

SACRED HEART MITIGATION

2025 Monitoring Report (Final) and Mitigation Release Request

USACE Permit No.: SAJ-1998-4720 IP-RVH

Permittee: Sacred Heart Hospital of Pensacola
C/o Mr. Patrick J. Madden – President
5151 North 9th Avenue
Pensacola, FL 32504

Responsible Party for Monitoring and Mitigation Implementation: Northwest Florida Water Management District
81 Water Management Drive
Havana, FL 32333

Entity Conducting Quantitative Vegetation Monitoring: Florida Natural Areas Inventory
Institute of Science and Public Affairs
Florida State University
1018 Thomasville Road, Suite 200-C
Tallahassee, FL 32303

Monitoring Dates: 10/27-29/2025 (Quantitative Vegetation Transects)
9/5/2025 (Panoramic Photography)

Summary

The Northwest Florida Water Management District (NFWFMD) has implemented mitigation (restoration of hydric pine flatwoods from existing slash pine plantation) on 82 acres at Devils Swamp (Sacred Heart Mitigation) to offset impacts to 8.77 acres of jurisdictional wetlands associated with construction of the Sacred Heart Hospital in south Walton County. Quantitative monitoring was conducted from 2017 – 2025 with annual reports submitted to the US Army Corps of Engineers (USACE), Jacksonville District, Regulatory Division, Enforcement Section and posted online at the NFWFMD website. Restoration activities included implementation of prescribed fire (2018, 2021, 2024), thinning of pines (2021), and herbicide treatment of shrubs (2019). Species diversity has increased from a baseline of 53 plant taxa identified in 2017 to 168 plant taxa identified in 2025. All success criteria appear to have been met. This report is the 10th quantitative report submitted to the USACE. Written verification releasing this site from further quantitative monitoring and reporting requirements is requested. Unless otherwise directed by the USACE, quantitative monitoring shall cease and no further reports shall be submitted. Although scheduled quantitative monitoring has ended, the NFWFMD shall continue annual photo monitoring and site inspections. Consistent with permit conditions, the NFWFMD will, in perpetuity, maintain and manage the site in a natural state as hydric pine flatwoods (including implementation of prescribed fire on a 2 to 3-year cycle and

treatment of exotic invasive vegetation, such as cogongrass, if or when observed).

Location and Site Description

The Sacred Heart offsite mitigation area is located approximately 15 miles east of the impact along an unnamed dirt road east of the unincorporated community of Bunker (Figure 1; Figure 2). Owned by the NFWFMD, the site had been converted to slash pine plantation prior to public acquisition in 1992. Available records indicate that the larger, western polygon that makes up the Sacred Heart mitigation site (see Figure 2) was planted with commercial stocking of slash pine in 1981 and that the smaller, eastern polygon was planted in 1988. Historic aerials suggest one or more rotations occurred prior to the 1980s.

Success Criteria

A) Reduce tree density to <200 trees per acre—met.

Thinning of slash pine within the mitigation area to <200 trees per acre was completed January 2021. Pine densities of 100 – 200 trees per acre are typical of hydric pine flatwoods in northwest Florida. Thermal thinning from ongoing prescribed fire is expected to result in additional reductions in pine density.

B) Implement prescribed fire on a 2 to 3-year cycle—met.

Since 2018, prescribed fire has been implemented on a 2 to 3-year cycle and will continue to be implemented in perpetuity on a 2 to 3-year cycle. Future burns will generally be implemented during the growing season as circumstances allow. Two-year fire returns are planned.

- February 2018 (dormant season fuel reduction burn).
- April 2021 (growing season burn).
- May 2024 (growing season burn).
- A growing season burn is planned for late spring or early summer in 2026.

C) Cover of Category I & II invasive exotic plant species (Florida Exotic Pest Plant Council) <1%—met.

Invasive exotic plants (Category I & II; Florida Exotic Pest Plant Council) cover less than 1% of the mitigation polygons at the site (see attached Florida Natural Areas Inventory Fall 2025 report). One occurrence of the non-native invasive cogongrass (*Imperata cylindrica*) was observed during the Fall 2025 vegetation monitoring and will be treated by NFWFMD staff with an appropriate herbicide. No other invasive exotic plants were found. Spot treatment of exotics will continue when occurrences are observed.

D) Conduct annual monitoring for a minimum of 5 years—met.

Quantitative vegetation monitoring was conducted annually from 2017 – 2025 with detailed reports submitted to the USACE. Repeat photo points were established in 2018 (Figure 3). Panoramic monitoring photos have been taken at each point annually and after each prescribed fire since 2018. All reports and panoramic monitoring photos are posted online at the NFWFMD website [<https://nfwfwater.com/water-resources/regional-wetland-mitigation-program/other-mitigation/sacred-heart-mitigation/>]. Monitoring was conducted by NFWFMD staff from 2017 – 2020. From 2021 – 2025, vegetation monitoring was conducted by the Florida Natural Areas Inventory (FNAI) of Florida State University. All panoramic photo monitoring has been conducted by NFWFMD staff.

- Fall 2017—baseline quantitative vegetation monitoring (NFWFMD Staff).
- Spring 2018—quantitative vegetation monitoring (NFWFMD Staff).
- Spring 2019—quantitative vegetation monitoring (NFWFMD Staff).
- Fall 2019—quantitative vegetation monitoring (NFWFMD Staff).
- Fall 2020—quantitative vegetation monitoring (NFWFMD Staff).
- Fall 2021—quantitative vegetation monitoring (FNAI).
- Fall 2022—quantitative vegetation monitoring (FNAI).
- Fall 2023—quantitative vegetation monitoring (FNAI).
- Fall 2024—quantitative vegetation monitoring (FNAI).
- Fall 2025—quantitative vegetation monitoring (FNAI).

E) Reduce shrub cover to <5%—met (applicable only to nuisance shrubs defined in this report as *Cliftonia monophylla* and *Cyrilla racemiflora*).

Shrubs are a natural component of hydric pine flatwoods and are generally controlled over time with frequent fire. Density of shrub cover within these systems can vary greatly. Sites where fire has been suppressed tend to be dominated by tall shrub cover (up to several meters tall) which can reduce the diversity of the herbaceous community. Conversely, sites with frequent fire tend to have more diverse herbaceous communities. Twenty-nine shrubs and subshrubs were identified in Fall 2025 at the Sacred Heart site and include those typically found within hydric pine flatwoods such as *Ilex glabra*, *Ilex coriacea*, *Cyrilla parviflora*, *Cliftonia monophylla*, and several *Gaylussacia* and *Hypericum* species. Although the percent cover for all shrub species combined in Fall 2025 averaged 16.25% (a value consistent with other high-quality, hydric pine flatwood systems), nuisance shrub cover (*Cliftonia monophylla* and *Cyrilla racemiflora*) has been reduced to 1.55%. Furthermore, average height across all shrub species has been reduced to <0.5m. The tall shrub stratum (~1-3m height; generally consisting of *Cliftonia monophylla* and *Cyrilla racemiflora*) that most severely impacted the herbaceous community has been eliminated. The herbaceous community has responded well. In 2017, 30 herbaceous species were identified at the Sacred Heart site; by 2025, the number of identified herbaceous species had risen to 131. Continued prescribed fire on a regular basis is expected to keep the shrub cover at acceptable densities and heights and keep nuisance shrub cover below 5%.

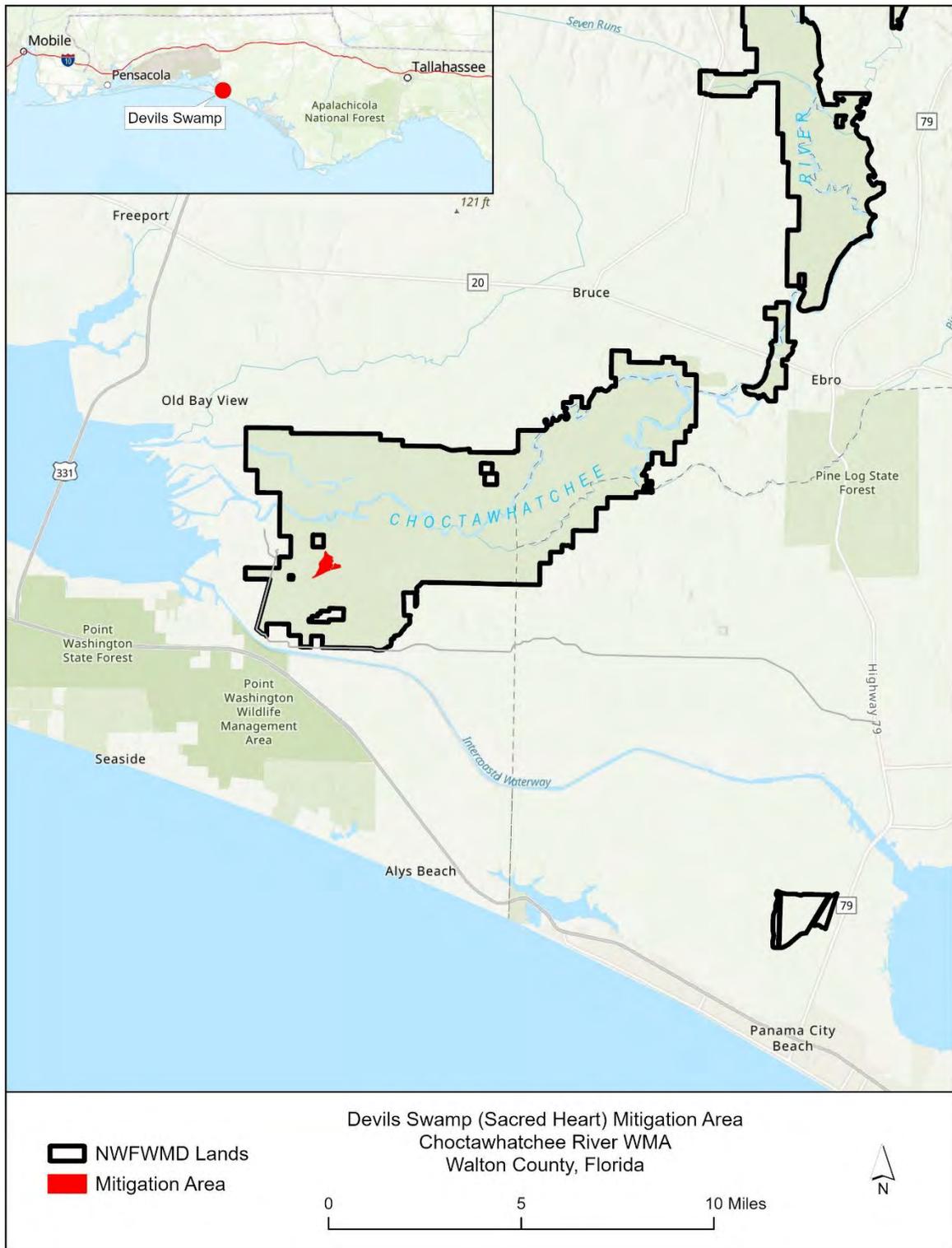


Figure 1. Mitigation Site Location Map

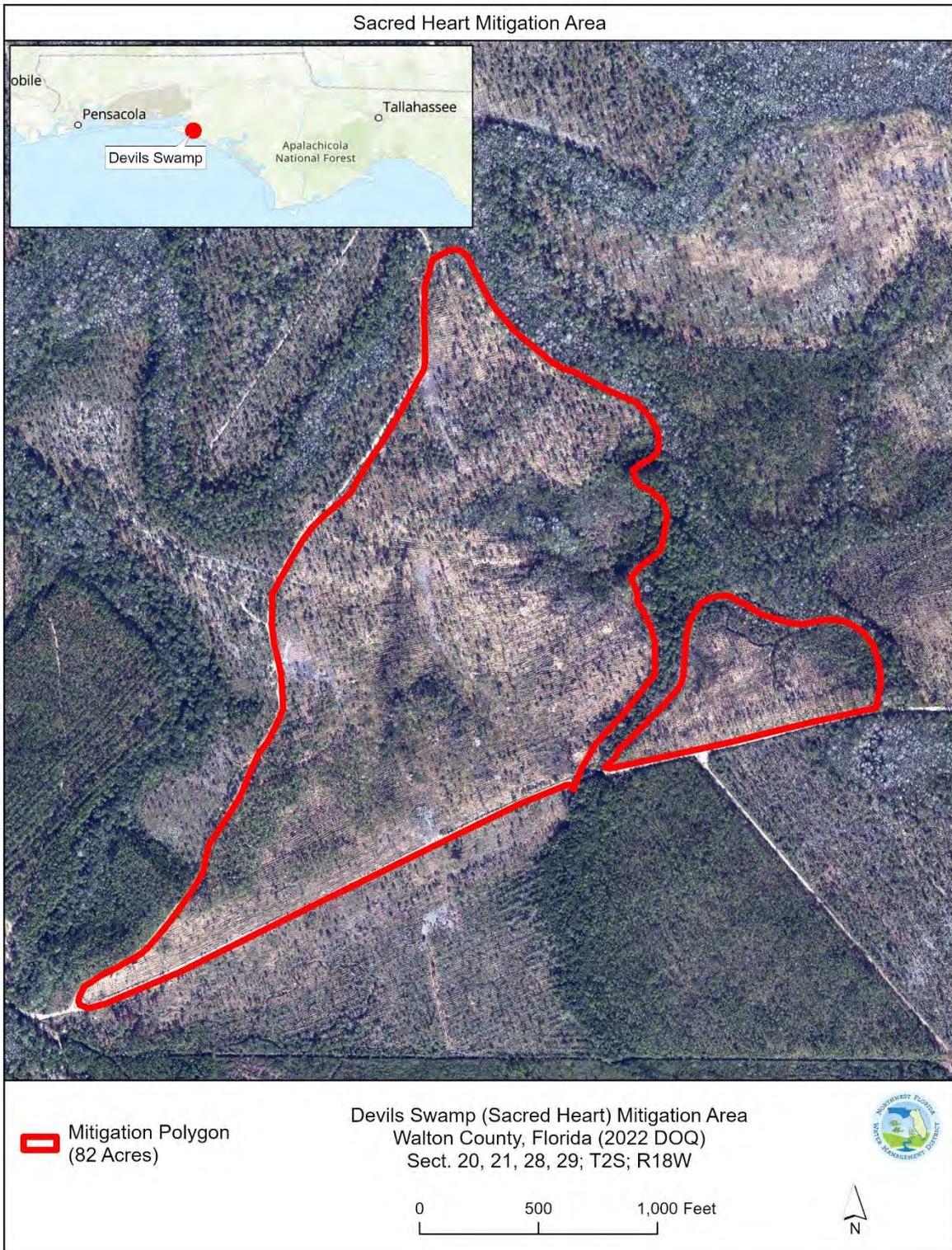


Figure 2. Mitigation Site Polygons

Panoramic Monitoring Photos

Photo Point 1 (Hydric Pine Flatwoods Restoration)



Sacred Heart Mitigation Photo Point 1: 3/8/2018



Sacred Heart Mitigation Photo Point 1: 9/18/2018



Sacred Heart Mitigation Photo Point 1: 9/26/2019



Sacred Heart Mitigation Photo Point 1: 10/30/2020



Sacred Heart Mitigation Photo Point 1: 4/21/2021



Sacred Heart Mitigation Photo Point 1: 9/23/2021



Sacred Heart Mitigation Photo Point 1: 11/3/2022



Sacred Heart Mitigation Photo Point 1: 9/22/2023



Sacred Heart Mitigation Photo Point 1: 6/4/2024



Sacred Heart Mitigation Photo Point 1: 10/8/2024



Sacred Heart Mitigation Photo Point 1: 9/5/2025

**Photo Point 2
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 2: 3/8/2018



Sacred Heart Mitigation Photo Point 2: 9/18/2018



Sacred Heart Mitigation Photo Point 2: 9/26/2019



Sacred Heart Mitigation Photo Point 2: 10/30/2020



Sacred Heart Mitigation Photo Point 2: 4/21/2021



Sacred Heart Mitigation Photo Point 2: 9/23/2021



Sacred Heart Mitigation Photo Point 2: 11/3/2022



Sacred Heart Mitigation Photo Point 2: 9/22/2023



Sacred Heart Mitigation Photo Point 2: 6/4/2024



Sacred Heart Mitigation Photo Point 2: 10/8/2024



Sacred Heart Mitigation Photo Point 2: 9/5/2025

**Photo Point 3
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 3: 3/8/2018



Sacred Heart Mitigation Photo Point 3: 9/18/2018



Sacred Heart Mitigation Photo Point 3: 9/26/2019



Sacred Heart Mitigation Photo Point 3: 10/30/2020



Sacred Heart Mitigation Photo Point 3: 4/21/2021



Sacred Heart Mitigation Photo Point 3: 9/23/2021



Sacred Heart Mitigation Photo Point 3: 11/3/2022



Sacred Heart Mitigation Photo Point 3: 9/22/2023



Sacred Heart Mitigation Photo Point 3: 6/4/2024



Sacred Heart Mitigation Photo Point 3: 10/8/2024



Sacred Heart Mitigation Photo Point 3: 9/5/2025

**Photo Point 4
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 4: 3/8/2018



Sacred Heart Mitigation Photo Point 4: 9/18/2018



Sacred Heart Mitigation Photo Point 4: 9/26/2019



Sacred Heart Mitigation Photo Point 4: 10/30/2020



Sacred Heart Mitigation Photo Point 4: 4/21/2021



Sacred Heart Mitigation Photo Point 4: 9/23/2021



Sacred Heart Mitigation Photo Point 4: 11/3/2022



Sacred Heart Mitigation Photo Point 4: 9/22/2023



Sacred Heart Mitigation Photo Point 4: 6/4/2024



Sacred Heart Mitigation Photo Point 4: 10/8/2024



Sacred Heart Mitigation Photo Point 4: 9/5/2025

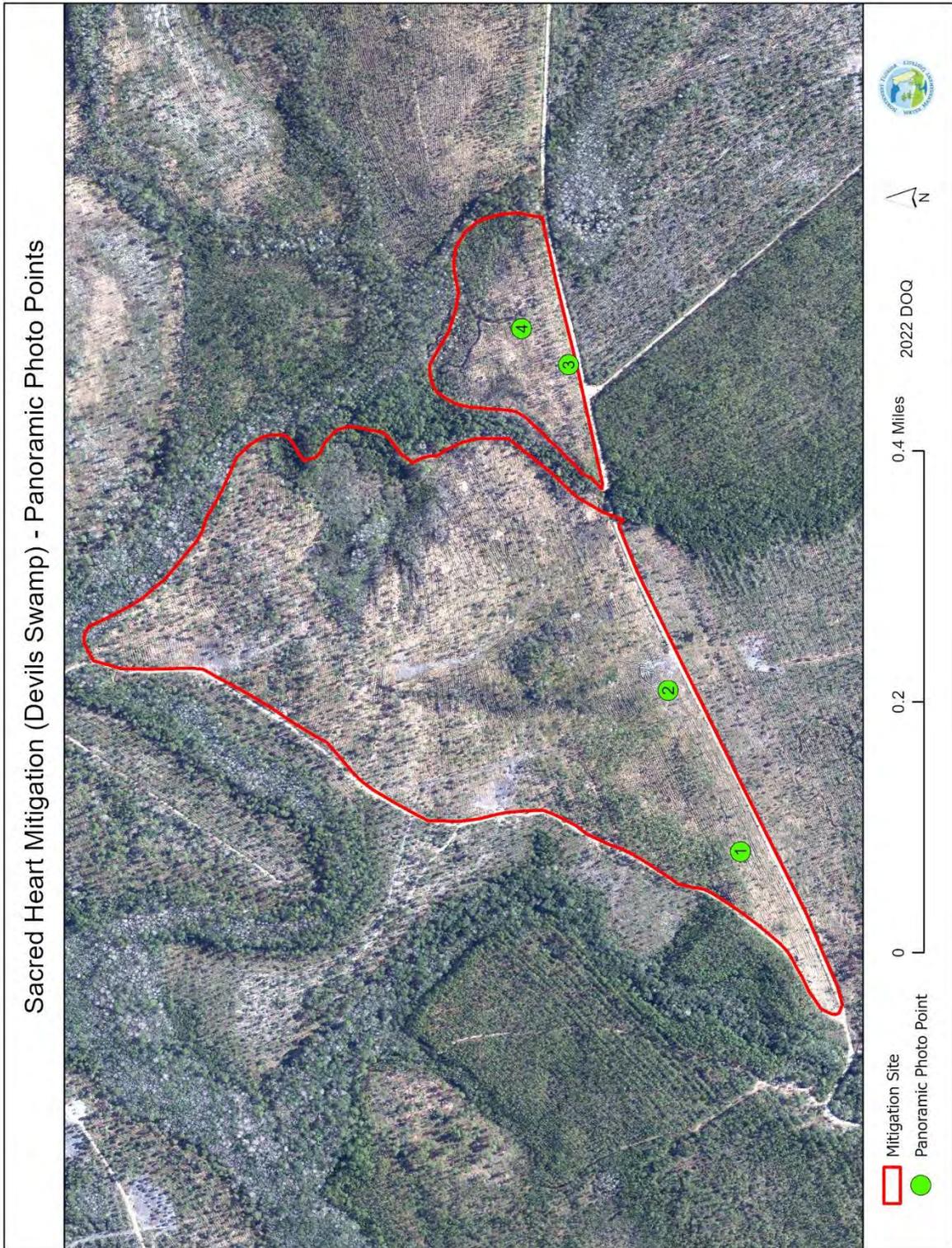


Figure 3. Panoramic Photo Points

APPENDIX (FNAI 20025 VEGETATION MONITORING REPORT)

**Vegetation Monitoring at Sacred Heart
Northwest Florida Water Management District
Non-FDOT Mitigation Site**

Fall 2025

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Funding for this project was provided by the Northwest Florida Water Management District under the Purchase Order #00260037-000 with the Florida Natural Areas Inventory

Florida State University
Sacred Heart Mitigation Site
Bay County
USACE Permit #SAJ-1998-4720 IP-RVH
Qualitative and Quantitative Monitoring
October 2025

INTRODUCTION

The Sacred Heart Mitigation Site project compensates for impacts to jurisdictional wetlands associated with the construction of Sacred Heart Hospital near the intersection of US 98 and Mack Bayou Road in Walton County. The goal of this mitigation is to restore 82 acres of hydric pine flatwoods at Devils Swamp, an area that is owned and managed for ecological integrity by the Northwest Florida Water Management District (NFWFMD) and is part of the Choctawhatchee River Water Management Area. The offsite mitigation area is located approximately 15 miles east of the impact along an unnamed dirt road east of the unincorporated community of Bunker. The site is adjacent to the Bayport Mitigation Site which was monitored at the same time (Figure 1). Prior to NFWFMD acquisition in 1992, the Devils Swamp site had been converted to slash pine plantation.

The mitigation area is divided into two polygons. According to NFWFMD, mitigation activities implemented to date include baseline monitoring (August 2017), shrub and tree density reduction, prescribed fire, repeat panoramic photography, herbicide treatments to reduce shrub regrowth, and post-baseline quantitative vegetation monitoring.

FNAI conducted quantitative and qualitative monitoring to document the current plant species composition and vegetation structure of these targeted areas. FNAI biologists previously monitored the site vegetation in Fall 2024.

METHODS

We measured percent vegetation cover along four 150-foot transects (Figure 2). We placed fifteen 1m x 1m quadrats along the left side of each transect line, beginning at 10 feet and then spaced every 10 feet thereafter.

In each quadrat, we visually estimated the percent cover of each plant species, including individuals rooted in the quadrat as well as overhanging. Canopy over 2 m in height was excluded from cover estimates. Only the lower 2 m portions of larger individuals were counted as cover, including the lower portions of tree trunks rooted in quadrats. We converted plant cover estimates to mid-point values and averaged them across each transect. We also calculated relative cover (in which all plant cover and open ground is given as a proportion of the total plant cover); this is reported in separate pie charts.

In addition to cover by species, cover was also estimated as a whole number for all plants, all herbs, and all shrubs. Relative covers for each plant species were calculated as a portion of the total plant cover.

For each quad, the height of shrubs was recorded in centimeters. The observer used a measuring pole marked in decimeters and estimated the average height over the quad. Woody vines and tree species were omitted from this measurement.

To monitor rooted shrub stem density, we used five 1 m² quadrats established at random and counted each stem originating from the ground (Table 6).

For qualitative monitoring, we walked meandering transects throughout the mitigation site and recorded all plant species as well as observations on vegetation structure. FNAI botanists Kim Alexander and Ethan Hughes conducted all field surveys on October 27-29, 2025.

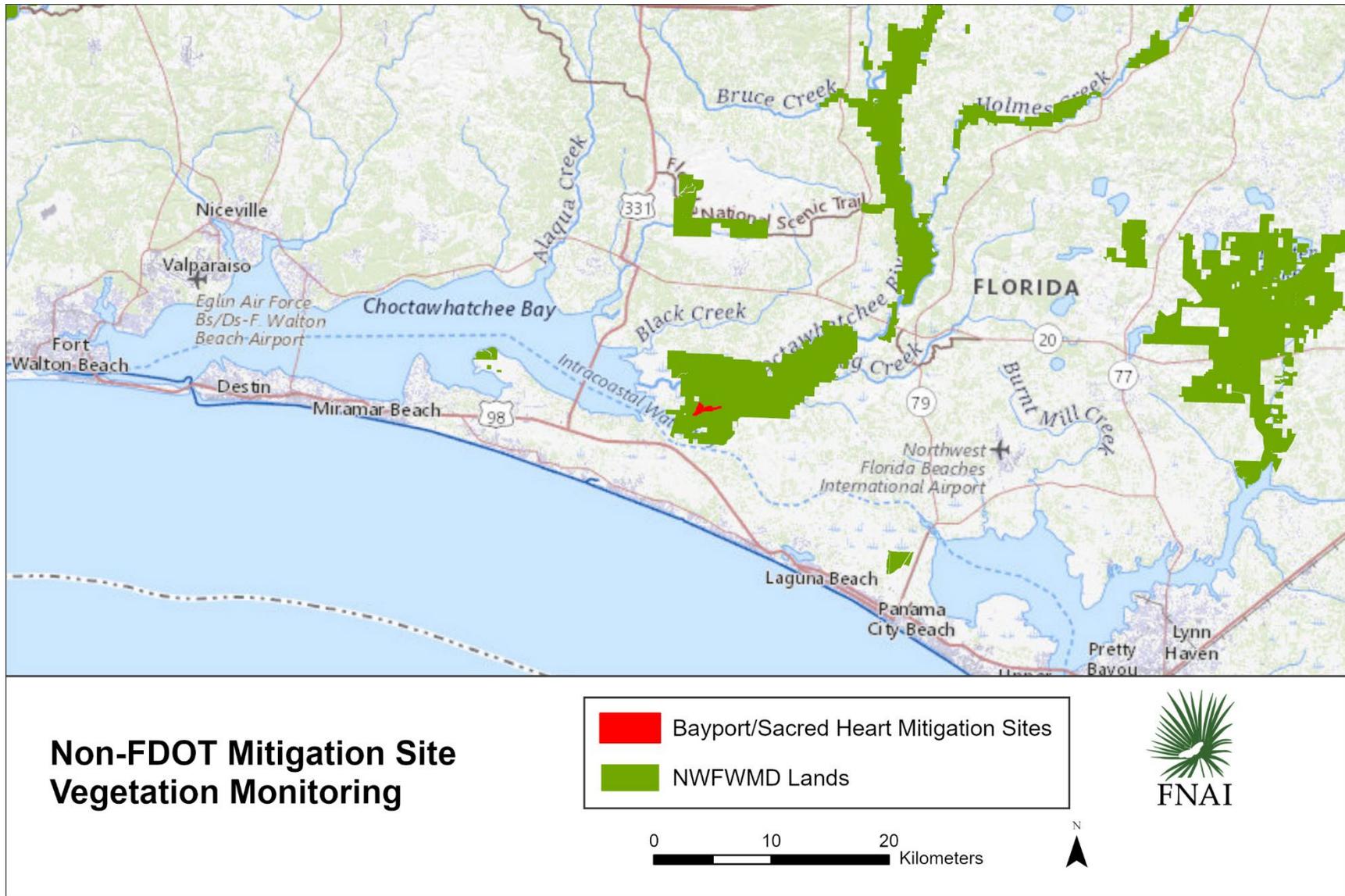
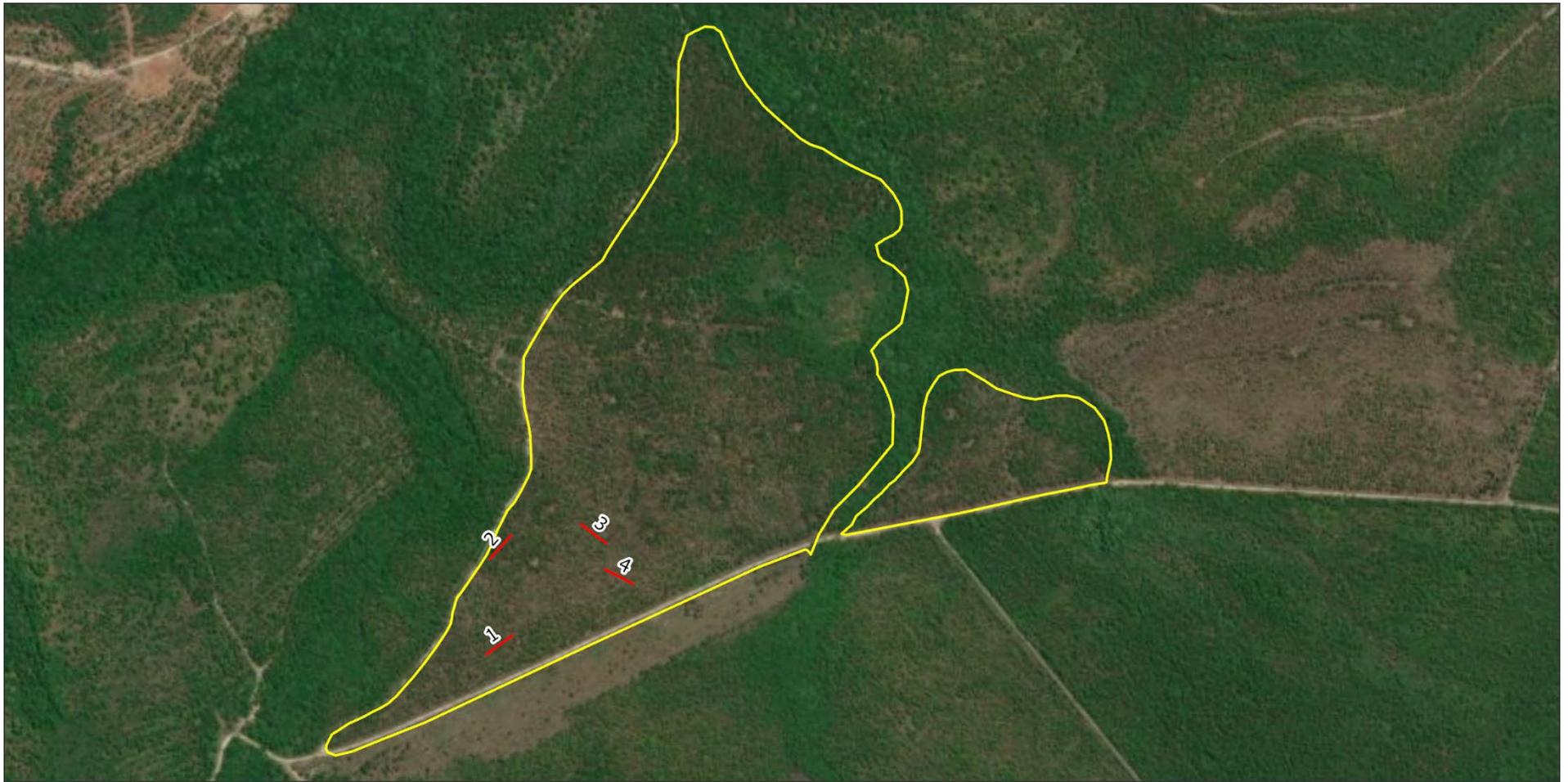


Figure 1. Location map of Devils Swamp non-FDOT NFWMD mitigation sites monitored by FNAI.



Sacred Heart Mitigation Site Vegetation Monitoring

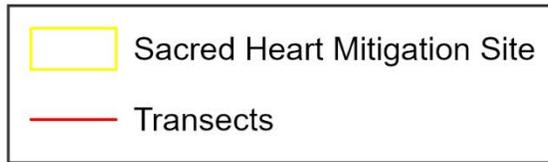


Figure 2. Location of transects at Sacred Heart Mitigation Site.

RESULTS AND DISCUSSION

FNAI detected 168 plant taxa in the surveyed area of Sacred Heart Mitigation Site during the 2025 monitoring period (Table 1). We documented 51 new taxa during the 2025 monitoring (i.e., species or varieties not observed during 2021-2024 site visits). Taxonomy follows Weakley, A.S., and Southeastern Flora Team. 2023. Flora of the southeastern United States: Florida. University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, U.S.A.

Table 1. Species observed at Sacred Heart Mitigation Site, October 27-29, 2025 (bold name = new species, * = state-listed threatened or endangered, † = non-native invasive).

Scientific Name	Common Name
* <i>Andropogon arctatus</i>	pinewoods bluestem
<i>Andropogon capillipes</i>	dryland white bluestem
<i>Andropogon cretaceus</i>	purple bluestem
<i>Andropogon dealbatus</i>	wetland white bluestem
<i>Andropogon glomeratus</i>	bushy bluestem
<i>Andropogon gyrans</i>	Elliott's bluestem
<i>Andropogon perangustatus</i>	narrowleaf bluestem
<i>Andropogon ternarius</i>	splitbeard bluestem
<i>Andropogon virginicus</i> var. 1	smooth bluestem
<i>Andropogon virginicus</i> var. <i>virginicus</i>	broomsedge bluestem
<i>Anthenantia rufa</i>	purple silkscale
<i>Aristida beyrichiana</i>	Southern wiregrass
<i>Aristida purpurascens</i>	arrowfeather threeawn
<i>Aristida tenuispica</i>	Southern arrowfeather
<i>Aristida virgata</i>	arrowfeather threeawn
<i>Aronia arbutifolia</i>	red chokeberry
<i>Asimina parviflora</i>	smallflower pawpaw
<i>Balduina uniflora</i>	oneflower honeycomb-head
<i>Baptisia lanceolata</i>	gopherweed
<i>Callicarpa americana</i>	American beautyberry
<i>Carphephorus pseudoliatris</i>	bristleleaf chaffhead
<i>Centella erecta</i>	spadeleaf
<i>Chrysopsis lanuginosa</i>	Lynn Haven goldenaster
<i>Clethra alnifolia</i>	sweet pepperbush
<i>Clethra tomentosa</i>	downy sweet pepperbush
<i>Cliftonia monophylla</i>	black titi
<i>Cnidocolus stimulosus</i>	tread softly
<i>Coleataenia longifolia</i>	ciliate redtop panicum
<i>Ctenium aromaticum</i>	toothache grass
<i>Cyrilla parvifolia</i>	littleleaf titi
<i>Dichanthelium aciculare</i>	needleleaf witchgrass
<i>Dichanthelium angustifolium</i>	narrowleaf witchgrass

Scientific Name	Common Name
<i>Dichanthelium ensifolium</i>	small-leaved witchgrass
<i>Dichanthelium laxiflorum</i>	openflower witchgrass
<i>Dichanthelium longiligulatum</i>	long-ligule witchgrass
<i>Dichanthelium ovale</i> var. <i>ovale</i>	oval-flowered witchgrass
<i>Dichanthelium scabriusculum</i>	woolly witchgrass
<i>Dichanthelium sphaerocarpon</i>	roundseed witchgrass
<i>Dichanthelium strigosum</i>	roughhair witchgrass
<i>Dichanthelium strigosum</i> var. <i>glabrescens</i>	roughhair witchgrass
<i>Dichanthelium tenue</i>	white-edged witchgrass
<i>Dichanthelium consanguineum</i>	Kunth's witchgrass
<i>Dichanthelium ravenelii</i>	Ravenel's witchgrass
<i>Digitaria villosa</i>	shaggy crabgrass
<i>Diospyros virginiana</i>	common persimmon
<i>Drosera capillaris</i>	pink sundew
<i>Edrastima uniflora</i>	oldenlandia
<i>Elephantopus elatus</i>	tall elephantsfoot
<i>Eragrostis</i> sp.	lovegrass
<i>Eriocaulon decangulare</i>	tenangle pipewort
<i>Eupatorium compositifolium</i>	yankeeweed
<i>Eupatorium mohrii</i>	Mohr's thoroughwort
<i>Eupatorium pilosum</i>	rough boneset
<i>Eupatorium rotundifolium</i>	roundleaf thoroughwort
<i>Eupatorium semiserratum</i>	smallflower thoroughwort
<i>Euphorbia discoidalis</i>	summer spurge
<i>Euphorbia inundata</i> var. <i>inundata</i>	Florida pineland spurge
<i>Eurybia eryngiifolia</i>	thistleleaf aster
<i>Euthamia caroliniana</i>	slender flattop goldenrod
<i>Gaylussacia dumosa</i>	dwarf huckleberry
<i>Gaylussacia mosieri</i>	woolly huckleberry
<i>Gaylussacia nana</i>	dwarf dangleberry
<i>Geobalanus oblongifolius</i>	gopher apple
<i>Hibiscus aculeatus</i>	comfortroot
<i>Houstonia procumbens</i>	roundleaf bluet
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort
<i>Hypericum cistifolium</i>	roundpod St. John's wort
<i>Hypericum crux-andreae</i>	St. Peter's wort
<i>Hypericum gentianoides</i>	orangegrass
<i>Hypericum hypericoides</i>	St. Andrew's cross
<i>Hypericum microsepalum</i>	flatwoods St. John's wort
<i>Hypericum setosum</i>	hairy St. John's wort
<i>Ilex coriacea</i>	large gallberry
<i>Ilex glabra</i>	gallberry
<i>Ilex myrtifolia</i>	myrtle-leaved holly

Scientific Name	Common Name
<i>Ilex vomitoria</i>	yaupon
† <i>Imperata cylindrica</i>	cogon grass
<i>Iva microcephala</i>	Piedmont marshelder
<i>Kelochloa verrucosa</i>	warty panicgrass
<i>Lachnanthes caroliniana</i>	Carolina redroot
<i>Lachnocaulon anceps</i>	whitehead bogbutton
<i>Lechea</i> sp.	pinweed
<i>Liatris resinosa</i>	dense gayfeather
<i>Liatris tenuifolia</i>	shortleaf gayfeather
<i>Liquidambar styraciflua</i>	sweetgum
<i>Lobelia brevifolia</i>	shortleaf lobelia
<i>Lophiola aurea</i>	golden crest
<i>Ludwigia linearis</i> var. <i>linearis</i>	Eastern narrowleaf primrosewillow
<i>Ludwigia linifolia</i>	Southeastern primrosewillow
<i>Ludwigia maritima</i>	seaside primrosewillow
<i>Lycopodiella alopecuroides</i>	foxtail club-moss
<i>Lycopodiella appressa</i>	Southern club-moss
<i>Magnolia virginiana</i> var. <i>australis</i>	sweetbay
<i>Mecardonia acuminata</i>	axilflower
<i>Mitreola sessilifolia</i>	swamp hornpod
<i>Morella pumila</i>	dwarf bayberry
moss	
<i>Muscadinia rotundifolia</i>	muscadine
<i>Nyssa biflora</i>	swamp tupelo
<i>Nyssa sylvatica</i>	blackgum
<i>Osmunda spectabilis</i>	royal fern
<i>Osmundastrum cinnamomeum</i>	cinnamon fern
<i>Palhinhaea cernua</i>	nodding club-moss
<i>Pinus elliotii</i>	slash pine
<i>Pinus palustris</i>	longleaf pine
<i>Pinus taeda</i>	loblolly pine
<i>Pityopsis nervosa</i>	silkgrass
<i>Polygala lutea</i>	orange milkwort
<i>Polygala ramosa</i>	low pinebarren milkwort
<i>Polygonella gracilis</i>	tall jointweed
<i>Polypremum procumbens</i>	rustweed
<i>Prunus serotina</i> var. <i>serotina</i>	Eastern wild black cherry
<i>Pseudognaphalium obtusifolium</i>	sweet everlasting
<i>Pseudolycopodiella caroliniana</i>	slender club-moss
<i>Quercus falcata</i>	Southern red oak
<i>Quercus hemisphaerica</i>	laurel oak
<i>Quercus incana</i>	bluejack oak
<i>Quercus minima</i>	dwarf live oak

Scientific Name	Common Name
<i>Quercus nigra</i>	water oak
<i>Quercus virginiana</i>	live oak
<i>Rhexia alifanus</i>	savannah meadowbeauty
<i>Rhexia lutea</i>	yellow meadowbeauty
<i>Rhexia mariana</i> var. <i>exalbida</i>	white meadowbeauty
<i>Rhexia petiolata</i>	fringed meadowbeauty
<i>Rhus copallinum</i> var. <i>copallinum</i>	winged sumac
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge
<i>Rhynchospora compressa</i>	flatfruit beaksedge
<i>Rhynchospora debilis</i>	savannah beaksedge
<i>Rhynchospora distans</i>	narrow-fruited fascicled beaksedge
<i>Rhynchospora fascicularis</i>	fascicled beaksedge
<i>Rhynchospora pineticola</i>	pinebarren beaksedge
<i>Rhynchospora plumosa</i>	plumed beaksedge
<i>Rhynchospora pusilla</i>	fairy beaksedge
<i>Rubus cuneifolius</i>	sand blackberry
<i>Sabatia brevifolia</i>	shortleaf rosegentian
<i>Salvia azurea</i> var. <i>azurea</i>	azure blue sage
<i>Schizachyrium scoparium</i>	little bluestem
<i>Schizachyrium tenerum</i>	slender bluestem
<i>Scleria ciliata</i> var. <i>ciliata</i>	hairy nutrush
<i>Scleria ciliata</i> var. <i>elliottii</i>	broad-leaved hairy nutrush
<i>Scleria muehlenbergii</i>	pitted nutrush
<i>Serenoa repens</i>	saw palmetto
<i>Sericocarpus tortifolius</i>	whitetop aster
<i>Seymeria cassioides</i>	yaupon blacksennea
<i>Smilax auriculata</i>	earleaf greenbriar
<i>Smilax glauca</i>	cat greenbriar
<i>Smilax laurifolia</i>	laurel greenbriar
<i>Smilax walteri</i>	coral greenbriar
<i>Solidago fistulosa</i>	pinebarren goldenrod
<i>Solidago odora</i>	sweet goldenrod
<i>Solidago virgata</i>	wand goldenrod
<i>Sophronanthe pilosa</i>	shaggy hedgehyssop
<i>Stillingia sylvatica</i>	queen's delight
<i>Symphyotrichum adnatum</i>	scaleleaf aster
<i>Symphyotrichum concolor</i> var. <i>devestitum</i>	Gulf Coast silver aster
<i>Symphyotrichum dumosum</i>	rice button aster
<i>Tephrosia spicata</i>	spiked hoary-pea
<i>Trilisa odoratissima</i>	vanillaleaf
<i>Vaccinium fuscatum</i>	hairy highbush blueberry

Scientific Name	Common Name
<i>Vaccinium myrsinites</i>	shiny blueberry
<i>Viola vittata</i>	Southern water violet
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass
<i>Xyris curtissii</i>	Curtiss' yellow-eyed grass
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass
<i>Xyris platylepis</i>	tall yellow-eyed grass
<i>Xyris serotina</i>	acid swamp yellow-eyed grass
Total number of taxa: 168	

Qualitative sampling

We found 168 plant taxa at this site in 2025 (Table 1), a large increase from last year probably attributable to a different meander path through a drier portion of the site. Species include one state-listed threatened species (Curtiss' sandgrass and pinewoods bluestem). The state-listed rare Curtiss' sandgrass and wiregrass gentian have also been seen on the site in prior surveys but were not found in the area searched this year. A new occurrence of the non-native invasive cogon grass was seen.

This is a pine plantation in various stages of thinning. Slash pines are young with basal areas ranging from 10-30 ft² per acre up to 150-200 ft² per acre, depending on how much canopy reduction has taken place. There is heavy soil disturbance from past bedding plus scattered low artificial mounds. There are patches of dense, tall titi shrubs, but otherwise, shrubs are around 1 meter or shorter, mostly gallberry, black titi, and woolly huckleberry. Saw palmetto is sparse. Herbs are primarily weedy bluestems, particularly on the southern half of the site, with a mix of other mostly graminoids. Laurel greenbrier is found throughout, forming some thick patches.

Quantitative sampling

- Transect 1 (Figure 3, Table 2) had a total of 40 taxa with 76% total plant cover. Overall shrub cover was 17% and herbs averaged 59% cover. Compared to 2024, this represents about the same species diversity and an increase in total plant cover (58% in 2024). Shrub cover and overall woody cover increased compared to last year. Nuisance shrubs (titi and black titi) were 3.7% cover. Shrubs averaged about 0.5 meters tall.
- Transect 2 (Figure 4, Table 3) had a total of 45 taxa with 52% total plant cover. Overall shrub cover was 8% and herbs averaged 16% cover. Compared to 2024, this represents an increase in species diversity (36 in 2024) and a small decrease in total plant cover (61% in 2024). Although shrub cover was low, total woody cover increased compared to last year driven by an increase in greenbriers. Nuisance shrubs (titi and black titi) were 2.5% cover. Shrubs averaged 0.4 meters tall.

- Transect 3 (Figure 5, Table 4) had a total of 52 taxa with 72% total plant cover. Overall shrub cover was 12% and herbs averaged 58% cover. Compared to 2024, this represents an increase in species diversity (37 in 2024) and little change in total plant cover. Total woody cover was about the same as last year, and shrubs averaged around 0.5 meters tall. There were no nuisance shrubs (titi and black titi).
- Transect 4 (Figure 6, Table 5) had a total of 41 taxa with 80% total plant cover. Overall shrub cover was 28% and herbs averaged 58% cover. Compared to 2024, this represents a slight decrease in species diversity (44 in 2024) and an increase in total plant cover (67% in 2024). Total woody cover increased from last year, and shrubs averaged around 0.5 meters tall. There were no nuisance shrubs (titi and black titi).

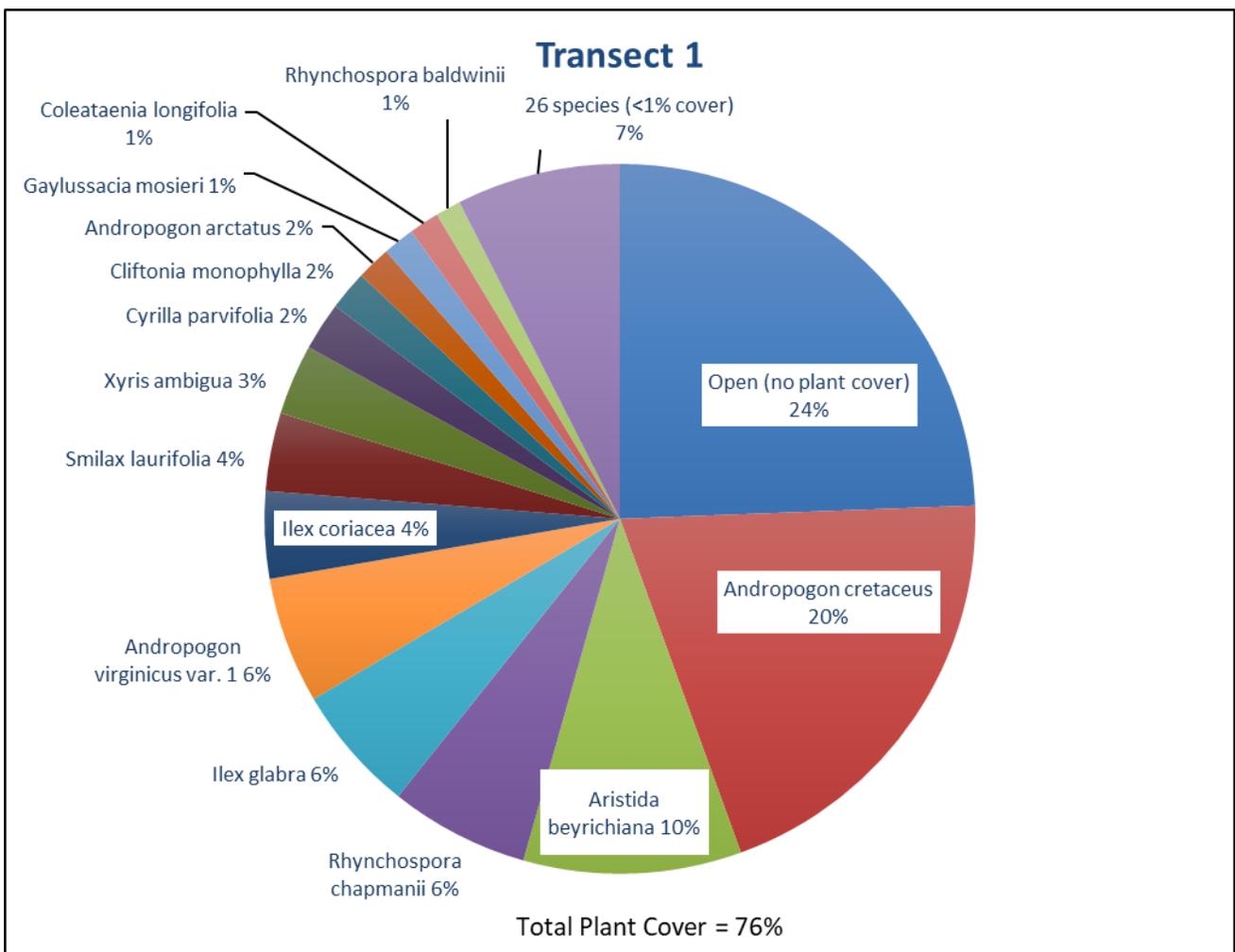


Figure 3. Percent relative cover of plant species in Transect 1.

Table 2. Percent cover of plant species in Transect 1 sampled on October 28, 2025.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon arctatus</i>	pinewoods bluestem	1.43
<i>Andropogon cretaceus</i>	purple bluestem	18.57
<i>Andropogon glomeratus</i>	bushy bluestem	0.23
<i>Andropogon perangustatus</i>	narrowleaf bluestem	0.27
<i>Andropogon virginicus</i> var. <i>virginicus</i>	broomsedge bluestem	0.47
<i>Andropogon virginicus</i> var. <i>1</i>	smooth bluestem	5.33
<i>Aristida beyrichiana</i>	Southern wiregrass	9.17
<i>Aronia arbutifolia</i>	red chokeberry	0.73
<i>Cliftonia monophylla</i>	black titi	1.67
<i>Coleataenia longifolia</i>	ciliate redtop panicum	1.27
<i>Ctenium aromaticum</i>	toothache grass	0.53
<i>Cyrilla parvifolia</i>	littleleaf titi	2.03
<i>Dichanthelium ensifolium</i>	small-leaved witchgrass	0.40
<i>Dichanthelium longiligulatum</i>	long-ligule witchgrass	0.87
<i>Dichanthelium strigosum</i>	roughhair witchgrass	0.10
<i>Eriocaulon decangulare</i>	tenangle pipewort	0.20
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.03
<i>Gaylussacia mosieri</i>	woolly huckleberry	1.33
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort	0.07
<i>Hypericum cistifolium</i>	roundpod St. John's wort	0.27
<i>Ilex coriacea</i>	large gallberry	3.67
<i>Ilex glabra</i>	gallberry	5.37
<i>Ilex myrtifolia</i>	myrtle-leaved holly	0.10
<i>Kelloggloa verrucosa</i>	warty panicgrass	0.20
<i>Lachnanthes caroliniana</i>	Carolina redroot	0.23
<i>Lachnocaulon anceps</i>	whitehead bogbutton	0.13
<i>Lophiola aurea</i>	golden crest	0.30
<i>Ludwigia maritima</i>	seaside primrosewillow	0.13
<i>Lycopodiella alopecuroides</i>	foxtail club-moss	0.37
<i>Polygala lutea</i>	orange milkwort	0.03
<i>Rhexia alifanus</i>	savannah meadowbeauty	0.27
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.13
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	1.07
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	5.87
<i>Rhynchospora plumosa</i>	plumed beaksedge	0.47
<i>Smilax laurifolia</i>	laurel greenbriar	3.30
<i>Vaccinium fuscatum</i>	hairy highbush blueberry	0.10
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	2.97
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass	0.23
<i>Xyris</i> sp.	yellow-eyed grass	0.03
Open (no plant cover)		24.40

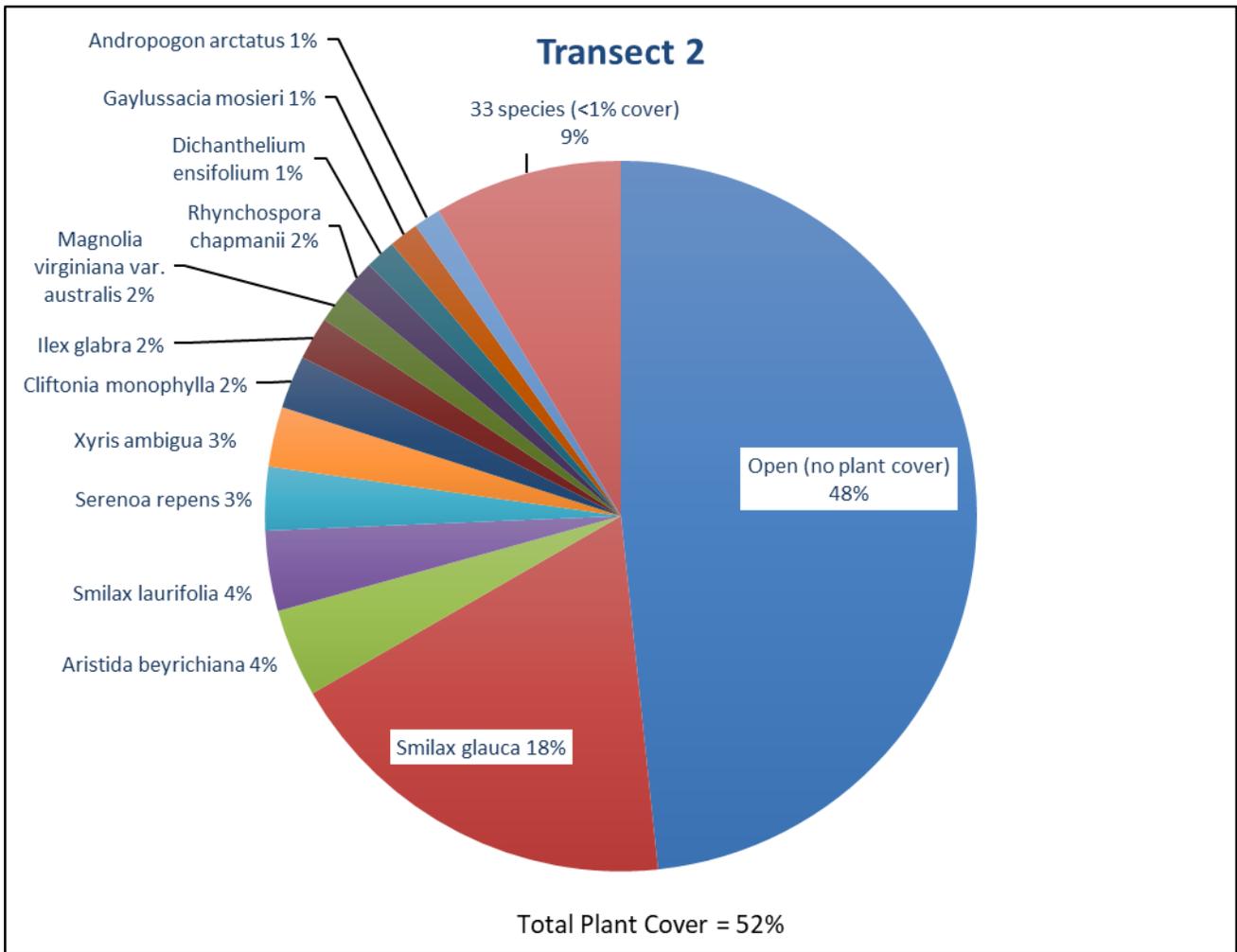


Figure 4. Percent relative cover of plant species in Transect 2.

Table 3. Percent cover of plant species in Transect 2 sampled on October 27, 2025.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon arctatus</i>	pinewoods bluestem	1.27
<i>Andropogon capillipes</i>	dryland white bluestem	0.27
<i>Andropogon cretaceus</i>	purple bluestem	0.50
<i>Andropogon virginicus</i> var. <i>virginicus</i>	broomsedge bluestem	0.77
<i>Aristida beyrichiana</i>	Southern wiregrass	4.17
<i>Aristida virgata</i>	arrowfeather threeawn	0.03
<i>Cliftonia monophylla</i>	black titi	2.50
<i>Coleataenia longifolia</i>	ciliate redtop panicum	0.17
<i>Ctenium aromaticum</i>	toothache grass	0.03
<i>Dichanthelium ensifolium</i>	small-leaved witchgrass	1.43
<i>Dichanthelium</i> sp.	witchgrass	0.10
<i>Dichanthelium strigosum</i>	roughhair witchgrass	0.10

Scientific name	Common name	Average percent cover per quadrat
<i>Edrastima uniflora</i>	oldenlandia	0.80
<i>Eragrostis</i> sp.	lovegrass	0.03
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.10
<i>Eupatorium pilosum</i>	rough boneset	0.03
<i>Gaylussacia mosieri</i>	woolly huckleberry	1.40
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort	0.63
<i>Hypericum cistifolium</i>	roundpod St. John's wort	0.07
<i>Hypericum crux-andreae</i>	St. Peter's wort	0.50
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	0.10
<i>Ilex glabra</i>	gallberry	2.03
<i>Kelochloa verrucosa</i>	warty panicgrass	0.73
<i>Lachnanthes caroliniana</i>	Carolina redroot	0.27
<i>Lechea</i> sp.	pinweed	0.03
<i>Magnolia virginiana</i> var. <i>australis</i>	sweetbay	1.67
moss	moss	0.03
<i>Muscadinia rotundifolia</i>	muscadine	0.23
<i>Pinus elliotii</i>	slash pine	0.97
<i>Quercus minima</i>	dwarf live oak	0.13
<i>Rhexia alifanus</i>	savannah meadowbeauty	0.33
<i>Rhexia mariana</i> var. <i>exalbida</i>	white meadowbeauty	0.17
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	0.73
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	1.63
<i>Rhynchospora debilis</i>	savannah beaksedge	0.10
<i>Rhynchospora distans</i>	narrow-fruited fascicled beaksedge	0.03
<i>Scleria ciliata</i> var. <i>ciliata</i>	hairy nutrush	0.13
<i>Scleria muehlenbergii</i>	pitted nutrush	0.10
<i>Serenoa repens</i>	saw palmetto	3.00
<i>Smilax glauca</i>	cat greenbriar	19.07
<i>Smilax laurifolia</i>	laurel greenbriar	3.80
<i>Viola vittata</i>	Southern water violet	0.43
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	2.83
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass	0.07
<i>Xyris curtissii</i>	Curtiss' yellow-eyed grass	0.17
Open (no plant cover)		48.33

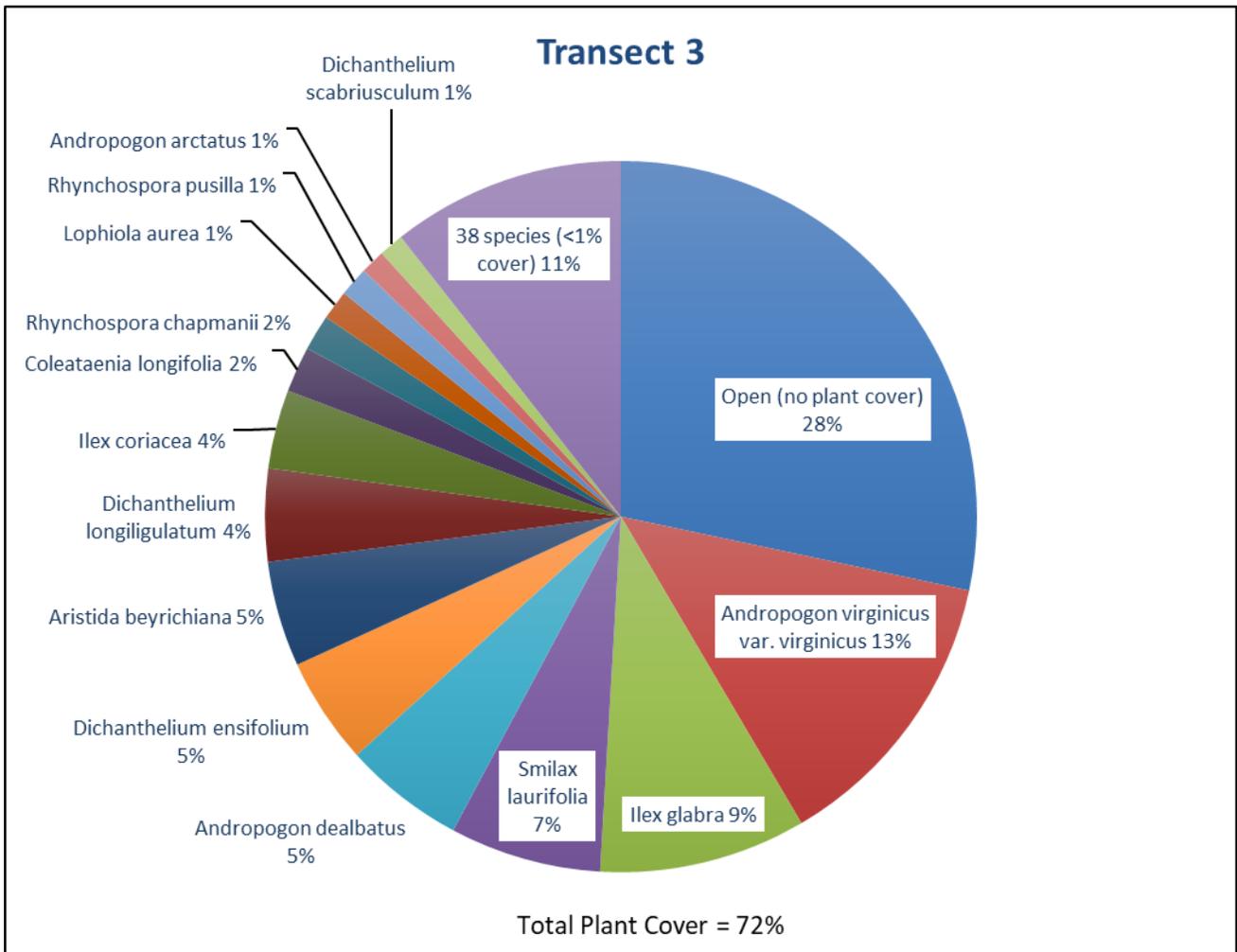


Figure 5. Percent relative cover of plant species in Transect 3.

Table 4. Percent cover of plant species in Transect 3 sampled on October 27, 2025.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon arctatus</i>	pinewoods bluestem	1.17
<i>Andropogon cretaceus</i>	purple bluestem	0.23
<i>Andropogon dealbatus</i>	wetland white bluestem	5.73
<i>Andropogon glomeratus</i>	bushy bluestem	0.57
<i>Andropogon virginicus var. virginicus</i>	broomsedge bluestem	13.77
<i>Aristida beyrichiana</i>	Southern wiregrass	5.00
<i>Aristida virgata</i>	arrowfeather threeawn	0.03
<i>Coleataenia longifolia</i>	ciliate redbtop panicum	2.17
<i>Dichanthelium consanguineum</i>	Kunth's witchgrass	0.10
<i>Dichanthelium ensifolium</i>	small-leaved witchgrass	5.07
<i>Dichanthelium longiligulatum</i>	long-ligule witchgrass	4.40
<i>Dichanthelium scabriusculum</i>	woolly witchgrass	1.17

Scientific name	Common name	Average percent cover per quadrat
<i>Dichanthelium strigosum</i> var. <i>glabrescens</i>	roughhair witchgrass	0.10
<i>Dichanthelium tenue</i>	white-edged witchgrass	0.03
<i>Drosera capillaris</i>	pink sundew	0.03
<i>Edrastima uniflora</i>	oldenlandia	0.17
<i>Eragrostis</i> sp.	lovegrass	0.10
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.03
<i>Eupatorium</i> sp.	thoroughwort	0.03
<i>Gaylussacia mosieri</i>	woolly huckleberry	0.77
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort	0.07
<i>Hypericum crux-andreae</i>	St. Peter's wort	0.13
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	0.03
<i>Ilex coriacea</i>	large gallberry	3.73
<i>Ilex glabra</i>	gallberry	9.80
<i>Kelloggloa verrucosa</i>	warty panicgrass	0.23
<i>Lachnanthes caroliniana</i>	Carolina redroot	0.47
<i>Lachnocaulon anceps</i>	whitehead bogbutton	0.83
<i>Lophiola aurea</i>	golden crest	1.40
<i>Ludwigia linearis</i>	narrowleaf primrosewillow	0.03
<i>Ludwigia linifolia</i>	Southeastern primrosewillow	0.03
<i>Lycopodiella alopecuroides</i>	foxtail club-moss	0.27
<i>Magnolia virginiana</i> var. <i>australis</i>	sweetbay	0.23
<i>Morella cerifera</i>	Southern bayberry	0.23
<i>Muscadinia rotundifolia</i>	muscadine	0.10
<i>Nyssa biflora</i>	swamp tupelo	0.07
<i>Pinus elliotii</i>	slash pine	0.40
<i>Rhexia alifanus</i>	savannah meadowbeauty	0.27
<i>Rhexia lutea</i>	yellow meadowbeauty	0.47
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.10
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	1.00
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	1.70
<i>Rhynchospora debilis</i>	savannah beaksedge	0.50
<i>Rhynchospora fascicularis</i>	fascicled beaksedge	0.23
<i>Rhynchospora plumosa</i>	plumed beaksedge	0.57
<i>Rhynchospora pusilla</i>	fairy beaksedge	1.40
<i>Schizachyrium scoparium</i>	little bluestem	0.50
<i>Smilax glauca</i>	cat greenbriar	0.87
<i>Smilax laurifolia</i>	laurel greenbriar	7.17
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	0.77
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass	0.03
<i>Xyris serotina</i>	acid swamp yellow-eyed grass	0.43
Open (no plant cover)		28.33

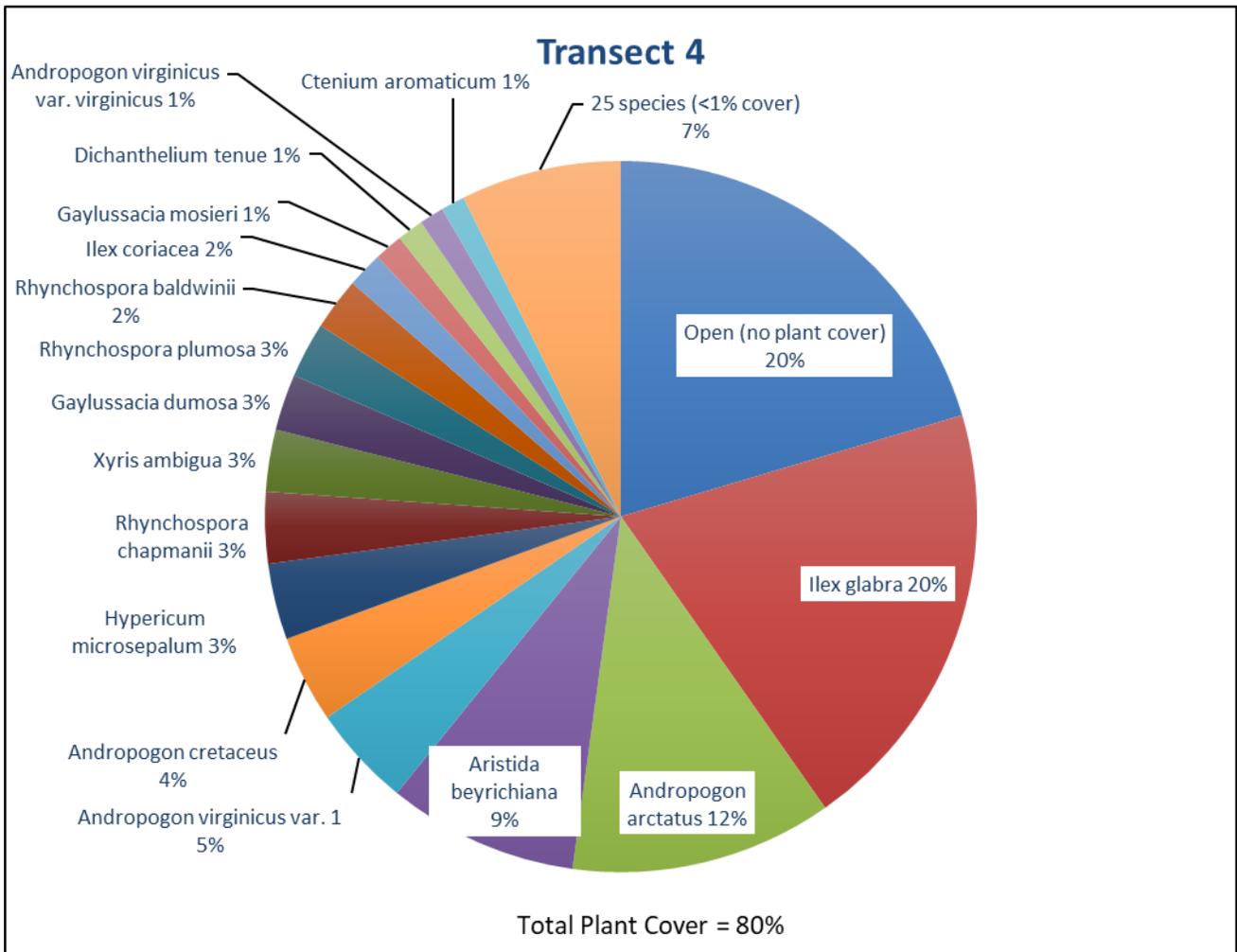


Figure 6. Percent relative cover of plant species in Transect 4.

Table 5. Percent cover of plant species in Transect 4 sampled on October 28, 2025.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon arctatus</i>	pinewoods bluestem	11.00
<i>Andropogon cretaceus</i>	purple bluestem	3.67
<i>Andropogon dealbatus</i>	wetland white bluestem	0.20
<i>Andropogon virginicus var. 1</i>	smooth bluestem	4.27
<i>Andropogon virginicus var. virginicus</i>	broomsedge bluestem	1.03
<i>Aristida beyrichiana</i>	Southern wiregrass	8.00
<i>Aristida virgata</i>	arrowfeather threeawn	0.33
<i>Aronia arbutifolia</i>	red chokeberry	0.10
<i>Coleataenia longifolia</i>	ciliate redbtop panicum	0.10
<i>Ctenium aromaticum</i>	toothache grass	1.00
<i>Dichantherium consanguineum</i>	Kunth's witchgrass	0.10
<i>Dichantherium ensifolium</i>	small-leaved witchgrass	0.73

Scientific name	Common name	Average percent cover per quadrat
<i>Dichanthelium strigosum</i>	roughhair witchgrass	0.77
<i>Dichanthelium strigosum</i> var. <i>glabrescens</i>	roughhair witchgrass	0.13
<i>Dichanthelium tenue</i>	white-edged witchgrass	1.10
<i>Drosera capillaris</i>	pink sundew	0.10
<i>Edrastima uniflora</i>	oldenlandia	0.47
<i>Euphorbia inundata</i> var. <i>inundata</i>	Florida pineland spurge	0.03
<i>Eurybia eryngiifolia</i>	thistleleaf aster	0.10
<i>Gaylussacia dumosa</i>	dwarf huckleberry	2.37
<i>Gaylussacia mosieri</i>	woolly huckleberry	1.20
<i>Gaylussacia nana</i>	dwarf dangleberry	0.23
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	3.20
<i>Ilex coriacea</i>	large gallberry	1.50
<i>Ilex glabra</i>	gallberry	18.37
<i>Lachnocaulon anceps</i>	whitehead bogbutton	0.10
<i>Lophiola aurea</i>	golden crest	0.20
<i>Lycopodiella appressa</i>	Southern club-moss	0.70
<i>Pinus elliotii</i>	slash pine	0.50
<i>Polygala lutea</i>	orange milkwort	0.03
<i>Quercus minima</i>	dwarf live oak	0.10
<i>Rhexia alifanus</i>	savannah meadowbeauty	0.40
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	2.20
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	3.00
<i>Rhynchospora plumosa</i>	plumed beaksedge	2.33
<i>Sabatia brevifolia</i>	shortleaf rosegentian	0.07
<i>Smilax glauca</i>	cat greenbriar	0.03
<i>Smilax laurifolia</i>	laurel greenbriar	0.73
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	2.60
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass	0.03
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass	0.43
Open (no plant cover)		20.40

Shrub Quadrats

The average shrub stem density was slightly increased from 2024. We recorded an average of 19.2 shrub stems/m² (Table 6), compared to 11.4 shrub stems/m² in 2024.

Table 6. Rooted Shrub Stems per Square Meter (Fall 2025)

Shrub Quadrat	Shrub Stems per m²
1	16
2	5
3	4
4	23
5	48
Average Stems per m ²	19.2