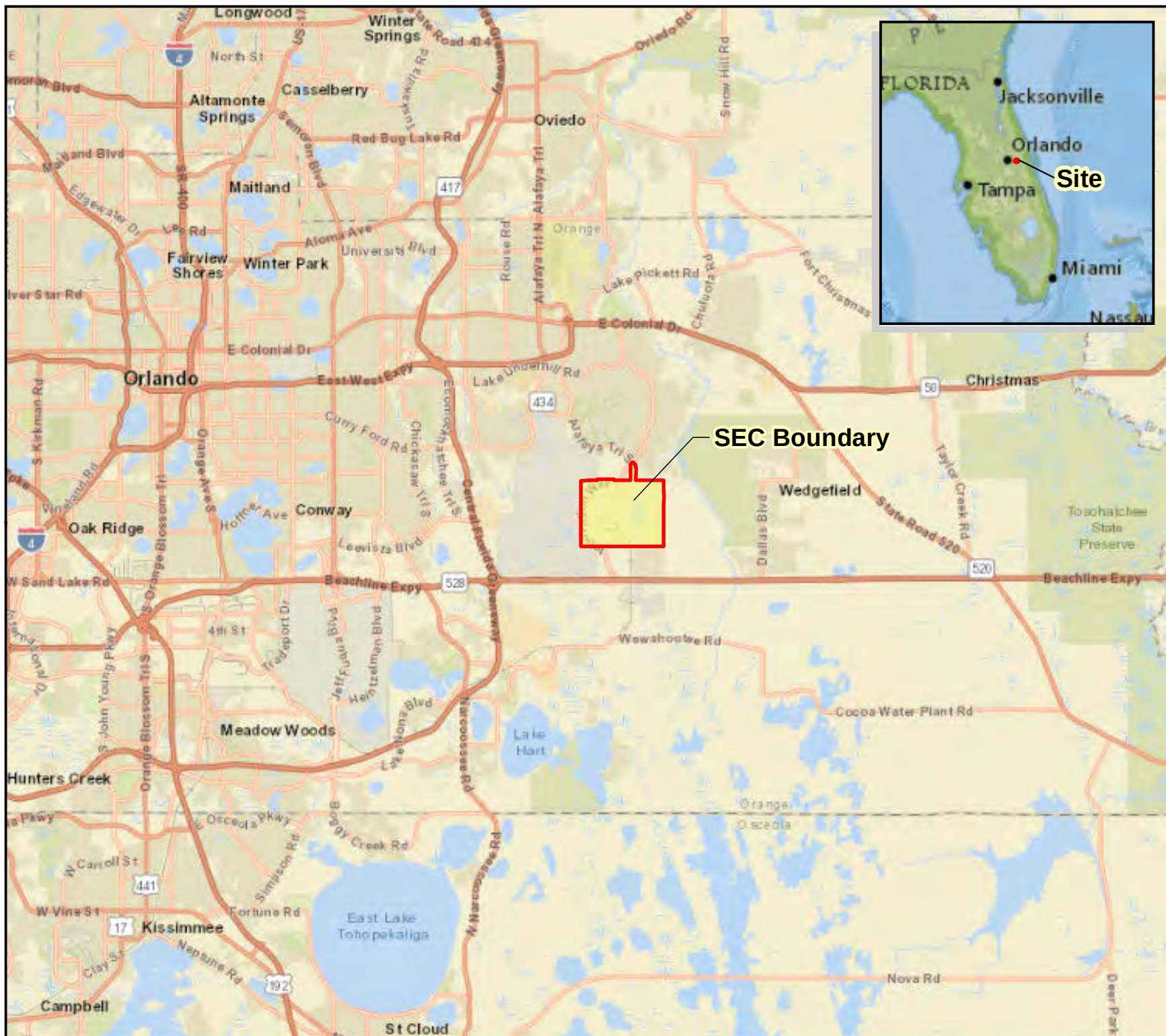


Figure 1
Site Location

Orlando Utilities Commission
The Curtis H Stanton
Energy Center
5100 South Alafaya Trail
Orlando, Florida

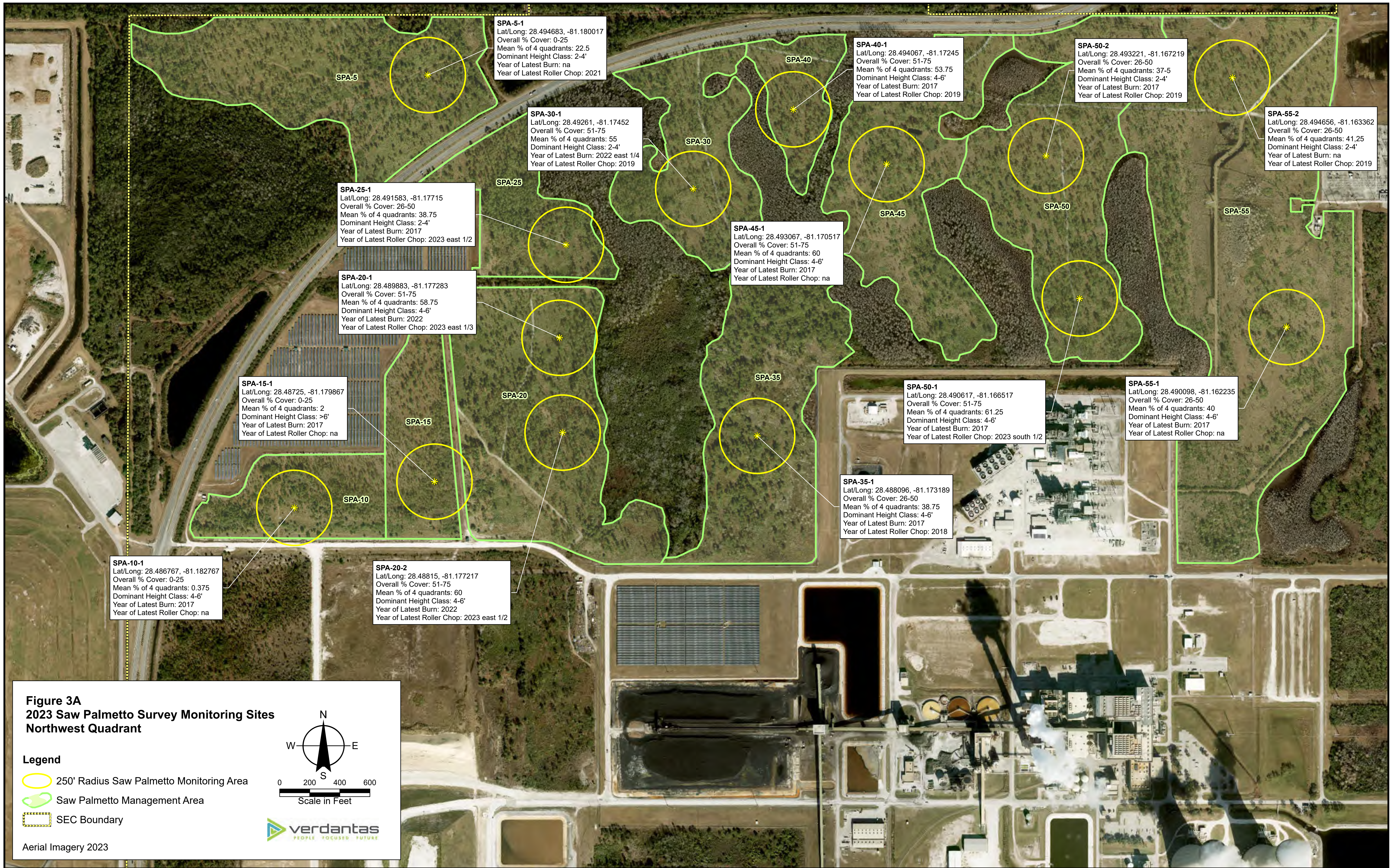




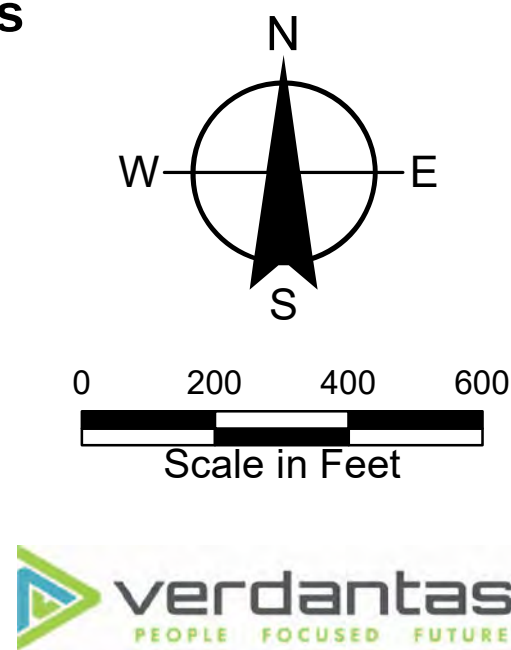


Figure 3D
2023 Saw Palmetto Survey Monitoring Sites
Southwest Quadrant

Legend

-  Saw Palmetto Monitoring Area Center
-  250' Radius Saw Palmetto Monitoring Area
-  Saw Palmetto Management Area
-  SEC Boundary

Aerial Imagery 2023



SPA-185-1
Lat/Long: 28.478633, -81.175717
Overall % Cover: 26-50
Mean % of 4 quadrants: 45
Dominant Height Class: 2-4'
Year of Latest Burn: 2023
Year of Latest Roller Chop: 2023

SPA-180-1
Lat/Long: 28.4745, -81.17225
Overall % Cover: 26-50
Mean % of 4 quadrants: 46.25
Dominant Height Class: 4-6'
Year of Latest Burn: 2023
Year of Latest Roller Chop: na

SPA-180-2
Lat/Long: 28.474833, -81.170117
Overall % Cover: 51-75
Mean % of 4 quadrants: 78.75
Dominant Height Class: 4-6'
Year of Latest Burn: 2023
Year of Latest Roller Chop: na

SPA-185-2
Lat/Long: 28.475083, -81.174967
Overall % Cover: 51-75
Mean % of 4 quadrants: 53.75
Dominant Height Class: 2-4'
Year of Latest Burn: 2023
Year of Latest Roller Chop: 2023

SPA-170-1
Lat/Long: 28.470383, -81.177117
Overall % Cover: 26-50
Mean % of 4 quadrants: 26.25
Dominant Height Class: 2-4'
Year of Latest Burn: 2023 west 1/3, 2022 east 2/3
Year of Latest Roller Chop: na

SPA-175-1
Lat/Long: 28.472817, -81.172417
Overall % Cover: 26-50
Mean % of 4 quadrants: 36.25
Dominant Height Class: 2-4'
Year of Latest Burn: 2022
Year of Latest Roller Chop: na

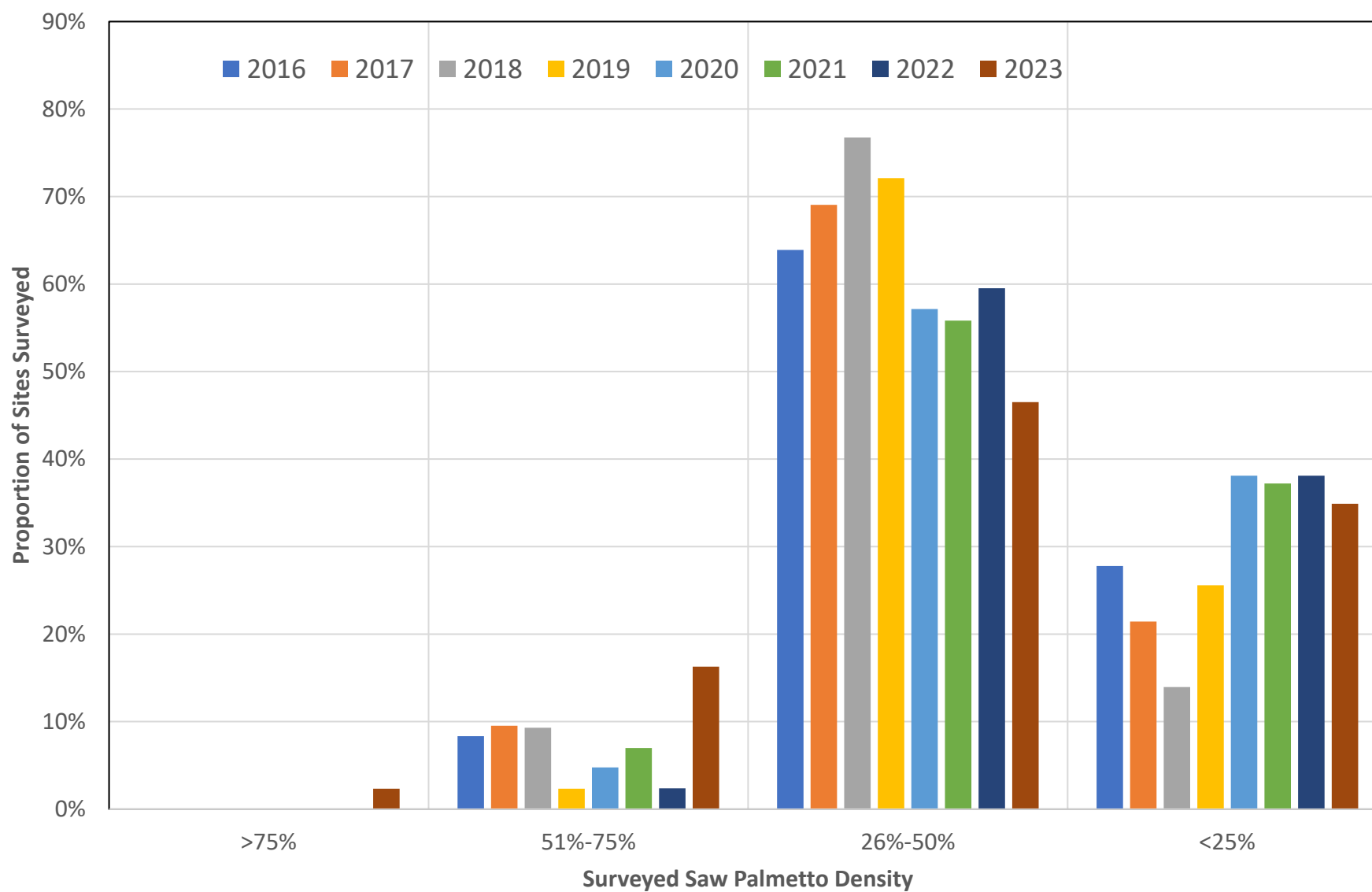
SPA-160-1
Lat/Long: 28.468783, -81.163583
Overall % Cover: 26-50
Mean % of 4 quadrants: 41.25
Dominant Height Class: 2-4'
Year of Latest Burn: 2022
Year of Latest Roller Chop: na

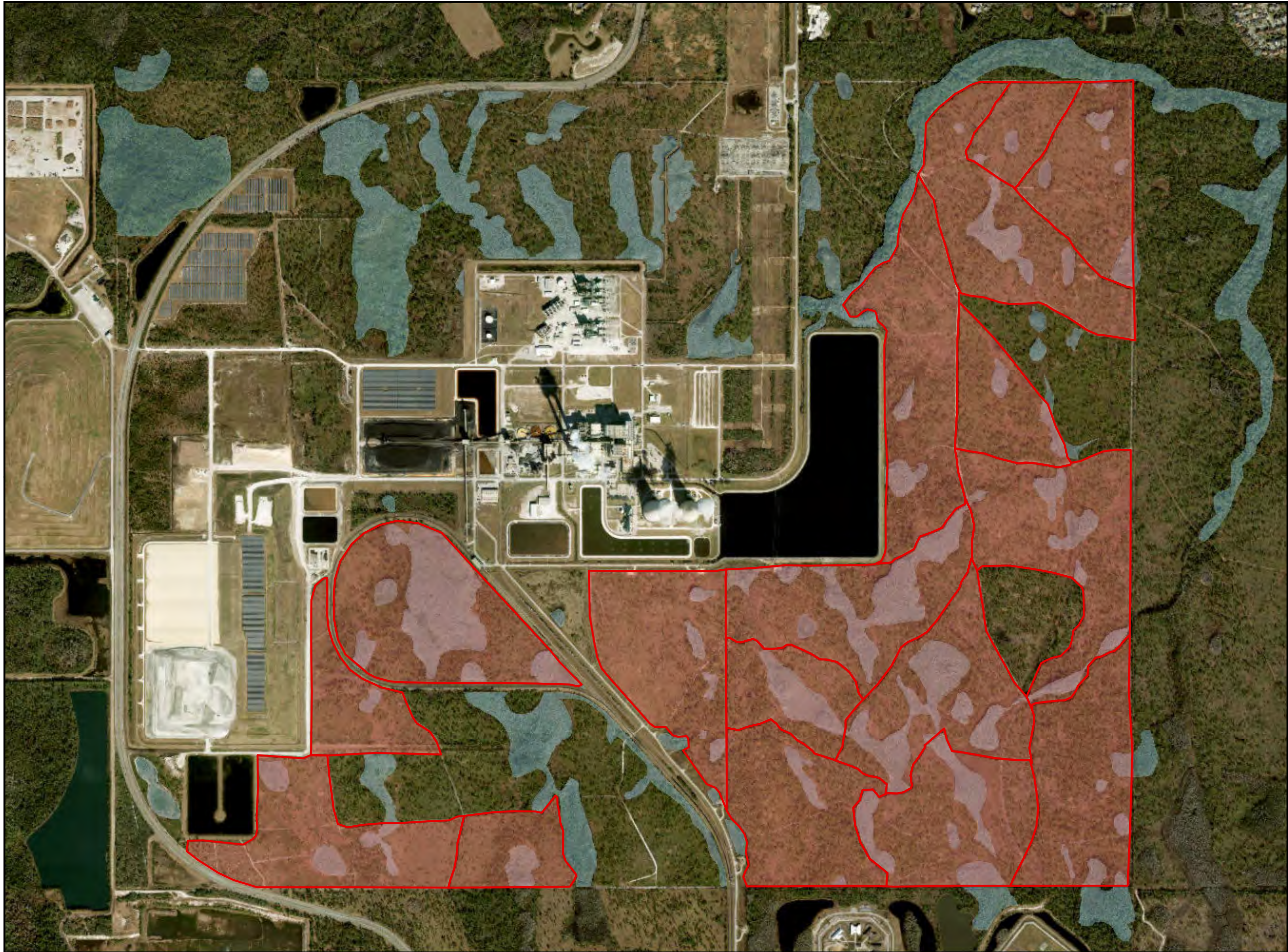
SPA-165-1
Lat/Long: 28.46785, -81.1771
Overall % Cover: 26-50
Mean % of 4 quadrants: 26.25
Dominant Height Class: 2-4'
Year of Latest Burn: 2023
Year of Latest Roller Chop: na



Figure 4. Monitoring Site Survey Route

Figure 5. Monitoring Year-Over-Year Saw Palmetto Cover Density Comparison





- Legend**
- 2023 Prescribed Burn Areas (~1,200 acres)
 - Wetland

Aerial Imagery 2023

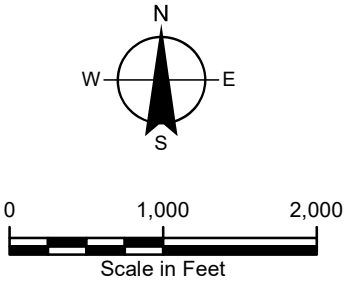
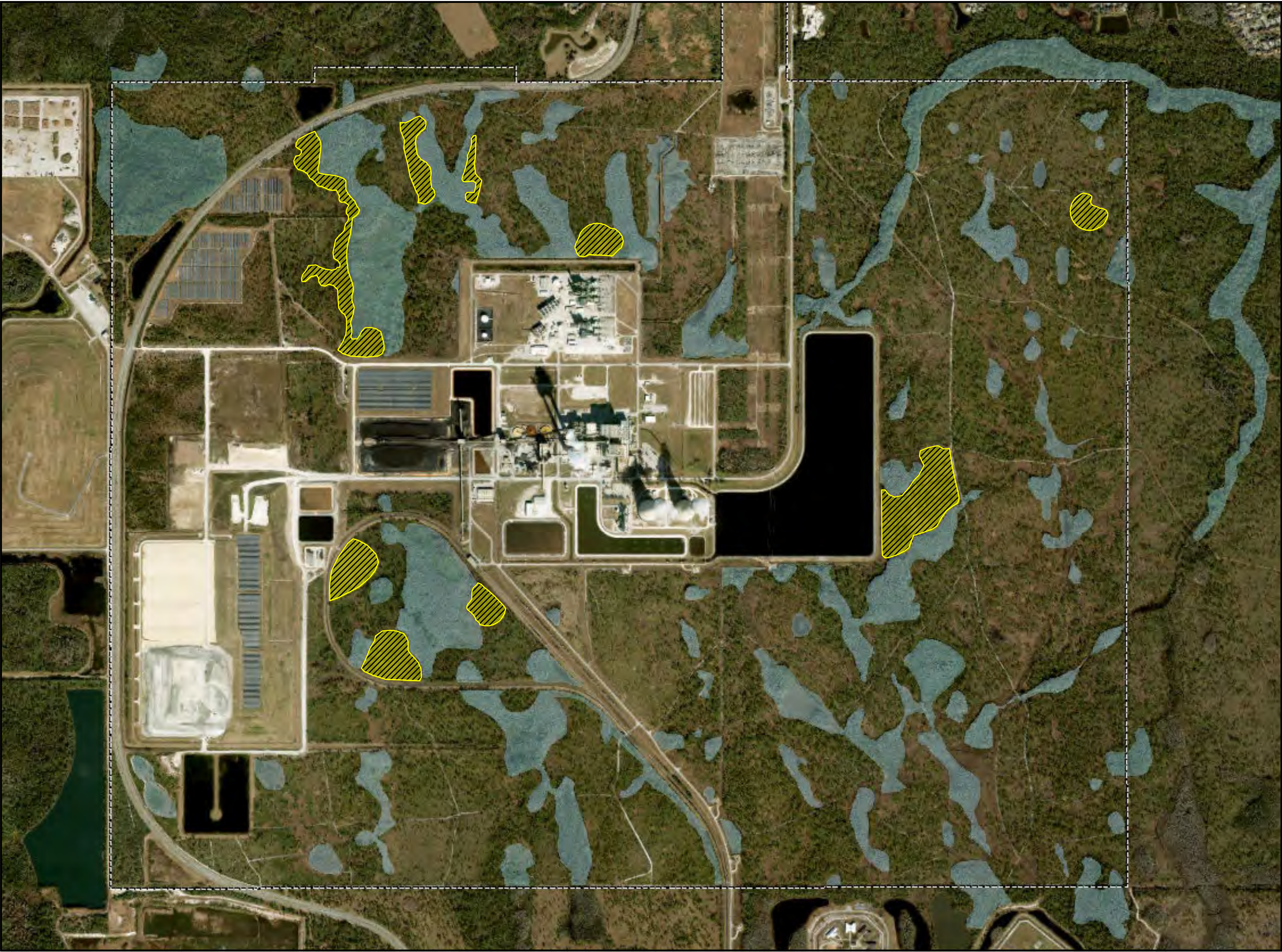


Figure 6
Prescribed Burn Site Locations
2023

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida





- Legend**
-  2023 Recommended Roller Chopped Areas
 -  Wetland
 -  SEC Property Boundary

Aerial Imagery 2023

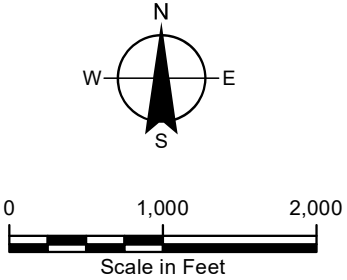


Figure 7
Recommended Roller Chopped
Site Locations 2023

Orlando Utilities Commission
The Curtis H Stanton Energy Center
5100 South Alafaya Trail
Orlando, Orange County, Florida



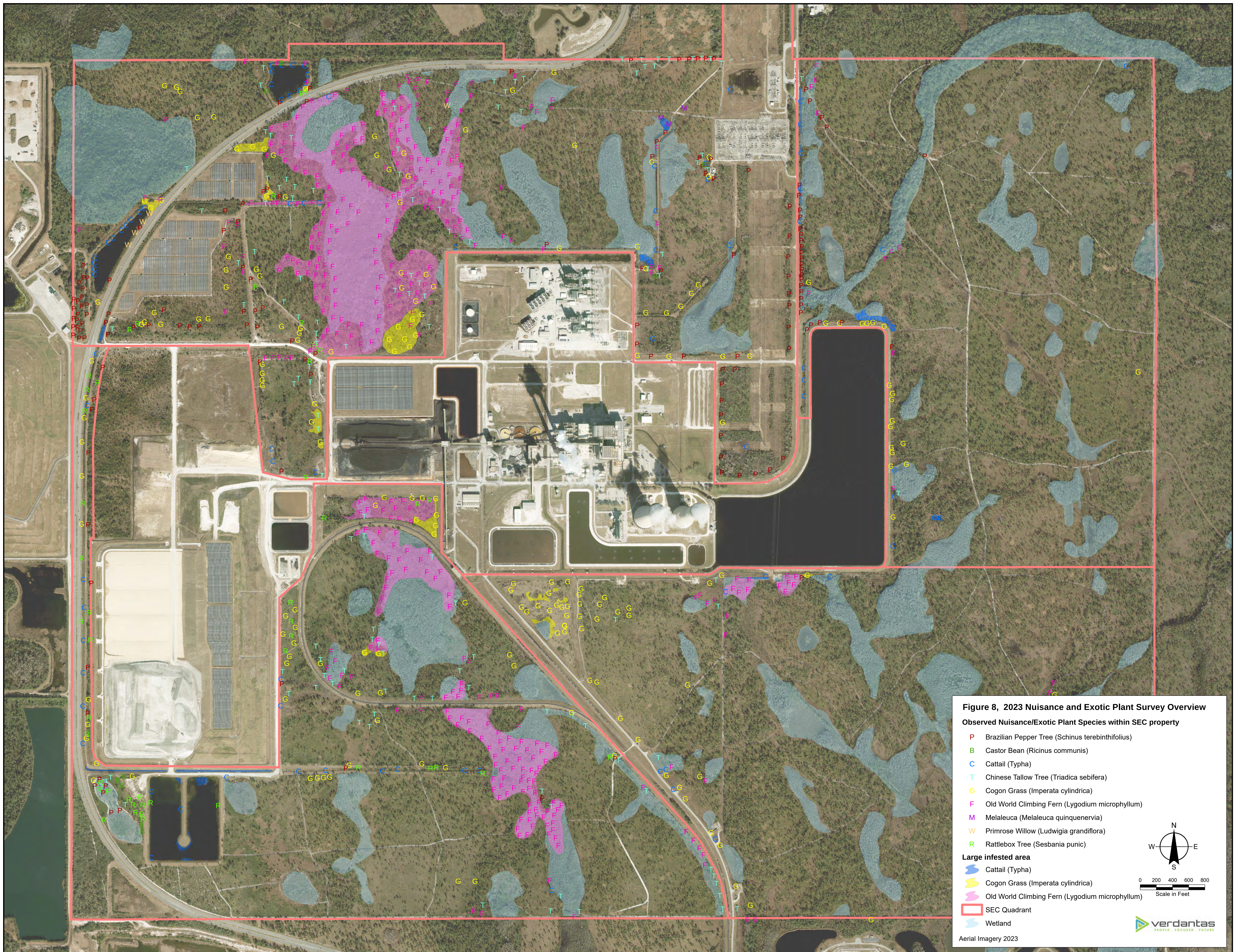


Figure 8, 2023 Nuisance and Exotic Plant Survey Overview

Observed Nuisance/Exotic Plant Species within SEC property

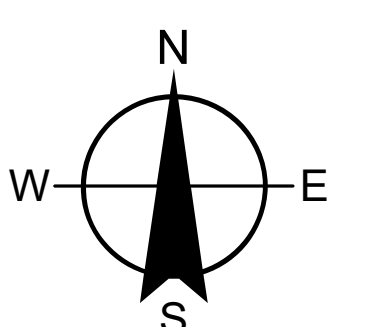
- P Brazilian Pepper Tree (*Schinus terebinthifolius*)
- B Castor Bean (*Ricinus communis*)
- C Cattail (*Typha*)
- T Chinese Tallow Tree (*Triadica sebifera*)
- G Cogon Grass (*Imperata cylindrica*)
- F Old World Climbing Fern (*Lygodium microphyllum*)
- M Melaleuca (*Melaleuca quinquenervia*)
- W Primrose Willow (*Ludwigia grandiflora*)
- R Rattlebox Tree (*Sesbania punicea*)

Large infested area

- Cattail (*Typha*)
- Cogon Grass (*Imperata cylindrica*)
- Old World Climbing Fern (*Lygodium microphyllum*)

SEC Quadrant

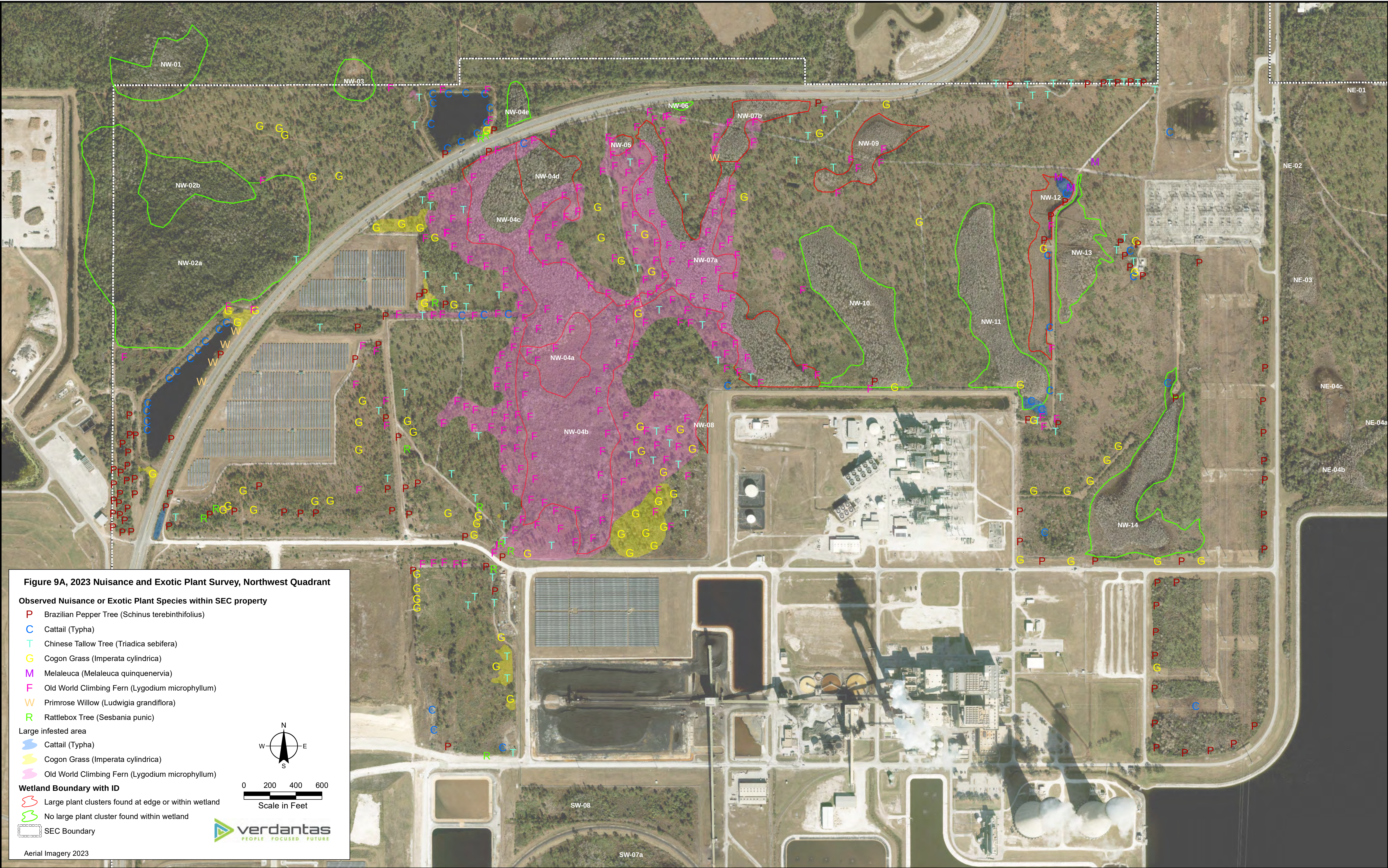
Wetland



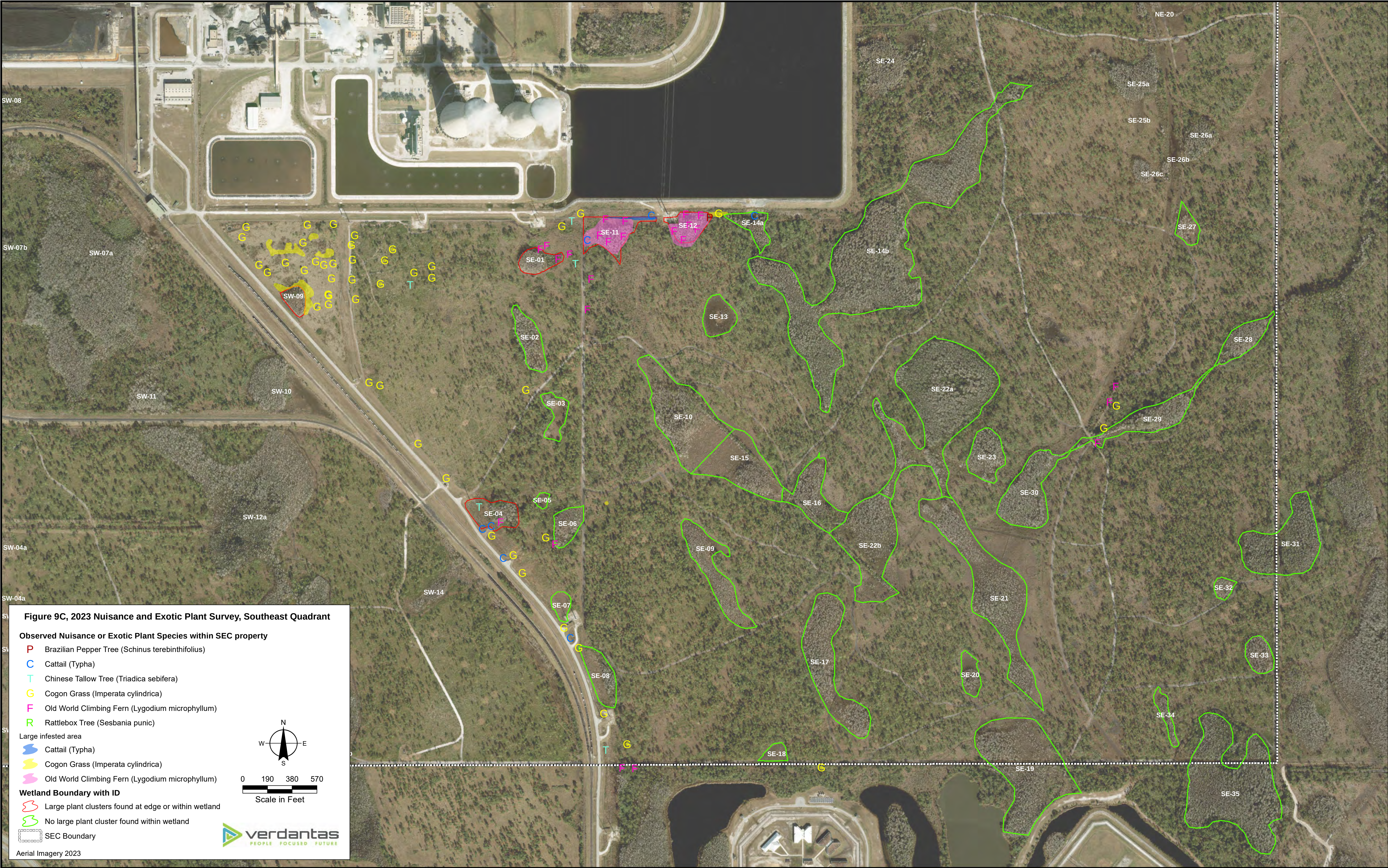
0 200 400 600 800
Scale in Feet

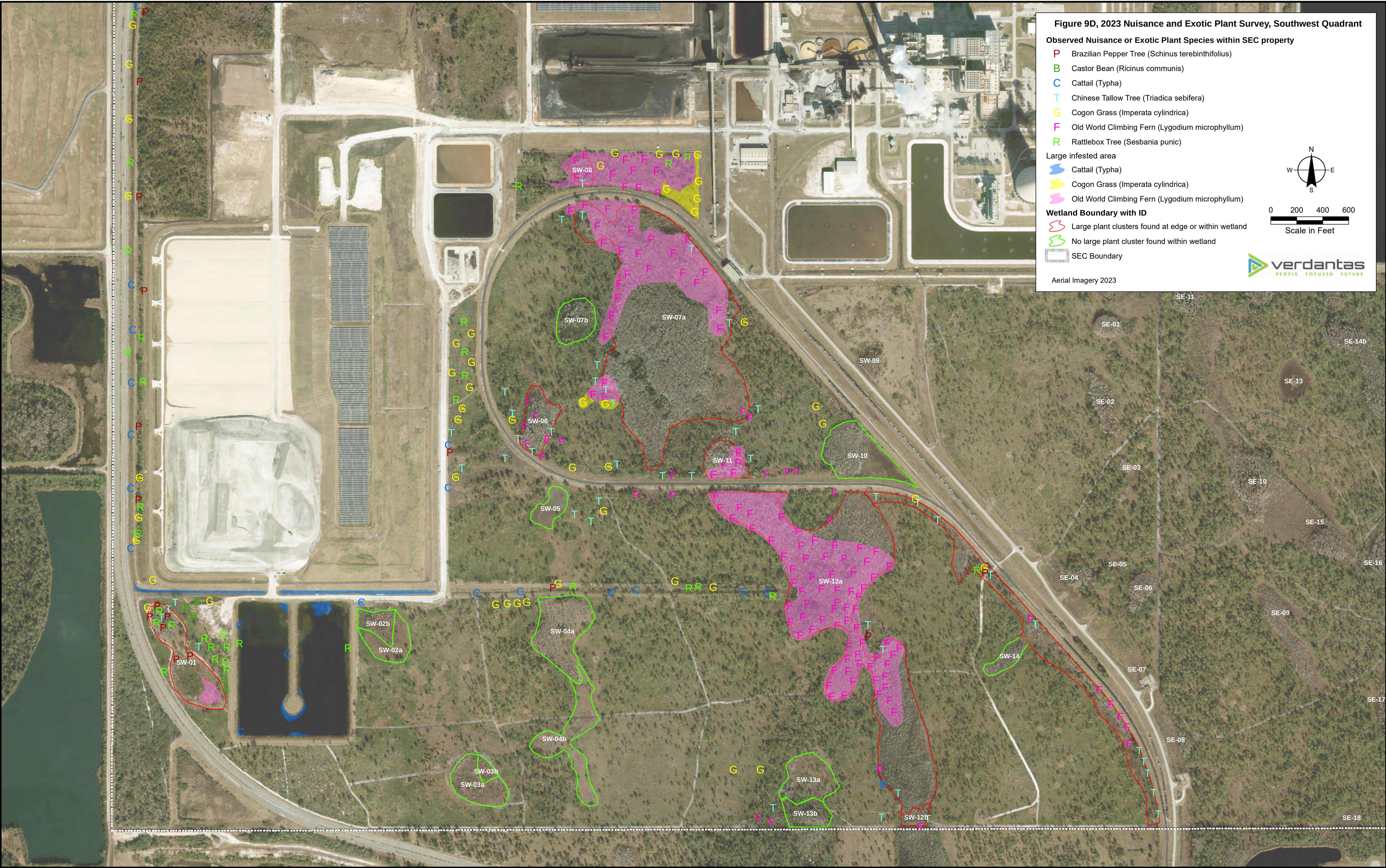


Aerial Imagery 2023









Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-5-1	N	0 - 2'	3	25	22.5	2 - 4'	
		2 - 4'	20				
		4 - 6'	2				
		> 6'	0				
	E	0 - 2'	10	20			
		2 - 4'	5				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	9	20			
		2 - 4'	8				
		4 - 6'	3				
		> 6'	0				
	W	0 - 2'	5	25			
		2 - 4'	15				
		4 - 6'	5				
		> 6'	0				
SPA-10-1	N	0 - 2'	0	1.5	0.375	4 - 6'	
		2 - 4'	0				
		4 - 6'	1.5				
		> 6'	0				
	E	0 - 2'	0	0			
		2 - 4'	0				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	0	0			
		2 - 4'	0				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	0	0			
		2 - 4'	0				
		4 - 6'	0				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-15-1	N	0 - 2'	0	2	2	> 6'	
		2 - 4'	0				
		4 - 6'	1				
		> 6'	1				
	E	0 - 2'	0	2			
		2 - 4'	1				
		4 - 6'	1				
		> 6'	0				
	S	0 - 2'	0	2			
		2 - 4'	0				
		4 - 6'	0				
		> 6'	2				
	W	0 - 2'	0	2			
		2 - 4'	0				
		4 - 6'	1				
		> 6'	1				
SPA-20-1	N	0 - 2'	5	65	58.75	4 - 6'	
		2 - 4'	25				
		4 - 6'	30				
		> 6'	5				
	E	0 - 2'	5	65			
		2 - 4'	25				
		4 - 6'	30				
		> 6'	5				
	S	0 - 2'	5	55			
		2 - 4'	20				
		4 - 6'	30				
		> 6'	0				
	W	0 - 2'	5	50			
		2 - 4'	20				
		4 - 6'	25				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-20-2	N	0 - 2'	5	55	60	4 - 6'	
		2 - 4'	5				
		4 - 6'	30				
		> 6'	15				
	E	0 - 2'	5	70			
		2 - 4'	10				
		4 - 6'	35				
		> 6'	20				
	S	0 - 2'	5	60			
		2 - 4'	10				
		4 - 6'	30				
		> 6'	15				
	W	0 - 2'	5	55			
		2 - 4'	10				
		4 - 6'	35				
		> 6'	5				
SPA-25-1	N	0 - 2'	3	45	38.75	2 - 4'	
		2 - 4'	12				
		4 - 6'	25				
		> 6'	5				
	E	0 - 2'	3	35			
		2 - 4'	20				
		4 - 6'	10				
		> 6'	2				
	S	0 - 2'	4	35			
		2 - 4'	20				
		4 - 6'	10				
		> 6'	1				
	W	0 - 2'	3	40			
		2 - 4'	20				
		4 - 6'	15				
		> 6'	2				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-30-1	N	0 - 2'	5	55	48.75	2 - 4'	
		2 - 4'	30				
		4 - 6'	20				
		> 6'	0				
	E	0 - 2'	5	55			
		2 - 4'	30				
		4 - 6'	20				
		> 6'	0				
	S	0 - 2'	5	50			
		2 - 4'	35				
		4 - 6'	10				
		> 6'	0				
	W	0 - 2'	5	35			
		2 - 4'	5				
		4 - 6'	23				
		> 6'	2				
SPA-35-1	N	0 - 2'	2	35	38.75	4 - 6'	
		2 - 4'	5				
		4 - 6'	20				
		> 6'	8				
	E	0 - 2'	2	40			
		2 - 4'	5				
		4 - 6'	20				
		> 6'	13				
	S	0 - 2'	2	35			
		2 - 4'	8				
		4 - 6'	20				
		> 6'	5				
	W	0 - 2'	3	45			
		2 - 4'	5				
		4 - 6'	17				
		> 6'	20				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-40-1	N	0 - 2'	5	55	53.75	4 - 6'	
		2 - 4'	20				
		4 - 6'	30				
		> 6'	0				
	E	0 - 2'	5	45			
		2 - 4'	25				
		4 - 6'	15				
		> 6'	0				
	S	0 - 2'	3	50			
		2 - 4'	25				
		4 - 6'	20				
		> 6'	2				
	W	0 - 2'	2	65			
		2 - 4'	25				
		4 - 6'	35				
		> 6'	3				
SPA-45-1	N	0 - 2'	3	65	60	4 - 6'	
		2 - 4'	25				
		4 - 6'	35				
		> 6'	2				
	E	0 - 2'	3	55			
		2 - 4'	22				
		4 - 6'	28				
		> 6'	2				
	S	0 - 2'	5	55			
		2 - 4'	35				
		4 - 6'	15				
		> 6'	0				
	W	0 - 2'	3	65			
		2 - 4'	25				
		4 - 6'	35				
		> 6'	2				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-50-1	N	0 - 2'	5	60	61.25	4 - 6'	
		2 - 4'	30				
		4 - 6'	25				
		> 6'	0				
	E	0 - 2'	5	60			
		2 - 4'	25				
		4 - 6'	30				
		> 6'	0				
	S	0 - 2'	3	65			
		2 - 4'	25				
		4 - 6'	35				
		> 6'	2				
	W	0 - 2'	5	60			
		2 - 4'	25				
		4 - 6'	30				
		> 6'	0				
SPA-50-2	N	0 - 2'	4	35	37.5	2 - 4'	Nice LLP nursery.
		2 - 4'	30				
		4 - 6'	1				
		> 6'	0				
	E	0 - 2'	5	40			
		2 - 4'	30				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	5	40			
		2 - 4'	32				
		4 - 6'	3				
		> 6'	0				
	W	0 - 2'	6	35			
		2 - 4'	28				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-55-1	N	0 - 2'	1	35	40	4 - 6'	Full of black berry.
		2 - 4'	14				
		4 - 6'	20				
		> 6'	0				
	E	0 - 2'	1	30			Cogon grass 0.5 acres
		2 - 4'	14				
		4 - 6'	15				
		> 6'	0				
	S	0 - 2'	2	55			
		2 - 4'	15				
		4 - 6'	35				
		> 6'	3				
	W	0 - 2'	2	40			
		2 - 4'	13				
		4 - 6'	22				
		> 6'	3				
SPA-55-2	N	0 - 2'	5	35	41.25	2 - 4'	Beautiful area. Nice LLP nursery.
		2 - 4'	25				
		4 - 6'	5				
		> 6'	0				
	E	0 - 2'	5	45			
		2 - 4'	30				
		4 - 6'	10				
		> 6'	0				
	S	0 - 2'	5	45			
		2 - 4'	25				
		4 - 6'	15				
		> 6'	0				
	W	0 - 2'	5	40			
		2 - 4'	30				
		4 - 6'	5				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-60-1	N	0 - 2'	10	30	32.5	2 - 4'	
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	15	35			
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	5	35			
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	10	30			
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
SPA-65-1	N	0 - 2'	7	20	17.5	2 - 4'	
		2 - 4'	13				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	9	15			
		2 - 4'	6				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	9	15			
		2 - 4'	6				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	5	20			
		2 - 4'	14				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-70-1	N	0 - 2'	8	35	35	2 - 4'	Roller chop or burn.
		2 - 4'	25				
		4 - 6'	2				
		> 6'	0				
	E	0 - 2'	9	35			
		2 - 4'	25				
		4 - 6'	1				
		> 6'	0				
	S	0 - 2'	10	35			
		2 - 4'	24				
		4 - 6'	1				
		> 6'	0				
	W	0 - 2'	10	35			
		2 - 4'	24				
		4 - 6'	1				
		> 6'	0				
SPA-75-1	N	0 - 2'	5	20	21.25	2 - 4'	
		2 - 4'	13				
		4 - 6'	2				
		> 6'	0				
	E	0 - 2'	8	20			
		2 - 4'	12				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	8	25			
		2 - 4'	15				
		4 - 6'	2				
		> 6'	0				
	W	0 - 2'	8	20			
		2 - 4'	10				
		4 - 6'	2				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-80-1	N	0 - 2'	5	20	23.75	2 - 4'	
		2 - 4'	10				
		4 - 6'	5				
		> 6'	0				
	E	0 - 2'	8	25			
		2 - 4'	15				
		4 - 6'	2				
		> 6'	0				
	S	0 - 2'	8	30			
		2 - 4'	20				
		4 - 6'	2				
		> 6'	0				
	W	0 - 2'	4	20			
		2 - 4'	15				
		4 - 6'	1				
		> 6'	0				
SPA-85-1	N	0 - 2'	10	40	41.25	2 - 4'	
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	10	40			
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	10	45			
		2 - 4'	35				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	9	40			
		2 - 4'	30				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-85-2	N	0 - 2'	10	40	38.75	2 - 4'	
		2 - 4'	25				
		4 - 6'	5				
		> 6'	0				
	E	0 - 2'	5	40			
		2 - 4'	30				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	8	40			
		2 - 4'	30				
		4 - 6'	2				
		> 6'	0				
	W	0 - 2'	5	35			
		2 - 4'	27				
		4 - 6'	3				
		> 6'	0				
SPA-90-1	N	0 - 2'	10	15	18.75	0 - 2'	
		2 - 4'	5				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	9	15			
		2 - 4'	6				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	10	25			
		2 - 4'	13				
		4 - 6'	2				
		> 6'	0				
	W	0 - 2'	10	20			
		2 - 4'	8				
		4 - 6'	2				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-95-1	N	0 - 2'	5	35	20	2 - 4'	
		2 - 4'	8				
		4 - 6'	20				
		> 6'	2				
	E	0 - 2'	4	15			
		2 - 4'	10				
		4 - 6'	1				
		> 6'	0				
	S	0 - 2'	4	15			
		2 - 4'	10				
		4 - 6'	1				
		> 6'	0				
	W	0 - 2'	5	15			
		2 - 4'	7				
		4 - 6'	3				
		> 6'	0				
SPA-100-1	N	0 - 2'	2	3	4.75	0 - 2', 2 - 4'	
		2 - 4'	1				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	2	3			
		2 - 4'	1				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	2	3			
		2 - 4'	1				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	3	10			
		2 - 4'	6				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-105-1	N	0 - 2'	5	15	10	0 - 2'	
		2 - 4'	10				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	7	10			
		2 - 4'	3				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	4	5			
		2 - 4'	1				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	7	10			
		2 - 4'	3				
		4 - 6'	0				
		> 6'	0				
SPA-110-1	N	0 - 2'	4	30	36.25	2 - 4'	
		2 - 4'	25				
		4 - 6'	1				
		> 6'	0				
	E	0 - 2'	4	35			
		2 - 4'	30				
		4 - 6'	1				
		> 6'	0				
	S	0 - 2'	5	35			
		2 - 4'	13				
		4 - 6'	17				
		> 6'	0				
	W	0 - 2'	5	45			
		2 - 4'	15				
		4 - 6'	25				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-115-1	N	0 - 2'	4	35	30	2 - 4'	
		2 - 4'	30				
		4 - 6'	1				
		> 6'	0				
	E	0 - 2'	5	35			
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	7	20			
		2 - 4'	13				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	10	30			
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
SPA-120-1	N	0 - 2'	4	45	43.75	4 - 6'	
		2 - 4'	15				
		4 - 6'	25				
		> 6'	1				
	E	0 - 2'	4	35			
		2 - 4'	20				
		4 - 6'	10				
		> 6'	1				
	S	0 - 2'	3	50			
		2 - 4'	15				
		4 - 6'	30				
		> 6'	2				
	W	0 - 2'	4	45			
		2 - 4'	15				
		4 - 6'	25				
		> 6'	1				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-125-1	N	0 - 2'	4	55	46.25	4 - 6'	
		2 - 4'	20				
		4 - 6'	30				
		> 6'	1				
	E	0 - 2'	5	35			
		2 - 4'	10				
		4 - 6'	20				
		> 6'	0				
	S	0 - 2'	5	35			
		2 - 4'	13				
		4 - 6'	17				
		> 6'	0				
	W	0 - 2'	2	60			
		2 - 4'	20				
		4 - 6'	35				
		> 6'	3				
SPA-130-1	N	0 - 2'	5	15	12.5	2 - 4'	
		2 - 4'	6				
		4 - 6'	4				
		> 6'	0				
	E	0 - 2'	4	10			
		2 - 4'	6				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	3	10			
		2 - 4'	7				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	5	15			
		2 - 4'	7				
		4 - 6'	2				
		> 6'	1				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-135-1	N	0 - 2'	4	15	15	2 - 4'	
		2 - 4'	8				
		4 - 6'	3				
		> 6'	0				
	E	0 - 2'	2	15			
		2 - 4'	8				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	2	15			
		2 - 4'	10				
		4 - 6'	3				
		> 6'	0				
	W	0 - 2'	4	15			
		2 - 4'	10				
		4 - 6'	1				
		> 6'	0				
SPA-140-1	N	0 - 2'	5	20	17.5	2 - 4'	
		2 - 4'	9				
		4 - 6'	6				
		> 6'	0				
	E	0 - 2'	5	20			
		2 - 4'	10				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	7	15			
		2 - 4'	8				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	7	15			
		2 - 4'	8				
		4 - 6'	0				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-145-1	N	0 - 2'	4	45	38.75	4 - 6'	
		2 - 4'	15				
		4 - 6'	25				
		> 6'	1				
	E	0 - 2'	4	40			
		2 - 4'	15				
		4 - 6'	20				
		> 6'	1				
	S	0 - 2'	4	35			
		2 - 4'	14				
		4 - 6'	16				
		> 6'	1				
	W	0 - 2'	4	35			
		2 - 4'	16				
		4 - 6'	14				
		> 6'	1				
SPA-150-1	N	0 - 2'	5	15	12.5	2 - 4'	
		2 - 4'	7				
		4 - 6'	3				
		> 6'	0				
	E	0 - 2'	4	10			
		2 - 4'	5				
		4 - 6'	1				
		> 6'	0				
	S	0 - 2'	3	10			
		2 - 4'	7				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	4	15			
		2 - 4'	10				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-155-1	N	0 - 2'	4	10	13.75	2 - 4'	
		2 - 4'	6				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	5	15			
		2 - 4'	10				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	5	15			
		2 - 4'	10				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	5	15			
		2 - 4'	10				
		4 - 6'	0				
		> 6'	0				
SPA-160-1	N	0 - 2'	5	55	41.25	2 - 4'	
		2 - 4'	45				
		4 - 6'	5				
		> 6'	0				
	E	0 - 2'	5	35			
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	5	35			
		2 - 4'	30				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	4	40			
		2 - 4'	35				
		4 - 6'	1				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-165-1	N	0 - 2'	5	25	26.25	2 - 4'	
		2 - 4'	16				
		4 - 6'	4				
		> 6'	0				
	E	0 - 2'	5	30			
		2 - 4'	20				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	10	25			
		2 - 4'	15				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	10	25			
		2 - 4'	15				
		4 - 6'	0				
		> 6'	0				
SPA-170-1	N	0 - 2'	10	30	26.25	2 - 4'	
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
	E	0 - 2'	10	35			
		2 - 4'	25				
		4 - 6'	0				
		> 6'	0				
	S	0 - 2'	10	30			
		2 - 4'	20				
		4 - 6'	0				
		> 6'	0				
	W	0 - 2'	6	10			
		2 - 4'	4				
		4 - 6'	0				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-175-1	N	0 - 2'	5	40	36.25	2 - 4'	
		2 - 4'	30				
		4 - 6'	5				
		> 6'	0				
	E	0 - 2'	5	35			
		2 - 4'	28				
		4 - 6'	2				
		> 6'	0				
	S	0 - 2'	5	35			
		2 - 4'	27				
		4 - 6'	3				
		> 6'	0				
	W	0 - 2'	5	35			
		2 - 4'	27				
		4 - 6'	3				
		> 6'	0				
SPA-180-1	N	0 - 2'	1	55	46.25	4 - 6'	
		2 - 4'	9				
		4 - 6'	20				
		> 6'	25				
	E	0 - 2'	2	40			
		2 - 4'	8				
		4 - 6'	20				
		> 6'	10				
	S	0 - 2'	3	45			
		2 - 4'	7				
		4 - 6'	25				
		> 6'	10				
	W	0 - 2'	1	45			
		2 - 4'	4				
		4 - 6'	30				
		> 6'	10				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-180-2	N	0 - 2'	4	80	78.75	4 - 6'	
		2 - 4'	20				
		4 - 6'	55				
		> 6'	1				
	E	0 - 2'	6	80			
		2 - 4'	20				
		4 - 6'	50				
		> 6'	4				
	S	0 - 2'	4	75			
		2 - 4'	20				
		4 - 6'	50				
		> 6'	1				
	W	0 - 2'	3	80			
		2 - 4'	20				
		4 - 6'	55				
		> 6'	2				
SPA-185-1	N	0 - 2'	5	40	45	2 - 4'	
		2 - 4'	20				
		4 - 6'	15				
		> 6'	0				
	E	0 - 2'	5	40			
		2 - 4'	30				
		4 - 6'	5				
		> 6'	0				
	S	0 - 2'	9	50			
		2 - 4'	40				
		4 - 6'	1				
		> 6'	0				
	W	0 - 2'	5	50			
		2 - 4'	35				
		4 - 6'	10				
		> 6'	0				

Appendix A
Field Data and Sampling Site Calculations



Site ID	Photo Quadrant	Height Class	% Cover	Total Quadrant Cover (%)	Avg. Site Cover (%)	Dominant Height Class	Notes
SPA-185-2	N	0 - 2'	4	55	53.75	2 - 4'	
		2 - 4'	24				
		4 - 6'	26				
		> 6'	1				
	E	0 - 2'	5	50			
		2 - 4'	25				
		4 - 6'	15				
		> 6'	5				
	S	0 - 2'	5	50			
		2 - 4'	30				
		4 - 6'	15				
		> 6'	0				
	W	0 - 2'	5	60			
		2 - 4'	20				
		4 - 6'	30				
		> 6'	5				

APPENDIX B

Monitoring Site Summaries



Site SPA 5-1

Land Management
Good

GPS: 28.493777, -81.18151

SPA-5-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	3	20	2	0	25
East	10	5	5	0	20
South	9	8	3	0	20
West	5	15	5	0	25
Average	6.75	12	3.75	0	22.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



-



East

South



West

Site SPA-10-I

GPS: 28.489009,-81.17859

Land Management
Good

SPA-10-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	0	0	1.5	0	1.5
East	0	0	0	0	0
South	0	0	0	0	0
West	0	0	0	0	0
Average	0	0	0.375	0	0.375

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 15-I

Land Management
Good

GPS: 28.489792, -81.17291

SPA-15-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	0	0	1	1	2
East	0	1	1	0	2
South	0	0	0	2	2
West	0	0	1	1	2
Average	0	0.25	0.75	1	2

Saw Palmetto Overall Height Class: > 6'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is >6'.

North



East



South



West



Site SPA 20-I

**Land Management
Activity Recommended**

GPS: 28.490634, -81.16949

SPA-20-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	25	30	5	65
East	5	25	30	5	65
South	5	20	30	0	55
West	5	20	25	0	50
Average	5	22.5	28.75	2.5	58.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 4-6'.

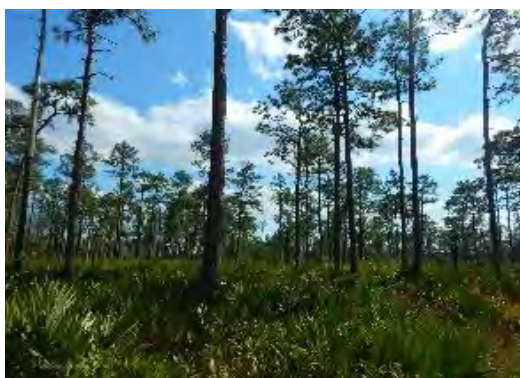
North



East



South



West



Site SPA 20-2

**Land Management
Activity Necessary**

GPS: 28.494762, -81.16598

SPA-20-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	5	30	15	55
East	5	10	35	20	70
South	5	10	30	15	60
West	5	10	35	5	55
Average	5	8.75	32.5	13.75	60

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 25-I

Land Management
Good

GPS: 28.492256, -81.15523

SPA-25-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	3	12	25	5	45
East	3	20	10	2	35
South	4	20	10	1	35
West	3	20	15	2	40
Average	3.25	18	15	2.5	38.75

Saw Palmetto Overall Height Class: 2 - 4'

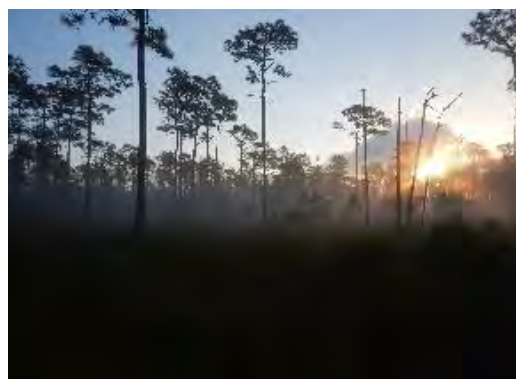
Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 30-I

**Land Management
Activity Recommended**

GPS: 28.490531, -81.15617

SPA-30-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	30	20	0	55
East	5	30	20	0	55
South	5	35	10	0	50
West	5	5	23	2	35
Average	5	25	18.25	0.5	48.75

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 35-I

Land Management
Good

GPS: 28.494996, -81.14806

SPA-35-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	2	5	20	8	35
East	2	5	20	13	40
South	2	8	20	5	35
West	3	5	17	20	45
Average	2.25	5.75	19.25	11.5	38.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 40-I

**Land Management
Activity Recommended**

GPS: 28.490401, -81.1463

SPA-40-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	20	30	0	55
East	5	25	15	0	45
South	3	25	20	2	50
West	2	25	35	3	65
Average	3.75	23.75	25	1.25	53.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 4-6'.

North



East



South



West

Site SPA 45-I

**Land Management
Activity Necessary**

GPS: 28.492186, -81.15125

SPA-45-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	3	25	35	2	65
East	3	22	28	2	55
South	5	35	15	0	55
West	3	25	35	2	65
Average	3.5	26.75	28.25	1.5	60

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 50-1

**Land Management
Activity Necessary**

GPS: 28.489114, -81.15126

SPA-50-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	30	25	0	60
East	5	25	30	0	60
South	3	25	35	2	65
West	5	25	30	0	60
Average	4.5	26.25	30	0.5	61.25

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 50-2

Land Management
Good

GPS: 28.486654, -81.15318

SPA-50-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	30	1	0	35
East	5	30	5	0	40
South	5	32	3	0	40
West	6	28	1	0	35
Average	5	30	2.5	0	37.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 55-1

**Land Management
Activity Recommended**

GPS: 28.480366, -81.15295

SPA-55-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	1	14	20	0	35
East	1	14	15	0	30
South	2	15	35	3	55
West	2	13	22	3	40
Average	1.5	14	23	1.5	40

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 55-2

**Land Management
Activity Recommended**

GPS: 28.48715833, -81.14948667

SPA-55-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	25	5	0	35
East	5	30	10	0	45
South	5	25	15	0	45
West	5	30	5	0	40
Average	5	27.5	8.75	0	41.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 60-I

Land Management
Good

GPS: 28.486328, -81.14536

SPA-60-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	10	20	0	0	30
East	15	20	0	0	35
South	5	30	0	0	35
West	10	20	0	0	30
Average	10	22.5	0	0	32.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 65-1

Land Management
Good

GPS: 28.484535, -81.14643

SPA-65-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	7	13	0	0	20
East	9	6	0	0	15
South	9	6	0	0	15
West	5	14	1	0	20
Average	7.5	9.75	0.25	0	17.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 70-I

Land Management
Good

GPS: 28.480903, -81.14546

SPA-70-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	8	25	2	0	35
East	9	25	1	0	35
South	10	24	1	0	35
West	10	24	1	0	35
Average	9.25	24.5	1.25	0	35

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 75-I

Land Management
Good

GPS: 28.482238, -81.1502

SPA-75-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	13	2	0	20
East	8	12	0	0	20
South	8	15	2	0	25
West	8	10	2	0	20
Average	7.25	12.5	1.5	0	21.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 80-1

Land Management
Good

GPS: 28.478804, -81.14555

SPA-80-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	10	5	0	20
East	8	15	2	0	25
South	8	20	2	0	30
West	4	15	1	0	20
Average	6.25	15	2.5	0	23.75

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 85-1

**Land Management
Activity Recommended**

GPS: 28.476443, -81.15173

SPA-85-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	10	30	0	0	40
East	10	30	0	0	40
South	10	35	0	0	45
West	9	30	1	0	40
Average	9.75	31.25	0.25	0	41.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 85-2

Land Management
Good

GPS: 28.474544, -81.15005

SPA-85-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	10	25	5	0	40
East	5	30	5	0	40
South	8	30	2	0	40
West	5	27	3	0	35
Average	7	28	3.75	0	38.75

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 90-I

Land Management
Good

GPS: 28.476995, -81.15907

SPA-90-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	10	5	0	0	15
East	9	6	0	0	15
South	10	13	2	0	25
West	10	8	2	0	20
Average	9.75	8	1	0	18.75

Saw Palmetto Overall Height Class: 0 - 2'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 0-2'.

North



East



South



West



Site SPA 95-1

Land Management
Good

GPS: 28.47551, -81.15421

SPA-95-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	8	20	2	35
East	4	10	1	0	15
South	4	10	1	0	15
West	5	7	3	0	15
Average	4.5	8.75	6.25	0.5	20

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 100-I

Land Management
Good

GPS: 28.473872, -81.14564

SPA-100-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	2	1	0	0	3
East	2	1	0	0	3
South	2	1	0	0	3
West	3	6	1	0	10
Average	2.25	2.25	0.25	0	4.75

Saw Palmetto Overall Height Class: 0 - 2', 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is equal between 0-2' and 2-4'.

North



East



South



West



Site SPA I05-I

Land Management
Good

GPS: 28.470991, -81.14724

SPA-105-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	10	0	0	15
East	7	3	0	0	10
South	4	1	0	0	5
West	7	3	0	0	10
Average	5.75	4.25	0	0	10

Saw Palmetto Overall Height Class: 0 - 2'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 0-2'.

North



East



South



West



Site SPA 110-I

Land Management
Good

GPS: 28.468263, -81.1493

SPA-110-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	25	1	0	30
East	4	30	1	0	35
South	5	13	17	0	35
West	5	15	25	0	45
Average	4.5	20.75	11	0	36.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 115-I

Land Management
Good

GPS: 28.46749, -81.15286

SPA-115-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	30	1	0	35
East	5	30	0	0	35
South	7	13	0	0	20
West	10	20	0	0	30
Average	6.5	23.25	0.25	0	30

Saw Palmetto Overall Height Class: 2 - 4'

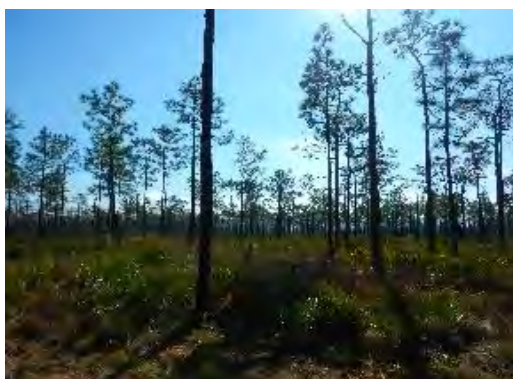
Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 120-I

**Land Management
Activity Recommended**

GPS: 28.470531, -81.15641

SPA-120-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	15	25	1	45
East	4	20	10	1	35
South	3	15	30	2	50
West	4	15	25	1	45
Average	3.75	16.25	22.5	1.25	43.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 125-I

**Land Management
Activity Recommended**

GPS: 28.469813, -81.15981

SPA-125-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	20	30	1	55
East	5	10	20	0	35
South	5	13	17	0	35
West	2	20	35	3	60
Average	4	15.75	25.5	1	46.25

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 130-I

Land Management
Good

GPS: 28.472847, -81.16215

SPA-130-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	6	4	0	15
East	4	6	0	0	10
South	3	7	0	0	10
West	5	7	2	1	15
Average	4.25	6.5	1.5	0.25	12.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 135-I

Land Management
Good

GPS: 28.476388, -81.16154

SPA-135-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	8	3	0	15
East	2	8	5	0	15
South	2	10	3	0	15
West	4	10	1	0	15
Average	3	9	3	0	15

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 140-I

Land Management
Good

GPS: 28.473333, -81.16399

SPA-140-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	9	6	0	20
East	5	10	5	0	20
South	7	8	0	0	15
West	7	8	0	0	15
Average	6	8.75	2.75	0	17.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 145-I

Land Management
Good

GPS: 28.477211, -81.16414

SPA-145-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	15	25	1	45
East	4	15	20	1	40
South	4	14	16	1	35
West	4	16	14	1	35
Average	4	15	18.75	1	38.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 150-I

Land Management
Good

GPS: 28.471152, -81.16677

SPA-150-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	7	3	0	15
East	4	5	1	0	10
South	3	7	0	0	10
West	4	10	1	0	15
Average	4	7.25	1.25	0	12.5

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 155-I

Land Management
Good

GPS: 28.468045, -81.1655

SPA-155-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	6	0	0	10
East	5	10	0	0	15
South	5	10	0	0	15
West	5	10	0	0	15
Average	4.75	9	0	0	13.75

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 15 sites (out of 43) that exhibits saw palmetto percent cover at between <25%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 160-I

**Land Management
Activity Recommended**

GPS: 28.470371, -81.17124

SPA-160-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	45	5	0	55
East	5	30	0	0	35
South	5	30	0	0	35
West	4	35	1	0	40
Average	4.75	35	1.5	0	41.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 165-I

Land Management
Good

GPS: 28.467915, -81.17959

SPA-165-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	16	4	0	25
East	5	20	5	0	30
South	10	15	0	0	25
West	10	15	0	0	25
Average	7.5	16.5	2.25	0	26.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 170-I

Land Management
Good

GPS: 28.468154, -81.17363

SPA-170-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	10	20	0	0	30
East	10	25	0	0	35
South	10	20	0	0	30
West	6	4	0	0	10
Average	9	17.25	0	0	26.25

Saw Palmetto Overall Height Class: 2-4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 175-I

Land Management
Good

GPS: 28.472505, -81.17719

SPA-175-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	30	5	0	40
East	5	28	2	0	35
South	5	27	3	0	35
West	5	27	3	0	35
Average	5	28	3.25	0	36.25

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 180-I

**Land Management
Activity Recommended**

GPS: 28.472457, -81.17377

SPA-180-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	1	9	20	25	55
East	2	8	20	10	40
South	3	7	25	10	45
West	1	4	30	10	45
Average	1.75	7	23.75	13.75	46.25

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 180-2

**Land Management
Activity Necessary**

GPS: 28.476619, -81.17083

SPA-180-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	4	20	55	1	80
East	6	20	50	4	80
South	4	20	50	1	75
West	3	20	55	2	80
Average	4.25	20	52.5	2	78.75

Saw Palmetto Overall Height Class: 4 - 6'

Management Comment:

This is the only site (out of 43) that exhibits saw palmetto percent cover at >75%. The dominant height class is 4-6'.

North



East



South



West



Site SPA 185-I

**Land Management
Activity Recommended**

GPS: 28.477055, -81.17648

SPA-185-1					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	Total
North	5	20	15	0	40
East	5	30	5	0	40
South	9	40	1	0	50
West	5	35	10	0	50
Average	6	31.25	7.75	0	45

Saw Palmetto Overall Height Class: 2 - 4'

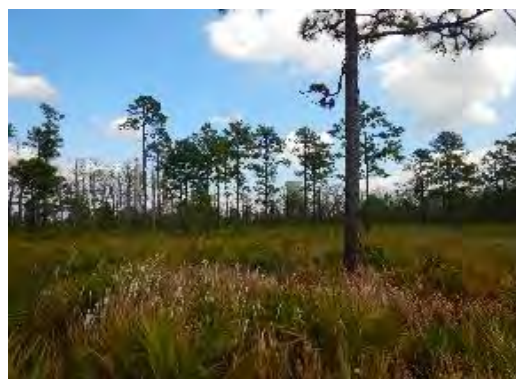
Management Comment:

This is one of 20 sites (out of 43) that exhibits saw palmetto percent cover at between 26-50%. The dominant height class is 2-4'.

North



East



South



West



Site SPA 185-2

**Land Management
Activity Recommended**

GPS:

SPA-185-2					
Quadrant	0 - 2'	2 - 4'	4 - 6'	> 6'	
North	4	24	26	1	55
East	5	25	15	5	50
South	5	30	15	0	50
West	5	20	30	5	60
Average	4.75	24.75	21.5	2.75	53.75

Saw Palmetto Overall Height Class: 2 - 4'

Management Comment:

This is one of 7 sites (out of 43) that exhibits saw palmetto percent cover at between 51-75%. The dominant height class is 2-4'.

North



East



South



West



APPENDIX C

Florida Administrative Code 5B-57.007 Noxious Weed List



5B-57.007 Noxious Weed List.

The following plants shall be considered noxious for the purpose of this rule chapter.

(1) Parasitic Weeds.

(a) *Aeginetia* spp. – *Aeginetia*

(b) *Alectra* spp. – *Alectra*

(c) *Cuscuta* spp. Only the native Florida species are excluded from this list. These include:

1. *C. americana*

2. *C. compacta*

3. *C. exaltata*

4. *C. gronovii*

5. *C. indecora*

6. *C. obtusiflora*

7. *C. pentagona*

8. *C. umbellata*

(d) *Orobanche* spp. – broomrapes, with the exception of *O. uniflora* – oneflowered broomrape.

(2) Terrestrial Weeds.

(a) *Ageratina adenophora* – crofton weed

(b) *Alternanthera sessilis* – sessile joyweed

(c) *Abrus precatorius* – rosary pea

(d) *Ardisia crenata* – coral ardisia

(e) *Ardisia elliptica* – shoebutton ardisia

(f) *Asphodelus fistulosus* – onionweed

(g) *Avena sterilis* – animated oat, wild oat

(h) *Borreria alata* – broadleaf buttonweed

(i) *Carthamus oxyacantha* – wild safflower

(j) *Casuarina equisetifolia* – Australian pine

(k) *Casuarina glauca* – suckering Australian pine

(l) *Chrysopogon aciculatus* – pilipiliula

(m) *Colubrina asiatica* – latherleaf

(n) *Commelina benghalensis* – Benghal dayflower

(o) *Crupina vulgaris* – common crupina

(p) *Cupaniopsis anacardioides* – carrotwood

(q) *Digitaria scalarum* – African couchgrass, fingergrass

(r) *Digitaria velutina* – velvet fingergrass, annual couchgrass

(s) *Dioscorea alata* – white yam

(t) *Dioscorea bulbifera* – air potato

(u) *Drymaria arenarioides* – lightning weed

(v) *Emex australis* – three-corner jack

(w) *Emex spinosa* – devil's thorn

(x) *Euphorbia prunifolia* – painted euphorbia

(y) *Galega officinalis* – goat's rue

(z) *Heracleum mantegazzianum* – giant hogweed

(aa) *Imperata brasiliensis* – Brazilian satintail

(bb) *Imperata cylindrica* – cogongrass

(cc) *Ipomoea triloba* – little bell, aiea morning glory

(dd) *Ischaemum rugosum* – murainograss

(ee) *Leptochloa chinensis* – Asian sprangletop

(ff) *Leucaena leucocephala* – lead tree

(gg) *Ligustrum sinense* – Chinese privet, except the cultivars 'Variegatum' and 'Sunshine'

(hh) *Lycium ferocissimum* – African boxthorn
 (ii) *Lygodium japonicum* – Japanese climbing fern
 (jj) *Lygodium microphyllum* – small-leaved climbing fern
 (kk) *Melaleuca quinquenervia* – melaleuca
 (ll) *Melastoma malabathricum* – Indian rhododendron.
 (mm) *Mikania cordata* – mile-a-minute
 (nn) *Mikania micrantha* – climbing hempweed
 (oo) *Mimosa invisa* – giant sensitive plant
 (pp) *Mimosa pigra* – catclaw mimosa
 (qq) *Nassella trichotoma* – serrated tussock
 (rr) *Neyraudia reynaudiana* – Burma reed
 (ss) *Nymphoides cristata* – crested floating heart
 (tt) *Nymphoides peltata* – yellow floating heart
 (uu) *Opuntia aurantiaca* – jointed prickly pear
 (vv) *Oryza longistaminata* – red rice
 (ww) *Oryza punctata* – red rice
 (xx) *Oryza rufipogon* – wild red rice
 (yy) *Paederia cruddasiana* – sewer-vine
 (zz) *Paederia foetida* – skunk-vine
 (aaa) *Paspalum scrobiculatum* – Kodomillet
 (bbb) *Pennisetum clandestinum* – Kikuyu grass
 (ccc) *Pennisetum macrourum* – African feathergrass
 (ddd) *Pennisetum pedicellatum* – Kyasuma grass
 (eee) *Pennisetum polystachyon* – missiongrass, thin napiergrass
 (fff) *Prosopis* spp.
 (ggg) *Pueraria montana* – kudzu
 (hhh) *Rhodomyrtus tomentosa* – downy myrtle
 (iii) *Rottboellia cochinchinensis* – itchgrass
 (jjj) *Rubus fruticosus* – bramble blackberry
 (kkk) *Rubus molluccanus* – wild raspberry
 (lll) *Saccharum spontaneum* – wild sugarcane
 (mmm) *Salsola vermiculata* – wormleaf salsola
 (nnn) *Sapium sebiferum* – Chinese tallow tree
 (ooo) *Scaevola taccada* – beach naupaka
 (ppp) *Schinus terebinthifolius* – Brazilian pepper-tree
 (qqq) *Setaria pallidifusca* – cattail grass
 (rrr) *Solanum tampicense* – wetland nightshade
 (sss) *Solanum torvum* – turkeyberry
 (ttt) *Solanum viarum* – tropical soda apple
 (uuu) *Tridax procumbens* – coat buttons
 (vvv) *Urochloa panicoides* – liverseed grass

Rulemaking Authority 570.07(23), 581.031(4), (5) FS. Law Implemented 581.031(4), (5), (6), 581.083, 581.091 FS. History—New 7-27-93, Amended 2-28-94, 6-30-96, 7-7-99, 10-1-06, 7-29-13, 7-21-14, 12-25-16.