

**Vegetation Monitoring at Ward Creek West
Northwest Florida Water Management District
Mitigation Site**

Fall 2024

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Funding for this project was provided by the Northwest Florida Water Management District under the
Purchase Order #00250061-000 with the Florida Natural Areas Inventory
Florida State University

Ward Creek West Mitigation Site Qualitative and Quantitative Monitoring December 2024

INTRODUCTION

The Ward Creek West Mitigation Site consists of 724 acres in Bay County managed by the Northwest Florida Water Management District. It is located 0.5 mile west of SR 79 and 2.5 miles north of the junction of SR 79 and US 98 (Figure 1). The Ward Creek West Mitigation Project aims to restore hydric pine flatwoods (HPF) and hydric pine savanna (HPS) which had been converted to slash pine plantation, as well as to convert portions of the mixed forested wetlands to cypress (CY; Figure 2). FNAI used quantitative and qualitative monitoring to document the current plant species composition and vegetation structure of these targeted communities. FNAI biologists have previously monitored the site's vegetation during the fall from 2012 through 2023.

METHODS

We conducted quantitative monitoring using 300-foot-long permanent transect lines that were marked during the 2012 survey. In 2013, FNAI installed metal T-posts at the ends of each transect to provide permanent reference points. There are 2 transects in the Hydric Pine Flatwoods target community, and 2 in Hydric Pine Savanna (Figure 2). We placed fifteen 1m x 1m quadrats along the left side of each transect line, spaced every 20 feet, beginning at 0 and ending at 280 feet. In each quadrat, we visually estimated percent cover of each plant species; this included individuals rooted in the quadrat as well as overhanging. We excluded canopy over 2 m in height from cover estimates and counted only the lower 2 m portions of taller individuals, including the lower portions of tree trunks rooted in quadrats. We estimated open ground in each quadrat as the percentage of ground not obscured by plant cover up to 2 m tall. We converted cover estimates to mid-point values and averaged across each transect. We also calculated relative cover, in which all plant cover and open ground is given as a proportion of 100 percent cover; this is reported in separate pie charts.

We carried out qualitative monitoring by walking meandering transects through each of the two target communities plus the Cypress area. On these transects we recorded all species observed as well as descriptions of vegetation structure. FNAI botanists Allie Heiker and Ethan Hughes conducted all field surveys on December 2-3, 2024.

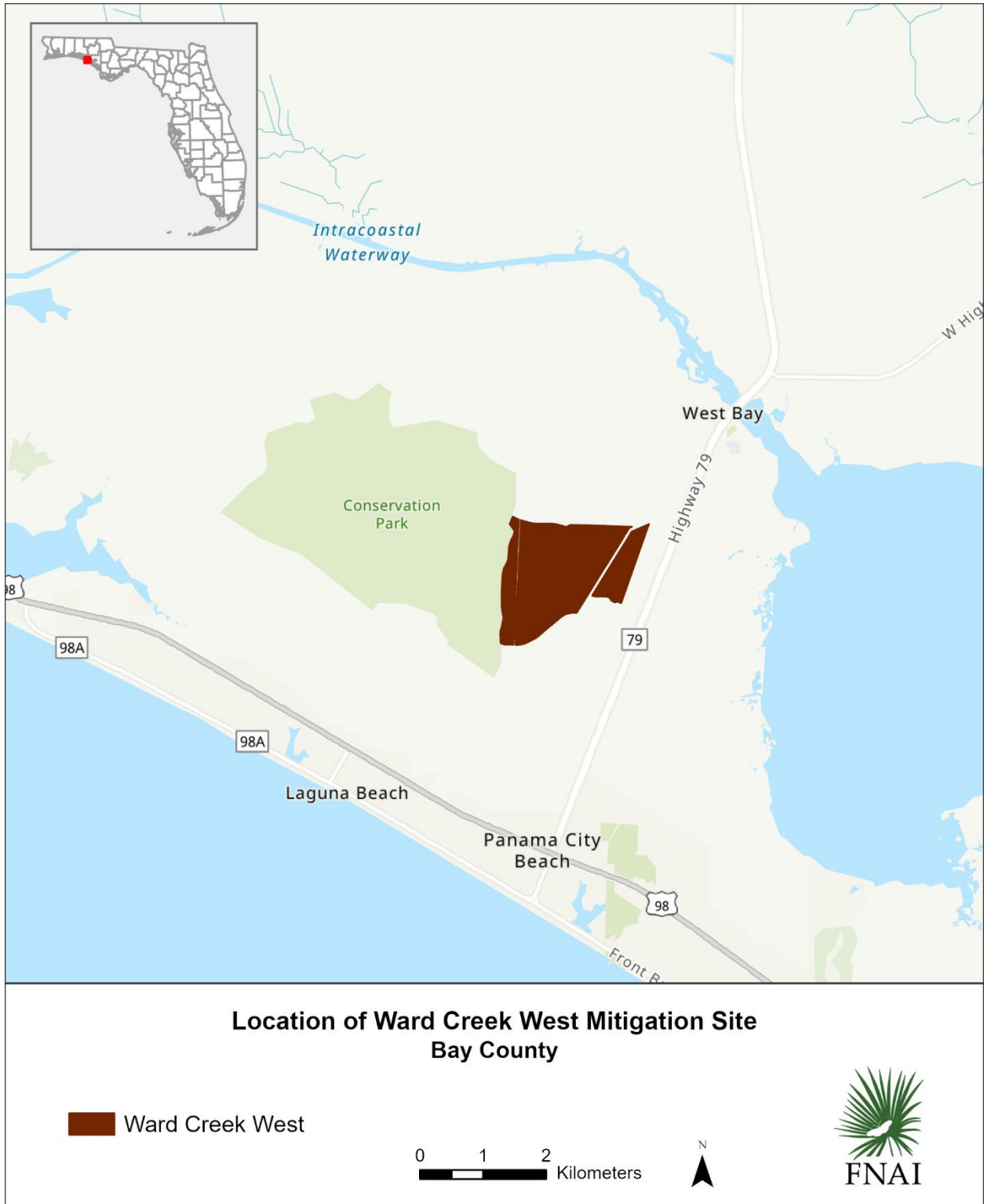


Figure 1. Location map of Ward Creek West Mitigation Site monitored by FNAI.

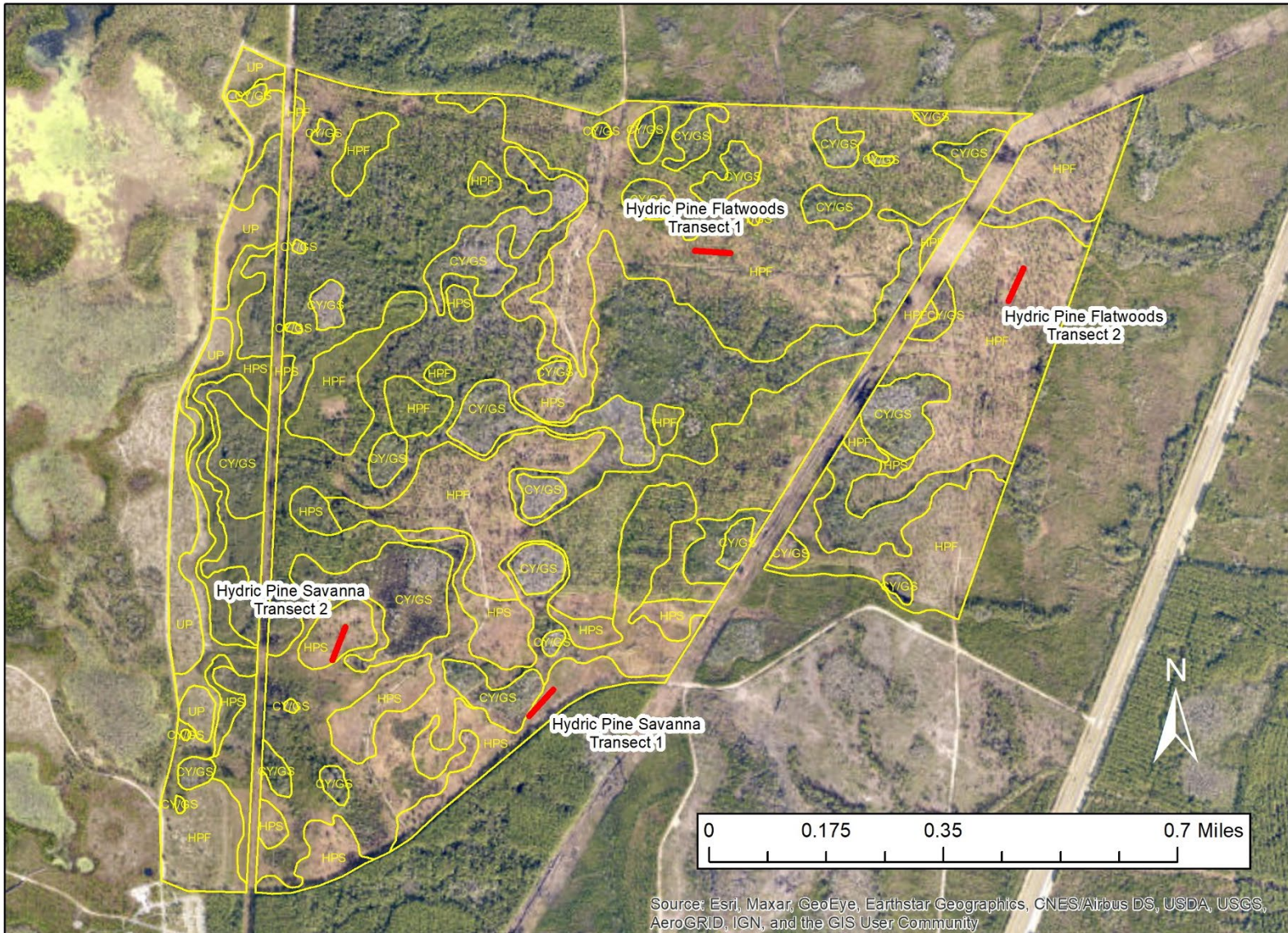


Figure 2. Location of permanent transects at Ward Creek West Mitigation Site. CY=Cypress, UP=Upland Pine, HPF=Hydrich Pine Flatwoods, HPS=Hydrich Pine Savanna, GS=Gum Swamp.

RESULTS AND DISCUSSION

We recorded a total of 186 plant taxa during the 2024 monitoring period in the target communities at Ward Creek West (Table 1). This included 24 new taxa that were not recorded prior to the 2024 monitoring.

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. This is a change from the previous FNAI monitoring reports, which followed Wunderlin, R. P., B.F. Hansen, A.R. Franck, and F.B. Essig. 2017. Atlas of Florida Plants (<http://florida.plantatlas.usf.edu/>), Institute for Systematic Botany, University of South Florida, Tampa.

Table 1. Plant species observed in the target communities at Ward Creek West Mitigation Site on December 2-3, 2024. (bold name = new species; bold X = new observation in community type; * = state-listed endangered or threatened; † = non-native invasive)

Scientific Name	Common Name	Cypress	Hydric Pine Flatwoods	Hydric Pine Savanna	Grand Total
<i>Amphicarpum muehlenbergianum</i>	blue maidencane			X	1
<i>Anchistea virginica</i>	Virginia chain fern		X		1
<i>Andropogon campbellii</i>	deceptive bluestem		X		1
<i>Andropogon capillipes</i>	dryland white bluestem		X		1
<i>Andropogon cretaceus</i>	purple bluestem	X	X	X	3
<i>Andropogon glomeratus</i>	bushy bluestem		X	X	2
<i>Andropogon gyrans</i>	Elliott's bluestem		X	X	2
<i>Andropogon</i> sp.	bluestem		X	X	2
<i>Andropogon virginicus</i>	broomsedge bluestem		X	X	2
<i>Andropogon virginicus</i> var. 1	smooth bluestem			X	1
<i>Anthenantia rufa</i>	purple silkyscale		X		1
<i>Anthenantia villosa</i>	green silkyscale		X		1
<i>Aristida beyrichiana</i>	Southern wiregrass		X	X	2
<i>Aristida palustris</i>	longleaf threeawn			X	1
<i>Aristida purpurascens</i>	arrowfeather threeawn		X		1
<i>Aristida spiciformis</i> var. <i>spiciformis</i>	bottlebrush threeawn		X	X	2
<i>Aristida tenuispica</i>	Southern arrowfeather		X	X	2
<i>Aronia arbutifolia</i>	red chokeberry		X		1
<i>Baccharis halimifolia</i>	groundsel tree		X		1
<i>Burmannia capitata</i>	Southern bluethread		X		1
* <i>Calamovilfa curtissii</i>	Curtiss' sandgrass			X	1
<i>Carex glaucescens</i>	clustered sedge	X			1
<i>Centella erecta</i>	spadeleaf		X	X	2
<i>Chamaecrista fasciculata</i>	partridge pea		X		1
<i>Chrysopsis lanuginosa</i>	Lynn Haven goldenaster		X	X	2
<i>Chrysopsis mariana</i>	Maryland goldenaster		X		1
<i>Clethra alnifolia</i>	sweet pepperbush	X	X		2
<i>Cliftonia monophylla</i>	black titi	X	X	X	3

Scientific Name	Common Name	Cypress	Hydric Pine Flatwoods	Hydric Pine Savanna	Grand Total
<i>Coleataenia longifolia</i>	ciliate redtop panicum		X	X	2
<i>Ctenium aromaticum</i>	toothache grass			X	1
<i>Cyperus retrorsus</i>	pineland flatsedge		X		1
<i>Cyrilla parvifolia</i>	littleleaf titi		X	X	2
<i>Cyrilla racemiflora</i>	titi	X	X	X	3
<i>Dichantherium aciculare</i>	needleleaf witchgrass		X		1
<i>Dichantherium angustifolium</i>	narrowleaf witchgrass		X		1
<i>Dichantherium ensifolium</i>	small-leaved witchgrass		X	X	2
<i>Dichantherium erectifolium</i>	erectleaf witchgrass			X	1
<i>Dichantherium leucothrix</i>	rough witchgrass		X	X	2
<i>Dichantherium longiligulatum</i>	long-ligule witchgrass			X	1
<i>Dichantherium portoricense</i>	Puerto Rican witchgrass		X	X	2
<i>Dichantherium scabriusculum</i>	woolly witchgrass			X	1
<i>Dichantherium</i> sp.	witchgrass		X	X	2
<i>Dichantherium sphaerocarpon</i>	roundseed witchgrass		X		1
<i>Dichantherium tenue</i>	white-edged witchgrass		X	X	2
<i>Dichantherium chamaelonche</i>	carpet witchgrass		X		1
<i>Dichantherium meridionale</i>	matting witchgrass		X		1
<i>Dichantherium webberianum</i>	Webber's witchgrass		X	X	2
<i>Drosera capillaris</i>	pink sundew		X	X	2
<i>Edrastima uniflora</i>	oldenlandia		X	X	2
<i>Eragrostis elliotii</i>	Elliott's lovegrass			X	1
<i>Eragrostis</i> sp.	lovegrass		X		1
<i>Erianthus giganteus</i>	sugarcane plumegrass			X	1
<i>Eriocaulon compressum</i>	flattened pipewort			X	1
<i>Eriocaulon decangulare</i>	tenangle pipewort		X	X	2
<i>Eryngium yuccifolium</i> var. <i>synchaetum</i>	Southern rattlesnakemaster		X		1
<i>Eupatorium compositifolium</i>	yankeeweed		X		1
<i>Eupatorium mohrii</i>	Mohr's thoroughwort		X	X	2
<i>Eupatorium pilosum</i>	rough boneset			X	1
<i>Euthamia caroliniana</i>	slender flattop goldenrod		X	X	2
<i>Fimbristylis cymosa</i> ssp. <i>spathacea</i>	hurricanegrass		X		1
<i>Fuirena scirpoidea</i>	Southern umbrellasedge		X		1
<i>Gaylussacia dumosa</i>	dwarf huckleberry		X	X	2
<i>Gaylussacia mosieri</i>	woolly huckleberry		X	X	2
<i>Gaylussacia nana</i>	dwarf dangleberry		X		1
<i>Gelsemium rankinii</i>	swamp jessamine	X			1
<i>Gelsemium sempervirens</i>	yellow jessamine		X		1
<i>Helianthus angustifolius</i>	narrowleaf sunflower			X	1
<i>Helianthus radula</i>	stiff sunflower		X		1
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort		X	X	2
<i>Hypericum chapmanii</i>	Chapman's St. John's wort	X			1
<i>Hypericum cistifolium</i>	roundpod St. John's wort			X	1
<i>Hypericum exile</i>	Florida sands St. John's wort		X	X	2

Scientific Name	Common Name	Cypress	Hydric Pine Flatwoods	Hydric Pine Savanna	Grand Total
<i>Hypericum fasciculatum</i>	peelbark St. John's wort		X	X	2
<i>Hypericum gentianoides</i>	orangegrass		X		1
<i>Hypericum microsepalum</i>	flatwoods St. John's wort		X	X	2
<i>Hypericum tetrapetalum</i>	fourpetal St. John's wort		X		1
<i>Ilex coriacea</i>	large gallberry	X	X	X	3
<i>Ilex glabra</i>	gallberry		X	X	2
<i>Ilex myrtifolia</i>	myrtle-leaved holly			X	1
<i>Ilex vomitoria</i>	yaupon		X		1
<i>Itea virginica</i>	Virginia willow	X			1
<i>Iva microcephala</i>	Piedmont marshelder		X		1
<i>Juncus marginatus</i>	grassleaf rush			X	1
<i>Juncus pelocarpus</i>	annual rush			X	1
<i>Juncus scirpoides</i>	needlepod rush		X		1
<i>Kalmia hirsuta</i>	hairy wicky		X	X	2
<i>Kellogglochia verrucosa</i>	warty panicgrass			X	1
<i>Lachnanthes caroliniana</i>	Carolina redroot	X	X	X	3
<i>Lachnocaulon anceps</i>	whitehead bogbutton		X	X	2
<i>Lechea pulchella</i> var. <i>ramosissima</i>	Leggett's pinweed		X		1
<i>Liatris chapmanii</i>	Chapman's gayfeather		X		1
<i>Liatris gracilis</i>	slender gayfeather		X		1
<i>Liatris resinosa</i>	dense gayfeather		X	X	2
<i>Liatris tenuifolia</i>	shortleaf gayfeather		X		1
<i>Lobelia brevifolia</i>	shortleaf lobelia			X	1
<i>Lophiola aurea</i>	golden crest		X	X	2
<i>Lorinseria areolata</i>	netted chain fern	X			1
<i>Ludwigia linearis</i>	narrowleaf primrosewillow		X		1
<i>Ludwigia pilosa</i>	hairy primrosewillow			X	1
<i>Lycopodiella alopecuroides</i>	foxtail club-moss		X	X	2
<i>Lycopodiella appressa</i>	Southern club-moss		X		1
<i>Lyonia ferruginea</i>	rusty staggerbush		X	X	2
<i>Lyonia fruticosa</i>	coastalplain staggerbush		X		1
<i>Lyonia lucida</i>	fetterbush	X	X	X	3
<i>Magnolia virginiana</i> var. <i>australis</i>	sweetbay	X	X	X	3
<i>Mitreola sessilifolia</i>	swamp hornpod			X	1
<i>Morella caroliniensis</i>	evergreen bayberry	X		X	2
<i>Morella inodora</i>	odorless bayberry	X			1
Bryophyta	moss		X		1
<i>Muhlenbergia expansa</i>	cutover muhly			X	1
<i>Muhlenbergia sericea</i>	Gulf hairawn muhly		X		1
<i>Muscadinia rotundifolia</i>	muscadine	X	X	X	3
<i>Nyssa biflora</i>	swamp tupelo	X			1
<i>Nyssa ogeche</i>	ogeechee tupelo	X			1
† <i>Panicum repens</i>	torpedo grass			X	1
<i>Panicum virgatum</i>	switchgrass		X		1

Scientific Name	Common Name	Cypress	Hydric Pine Flatwoods	Hydric Pine Savanna	Grand Total
<i>Pieris phillyreifolia</i>	climbing fetterbush	X			1
<i>Pinus elliotii</i>	slash pine	X	X	X	3
<i>Pityopsis nervosa</i>	goldenaster		X		1
<i>Polygala lutea</i>	orange milkwort		X	X	2
<i>Polygala nana</i>	candyroot		X		1
<i>Polygonella gracilis</i>	tall jointweed		X		1
<i>Polygonella polygama</i>	october flower		X		1
<i>Pseudolycopodiella caroliniana</i>	slender club-moss		X	X	2
<i>Pteridium pseudocaudatum</i>	tailed bracken		X	X	2
<i>Quercus hemisphaerica</i>	laurel oak		X		1
<i>Quercus minima</i>	dwarf live oak		X	X	2
<i>Rhexia alifanus</i>	savannah meadowbeauty		X	X	2
<i>Rhexia mariana</i>	pale meadowbeauty		X	X	2
<i>Rhexia nuttallii</i>	Nuttall's meadowbeauty		X		1
<i>Rhexia petiolata</i>	fringed meadowbeauty		X	X	2
<i>Rhexia virginica</i>	handsome harry	X	X	X	3
<i>Rhododendron serrulatum</i>	swamp azalea	X			1
<i>Rhus copallinum</i> var. <i>copallinum</i>	winged sumac		X		1
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge			X	1
<i>Rhynchospora cephalantha</i> var. <i>cephalantha</i>	bunched beaksedge	X	X	X	3
<i>Rhynchospora chalarocephala</i>	loosehead beaksedge		X	X	2
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge		X	X	2
<i>Rhynchospora ciliaris</i>	fringed beaksedge			X	1
<i>Rhynchospora corniculata</i>	shortbristle horned beaksedge			X	1
<i>Rhynchospora curtissii</i>	Curtiss' beaksedge		X		1
<i>Rhynchospora debilis</i>	savannah beaksedge		X		1
<i>Rhynchospora fascicularis</i>	fascicled beaksedge		X	X	2
<i>Rhynchospora filifolia</i>	threadleaf beaksedge			X	1
<i>Rhynchospora gracilentata</i>	slender beaksedge			X	1
<i>Rhynchospora inundata</i>	narrowfruit horned beaksedge			X	1
<i>Rhynchospora plumosa</i>	plumed beaksedge		X	X	2
<i>Rhynchospora</i> sp.	beaksedge		X	X	2
<i>Rubus pensilvanicus</i>	sawtooth blackberry		X	X	2
<i>Sabatia brevifolia</i>	shortleaf rosegentian		X		1
<i>Schizachyrium stoloniferum</i>	creeping little bluestem		X		1
<i>Schizachyrium tenerum</i>	slender bluestem		X		1
<i>Scleria baldwinii</i>	Baldwin's nutrush			X	1
<i>Scleria ciliata</i>	fringed nutrush		X		1
<i>Serenoa repens</i>	saw palmetto		X		1
<i>Sericocarpus tortifolius</i>	whitetop aster		X		1
<i>Seymeria cassioides</i>	yaupon blacksenna		X		1
<i>Smilax auriculata</i>	earleaf greenbriar		X	X	2
<i>Smilax bona-nox</i>	saw greenbriar		X		1
<i>Smilax glauca</i>	cat greenbriar		X		1

Scientific Name	Common Name	Cypress	Hydric Pine Flatwoods	Hydric Pine Savanna	Grand Total
<i>Smilax laurifolia</i>	laurel greenbriar	X	X	X	3
<i>Smilax pumila</i>	sarsaparilla vine		X	X	2
<i>Solidago fistulosa</i>	pinebarren goldenrod	X	X	X	3
<i>Solidago odora</i>	sweet goldenrod		X	X	2
<i>Solidago</i> sp.	goldenrod		X		1
<i>Sophranthe hispida</i>	rough hedgehyssop		X		1
<i>Sphagnum</i> sp.	sphagnum moss	X	X	X	3
<i>Symphotrichum bahamense</i>	Bahaman aster		X		1
<i>Tamala palustris</i>	swamp bay	X			1
<i>Taxodium ascendens</i>	pond cypress	X		X	2
<i>Trilisa odoratissima</i>	vanillaleaf		X	X	2
<i>Vaccinium darrowii</i>	Darrow's blueberry		X		1
<i>Vaccinium fuscatum</i>	hairy highbush blueberry		X		1
<i>Vaccinium myrsinites</i>	shiny blueberry		X	X	2
<i>Viola vittata</i>	Southern water violet		X		1
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass		X	X	2
<i>Xyris baldwiniana</i>	Baldwin's yellow-eyed grass	X			1
<i>Xyris brevifolia</i>	shortleaf yellow-eyed grass		X	X	2
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass		X		1
<i>Xyris elliottii</i>	Elliott's yellow-eyed grass			X	1
<i>Xyris fimbriata</i>	fringed yellow-eyed grass	X	X	X	3
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass		X	X	2
<i>Xyris serotina</i>	acid swamp yellow-eyed grass			X	1
<i>Xyris</i> sp.	yellow-eyed grass		X	X	2
<i>Xyris stricta</i>	pineland yellow-eyed grass			X	1
<i>Yucca filamentosa</i>	Adam's needle		X		1
Total number of taxa: 186		30	139	107	276

Hydric Pine Flatwoods

Qualitative sampling. The hydric pine flatwoods areas had been disturbed in the past few years by the thinning of mature planted slash pines. The open canopy of mature slash pines covered a variously dense shrub layer. The area near Transect 1 (western transect) had been bedded years ago when the pines were planted. This area had a moderately dense shrub stratum and an herbaceous layer composed primarily of purple bluestem. In the past, the eastern section near Transect 2 had more saw palmetto and gallberry and a diverse herbaceous cover with scattered patches of wiregrass and beaksedges. Recent shrub reduction efforts (chopping and chemical treatment) seem to have drastically altered this area, with less saw palmetto and runner oak, and an increase in weedy purple bluestem. The state-endangered Fernald's pogonia was detected in hydric pine flatwoods for the first time in 2021 but was not seen this year. FNAI observed a total of 139 species in this community (Table 1).

Quantitative sampling. The western Transect 1 (Figure 3, Table 2) had a total of 29 species with 19% open ground. Numerous slash pines had fallen in the area of the transect due to past storms. Woody

species (black titi, large gallberry, saw palmetto, and hairy highbush blueberry) contributed the most cover, followed by purple bluestem. Woody species made around 61% average cover per quadrat, unchanged from last year. Overall, the transect was similar to last year, although purple bluestem and saw palmetto have decreased, while there was a small increase in black titi.

The eastern Transect 2 (Figure 4, Table 3) had a total of 47 species with 34% open ground. Woody species, primarily saw palmetto and slash pine, contributed about one third of the total species cover (around 24% average cover per quadrat). Purple bluestem, dryland white bluestem, ciliate redtop panicum, and creeping little bluestem made up most of the herbaceous cover. Since 2018, dwarf live oak and shortleaf yellow-eyed grass, once dominants, are now only trace components, at most, while weedy purple bluestem is now the most abundant herbaceous species.

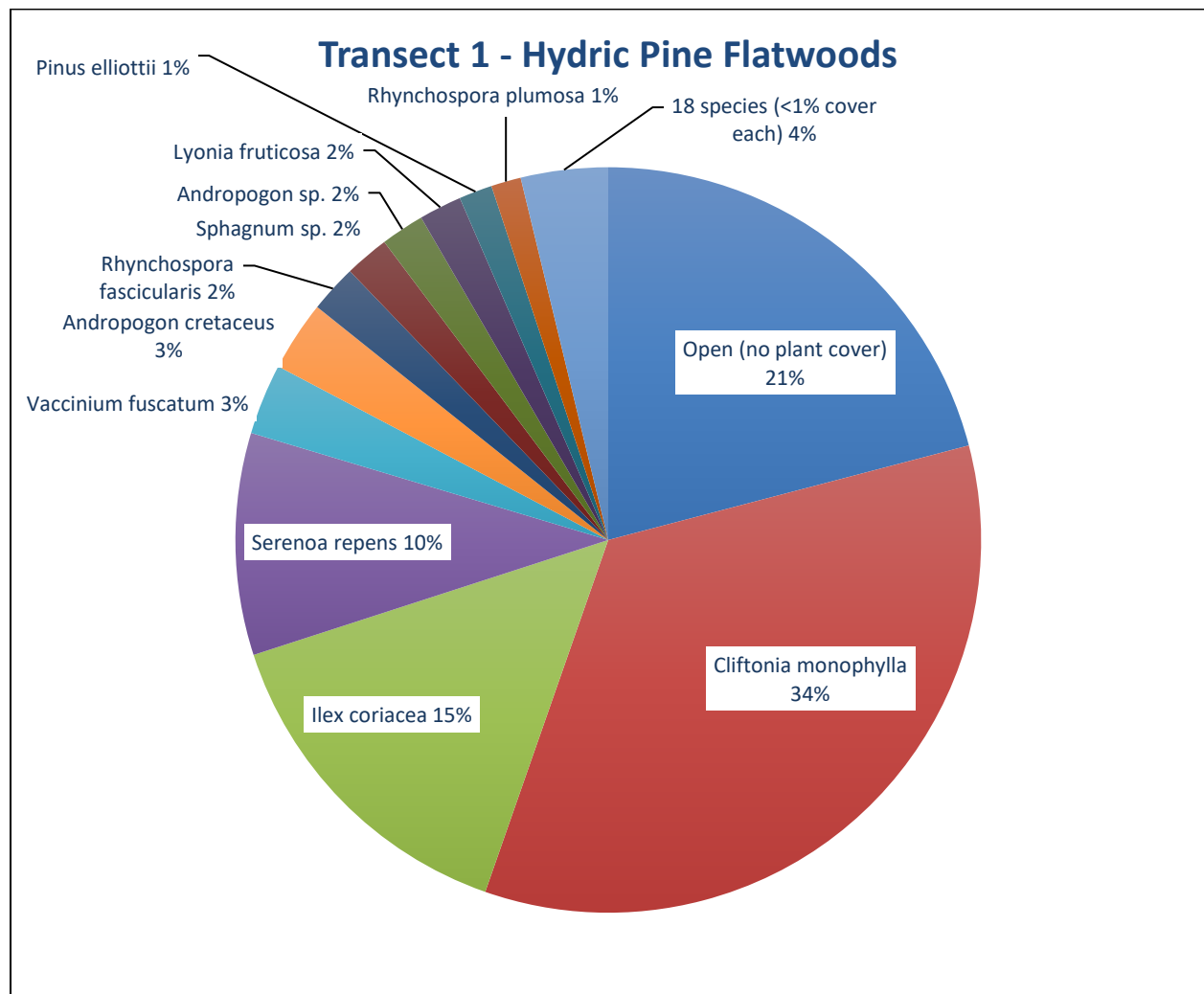


Figure 3. Percent relative cover of plant species in Hydric Pine Flatwoods Transect 1.

Table 2. Percent cover of plant species in Hydric Pine Flatwoods Transect 1 sampled on December 2, 2024.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon cretaceus</i>	purple bluestem	2.73
<i>Andropogon</i> sp.	bluestem	1.70
<i>Andropogon virginicus</i>	broomsedge bluestem	0.03
<i>Aronia arbutifolia</i>	red chokeberry	0.13
<i>Clethra alnifolia</i>	sweet pepperbush	0.23
<i>Cliftonia monophylla</i>	black titi	31.00
<i>Coleataenia longifolia</i>	ciliate redtop panicum	0.10
<i>Cyrilla parvifolia</i>	littleleaf titi	0.50
<i>Dichantherium ensifolium</i>	small-leaved witchgrass	0.13
<i>Dichantherium portoricense</i>	Puerto Rican witchgrass	0.10
<i>Dichantherium sphaerocarpon</i>	roundseed witchgrass	0.07
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.13
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	0.20
<i>Ilex coriacea</i>	large gallberry	13.20
<i>Kalmia hirsuta</i>	hairy wicky	0.50
<i>Lyonia fruticosa</i>	coastalplain staggerbush	1.67
<i>Magnolia virginiana</i> var. <i>australis</i>	sweetbay	0.03
<i>Muscadinia rotundifolia</i>	muscadine	0.10
<i>Pinus elliotii</i>	slash pine	1.30
<i>Polygala lutea</i>	orange milkwort	0.10
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.03
<i>Rhynchospora fascicularis</i>	fascicled beaksedge	1.87
<i>Rhynchospora plumosa</i>	plumed beaksedge	1.17
<i>Serenoa repens</i>	saw palmetto	8.67
<i>Smilax laurifolia</i>	laurel greenbrier	0.80
<i>Sphagnum</i> sp.	sphagnum moss	1.73
<i>Vaccinium fuscatum</i>	hairy highbush blueberry	2.77
<i>Vaccinium myrsinites</i>	shiny blueberry	0.10
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	0.10
Open (no plant cover)		18.83

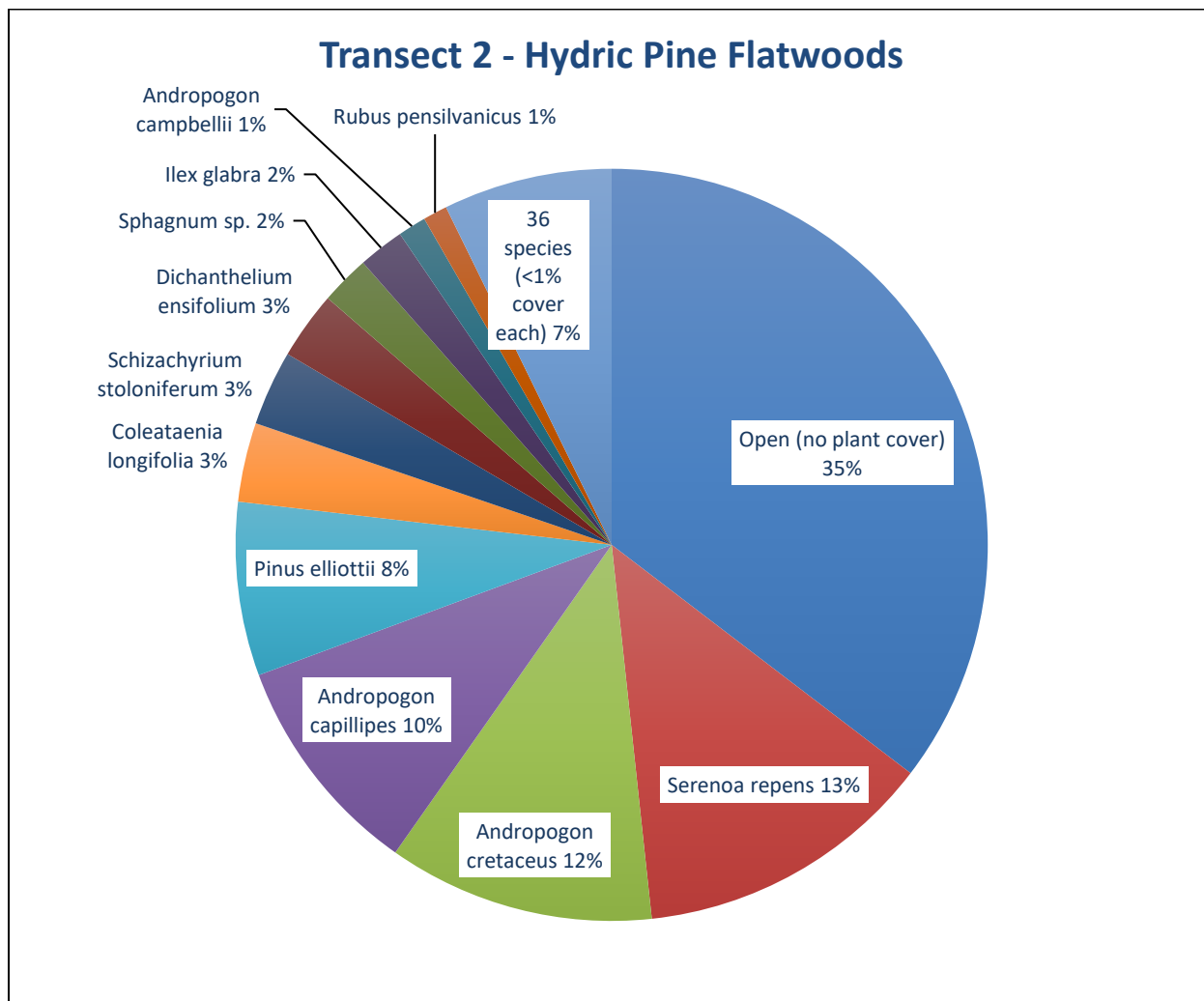


Figure 4. Percent relative cover of plant species in Hydric Pine Flatwoods Transect 2.

Table 3. Percent cover of plant species in Hydric Pine Flatwoods Transect 2 sampled on December 2, 2024.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon campbellii</i>	deceptive bluestem	1.17
<i>Andropogon capillipes</i>	dryland white bluestem	9.23
<i>Andropogon cretaceus</i>	purple bluestem	11.00
<i>Andropogon sp.</i>	bluestem	0.50
<i>Andropogon virginicus</i>	broomsedge bluestem	0.47
<i>Coleataenia longifolia</i>	ciliate redtop panicum	3.27
<i>Cyperus retrorsus</i>	pineland flatsedge	0.03
<i>Cyrilla parvifolia</i>	littleleaf titi	0.53
<i>Cyrilla racemiflora</i>	titi	0.10
<i>Dichanthelium ensifolium</i>	small-leaved witchgrass	2.80

Scientific name	Common name	Average percent cover per quadrat
<i>Dichantheium portoricense</i>	Puerto Rican witchgrass	0.10
<i>Dichantheium</i> sp.	witchgrass	0.10
<i>Edrastima uniflora</i>	oldenlandia	0.27
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.10
<i>Euthamia caroliniana</i>	slender flattop goldenrod	0.43
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort	0.10
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	0.27
<i>Ilex glabra</i>	gallberry	1.90
<i>Ilex vomitoria</i>	yaupon	0.23
<i>Juncus scirpoides</i>	needlepod rush	0.03
<i>Kalmia hirsuta</i>	hairy wicky	0.10
<i>Lachnocaulon anceps</i>	whitehead bogbutton	0.13
<i>Lyonia lucida</i>	fetterbush	0.03
Bryophyta	moss	0.17
<i>Pinus elliottii</i>	slash pine	7.17
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.10
<i>Rhexia virginica</i>	handsome harry	0.10
<i>Rhynchospora cephalantha</i> var. <i>cephalantha</i>	bunched beaksedge	0.33
<i>Rhynchospora chalarocephala</i>	loosehead beaksedge	0.63
<i>Rhynchospora debilis</i>	savannah beaksedge	0.07
<i>Rhynchospora plumosa</i>	plumed beaksedge	0.17
<i>Rhynchospora</i> sp.	beaksedge	0.47
<i>Rubus pensilvanicus</i>	sawtooth blackberry	1.00
<i>Schizachyrium stoloniferum</i>	creeping little bluestem	3.10
<i>Scleria ciliata</i>	hairy nutrush	0.07
<i>Serenoa repens</i>	saw palmetto	12.40
<i>Smilax auriculata</i>	earleaf greenbrier	0.27
<i>Smilax pumila</i>	sarsaparilla vine	0.10
<i>Solidago fistulosa</i>	pinebarren goldenrod	0.27
<i>Solidago</i> sp.	goldenrod	0.03
<i>Sophranathe hispida</i>	rough hedgehyssop	0.03
<i>Sphagnum</i> sp.	sphagnum moss	2.03
<i>Trilisa odoratissima</i>	vanillaleaf	0.23
<i>Xyris brevifolia</i>	shortleaf yellow-eyed grass	0.13
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass	0.03
<i>Xyris fimbriata</i>	fringed yellow-eyed grass	0.10
<i>Xyris</i> sp.	yellow-eyed grass	0.13
Open (no plant cover)		33.97

Hydric Pine Savanna

Qualitative sampling. The hydric pine savanna restoration area was highly disturbed by past silviculture operations. The pines have been harvested and the vegetative cover consisted of mostly weedy species intermixed with widely scattered clumps of wiregrass. Widely scattered young slash pine and pond cypress and shrubby clumps of fetterbush, titi, black titi, and laurel greenbrier occurred throughout. In prior years, four state-listed species have been found in this community, the threatened pinewoods bluestem (*Andropogon arctatus*), Curtiss' sandgrass (*Calamovilfa curtissii*), and red-flowered pitcher

plant (*Sarracenia rubra*), plus the endangered Fernald's pogonia (*Cleistesiopsis oricamporum*), referenced in prior reports as "upland spreading pogonia." In 2024, Curtiss' sandgrass was observed. We documented a total of 107 plant species in this community in 2024 (Table 1).

Quantitative sampling. Transect 1 (Figure 5, Table 4) had a total of 47 species and 19% open ground. Since 2023, black titi has increased and was dominant in 2024, with purple bluestem second in cover. Slender beaksedge and fetterbush also contributed significant cover. Woody species made up over a half of the overall plant cover, around 43% average cover per quadrat, an increase of 11% over 2023. Bluestem cover has been reduced somewhat, but otherwise, vegetation along the transect was largely unchanged from last year.

Transect 2 (Figure 6, Table 5) had a total of 33 species and 9% open ground. The vegetation was dominated by black titi shrubs, followed by fetterbush. The next most abundant species were tenangle pipewort, wiregrass, titi, and purple bluestem. Woody species made up over half of the overall plant cover, around 49% average cover per quadrat, unchanged from last year. Overall, the measured vegetation along this transect was similar to last year. Bluestem cover has been reduced somewhat, while wiregrass cover remained roughly the same.

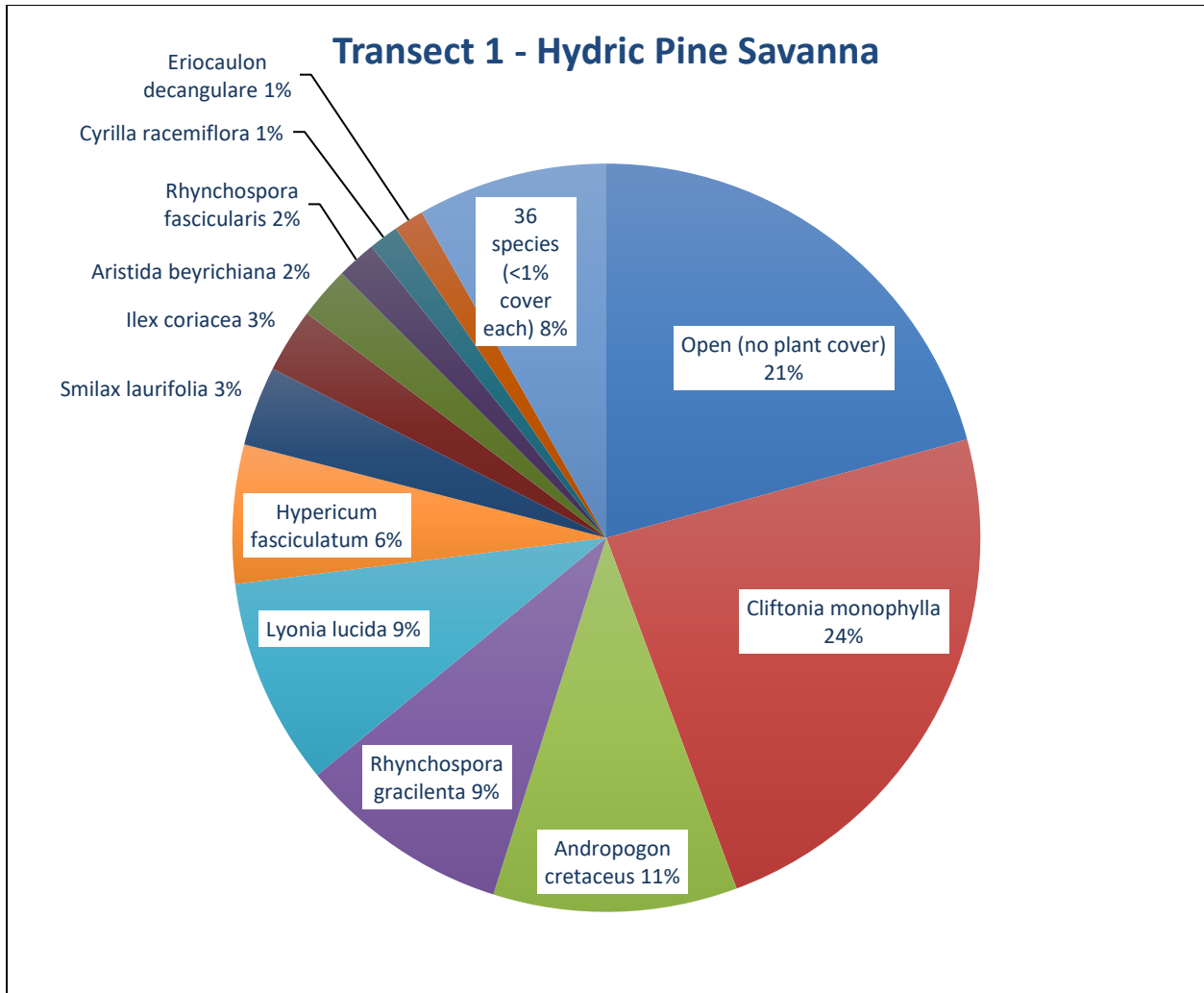


Figure 5. Percent relative cover of plant species in Hydric Pine Savanna Transect 1.

Table 4. Percent cover of plant species in Hydric Pine Savanna Transect 1 sampled on December 2, 2024.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon cretaceus</i>	purple bluestem	9.50
<i>Andropogon gyrans</i>	Elliott's bluestem	0.03
<i>Andropogon sp.</i>	bluestem	0.73
<i>Andropogon virginicus</i>	broomsedge bluestem	0.10
<i>Aristida beyrichiana</i>	Southern wiregrass	2.03
<i>Cliftonia monophylla</i>	black titi	21.23
<i>Coleataenia longifolia</i>	ciliate redtop panicum	0.10
<i>Ctenium aromaticum</i>	toothache grass	0.10
<i>Cyrilla parvifolia</i>	littleleaf titi	0.23
<i>Cyrilla racemiflora</i>	titi	1.17
<i>Dichantherium ensifolium</i>	small-leaved witchgrass	0.03
<i>Dichantherium portoricense</i>	Puerto Rican witchgrass	0.10
<i>Dichantherium scabrusculum</i>	woolly witchgrass	0.03

Scientific name	Common name	Average percent cover per quadrat
<i>Dichanthelium</i> sp.	witchgrass	0.17
<i>Dichanthelium webberianum</i>	Webber's witchgrass	0.10
<i>Drosera capillaris</i>	pink sundew	0.17
<i>Eriocaulon compressum</i>	flattened pipewort	0.03
<i>Eriocaulon decangulare</i>	tenangle pipewort	1.17
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.03
<i>Eupatorium pilosum</i>	rough boneset	0.03
<i>Euthamia caroliniana</i>	slender flattop goldenrod	0.20
<i>Gaylussacia dumosa</i>	dwarf huckleberry	0.23
<i>Gaylussacia mosieri</i>	woolly huckleberry	0.33
<i>Hypericum brachyphyllum</i>	coastalplain St. John's wort	0.10
<i>Hypericum fasciculatum</i>	peelbark St. John's wort	5.40
<i>Ilex coriacea</i>	large gallberry	2.50
<i>Kelochloa verrucosa</i>	warty panicgrass	0.07
<i>Lachnanthes caroliniana</i>	Carolina redroot	0.03
<i>Lyonia lucida</i>	fetterbush	8.07
<i>Mitreola sessilifolia</i>	swamp hornpod	0.03
<i>Pinus elliotii</i>	slash pine	0.83
<i>Rhexia mariana</i> var. <i>mariana</i>	pale meadowbeauty	0.03
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.33
<i>Rhynchospora cephalantha</i> var. <i>cephalantha</i>	bunched beaksedge	0.03
<i>Rhynchospora ciliaris</i>	fringed beaksedge	0.53
<i>Rhynchospora corniculata</i>	shortbristle horned beaksedge	0.23
<i>Rhynchospora fascicularis</i>	fascicled beaksedge	1.53
<i>Rhynchospora gracilentata</i>	slender beaksedge	8.27
<i>Rhynchospora plumosa</i>	plumed beaksedge	0.03
<i>Smilax laurifolia</i>	laurel greenbrier	3.10
<i>Sphagnum</i> sp.	sphagnum moss	0.53
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	0.90
<i>Xyris brevifolia</i>	shortleaf yellow-eyed grass	0.57
<i>Xyris elliotii</i>	Elliott's yellow-eyed grass	0.20
<i>Xyris fimbriata</i>	fringed yellow-eyed grass	0.10
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass	0.03
<i>Xyris</i> sp.	yellow-eyed grass	0.03
Open (no plant cover)		18.70

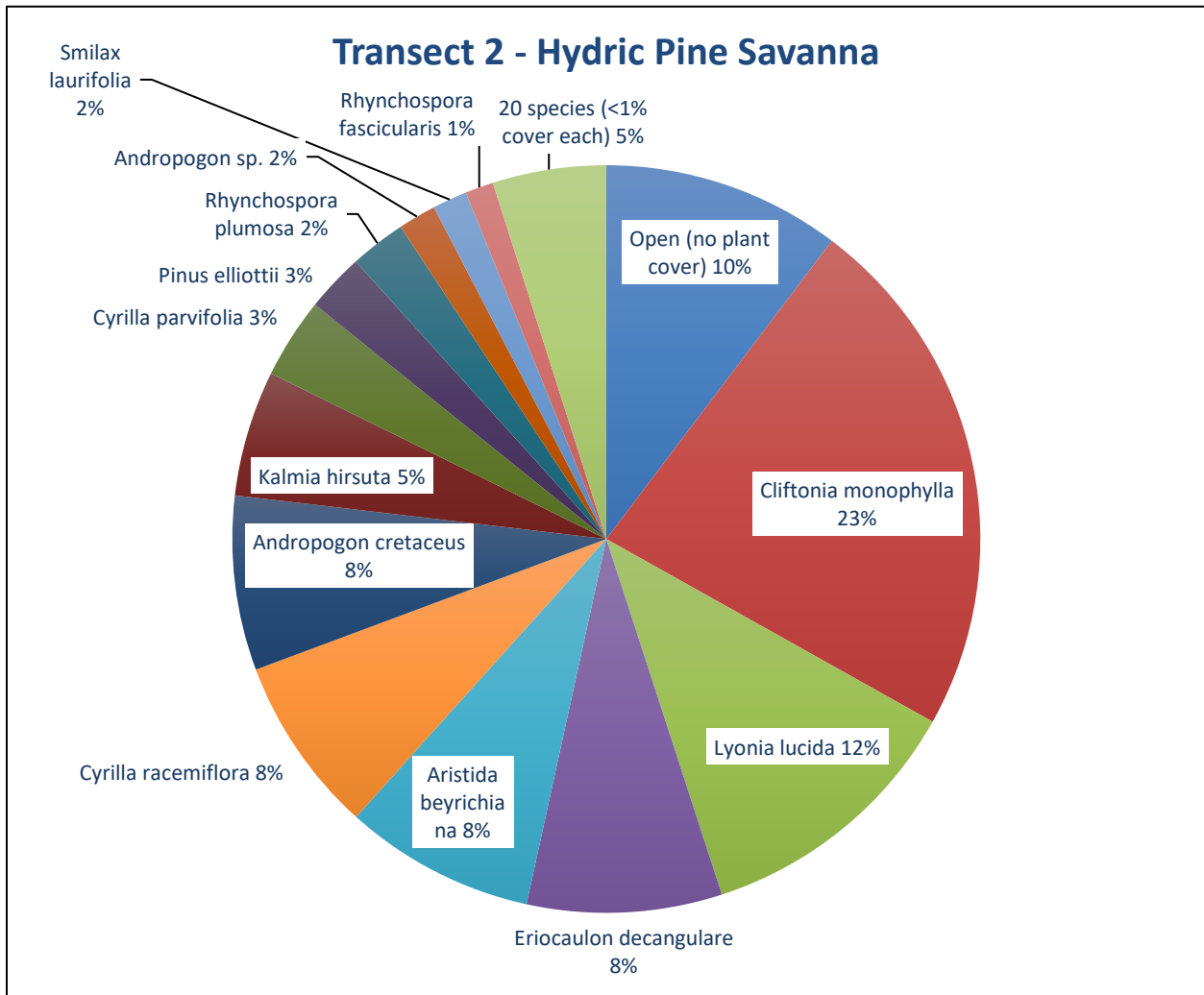


Figure 6. Percent relative cover of plant species in Hydric Pine Savanna Transect 2.

Table 5. Percent cover of plant species in Hydric Pine Savanna Transect 2 sampled on December 2, 2024.

Scientific name	Common name	Average percent cover per quadrat
<i>Andropogon cretaceus</i>	purple bluestem	6.57
<i>Andropogon sp.</i>	bluestem	1.43
<i>Aristida beyrichiana</i>	Southern wiregrass	7.17
<i>Aristida spiciformis</i> var. <i>spiciformis</i>	bottlebrush threeawn	0.03
<i>Cliftonia monophylla</i>	black titi	19.87
<i>Cyrilla parvifolia</i>	littleleaf titi	3.03
<i>Cyrilla racemiflora</i>	titi	6.67
<i>Dichanthelium sp.</i>	witchgrass	0.03
<i>Eriocaulon decangulare</i>	tenangle pipewort	7.33
<i>Eupatorium mohrii</i>	Mohr's thoroughwort	0.17
<i>Euthamia caroliniana</i>	slender flattop goldenrod	0.03

Scientific name	Common name	Average percent cover per quadrat
<i>Gaylussacia mosieri</i>	woolly huckleberry	0.03
<i>Hypericum exile</i>	Florida sands St. John's wort	0.03
<i>Hypericum microsepalum</i>	flatwoods St. John's wort	0.07
<i>Ilex glabra</i>	gallberry	0.73
<i>Kalmia hirsuta</i>	hairy wicky	4.73
<i>Lycopodiella alopecuroides</i>	foxtail club-moss	0.23
<i>Lyonia lucida</i>	fetterbush	10.33
<i>Pinus elliotii</i>	slash pine	2.20
<i>Pteridium pseudocaudatum</i>	tailed bracken	0.73
<i>Rhexia petiolata</i>	fringed meadowbeauty	0.07
<i>Rhynchospora chalarocephala</i>	loosehead beaksedge	0.03
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	0.03
<i>Rhynchospora fascicularis</i>	fascicled beaksedge	1.07
<i>Rhynchospora gracilentia</i>	slender beaksedge	0.23
<i>Rhynchospora plumosa</i>	plumed beaksedge	2.10
<i>Rhynchospora sp.</i>	beaksedge	0.03
<i>Smilax laurifolia</i>	laurel greenbrier	1.30
<i>Solidago fistulosa</i>	pinebarren goldenrod	0.03
<i>Sphagnum sp.</i>	sphagnum moss	0.33
<i>Xyris ambigua</i>	coastalplain yellow-eyed grass	0.97
<i>Xyris brevifolia</i>	shortleaf yellow-eyed grass	0.30
<i>Xyris flabelliformis</i>	savannah yellow-eyed grass	0.13
Open (no plant cover)		8.97

Cypress

Qualitative sampling. FNAI visited several sites in the cypress target community in 2024 (Figure 1). The canopy was around 45-60 feet tall and dominated by pond cypress and sweetbay, with smaller sweetbay, titi, and swamp bay in the subcanopy and tall shrub layers. Shorter shrubs included sweet pepperbush, swamp bay, sweetbay, and climbing fetterbush. A dense perimeter of shrubs and vines limited access to swamps somewhat. Areas of hog digging were common. The non-native invasive Chinese tallow tree was observed in this community for the first time in 2023 but was not observed this year. FNAI observed a total of 30 species observed in this community (Table 1).