Sand Hill Lakes Mitigation Bank
Combined FDEP/USACE
2024 (19th) Annual Report

FDEP Permit No. 0227351-001, issued 9/6/2005
USACE Permit SAJ-2002-5061 (NW-DEB), issued 5/17/2006

Northwest Florida Water Management District
81 Water Management Drive
Havana, Florida 32333-4712

Executive Summary

Located in southern Washington County in the Sand Hill Lakes region of the Florida Panhandle (Figure 1), the Sand Hill Lakes Mitigation Bank (SHLMB) consists of approximately 2,155 acres (~850 acres of wetlands; ~155 acres of natural lakes and ponds; ~1,150 acres of upland communities; Figure 2). Acquired in 2002 for the express purpose of establishing a mitigation bank, the Florida Department of Environmental Protection (FDEP) bank permit was issued September 5, 2005; the corresponding US Army Corps of Engineers (USACE) permit was issued on May 17, 2006.

This Combined FDEP/USACE 2024 (19th) Annual Report is written in accordance with Specific Conditions 26 and 28 of the FDEP permit. All restoration activities described in the state and federal permits have been implemented (including, though not limited to, wetland and upland habitat restoration, fire management, hydrologic enhancements, erosion stabilization, management of exotic and/or invasive vegetation, management of feral hog populations, management of beaver and beaver dams, and management of preserved high-quality cypress and seepage slope wetlands). Annual quantitative and qualitative monitoring of vegetation has been conducted since 2006. Restored habitats are improving, vegetation species diversity is increasing, preserved habitats are being managed for ecological integrity, and interim success criteria have been met since 2010.

Initial credits releases occurred in 2006 and 2008; 1st Interim Credit Release was in 2010; 2nd Interim Credit Release was in 2013; 3rd Interim Credit Release was in 2018; 4th Interim Credit Release was in 2023. The Final Credit Release will be requested upon attainment of final success criteria as described in Specific Condition 22 of the FDEP permit. To facilitate effective management of the site and to comply with differing USACE and FDEP credit assessment methodologies, the SHLMB is divided into Management Unit polygons for management prescriptions (Figure 3), UMAM[1] polygons for FDEP credit assessment (Figure 4), and WRAP[2] polygons for USACE credit assessment (Figure 5).

Prior to 2023, annual fall vegetation monitoring of the SHLMB (Specific Condition 26, FDEP permit) was conducted by Northwest Florida Water Management District (NWFWMD) staff. Since 2023, annual vegetation monitoring has been conducted by Florida Natural Areas Inventory (FNAI) staff (2024 vegetation monitoring included in this annual report as Appendix A).

The semiannual report (Specific Condition 27, FDEP Permit) for the period July – December 2024, as allowed by Specific Condition 28 of the FDEP Permit, is included as an attachment to this annual report (Appendix B).

Water level staff gage readings (2006 – 2024) are reported in Appendix C.

[1] Uniform Mitigation Assessment Method.

[2] Wetland Rapid Assessment Procedure.

Annual panoramic monitoring photos (Specific Condition 26, FDEP permit), taken 2006 – 2024 at approved points, are available online at https://nwfwater.com/water-resources/regional-wetland-mitigation-program/regional-mitigation-plan/nwfwmd-mitigation-sites/choctawhatchee-watershed-mitigation-sites/sand-hill-lakes-mitigation-bank/panoramic-photos/. In Appendix D attached, panoramic photos from 2006 and 2024 are shown.

Certification:

We certify, to the best of our knowledge, that this report represents a true and accurate description of the activities and site conditions at the time of this report.

Robert F Lide

Robert F. Lide, Senior Environmental Scientist, QMS Team Member
28 January 2025

Philip Garrett

Philip Garrett, Senior Environmental Scientist, QMS Team Member
28 January 2025

Coakley Taylor

Coakley Taylor, Lands Manager, QMS Team Member
28 January 2025

Contents

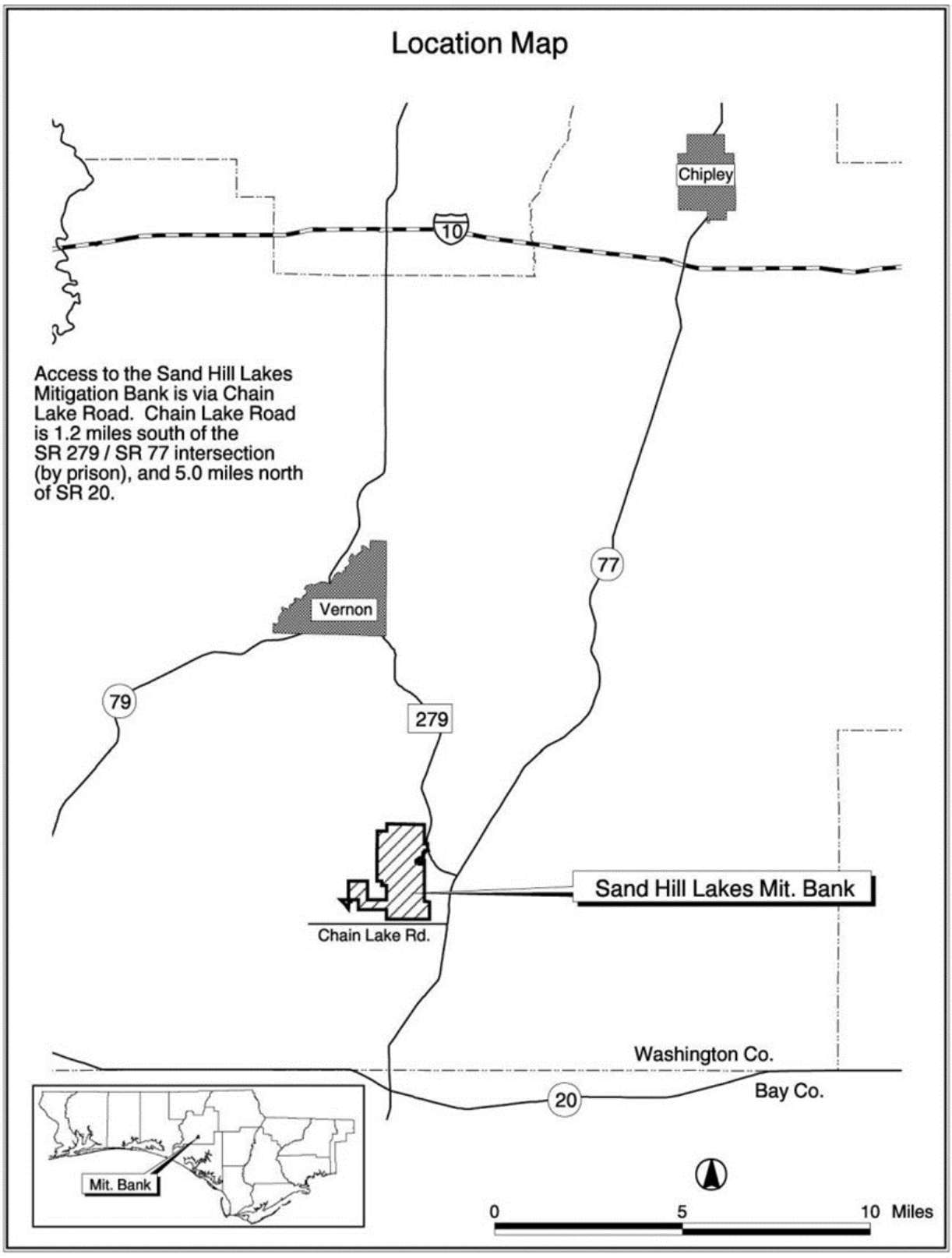


FIGURE 1. LOCATION MAP (FROM 2005 FDEP PERMIT)

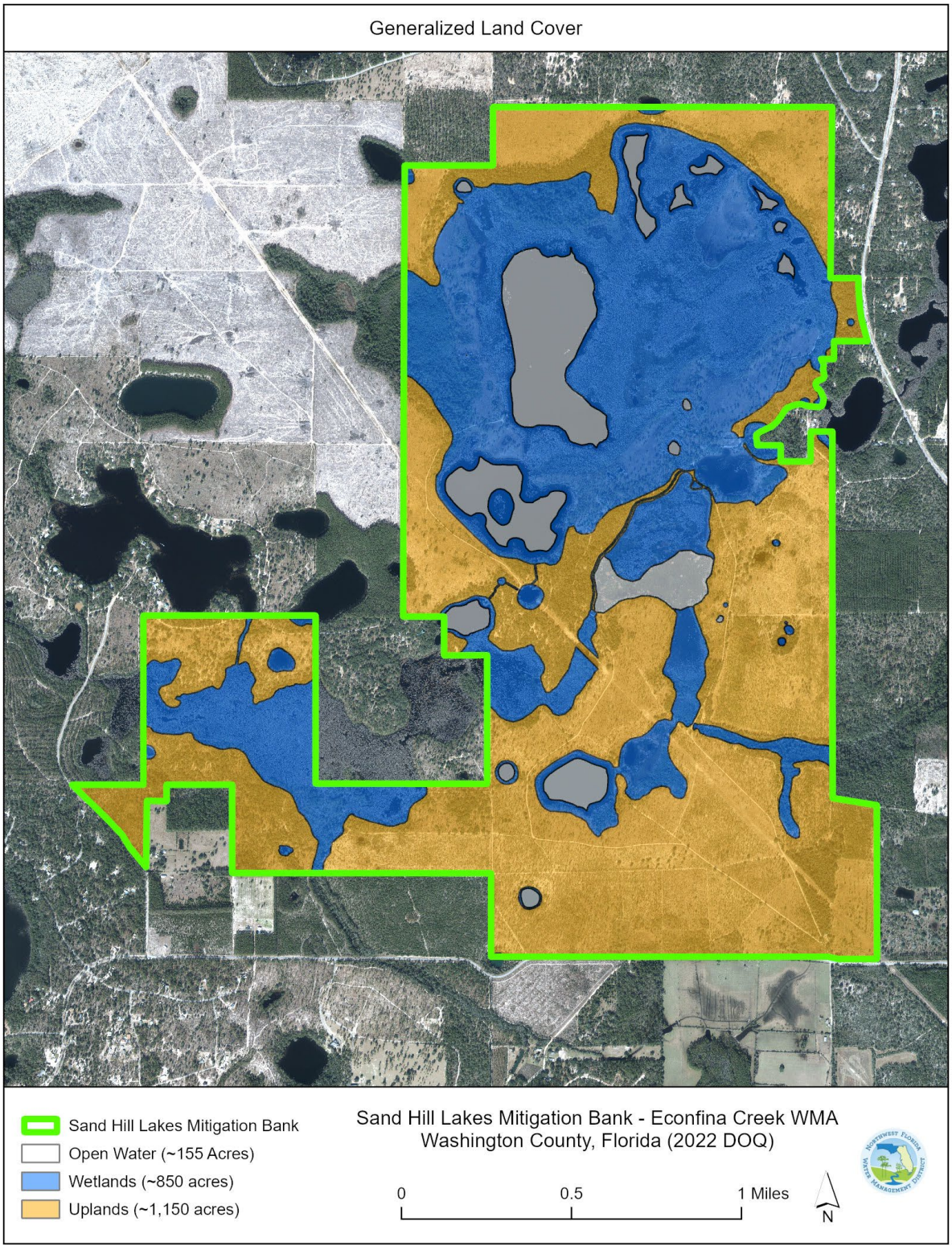


FIGURE 2. GENERALIZED LAND COVER

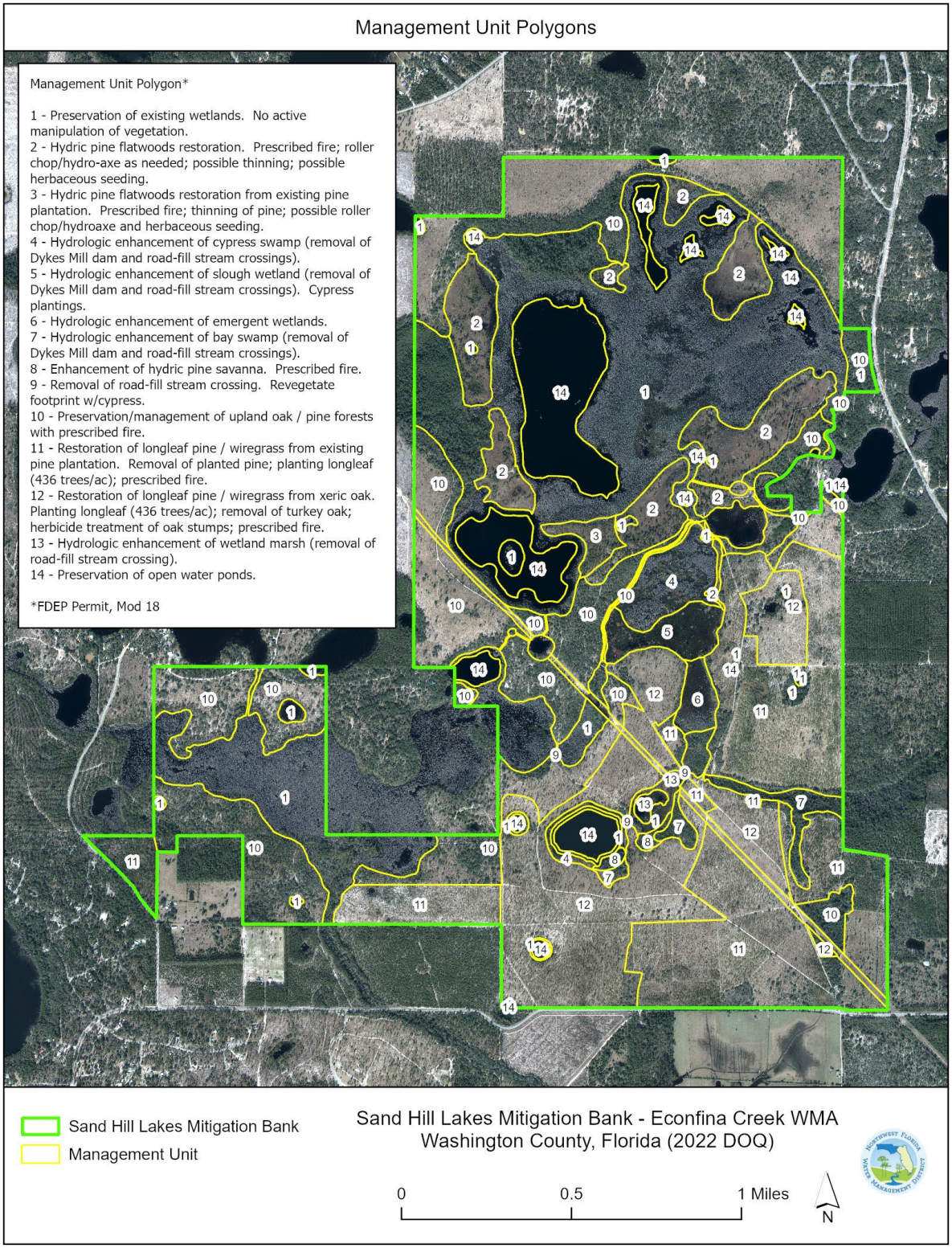


FIGURE 3. MANAGEMENT UNITS

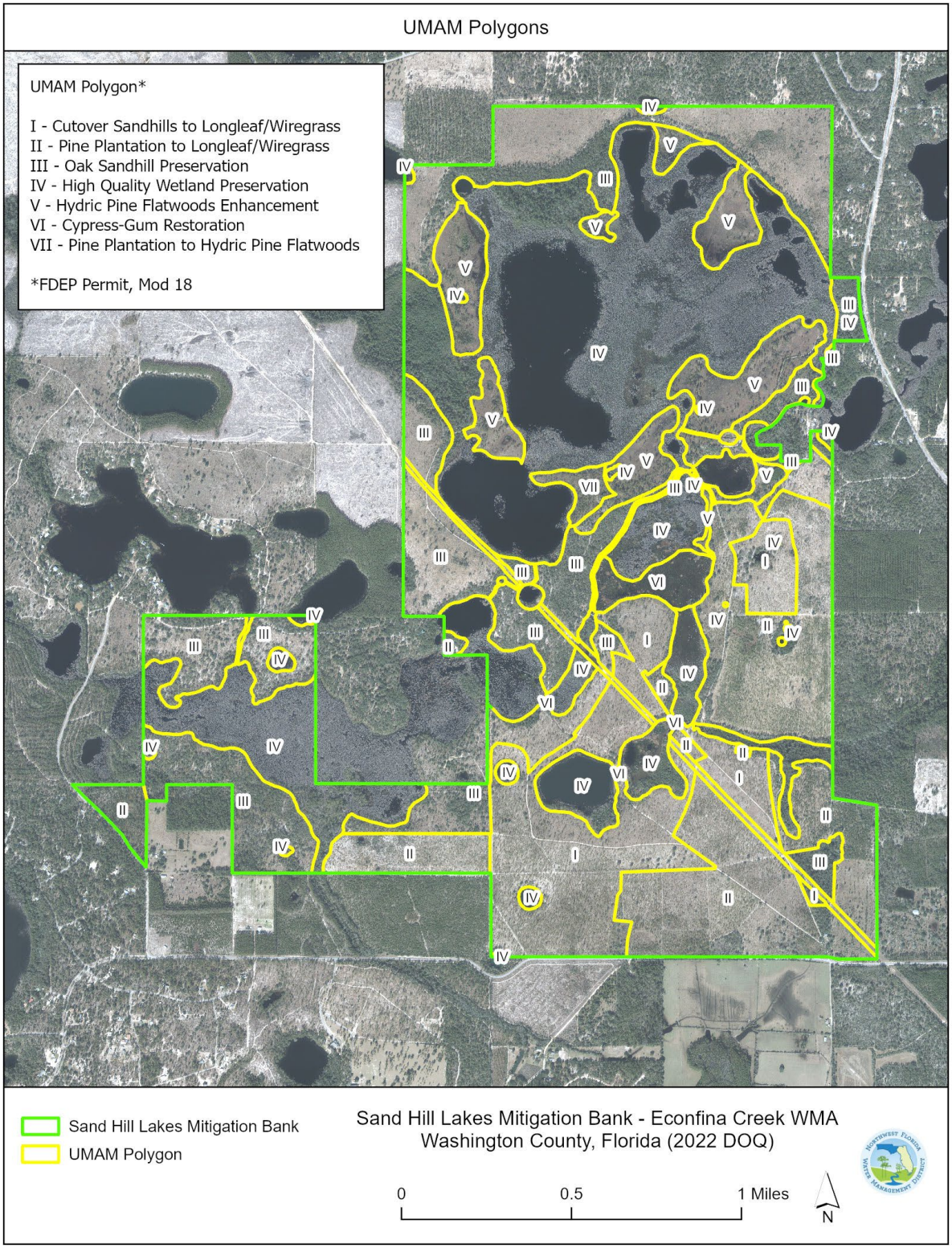


FIGURE 4. UMAM POLYGONS

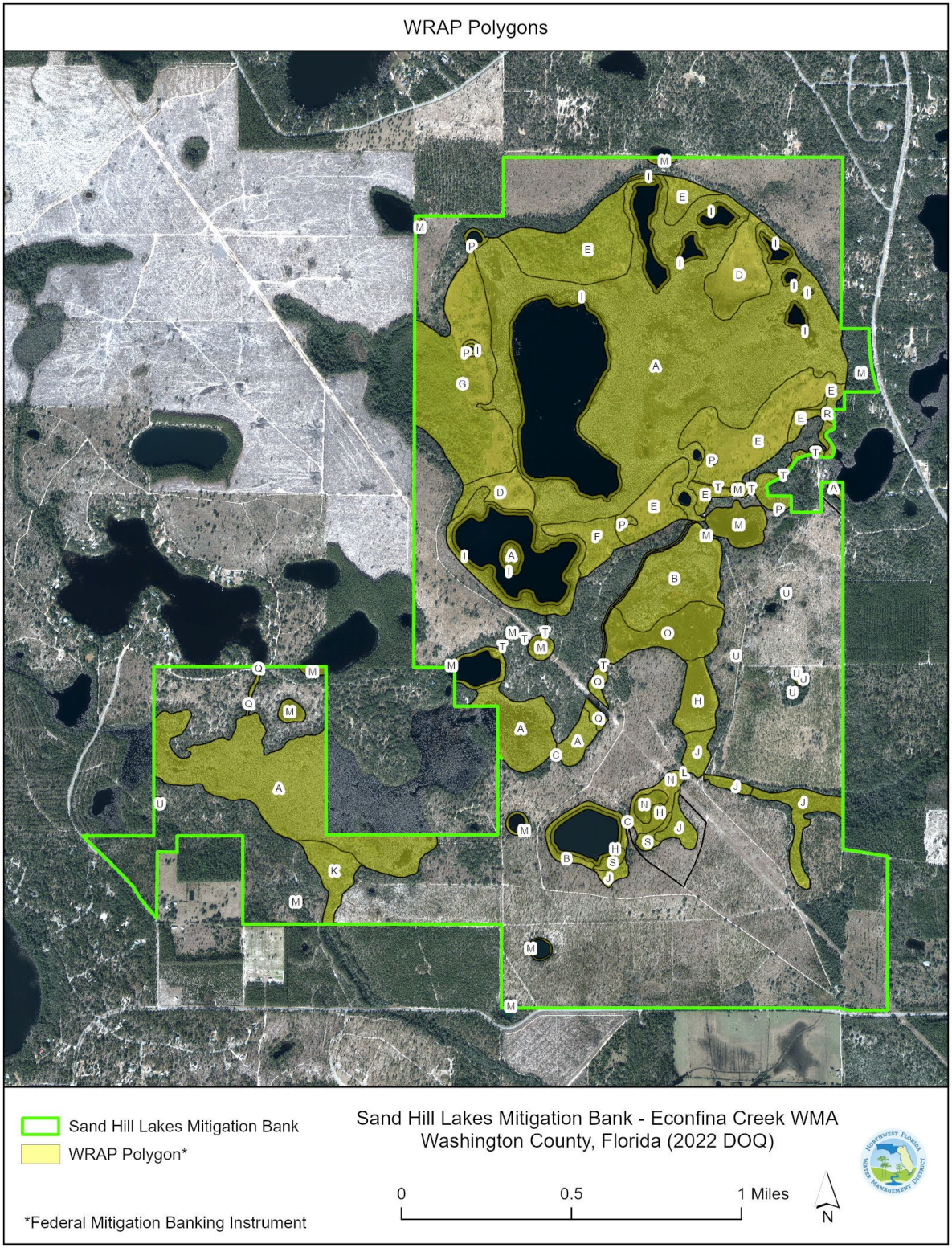


FIGURE 5. WRAP POLYGONS

Work Activity Schedule and Completion Date

Specific Condition 14 (FDEP Permit)

TABLE 1. WORK ACTIVITY SCHEDULE (ADAPTED FROM SPECIFIC CONDITION 14, FDEP PERMIT)

Activity	Completion Date
Conservation Easement, QMS	2006
Fencing and signage of site.	2005
Site security / law enforcement / internal gating / road closures.	Ongoing
Stabilization of 10 erosion sites.	2007
Hydrologic enhancements: -Replacement of Black Pond dam -Removal of Dykes Mill Pond dam -Removal of road-fill at 3 sites -Construction of 3 bridges and 2 box culverts	 2008 2006 2007 2007
Removal of pine plantation and replanting with longleaf pine.	*2007 (Initial Completion) *2012 (Additional thinning of Management Unit 3; Eradication of sand pine volunteers on 158 acres of former sand pine plantation)

Activity	Completion Date
Removal of oak overgrowth and replanting with longleaf pine.	*2005 (Longleaf pine planted) *2006 (Initial oak removal) *2007 (Additional longleaf pine planted) *2009 (Additional oak removal) *2010 (Oak/shrub reduction on 150 acres) *2011 (Additional oak removal) 2012 (Additional oak removal in 40 acres of sandhill restoration area)
80% completion of initial growing-season burns in areas to be maintained as oak / pine community.	2005
Initial thinning, roller chopping, and fuel-reduction burns in hydric pine.	*2005 (Initial burns) *2007 (Thinning of pine) *2008 (Shrub reduction via Gyro-trac)

Activity	Completion Date
Supplemental wiregrass seeding if necessitated by onsite conditions. To date within the 163.88 acres of hydric pine flatwoods restoration site, 1.18 million wiregrass plugs, 182,700 cut over muhly grass, 122,600 tooth ache grass and 72,600 mixed hydric pine flatwoods wildflowers have been established in the hydric pine flatwoods restoration area in accordance with Specific Condition 10. Road fill removal areas were planted with sapling cypress and black gum and shrub species in 2009 in accordance with Specific Condition 10. A total of 646 acres of sandhill and sandhill restoration were planted with longleaf pine at a rate of 436 trees per acre in accordance with Specific Condition 10. A total of 454.5 acres of sandhill understory was restored by planting wiregrass on 3' centers (2,199,780 plants). In 2017, 32,000 plants from 20 sandhill species grown from seed collected at the SHLMB were installed in sandhill restoration. In 2021, 12 acres of sandhill restoration east of Dykes Mill Pond were planted with 8 sandhill species on 6' centers.	*2012 (Initial work completed) *2017 (Supplemental planting) *2021 (Supplemental planting) *Additional supplemental plantings may occur as conditions warrant)
Installation of water level gages.	2005
Baseline assessment of vegetation.	2006
Fire Management / Baseline Monitoring / 1stt Annual Report	2006
Fire Management / Monitoring Year 1 / 2nd Annual Report	2007
Fire Management / Monitoring Year 2 / 3rd Annual Report	2008
Fire Management / Monitoring Year 3 / 4th Annual Report	2009
Fire Management / Monitoring Year 4 / 5th Annual Report	2010
Fire Management / Monitoring Year 5 / 6th Annual Report	2011

Activity	Completion Date
Fire Management / Monitoring Year 6 / 7th Annual Report	2012
Fire Management / Monitoring Year 7 / 8th Annual Report	2013
Fire Management / Monitoring Year 8 / 9th Annual Report	2014
Fire Management / Monitoring Year 9 / 10th Annual Report	2015
Fire Management / Monitoring Year 10 / 11th Annual Report	2017
Fire Management / Monitoring Year 11 / 12th Annual Report	2018
Fire Management / Monitoring Year 12 / 13th Annual Report	2019
Fire Management / Monitoring Year 13 / 14th Annual Report	2020
Fire Management / Monitoring Year 14 / 15th Annual Report	2021
Fire Management / Monitoring Year 15 / 16th Annual Report	2022
Fire Management / Monitoring Year 16 / 17th Annual Report	2023
Fire Management / Monitoring Year 17 / 18th Annual Report	2024
Fire Management / Monitoring Year 18 / 19th Annual Report	2025
Perpetual Ecological Management	Perpetual

Hydrologic Enhancements

Specific Condition 12 (FDEP Permit)

Hydrologic enhancements (Figure 6) included replacement of the failed Black Pond Dam, removal of the Dykes Mill Pond Dam, removal of road-fill at three sites (Pine Log Creek; Deep Edge Pond; Little Deep Edge Pond), construction of bridges at two sites (Dykes Mill Pond and Joiner Ditch), and construction of two box culverts (Power Line Pond; Green Ponds Channel). Per permit conditions, a boat ramp on the west side of Dry Pond was rehabilitated and ten erosion sites (Figure 7) were stabilized. All hydrologic enhancements (structures, road-fill removals, erosion stabilization areas) continue to function as designed.

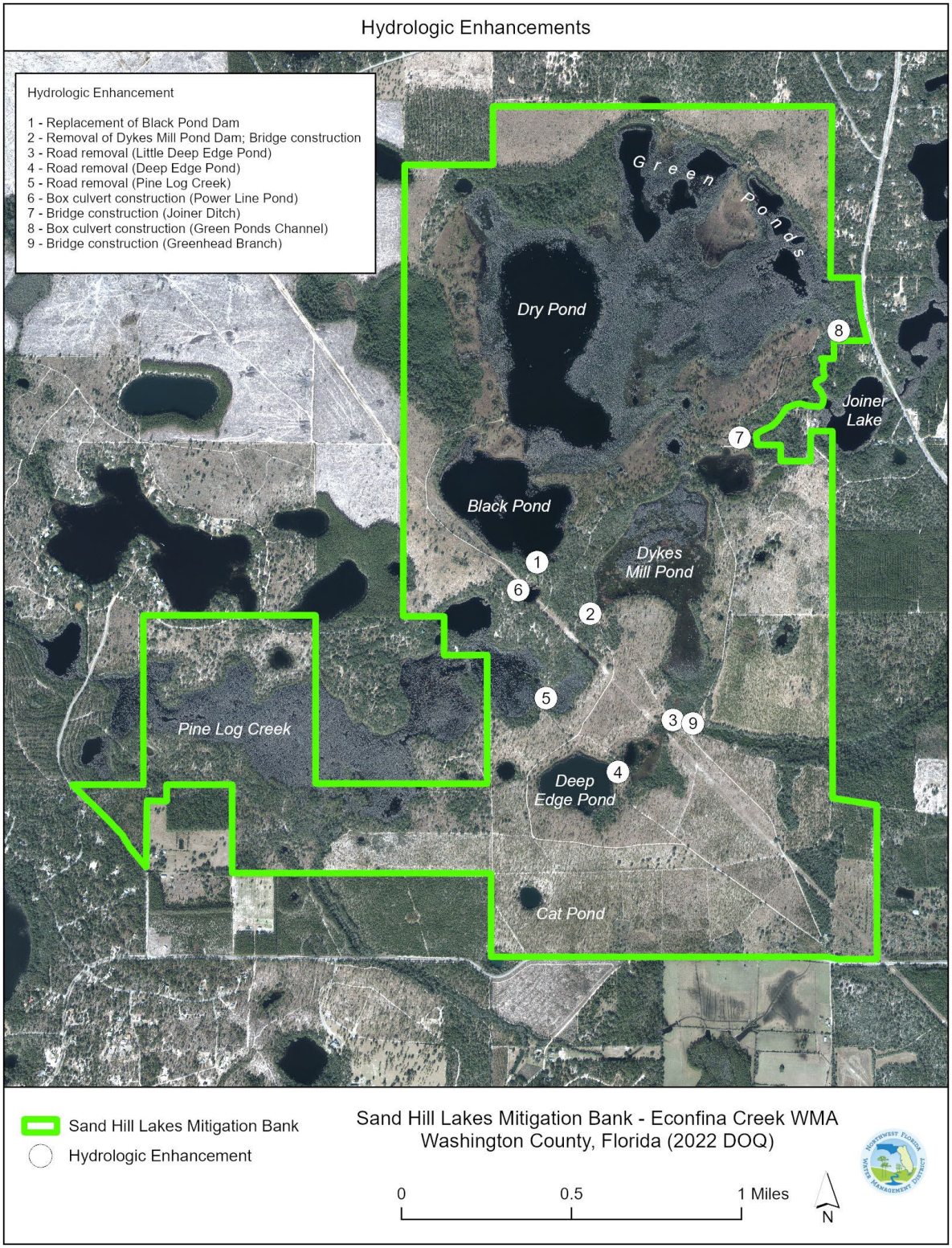


FIGURE 6. HYDROLOGIC ENHANCEMENTS

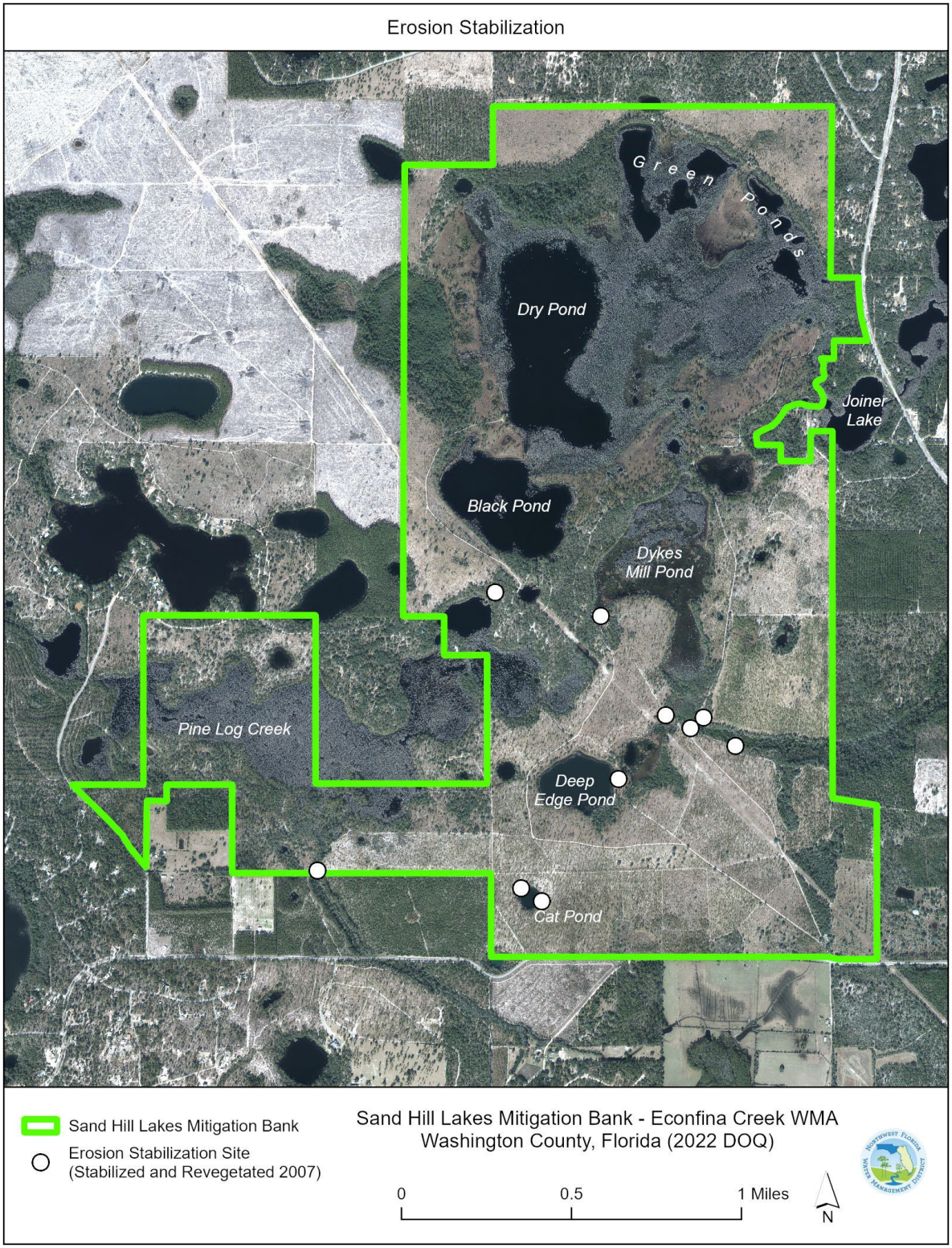


FIGURE 7. EROSION STABILIZATION

Fire Management

Specific Condition 11 (FDEP Permit)

Prescribed fire, reintroduced in the fall of 2004, is an integral component of the management, enhancement, and restoration at the SHLMB. Sandhill habitat (longleaf pine / wiregrass) and hydric pine flatwoods is burned on a targeted two-year cycle. In 2024, approximately 90 acres (Figure 8) were burned in May.

Fire will continue to be implemented in 2025 and beyond per permit conditions, fuel loads, and site conditions. Fire prescriptions are written in compliance with Chapter 590, Florida Statutes; all fires are implemented and supervised by a Florida Certified Prescribed Burn Manager.

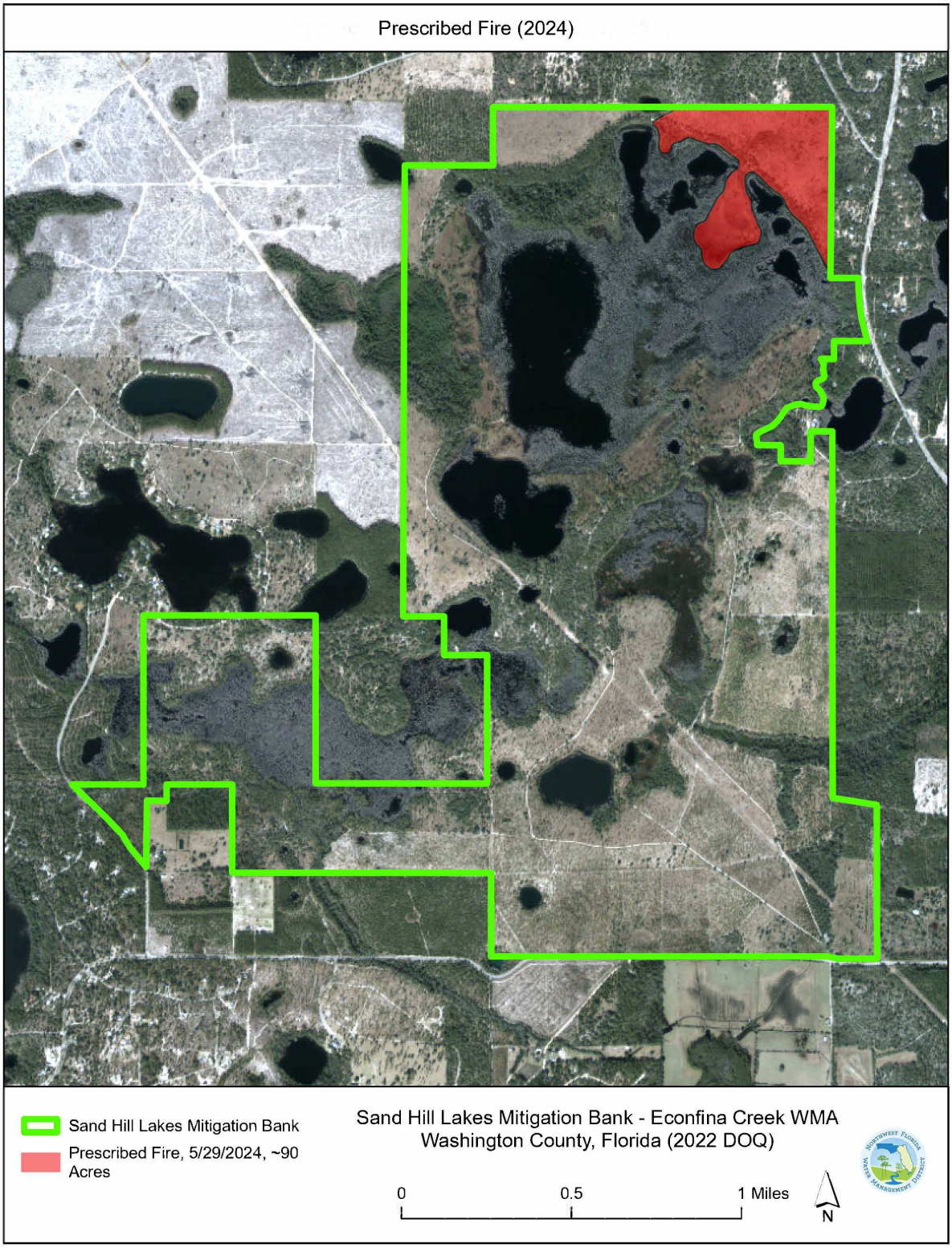


FIGURE 8. PRESCRIBED FIRE 2024

Site Management and Maintenance (Exotic and/or Invasive Vegetation and Fauna; Nuisance Vegetation; Fencing; Security; Public Use Data)

Specific Condition 25 (FDEP Permit)

Surveys of exotic and/or invasive vegetation are conducted throughout the year. In 2024, minor occurrences of exotic vegetation (including cogongrass) were identified and treated with herbicides (Figure 9). Surveys shall continue in 2025.

Efforts to limit damage to vegetation at SHLMB by feral hog and beaver are ongoing. Contract 24-060 with USDA APHIS-WS (Animal and Plant Health Inspection Service – Wildlife Services) to manage feral hog and beaver populations was executed 2/15/2024 and remains in effect through 9/30/2026. Three hog traps were installed at SHLMB (Figure 10) resulting in a total of 67 feral hogs being eliminated in 2024 at SHLMB. USDA APHIS-WS also removed beaver dams at two sites (Figure 11) and eliminated three beavers.

Perimeter fencing is inspected in accordance with permit conditions. In addition, herbicides have been applied to the exterior fences to control nuisance vegetation, thereby facilitating future repairs and preventing further damage.

The NWFWMD maintains a cooperative agreement with the Florida Fish and Wildlife Conservation Commission (FWC) to manage public access and site security (limited hunting, fishing, other passive public usage, patrols); collect biological data on harvested game and fish; monitor hunting and fishing pressures on natural resources; man a Check Station on all days the site is open to the public; and other duties such as keeping management access roads mowed. The most recent FWC report is available online at https://nwfwater.com/water-resources/regional-wetland-mitigation-program/regional-mitigation-plan/nwfwmd-mitigation-sites/choctawhatchee-watershed-mitigation-sites/sand-hill-lakes-mitigation-bank/fwc-reports/.

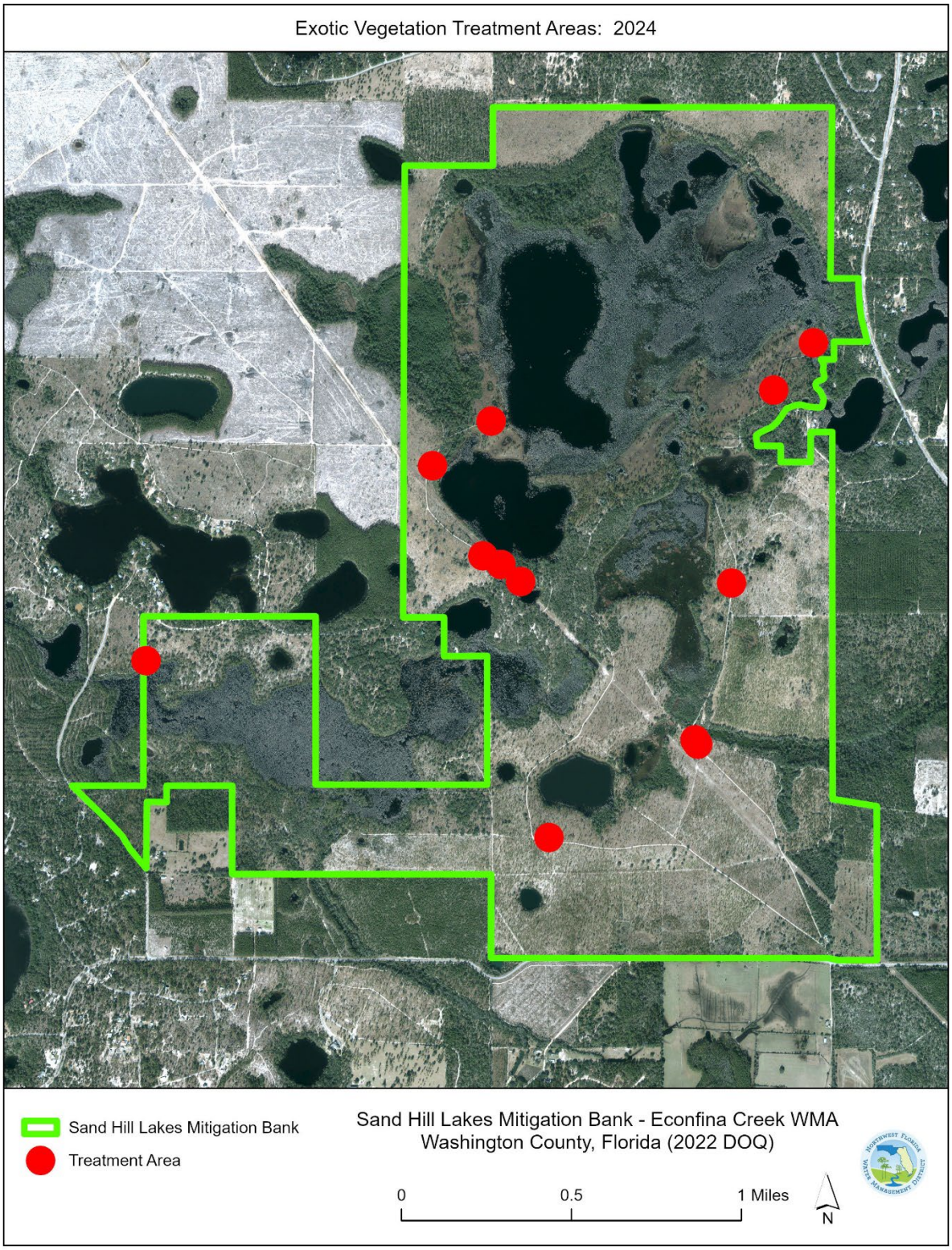


FIGURE 9. EXOTIC VEGETATION TREATMENT AREAS

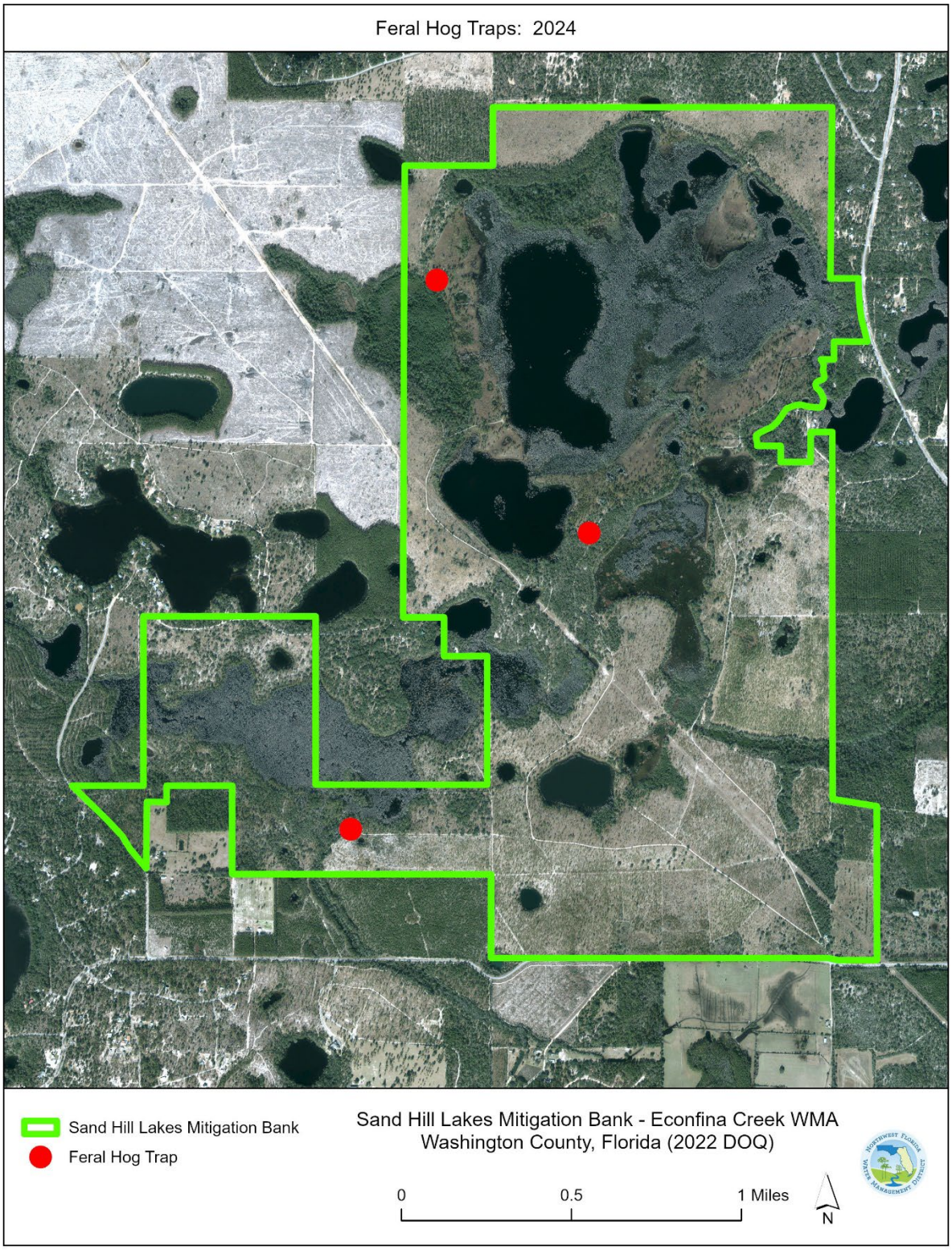


FIGURE 10. FERAL HOG TRAP LOCATIONS

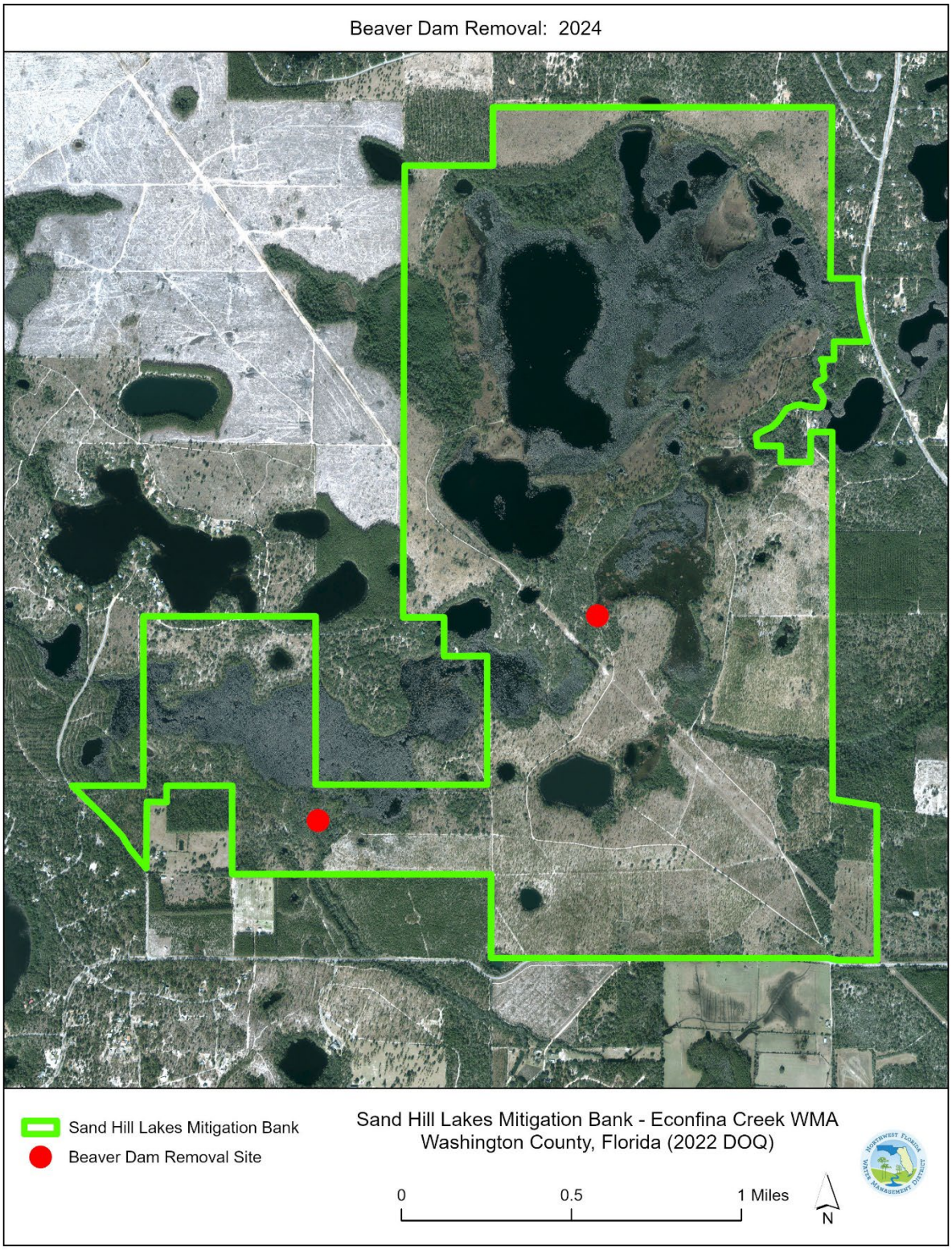


FIGURE 11. BEAVER DAM REMOVALS

Water Level Staff Gages

Specific Condition 12 (FDEP Permit)

Water level gages were installed at 10 locations in 2005 and are read monthly by Florida Fish and Wildlife Conservation Commission (FWC) staff (Figure 12). Data are reported in Appendix C.

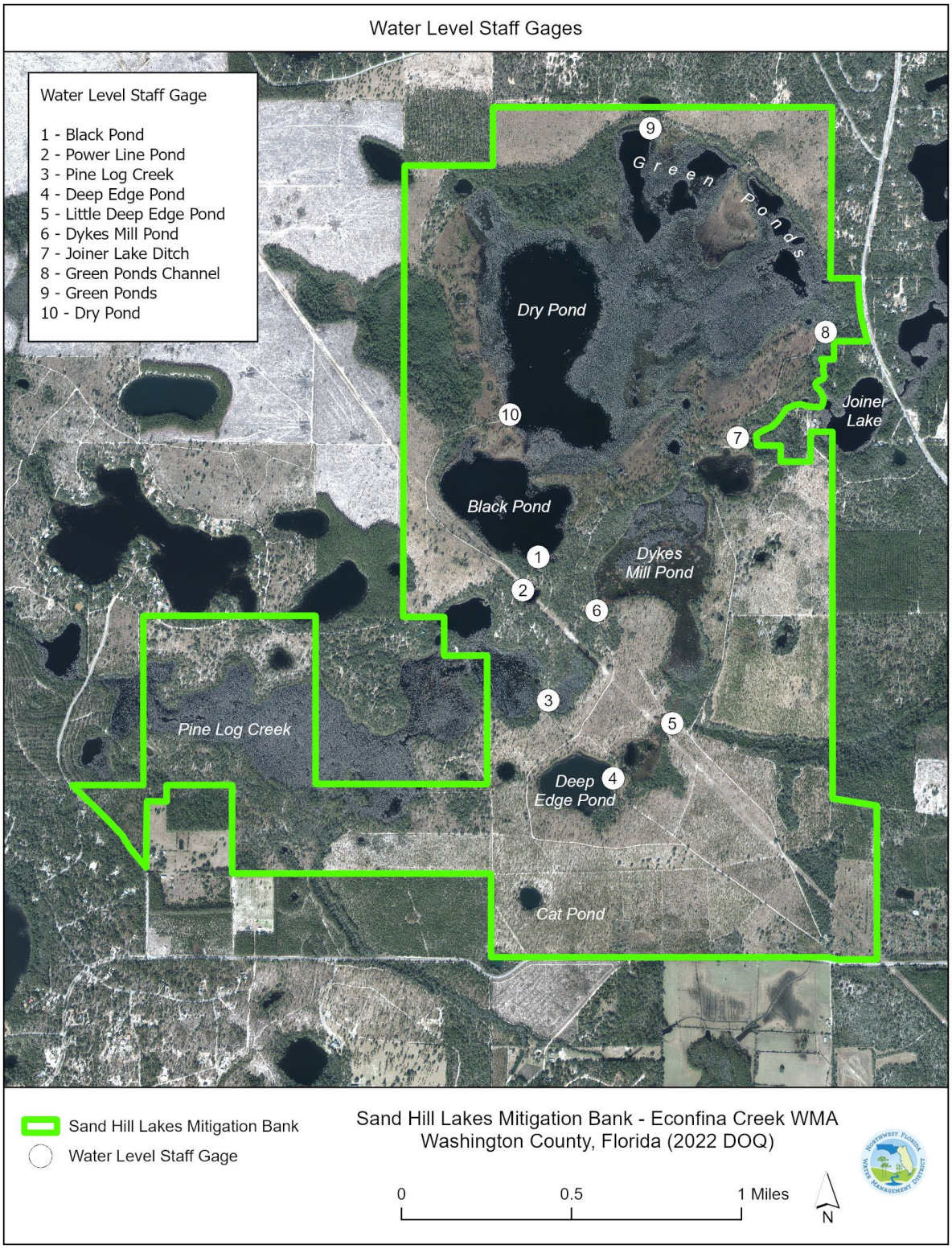


FIGURE 12. WATER LEVEL STAFF GAGES

Appendix A (Quantitative and Qualitative Vegetation Monitoring)

Vegetation Monitoring at Sand Hill Lakes Mitigation Bank
Northwest Florida Water Management District

Fall 2024

Kimberely Alexander
Kelly Anderson
Dani Davis
Allie Heiker
Amy Jenkins
Geoff Parks
Leyla Wilson

Florida Natural Area Inventory
1018 Thomasville Road, Suite 200-C
Tallahassee, FL 32303
Frank Price, Director

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

ANNUAL MONITORING INTRODUCTION

Annual fall vegetation monitoring of the Sand Hill Lakes Mitigation Bank (SHLMB) was conducted in October 2024, by the Florida Natural Areas Inventory (FNAI). Prior to 2023, the site vegetation was monitored by the Northwest Florida Water Management District (NWFWMD). This report satisfies Condition 26 of the 2006 Mitigation Bank Instrument for SHLMB.

Quantitative and qualitative monitoring was used to document the current plant species composition and vegetation structure of different habitats, and belt transects were used to measure longleaf pine (*Pinus palustris*) seedling survival in sandhill restoration and enhancement areas. Fall monitoring methods and data analysis are described below. Pedestrian surveys were conducted for both wetland and uplands. The pedestrian surveys are particularly useful in providing detailed species lists and help in determining community diversity. Species diversity is good to excellent throughout the SHLMB and is significantly higher than baseline.

The dates of annual sampling for the 2024 annual report were October 14 to October 16. All quantitative and qualitative sampling was completed by FNAI botanists Kim Alexander, Kelly Anderson, Dani Davis, Allie Heiker, Amy Jenkins, Geoff Parks, and Leyla Wilson. Philip Garrett and Robert Lide (NWFWMD) assisted with access. Plant taxonomy throughout this monitoring report 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 2023 monitoring report, which followed Wunderlin, R. P., B.F. Hansen, A.R. Franck, and F.B. Essig. 2017. Atlas of Florida Plants (htpp://florida.plantatlas.usf.edu/), Institute for Systematic Botany, University of South Florida, Tampa.

QUANTITATIVE MONITORING

METHODS

Quantitative monitoring has been conducted in accordance with the methods described in Attachment H – Monitoring Plan. Quantitative vegetation monitoring occurred at the end of the growing season. This is the fourteenth annual monitoring report for the SHLMB.

The percent vegetation cover was monitored at transect locations shown in Figure 9. One-meter square quadrats were established along 600-foot transects at 20-foot intervals. The start point of each transect is a permanent marker, and the approximate transect bearing was determined from prior monitoring reports. A 300-foot tape measure was used to establish the transect, taken in two parts. Quadrats were taken beginning at 20 feet and were always located along the left side of the tape. Data recorded in each quadrat consisted of the visually estimated percent cover of each plant species including individuals rooted in the the quadrat as well as overhanging. Cover was estimated using a modified Daubenmire cover scale with 8 categories. 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. Open ground was estimated in each quadrat as a percentage of ground not obscured by plant cover up to 2 m in height, and total plant cover was assumed to be the inverse of this estimate. Plant cover categories were converted to mid-point values and averaged across each transect. The sum of these values was adjusted to equal at least the total plant cover, with other subcategories (woody, shrub, graminoid, etc.) also relative to this total cover.

To measure the success of longleaf pine plantings in Sandhill restoration and enhancement areas, trees were measured using the “line strip” (belt transect) technique. Belt transects measuring 30 feet by 600 feet were co-located along each sandhill quantitative transect, using the measuring tape as the center line. All trees with a measurable diameter at breast height (DBH) were counted. The height of each tree was measured using a range finder, and a measuring tape was used to record DBH. Values are reported as a tally by height class. Longleaf pines that did not have a measurable DBH (shorter than 1.4 m) were simply tallied as seedlings.

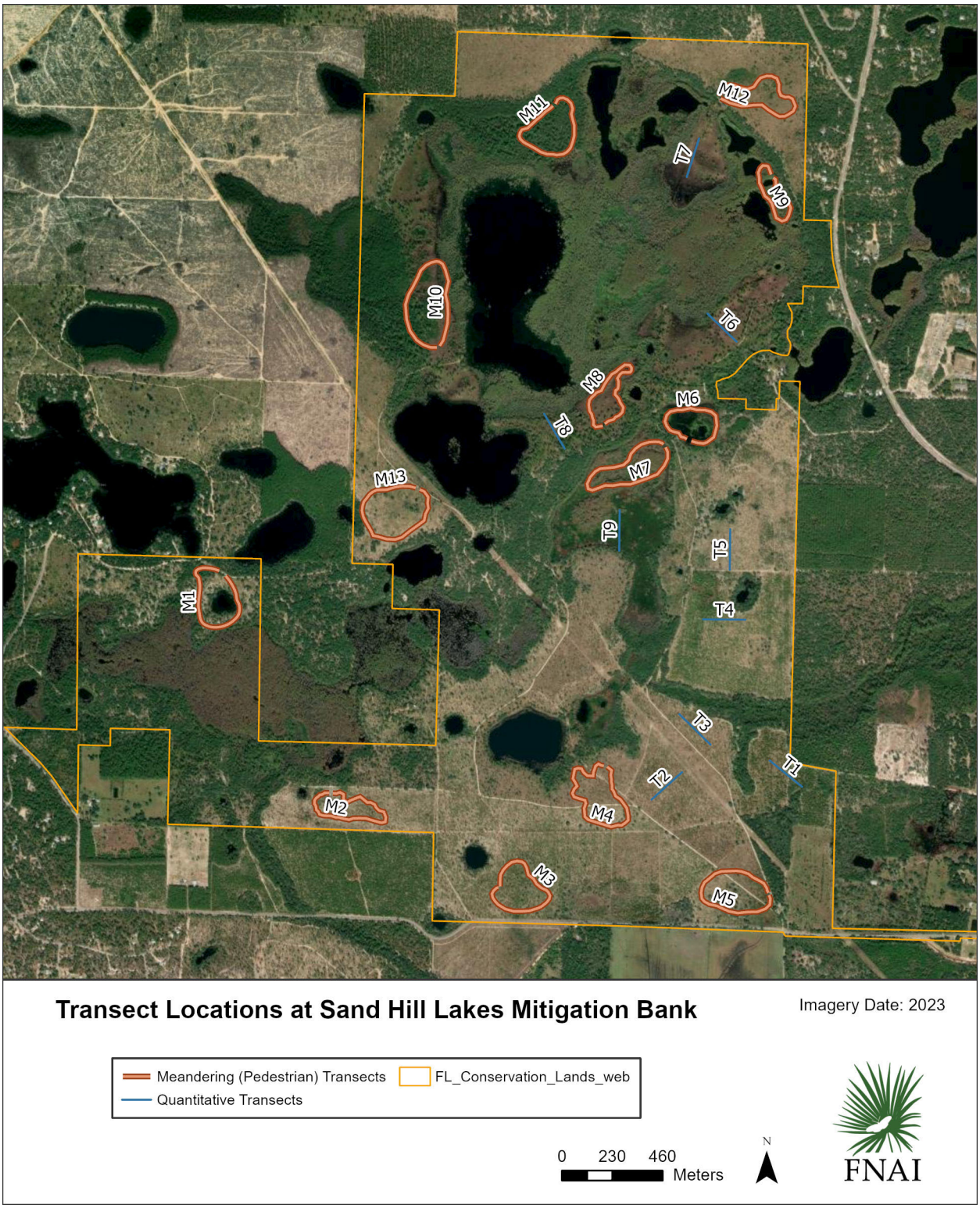


Figure 1. Location of quantitative and meandering transects at Sand Hill Lakes Mitigation Bank.

RESULTS AND DISCUSSION

Management Unit 11, UMAM Polygon II, Sand Pine Plantation (Transects #1, #2 and #4)

UMAM Polygon II, Management Unit 11, consists of 367 acres of planted sand pine plantation that have been restored to sandhills. Baseline conditions indicated a sand pine canopy with 100 percent canopy closure and an average of 880 sand pine trees per acre in the sand pine plantations. Removal of the sand pine was completed in November 2007 followed by planting of longleaf pine at 436 trees per acre. In 2021, eight sandhill species (145,450 plugs) were planted in the sandhill adjacent to Little Deep Edge Pond. It is hoped that these species will help augment the developing sandhill diversity.

Quantitative Transects

Baseline herbaceous monitoring in 2006 identified 10 species within Transect 1, 16 in Transect 2, and 20 in Transect 4.

2023 Monitoring:

Transect 1 – A total of 50 species was observed. Wiregrass had the greatest vegetative cover at 43%. Open ground was estimated at 20%. Total woody cover was 11%.

Transect 2 – A total of 47 species was observed. Wiregrass had the greatest vegetative cover at 23%. Open ground was estimated at 50%. Total woody cover was 8%.

Transect 4 – A total of 43 species was observed. Wiregrass had the greatest vegetative cover at 52%. Open ground was estimated at 42%. Total woody cover was 7%.

2024 Monitoring:

Transect 1 – A total of 50 species was detected (Table 1). Total plant cover (taken as the inverse of the open area) was 75% (Table 2, Figure 2). Herbacous cover was 64%, with wiregrass cover at around 44%. Shrub cover was 6%.

Transect 2 – A total of 52 species was detected (Table 3). Total plant cover (taken as the inverse of the open area) was 50% (Table 4, Figure 3). Herbacous cover was 39%, with wiregrass cover at around 27%. Shrub cover was 6%.

Transect 4 – A total of 53 species was detected (Table 5). Total plant cover (taken as the inverse of the open area) was 69% (Table 6, Figure 4). Herbacous cover was 63%, with wiregrass cover at around 52%. Shrub cover was 5%.

Final Success Criteria:

The sand pine plantations were harvested in 2007. Site preparation burns were conducted during the winter of 2008 and planted with longleaf pine in the winter of 2008-2009. Wiregrass plugs were planted on 3-foot centers in the former sand pine plantations in 2008 and completed in 2010. The area is burned on a two-year rotation.

Wiregrass continues to be the dominant species. Transects 1 and 4 have herbaceous cover nearing the target cover of 70%. Shrub cover is low across all transects and less than the maximum of 20% allowed in the Final Succcess Criteria.

On average, planted longleaf pine densities remain near or below 200 trees per acre. Trees are healthy and vigorous, although there has been some loss of canopy along Transect 1. Bahia and centipede grass cover continues to be monitored and treated as needed. Only small amounts of these pasture grasses were seen along the transects.

Table 1. Percent cover of plant species in Transect 1 - Sandhill Restoration sampled on October 14-15, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Acalypha gracilens	slender threeseed mercury	Forb/herb	non-woody	0.17
Andropogon gyrans	Elliott's bluestem	Graminoid	non-woody	0.07
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.27
Andropogon virginicus	broomsedge bluestem	Graminoid	non-woody	0.47
Andropogon virginicus* var. *virginicus	broomsedge bluestem	Graminoid	non-woody	0.15
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	43.50
Aristida purpurascens	arrowfeather threeawn	Graminoid	non-woody	0.68
Aristida tenuispica	Southern arrowfeather	Graminoid	non-woody	0.02
Baptisia lanceolata	gopherweed	Forb/herb	non-woody	0.07
Bulbostylis ciliatifolia	capillary hairsedge	Graminoid	non-woody	0.02
Callicarpa americana	American beautyberry	Shrub	woody	0.25
Chrysoma pauciflosculosa	woody goldenrod	Subshrub, Shrub	woody	0.60
Chrysopsis lanuginosa	Lynn Haven goldenaster	Forb/herb	non-woody	3.52
***Chrysopsis* sp.**	goldenaster	Forb/herb	non-woody	0.02
Coleataenia anceps	beaked panicum	Graminoid	non-woody	0.12
Commelina erecta* var. *angustifolia	whitemouth dayflower	Forb/herb	non-woody	0.02
Crocanthemum corymbosum	pinebarren frostweed	Subshrub, Forb/herb	non-woody	0.05
Crotalaria rotundifolia	rabbitbells	Forb/herb	non-woody	0.02
Croton glandulosus	vente conmigo	Subshrub, Forb/herb	non-woody	0.05
***Cyperus* sp.**	flatsedge	Graminoid	non-woody	0.20
Dichanthelium aciculare	needleleaf witchgrass	Graminoid	non-woody	0.37
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.08
Digitaria villosa	shaggy crabgrass	Graminoid	non-woody	0.03
Diospyros virginiana	common persimmon	Tree	woody	0.05
Eremochloa ophiuroides	centipede grass	Graminoid	non-woody	3.48
Erigeron canadensis	Canadian horseweed	Forb/herb	non-woody	0.02
Eupatorium compositifolium	yankeeweed	Forb/herb	non-woody	2.78
Euphorbia floridana	greater Florida spurge	Forb/herb	non-woody	0.02
***Galactia* sp.**	milkpea	Forb/herb,Vine	non-woody	0.23
Hexasepalum teres	poor joe	Forb/herb	non-woody	0.03
Houstonia procumbens	roundleaf bluet	Forb/herb	non-woody	0.08
Hypericum gentianoides	orangegrass	Forb/herb	non-woody	0.10
***Lespedeza* sp.**	lespedeza	Forb/herb	non-woody	0.03
Opuntia mesacantha* ssp. *lata	pricklypear	Shrub	woody	0.05
Paspalum setaceum	thin paspalum	Graminoid	non-woody	0.10
***Paspalum* sp.**	paspalum	Graminoid	non-woody	0.02
***Physalis* sp.**	groundcherry	Forb/herb	non-woody	0.03

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Pinus clausa	sand pine	Tree	woody	0.02
Pinus palustris	longleaf pine	Tree	woody	0.37
Pityopsis aspera* var. *adenolepis	pineland silkgrass	Forb/herb	non-woody	0.60
***Polygala* sp.**	milkwort	Forb/herb	non-woody	0.02
Polygonella gracilis	tall jointweed	Forb/herb	non-woody	0.05
Quercus hemisphaerica	laurel oak	Tree	woody	4.63
Quercus virginiana	live oak	Tree	woody	0.02
***Rhynchospora* sp.**	beaksedge	Graminoid	non-woody	0.03
Rubus argutus	sawtooth blackberry	Subshrub	woody	0.12
Rubus cuneifolius	sand blackberry	Subshrub	woody	4.23
***Schizachyrium* sp.**	little bluestem	Graminoid	non-woody	0.23
Schizachyrium stoloniferum	creeping little bluestem	Graminoid	non-woody	2.22
Tragia urens	wavyleaf noseburn	Forb/herb	non-woody	0.02
Open (no plant cover)				25.03

Table 2. Summary of plant cover in Transect 1 – Sandhill Restoration.

Group	Cover	Definition
Open	**25.03**	No plant cover up to 2 m above quad
Total Plant	**74.97**	Calculated as the inverse of “open” area estimated in the field
All Woody	**11.02**	Sum of “woody” plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**5.60**	Sum of “shrub” and “subshrub” growth form covers
Woody Vines	**0.00**	Sum of woody “vine” growth form covers
All Herbaceous	**63.95**	Sum of “non-woody” plant covers
Graminoids	**55.51**	Sum of covers for grasses, sedges, and rushes

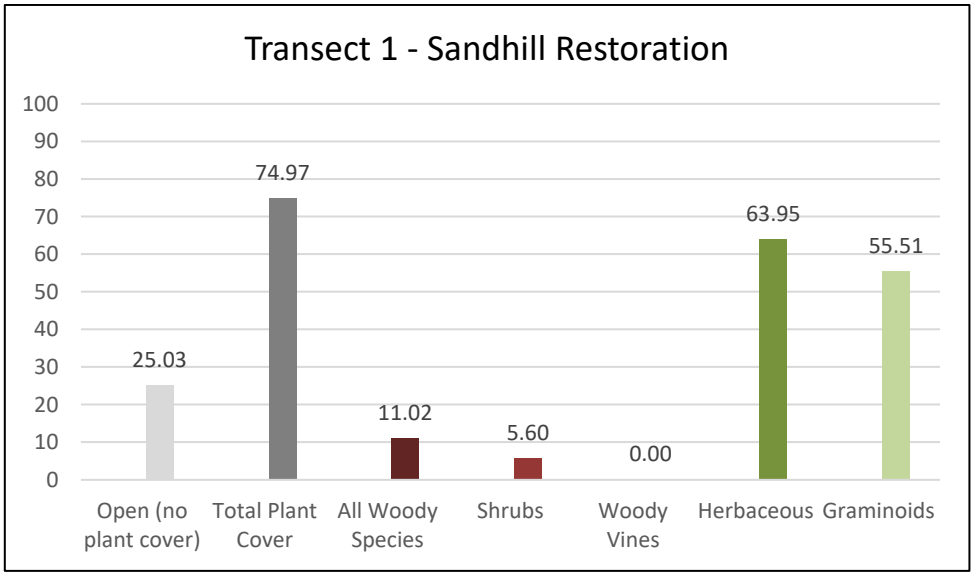


Figure 2. Summary of plant cover in Transect 1 - Sandhill Restoration.

Table 3. Percent cover of plant species in Transect 2 - Sandhill Restoration sampled on October 14, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Agalinis divaricata	pineland false foxglove	Forb/herb	non-woody	0.23
Andropogon campbellii	deceptive bluestem	Graminoid	non-woody	0.58
Andropogon gyrans	Elliott's bluestem	Graminoid	non-woody	0.23
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.32
Andropogon virginicus* var. *virginicus	broomsedge bluestem	Graminoid	non-woody	0.40
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	27.13
Aristida purpurascens	arrowfeather threeawn	Graminoid	non-woody	0.10
Aristida tenuispica	Southern arrowfeather	Graminoid	non-woody	0.65
Balduina angustifolia	coastalplain honeycomb-head	Forb/herb	non-woody	0.15
Bulbostylis ciliatifolia	capillary hairsedge	Graminoid	non-woody	0.23
Chrysoma pauciflosculosa	woody goldenrod	Subshrub, Shrub	woody	2.85
Chrysopsis lanuginosa	Lynn Haven goldenaster	Forb/herb	non-woody	1.23
Chrysopsis linearifolia	narrowleaf goldenaster	Forb/herb	non-woody	0.05
Dalea pinnata	summer farewell	Forb/herb	non-woody	0.22
Dichanthelium aciculare	needleleaf witchgrass	Graminoid	non-woody	0.33
Dichanthelium arenicoloides	sandy woods witchgrass	Graminoid	non-woody	0.02
Dichanthelium malacon	dehiscent witchgrass	Graminoid	non-woody	0.07
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.12
Eragrostis elliottii	Elliott's lovegrass	Graminoid	non-woody	0.02
***Eragrostis* sp.**	lovegrass	Graminoid	non-woody	0.03
Eragrostis spectabilis	purple lovegrass	Graminoid	non-woody	0.13
Eriogonum tomentosum	dogtongue wild buckwheat	Forb/herb	non-woody	0.05
Eupatorium capillifolium	dogfennel	Forb/herb	non-woody	0.12
Eupatorium compositifolium	yankeeweed	Forb/herb	non-woody	0.13
Euphorbia exserta	coastal sand spurge	Forb/herb	non-woody	0.03
***Galactia* sp.**	milkpea	Forb/herb,Vine	non-woody	0.18
Gaylussacia dumosa	dwarf huckleberry	Subshrub, Shrub	woody	0.50
Hypericum gentianoides	orangegrass	Forb/herb	non-woody	0.12
Ilex vomitoria	yaupon	Tree, Shrub	woody	2.13
Lechea sessiliflora	pineland pinweed	Forb/herb	non-woody	0.32
Liatris tenuifolia	shortleaf gayfeather	Forb/herb	non-woody	0.02
Mimosa microphylla	sensitive brier	Forb/herb, Vine	non-woody	0.02
Opuntia mesacantha* ssp. *lata	pricklypear	Shrub	woody	0.07
Paronychia patula	pineland nailwort	Forb/herb	non-woody	0.02
Pinus palustris	longleaf pine	Tree	woody	0.28
Pityopsis aspera	pineland silkgrass	Forb/herb	non-woody	0.07
Pityopsis aspera* var. *adenolepis	pineland silkgrass	Forb/herb	non-woody	0.07
***Pityopsis* sp.**	silkgrass	Forb/herb	non-woody	0.03
Polygonella gracilis	tall jointweed	Forb/herb	non-woody	0.22
Pteridium pseudocaudatum	tailed bracken	Forb/herb	non-woody	0.02
Quercus laevis	turkey oak	Tree	woody	3.50
Rhynchosia cytisoides	royal snoutbean	Forb/herb	non-woody	0.07
Rhynchospora fascicularis	fascicled beaksedge	Graminoid	non-woody	0.05
***Schizachyrium* sp.**	little bluestem	Graminoid	non-woody	0.05
Schizachyrium stoloniferum	creeping little bluestem	Graminoid	non-woody	0.33
Smilax bona-nox	saw greenbriar	Shrub, Vine	woody	0.02
Solidago odora	sweet goldenrod	Forb/herb	non-woody	0.23
Stylisma patens	coastalplain dawnflower	Forb/herb	non-woody	0.17

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Tragia urens	wavyleaf noseburn	Forb/herb	non-woody	0.02
Unknown herb		Forb/herb	non-woody	0.02
Vaccinium arboreum	sparkleberry	Shrub	woody	0.05
Vaccinium elliottii	Elliott's blueberry	Shrub	woody	0.05
Open (no plant cover)				50.08

Table 4. Summary of plant cover in Transect 2 – Sandhill Restoration.

Group	Cover	Definition
Open	**50.08**	No plant cover up to 2 m above quad
Total Plant	**49.92**	Calculated as the inverse of “open” area estimated in the field
All Woody	**10.71**	Sum of “woody” plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**6.41**	Sum of “shrub” and “subshrub” growth form covers
Woody Vines	**0.02**	Sum of woody “vine” growth form covers
All Herbaceous	**39.21**	Sum of “non-woody” plant covers
Graminoids	**34.92**	Sum of covers for grasses, sedges, and rushes

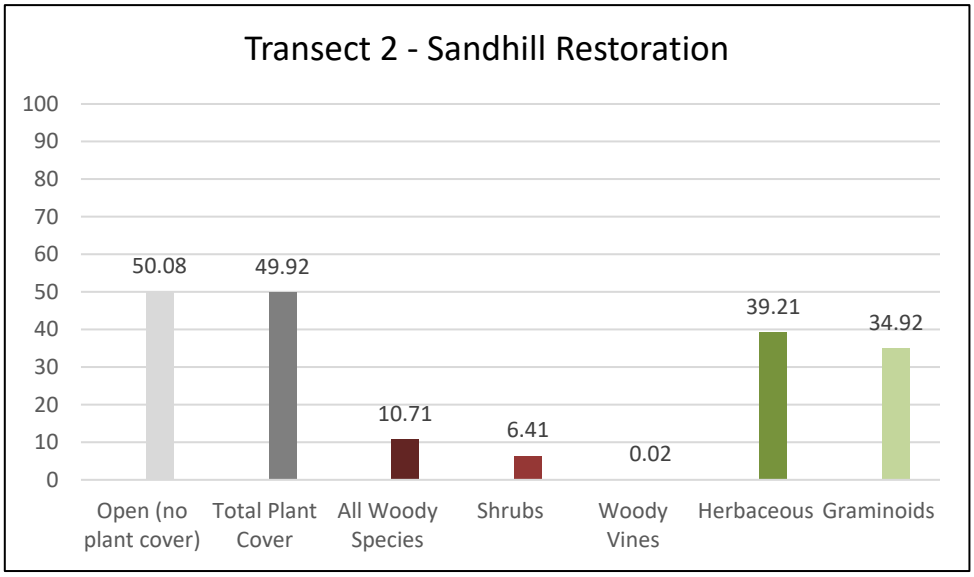


Figure 3. Summary of plant cover in Transect 2 - Sandhill Restoration.

Table 5. Percent cover of plant species in Transect 4 - Sandhill Restoration sampled on October 15, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Agalinis divaricata	pineland false foxglove	Forb/herb	non-woody	0.28
Andropogon gyrans	Elliott's bluestem	Graminoid	non-woody	0.12
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.10
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	51.75
Baptisia lanceolata	gopherweed	Forb/herb	non-woody	0.25
Bulbostylis ciliatifolia	capillary hairsedge	Graminoid	non-woody	0.12

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Chrysoma pauciflosculosa	woody goldenrod	Subshrub, Shrub	woody	1.55
Chrysopsis lanuginosa	Lynn Haven goldenaster	Forb/herb	non-woody	0.10
***Chrysopsis* sp.**	goldenaster	Forb/herb	non-woody	0.10
Commelina erecta* var. *angustifolia	whitemouth dayflower	Forb/herb	non-woody	0.02
Crotalaria rotundifolia	rabbitbells	Forb/herb	non-woody	1.05
Ctenodon viscidulus	sticky jointvetch	Forb/herb	non-woody	0.07
Cyperus retrorsus	pineland flatsedge	Graminoid	non-woody	0.07
***Cyperus* sp.**	flatsedge	Graminoid	non-woody	0.13
Dichanthelium aciculare	needleleaf witchgrass	Graminoid	non-woody	0.20
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.10
Digitaria villosa	shaggy crabgrass	Graminoid	non-woody	0.02
Diodia virginiana	Virginia buttonweed	Forb/herb	non-woody	0.02
Diospyros virginiana	common persimmon	Tree	woody	0.15
Eremochloa ophiuroides	centipede grass	Graminoid	non-woody	0.57
Erigeron canadensis	Canadian horseweed	Forb/herb	non-woody	0.02
Eupatorium compositifolium	yankeeweed	Forb/herb	non-woody	0.98
Froelichia floridana	cottonweed	Forb/herb	non-woody	0.02
***Galactia* sp.**	milkpea	Forb/herb,Vine	non-woody	0.45
Hexasepalum teres	poor joe	Forb/herb	non-woody	0.80
Houstonia procumbens	roundleaf bluet	Forb/herb	non-woody	0.15
Hypericum gentianoides	orangegrass	Forb/herb	non-woody	0.13
Ilex vomitoria	yaupon	Shrub	woody	0.58
Lechea sessiliflora	pineland pinweed	Forb/herb	non-woody	0.60
***Lespedeza* sp.**	lespedeza	Forb/herb	non-woody	0.07
Paronychia patula	pineland nailwort	Forb/herb	non-woody	0.58
Paspalum notatum	bahiagrass	Graminoid	non-woody	0.02
Paspalum setaceum	thin paspalum	Graminoid	non-woody	0.05
Penstemon multiflorus	manyflower beardtongue	Forb/herb	non-woody	1.18
***Physalis* sp.**	groundcherry	Forb/herb	non-woody	0.05
Pinus palustris	longleaf pine	Tree	woody	0.17
Pityopsis aspera* var. *adenolepis	pineland silkgrass	Forb/herb	non-woody	0.03
***Pityopsis* sp.**	silkgrass	Forb/herb	non-woody	0.02
Poaceae	grass family	Graminoid	non-woody	0.02
Polygonella gracilis	tall jointweed	Forb/herb	non-woody	0.03
Quercus geminata	sand live oak	Tree	woody	0.17
Quercus hemisphaerica	laurel oak	Tree	woody	0.27
Rhynchosia cytisoides	royal snoutbean	Forb/herb	non-woody	0.20
Rubus cuneifolius	sand blackberry	Subshrub	woody	1.85
Smilax auriculata	earleaf greenbrier	Shrub, Vine	woody	0.23
Stylisma patens	coastalplain dawnflower	Forb/herb	non-woody	0.08
Tephrosia chrysophylla	scurf hoary-pea	Forb/herb	non-woody	0.02
Tragia urens	wavyleaf noseburn	Forb/herb	non-woody	0.03
Unknown herb		Forb/herb	non-woody	0.03
Vaccinium arboreum	sparkleberry	Tree, Shrub	woody	0.37
Vaccinium elliottii	Elliott's blueberry	Shrub	woody	0.02
Vaccinium stamineum	deerberry	Shrub	woody	0.25
Yucca filamentosa	Adam's needle	Subshrub, Shrub	woody	0.62
Open (no plant cover)				30.97

Table 6. Summary of plant cover in Transect 4 – Sandhill Restoration.

Group	Cover	Definition
Open	**30.97**	No plant cover up to 2 m above quad
Total Plant	**69.03**	Calculated as the inverse of "open" area estimated in the field
All Woody	**6.42**	Sum of "woody" plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**5.40**	Sum of "shrub" and "subshrub" growth form covers
Woody Vines	**0.24**	Sum of woody "vine" growth form covers
All Herbaceous	**62.62**	Sum of "non-woody" plant covers
Graminoids	**54.98**	Sum of covers for grasses, sedges, and rushes

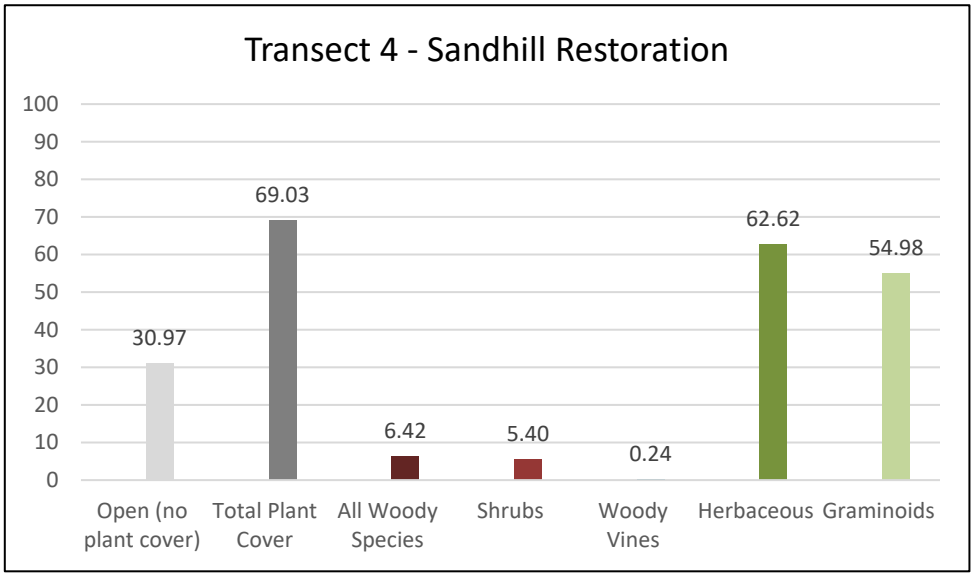


Figure 4. Summary of plant cover in Transect 4 - Sandhill Restoration.

Planted Longleaf Pine Seedlings

Planted tree densities were determined by counting all individual trees in a 30' X 600' belt transect co-located with and centered along each quantitative transect. The resulting total was then converted to trees per acre. All trees with a measurable diameter at breast height (DBH) were counted. The height of each tree was measured using a range finder and/or visual estimation, and a measuring tape was used to record DBH.

In 2024, the survival of longleaf pine seedlings along each transect was observed to be trees between 62 and 251 trees per acre, compared with a range between 87 and 264 trees per acre in 2023. Trees averaged 17 feet in height, and the average DBH was 4.5 inches (Figures 5-7). Overall health of the planted pines was excellent. However, trees along Transect 1 appear to have been impacted recently, possibly by a hot fire, and live pines have been reduced in the area.

Hardwood species and standing dead trees in each belt transect as well as longleaf pine seedlings were also noted. Transect 1 had 15 hardwoods, 18 dead longleaf pines, no longleaf pine seedlings, and a single sand

pine seedling. Transect 2 had 25 hardwoods (all turkey oaks), 3 dead longleaf pines, and no longleaf pine seedlings. Transect 4 had 1 hardwood (common persimmon), 2 dead longleaf pines and no longleaf pine seedlings.

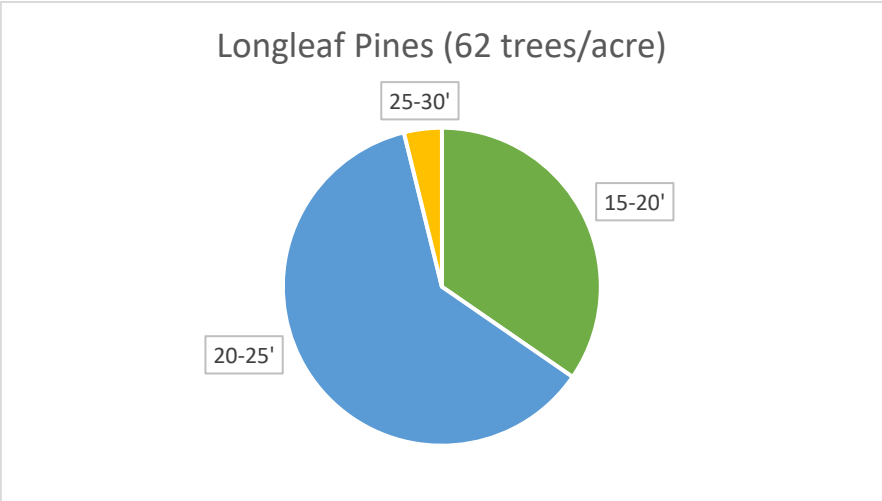


Figure 5. Longleaf Pine stems in Transect 1 - Sandhill Restoration.

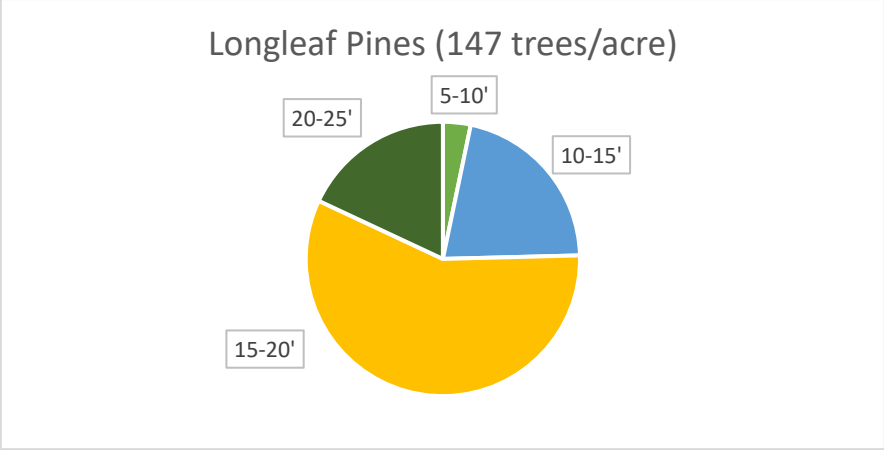


Figure 6. Longleaf Pine stems in Transect 2 - Sandhill Restoration.

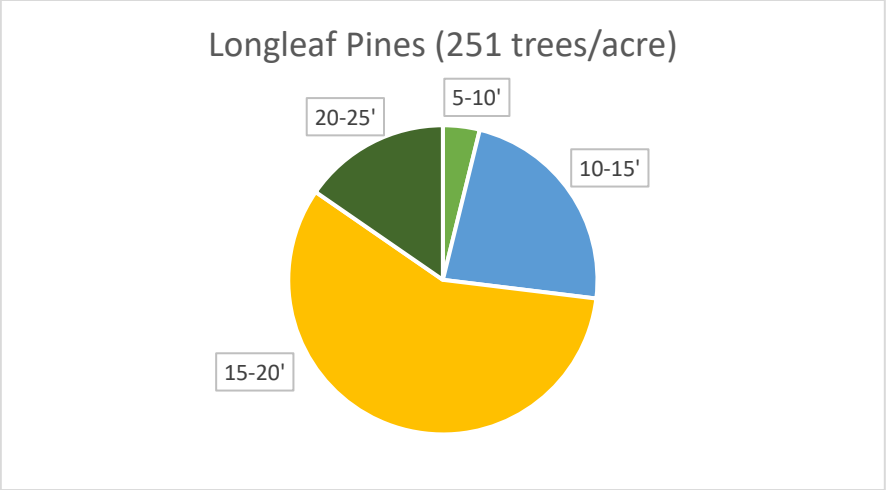


Figure 7. Longleaf Pine stems in Transect 4 - Sandhill Restoration.

Management Unit 12, UMAM Polygon I, Sandhill Enhancement (Transects #3 and #5)

UMAM Polygon I, Management Unit 12, consists of 263.52 acres. At the time of purchase, the sandhill overstory was dominated by turkey and live oaks with scattered remnant longleaf pine and an understory dominated by hardwood shrubs, woody goldenrod, wiregrass, and a variety of herbaceous species. Reclamation activities included reintroduction of fire, thinning of oaks to less than 150 trees per acre, and reestablishment of longleaf pine. Fire was reintroduced during the winter of 2004. Currently, longleaf pines dominate the overstory with scattered turkey, sand live oak, and bluejack oak. The understory is dominated by wiregrass.

Quantitative Transects

Baseline sampling in 2006 indicated 23 species within Transect 3 and 31 species in Transect 5.

2023 Monitoring:

Transect 3 – A total of 51 species was observed. Wiregrass had the greatest vegetative cover at 19%. Open ground was estimated at 57%. Total woody cover was 11%.

Transect 5 – A total of 45 species was observed. Wiregrass had the greatest vegetative cover at 25%. Open ground was estimated at 43%. Total woody cover was 4%.

2024 Monitoring:

Transect 3 – A total of 54 species was detected (Table 7). Total plant cover (taken as the inverse of the open area) was 53% (Table 8, Figure 8). Herbacous cover was 35%, with wiregrass cover at around 18%. Shrub cover was 13%.

Transect 5 – A total of 66 species was detected (Table 9). Total plant cover (taken as the inverse of the open area) was 51% (Table 10, Figure 9). Herbacous cover was 42%, with wiregrass cover at around 24%. Shrub cover was 2%.

Final Success Criteria:

The interim success criteria have been met for UMAM I Polygon I. Fire was re-introduced to the site, turkey and live oaks were thinned to less than 150 trees per acre and longleaf pine have been planted. No nuisance or exotic species were observed, fire adapted species dominate the vegetative cover.

Wiregrass continues to be the dominant species. Herbaceous cover is below the target cover of 70%, but diversity is very high. Shrub cover is low less than the maximum of 20% allowed in the Final Succcess Criteria.

On average, planted longleaf pine densities remain between 100-200 trees per acre. Trees are healthy and vigorous, although there has been some loss of canopy along Transect 1. Bahia and centipede grass cover continues to be monitored and treated as needed. Only small amounts of these pasture grasses were seen near the transects.

Table 7. Percent cover of plant species in Transect 3 - Sandhill Enhancement sampled on October 14, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Agalinis divaricata	pineland false foxglove	Forb/herb	non-woody	0.05
Andropogon gyrans	Elliott's bluestem	Graminoid	non-woody	1.20
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.02
Andropogon ternarius	splitbeard bluestem	Graminoid	non-woody	0.30
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	18.35
Asteraceae	Composite family	Forb/herb	non-woody	0.03
Balduina angustifolia	coastalplain honeycomb-head	Forb/herb	non-woody	0.25
Baptisia lanceolata	gopherweed	Forb/herb	non-woody	0.02
Bulbostylis ciliatifolia	capillary hairsedge	Graminoid	non-woody	0.32
Chrysoma pauciflosculosa	woody goldenrod	Subshrub, Shrub	woody	6.80
Chrysopsis lanuginosa	Lynn Haven goldenaster	Forb/herb	non-woody	1.27
***Chrysopsis* sp.**	goldenaster	Forb/herb	non-woody	0.05
Cnidoscolus stimulosus	tread softly	Forb/herb	non-woody	0.02
Croton argyranthemus	silver croton	Forb/herb	non-woody	0.02
Dalea pinnata	summer farewell	Forb/herb	non-woody	0.27
Dichanthelium arenicoloides	sandy woods witchgrass	Graminoid	non-woody	0.02
Dichanthelium malacon	dehiscent witchgrass	Graminoid	non-woody	0.05
Dichanthelium portoricense* ssp. *patulum	Nash's witchgrass	Graminoid	non-woody	0.12
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.07
Diodia virginiana	Virginia buttonweed	Forb/herb	non-woody	0.02
Diospyros virginiana	common persimmon	Tree	woody	0.33
Eriogonum tomentosum	dogtongue wild buckwheat	Forb/herb	non-woody	0.03
Euphorbia exserta	coastal sand spurge	Forb/herb	non-woody	0.13
***Euphorbia* sp.**	spurge	Forb/herb	non-woody	0.02
***Galactia* sp.**	milkpea	Forb/herb,Vine	non-woody	0.08
Gaylussacia dumosa	dwarf huckleberry	Subshrub, Shrub	woody	0.93
Geobalanus oblongifolius	gopher apple	Subshrub, Shrub	woody	0.12
Hypericum gentianoides	orangegrass	Forb/herb	non-woody	0.37
Lechea sessiliflora	pineland pinweed	Forb/herb	non-woody	1.33
Liatris gracilis	slender gayfeather	Forb/herb	non-woody	0.28

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
***Liatris* sp.**	gayfeather	Forb/herb	non-woody	0.07
Liatris tenuifolia	shortleaf gayfeather	Forb/herb	non-woody	0.05
Mimosa microphylla	sensitive brier	Forb/herb, Vine	non-woody	0.02
Opuntia mesacantha* ssp. *lata	pricklypear	Shrub	woody	0.05
***Paronychia* sp.**	nailwort	Forb/herb	non-woody	0.03
Pityopsis aspera* var. *adenolepis	pineland silkgrass	Forb/herb	non-woody	0.07
***Pityopsis* sp.**	silkgrass	Forb/herb	non-woody	0.27
Polygonella gracilis	tall jointweed	Forb/herb	non-woody	0.52
Pteridium pseudocaudatum	tailed bracken	Forb/herb	non-woody	0.32
Quercus incana	bluejack oak	Tree	woody	0.12
Quercus laevis	turkey oak	Tree	woody	1.77
Rhus copallinum* var. *copallinum	winged sumac	Shrub	woody	0.02
Rhynchosia cytisoides	royal snoutbean	Forb/herb	non-woody	0.02
Rhynchospora grayi	Gray's beaksedge	Graminoid	non-woody	0.05
Schizachyrium stoloniferum	creeping little bluestem	Graminoid	non-woody	2.78
Serenoa repens	saw palmetto	Shrub	woody	2.08
Seymeria pectinata	Piedmont blacksenna	Forb/herb	non-woody	0.17
Smilax auriculata	earleaf greenbrier	Shrub, Vine	woody	0.02
Solidago odora	sweet goldenrod	Forb/herb	non-woody	1.23
Stylisma patens	coastalplain dawnflower	Forb/herb	non-woody	0.02
Tephrosia chrysophylla	scurf hoary-pea	Forb/herb	non-woody	0.12
Tragia urens	wavyleaf noseburn	Forb/herb	non-woody	0.03
Unknown herb		Forb/herb	non-woody	0.05
Vaccinium myrsinites	shiny blueberry	Shrub	woody	1.77
Open (no plant cover)				46.75

Table 8. Summary of plant cover in Transect 3 – Sandhill Enhancement.

Group	Cover	Definition
Open	**46.75**	No plant cover up to 2 m above quad
Total Plant	**53.25**	Calculated as the inverse of “open” area estimated in the field
All Woody	**15.95**	Sum of “woody” plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**13.41**	Sum of “shrub” and “subshrub” growth form covers
Woody Vines	**0.02**	Sum of woody “vine” growth form covers
All Herbaceous	**34.71**	Sum of “non-woody” plant covers
Graminoids	**26.51**	Sum of covers for grasses, sedges, and rushes

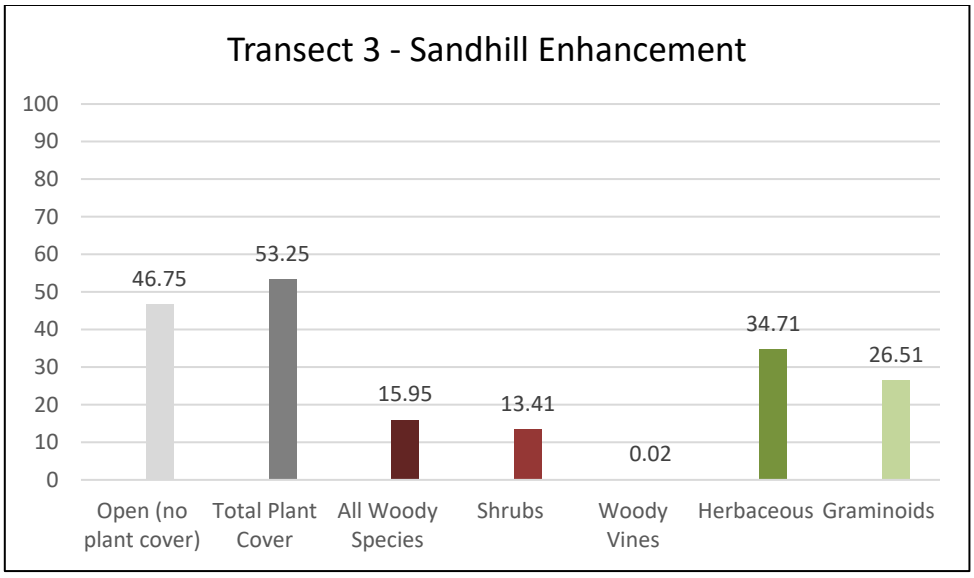


Figure 8. Summary of plant cover in Transect 3 - Sandhill Enhancement.

Table 9. Percent cover of plant species in Transect 5 - Sandhill Enhancement sampled on October 15, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Agalinis divaricata	pineland false foxglove	Forb/herb	non-woody	0.10
Andropogon gyrans	Elliott's bluestem	Graminoid	non-woody	0.48
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.70
Andropogon ternarius	splitbeard bluestem	Graminoid	non-woody	0.02
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	23.93
Balduina angustifolia	coastalplain honeycomb-head	Forb/herb	non-woody	0.73
Baptisia lanceolata	gopherweed	Forb/herb	non-woody	0.05
***Bryodesma* sp.**	sand spikemoss	Forb/herb	non-woody	0.02
Bulbostylis ciliatifolia	capillary hairsedge	Graminoid	non-woody	0.30
Bulbostylis stenophylla	sandyfield hairsedge	Graminoid	non-woody	0.05
Chamaecrista fasciculata	partridge pea	Forb/herb	non-woody	0.05
Chrysoma pauciflosculosa	woody goldenrod	Subshrub, Shrub	woody	0.60
Chrysopsis lanuginosa	Lynn Haven goldenaster	Forb/herb	non-woody	0.02
Commelina erecta* var. *angustifolia	whitemouth dayflower	Forb/herb	non-woody	0.05
Crataegus lassa* var. *lassa	sandhill hawthorn	Tree, Shrub	woody	0.22
Crotalaria purshii	Pursh's rattlebox	Forb/herb	non-woody	0.03
Croton argyranthemus	silver croton	Forb/herb	non-woody	0.08
Ctenodon viscidulus	sticky jointvetch	Forb/herb	non-woody	0.02
***Cyperus* sp.**	flatsedge	Graminoid	non-woody	0.30
Dichanthelium angustifolium	narrowleaf witchgrass	Graminoid	non-woody	0.25
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.10
Diospyros virginiana	common persimmon	Tree	woody	0.62
***Eragrostis* sp.**	lovegrass	Graminoid	non-woody	0.05
Eriogonum tomentosum	dogtongue wild buckwheat	Forb/herb	non-woody	0.02
Froelichia floridana	cottonweed	Forb/herb	non-woody	0.08
***Galactia* sp.**	milkpea	Forb/herb,Vine	non-woody	0.18

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Geobalanus oblongifolius	gopher apple	Subshrub, Shrub	woody	0.52
Hexasepalum teres	poor joe	Forb/herb	non-woody	0.03
Hieracium gronovii	queen-devil	Forb/herb	non-woody	0.07
Houstonia procumbens	roundleaf bluet	Forb/herb	non-woody	0.07
Hypericum gentianoides	orangegrass	Forb/herb	non-woody	0.28
Ilex vomitoria	yaupon	Shrub	woody	0.10
Liatris chapmanii	Chapman's gayfeather	Forb/herb	non-woody	0.47
Liatris gracilis	slender gayfeather	Forb/herb	non-woody	0.02
***Liatris* sp.**	gayfeather	Forb/herb	non-woody	0.08
Liatris tenuifolia	shortleaf gayfeather	Forb/herb	non-woody	0.05
Mimosa microphylla	sensitive brier	Forb/herb, Vine	non-woody	0.15
Opuntia mesacantha* ssp. *lata	pricklypear	Shrub	woody	0.07
Panicum virgatum	switchgrass	Graminoid	non-woody	0.08
Paronychia patula	pineland nailwort	Forb/herb	non-woody	0.58
Penstemon multiflorus	manyflower beardtongue	Forb/herb	non-woody	0.10
Pityopsis aspera	pineland silkgrass	Forb/herb	non-woody	0.32
Pityopsis aspera* var. *adenolepis	pineland silkgrass	Forb/herb	non-woody	0.53
***Pityopsis* sp.**	silkgrass	Forb/herb	non-woody	0.38
Polygonella gracilis	tall jointweed	Forb/herb	non-woody	0.05
Pteridium pseudocaudatum	tailed bracken	Forb/herb	non-woody	0.28
Quercus hemisphaerica	laurel oak	Tree	woody	0.58
Quercus incana	bluejack oak	Tree	woody	2.42
Quercus laevis	turkey oak	Tree	woody	2.68
Rhynchosia cytisoides	royal snoutbean	Forb/herb	non-woody	0.02
Rhynchosia reniformis	dollarleaf	Forb/herb	non-woody	0.02
Ruellia ciliosa	ciliate wild petunia	Forb/herb	non-woody	0.05
Schizachyrium stoloniferum	creeping little bluestem	Graminoid	non-woody	5.45
Serenoa repens	saw palmetto	Shrub	woody	0.07
Seymeria pectinata	Piedmont blacksenna	Forb/herb	non-woody	0.07
Smilax auriculata	earleaf greenbrier	Shrub, Vine	woody	0.27
Solidago odora	sweet goldenrod	Forb/herb	non-woody	0.72
Sporobolus junceus	pineywoods dropseed	Graminoid	non-woody	0.05
Stylisma patens	coastalplain dawnflower	Forb/herb	non-woody	0.13
Stylosanthes biflora	sidebeak pencil flower	Forb/herb	non-woody	0.07
Symphyotrichum concolor* var. *devestitum	Gulf Coast silver aster	Forb/herb	non-woody	0.58
Tephrosia chrysophylla	scurf hoary-pea	Forb/herb	non-woody	0.15
Tragia urens	wavyleaf noseburn	Forb/herb	non-woody	0.05
Trichostema setaceum	narrowleaf bluecurls	Forb/herb	non-woody	0.02
Vaccinium myrsinites	shiny blueberry	Shrub	woody	0.05
Warea sessilifolia	sessileleaf pinelandcress	Forb/herb	non-woody	0.10
Open (no plant cover)				49.08

Table 10. Summary of plant cover in Transect 5 – Sandhill Enhancement.

Group	Cover	Definition
Open	**49.08**	No plant cover up to 2 m above quad
Total Plant	**50.92**	Calculated as the inverse of "open" area estimated in the field
All Woody	**8.90**	Sum of "woody" plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**1.52**	Sum of "shrub" and "subshrub" growth form covers
Woody Vines	**0.29**	Sum of woody "vine" growth form covers
All Herbaceous	**42.01**	Sum of "non-woody" plant covers
Graminoids	**34.55**	Sum of covers for grasses, sedges, and rushes

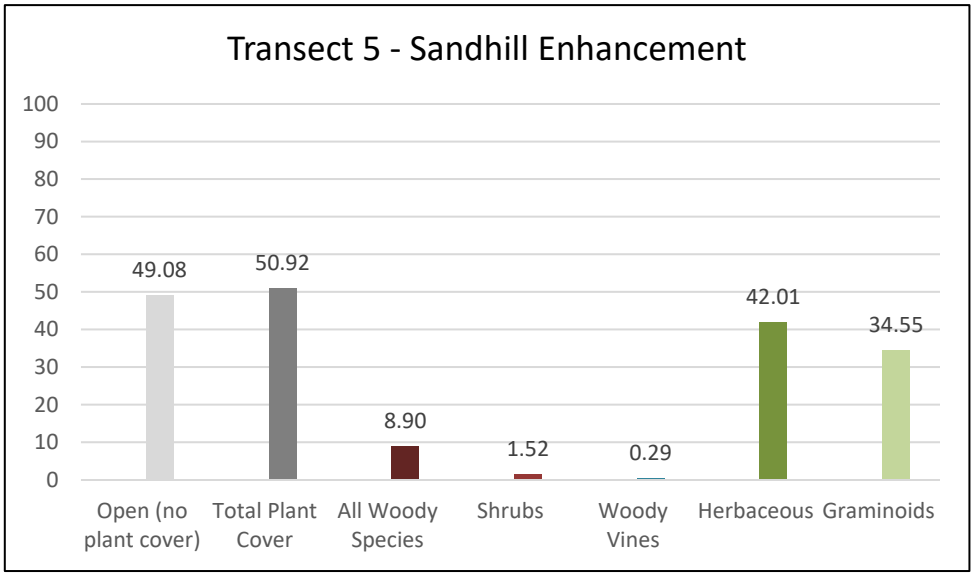


Figure 9. Summary of plant cover in Transect 5 - Sandhill Enhancement.

Planted Longleaf Pine Seedlings

Longleaf pine seedlings were planted in the sandhills at a rate of 436 trees per acre.

In 2024, the survival of longleaf pine seedlings was 142 trees per acre in Transect 3 and 89 trees per acre in Transect 5, compared with 145 trees per acre in Transect 3 and 97 trees per acre in Transect 5 in 2023. Overall health of the planted seedlings was excellent. Trees averaged 19 feet in height, and the average DBH was 4.3 inches (Figures 10 and 11).

Hardwood species and standing dead trees in each belt transect as well as longleaf pine seedlings were also noted. Transect 3 had 15 hardwoods (a mix of sandhill oaks, i.e., turkey and bluejack, and persimmon), 5 dead longleaf pines, and no longleaf pine seedlings. Transect 5 had 86 hardwoods (a mix of sandhill oaks, i.e., turkey, sand post, and bluejack, sand live oak, and persimmon), no dead longleaf pines, and one longleaf pine seedling. Only 2 hardwoods measured along either transect were greater than 1 inch DBH.

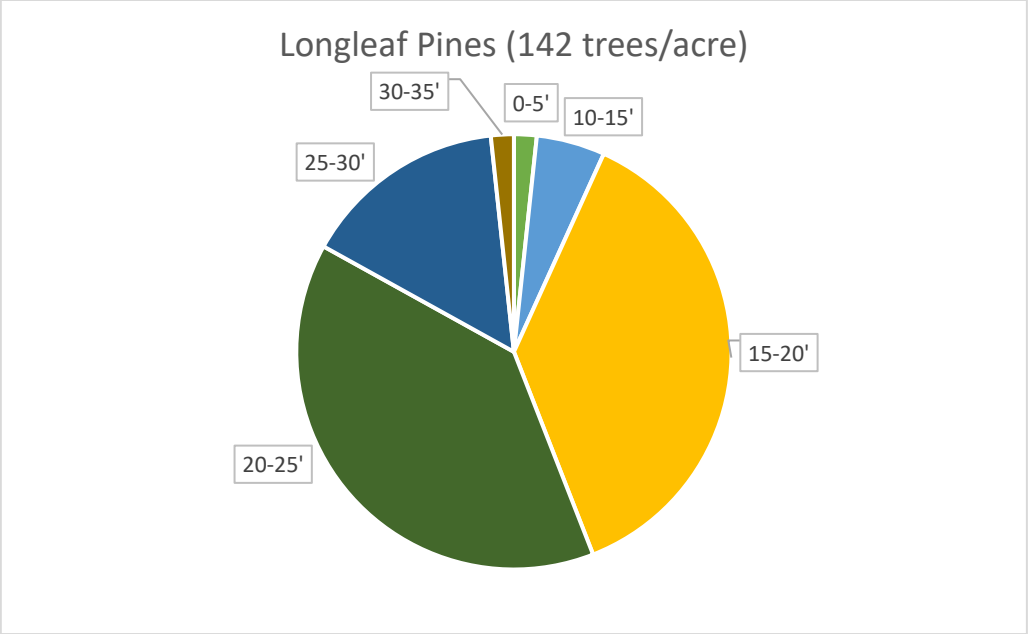


Figure 10. Longleaf Pine stems in Transect 3 – Sandhill Enhancement.

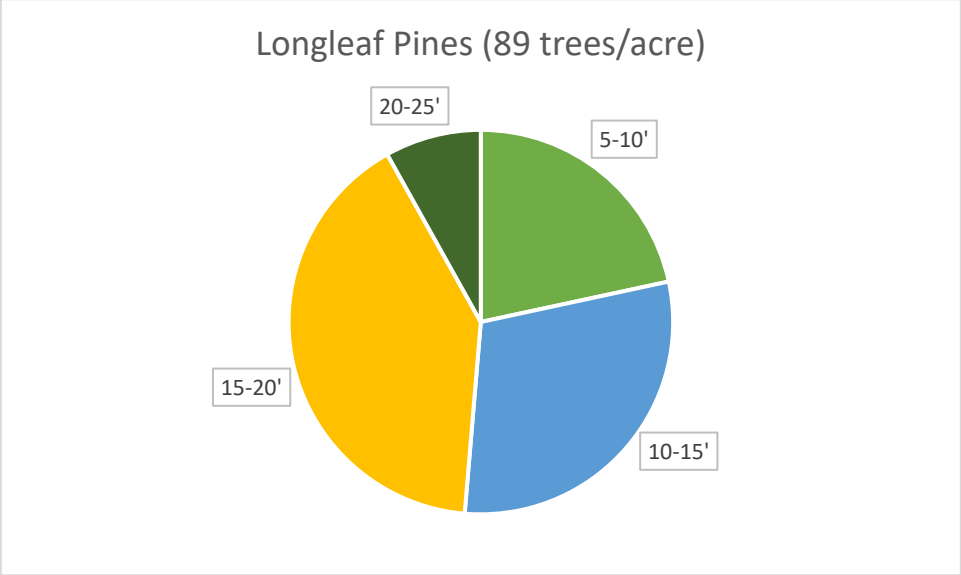


Figure 11. Longleaf Pine stems in Transect 5 – Sandhill Enhancement.

Management Unit 3, UMAM Polygon VII, Planted Slash Pine Plantation (Transect #8)

UMAM Polygon VII, Management Unit 3, consists of 11.5 acres of bedded planted slash pine restored to a hydric pine flatwood. The overstory was dominated by planted slash pine at 880 trees per acre. The shrub layer was well developed, and the understory largely absent due to the coverage of the trees and shrubs. Pines were thinned to 400 trees per acre in 2007. Trees were harvested again in 2012 to 200 trees per acre. Shrubs were eradicated using herbicide for two years. In winter 2012, wiregrass and toothache grass plugs were planted on three-foot centers. The restored slash pine plantation is burned annually starting in 2019.

Quantitative Transects

Baseline monitoring in 2006 indicated a total of 17 species. Nine of the observed species were shrubs.

2023 Monitoring:

Transect 8 – A total of 51 species was observed. Total plant cover (taken as the inverse of the open area) was 58%. Herbacous cover was 38%. Weedy species such as purple bluestem were abundant, but wiregrass was consistently found along the transect, occurring in 17 of 30 quadrats. Woody cover was low (just under 6%).

2024 Monitoring:

Transect 8 – A total of 65 species was detected (Table 11). Total plant cover (taken as the inverse of the open area) was 77% (Table 12, Figure 12). Herbacous cover was 62%, with graminoids forming 74% of herb cover. Andropogon cover was high, with 6 species of Andropogon making up 27% of total graminoid cover.

Final Success Criteria:

The management activities used to restore UMAM VII, Management Unit 3 have been completed. A diverse wet flatwoods understory continues to develop.

Overall herbacous cover was measured this year to be greater than the minimum Final Success Criteria of 55%. Graminoid cover as a percentage of herbaceous cover also met the criteria (at least 60%). Andropogon cover as a percentage of graminoid cover is near the maximum Final Criteria of no more than 25%. Overall diversity is quite high, and both wiregrass and the rare Curtiss' sandgrass were observed along the transect.

Table 11. Percent cover of plant species in Transect 8 - Hydric Pine Flatwoods Restoration sampled on October 14, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Anchistea virginica	Virginia chain fern	Forb/herb	non-woody	0.12
Andropogon cretaceus	purple bluestem	Graminoid	non-woody	9.43
Andropogon dealbatus	wetland white bluestem	Graminoid	non-woody	0.05
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.40
Andropogon ternarius	splitbeard bluestem	Graminoid	non-woody	0.25
Andropogon virginicus	broomsedge bluestem	Graminoid	non-woody	0.43
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	5.70
Bidens mitis	smallfruit beggarticks	Forb/herb	non-woody	0.02
Calamovilfa curtissii	Curtiss' sandgrass	Graminoid	non-woody	2.95
Centella erecta	spadeleaf	Forb/herb	non-woody	1.65
Chamaecrista fasciculata	partridge pea	Forb/herb	non-woody	0.30
Chamaecrista nictitans	sensitive pea	Forb/herb	non-woody	0.05
Cliftonia monophylla	black titi	Shrub	woody	2.18
Coleataenia longifolia	ciliate redtop panicum	Graminoid	non-woody	1.45
Ctenium aromaticum	toothache grass	Graminoid	non-woody	2.73
Cyperus ovatus	pinebarren flatsedge	Graminoid	non-woody	0.18

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Cyrilla racemiflora	titi	Shrub	woody	0.05
Dichanthelium ensifolium	small-leaved witchgrass	Graminoid	non-woody	1.87
Dichanthelium leucothrix	rough witchgrass	Graminoid	non-woody	2.20
Edrastima uniflora	oldenlandia	Forb/herb	non-woody	1.55
Eupatorium mohrii	Mohr's thoroughwort	Forb/herb	non-woody	1.12
Euthamia caroliniana	slender flattop goldenrod	Forb/herb	non-woody	0.35
Gaylussacia mosieri	woolly huckleberry	Shrub	woody	0.02
Hypericum cistifolium	roundpod St. John's wort	Subshrub, Shrub	woody	0.10
Hypericum microsepalum	flatwoods St. John's wort	Shrub, Subshrub	woody	7.22
Hypericum myrtifolium	myrtleleaf St. John's wort	Shrub, Subshrub	woody	0.05
Hypericum tetrapetalum	fourpetal St. John's wort	Subshrub, Shrub	woody	0.02
Ilex glabra	gallberry	Shrub	woody	0.02
Ilex myrtifolia	myrtle-leaved holly	Tree	woody	0.65
Juncus marginatus	grassleaf rush	Graminoid	non-woody	0.30
Kellochloa verrucosa	warty panicgrass	Graminoid	non-woody	10.45
Lachnanthes caroliniana	Carolina redroot	Forb/herb	non-woody	2.07
***Ludwigia* sp.**	primrosewillow	Forb/herb	non-woody	0.03
Lycopodiella alopecuroides	foxtail club-moss	Forb/herb	non-woody	0.47
Lyonia lucida	fetterbush	Shrub	woody	0.25
Paspalum setaceum	thin paspalum	Graminoid	non-woody	0.02
***Paspalum* sp.**	paspalum	Graminoid	non-woody	0.12
Pinus elliottii	slash pine	Tree	woody	0.17
Rhexia mariana	pale meadowbeauty	Forb/herb	non-woody	0.70
Rhexia petiolata	fringed meadowbeauty	Forb/herb	non-woody	0.35
Rhexia virginica	handsome harry	Forb/herb	non-woody	1.37
Rhus copallinum* var. *copallinum	winged sumac	Shrub	woody	0.05
Rhynchospora chalarocephala	loosehead beaksedge	Graminoid	non-woody	0.05
Rhynchospora chapmanii	Chapman's beaksedge	Graminoid	non-woody	0.23
Rhynchospora debilis	savannah beaksedge	Graminoid	non-woody	0.02
Rhynchospora fascicularis	fascicled beaksedge	Graminoid	non-woody	0.62
***Rhynchospora* sp.**	beaksedge	Graminoid	non-woody	0.17
Rubus pensilvanicus	sawtooth blackberry	Subshrub	woody	0.03
Scleria reticularis	netted nutrush	Graminoid	non-woody	0.03
***Scleria* sp.**	nutrush	Graminoid	non-woody	0.02
Smilax laurifolia	laurel greenbrier	Shrub, Vine	woody	0.05
Solidago fistulosa	pinebarren goldenrod	Forb/herb	non-woody	0.98
***Sphagnum* sp.**	sphagnum moss	moss	n/a	1.77
Syngonanthus flavidulus	yellow hatpins	Forb/herb	non-woody	0.02
Taxodium ascendens	pond cypress	Tree	woody	0.27
Trilisa odoratissima	vanillaleaf	Forb/herb	non-woody	1.20
Vaccinium fuscatum	hairy highbush blueberry	Shrub	woody	0.65
Vaccinium stamineum	deerberry	Shrub	woody	0.05
***Viola* sp.**	violet	Forb/herb	non-woody	0.02
Xyris caroliniana	Carolina yellow-eyed grass	Forb/herb	non-woody	0.48
Xyris drummondii	Drummond's yellow-eyed grass	Forb/herb	non-woody	0.08
Xyris elliottii	Elliott's yellow-eyed grass	Forb/herb	non-woody	0.65
Xyris flabelliformis	savannah yellow-eyed grass	Forb/herb	non-woody	0.13
Xyris platylepis	tall yellow-eyed grass	Forb/herb	non-woody	0.07

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
***Xyris* sp.**	yellow-eyed grass	Forb/herb	non-woody	0.02
Open (no plant cover)				22.63

Table 12. Summary of plant cover in Transect 8 – Hydric Pine Flatwoods Restoration.

Group	Cover	Definition
Open	**22.63**	No plant cover up to 2 m above quad
Total Plant	**77.37**	Calculated as the inverse of "open" area estimated in the field
All Woody	**13.64**	Sum of "woody" plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**12.33**	Sum of "shrub" and "subshrub" growth form covers
Woody Vines	**0.06**	Sum of woody "vine" growth form covers
All Herbaceous	**61.70**	Sum of "non-woody" plant covers
Graminoids	**45.79**	Sum of covers for grasses, sedges, and rushes
Andropogon	**12.20**	Sum of covers for pioneer bluestem species

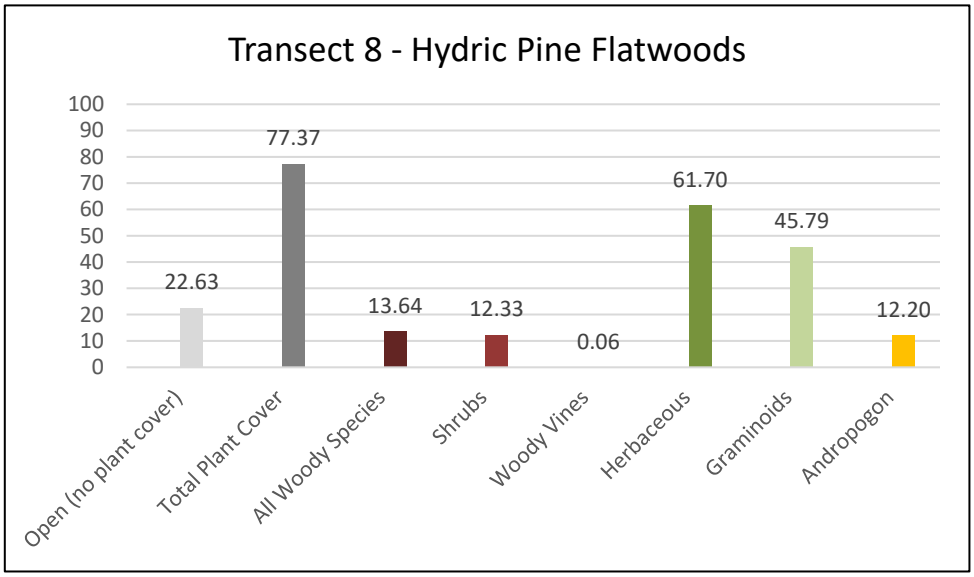


Figure 12. Summary of plant cover in Transect 8 - Hydric Pine Flatwoods Restoration.

Management Unit 2, UMAM Polygon V, Hydric Pine Flatwoods (Transects #6 and #7)

UMAM Polygon V, Management Unit 2 consists of 163.88 acres of fire suppressed shrub dominated hydric pine flatwoods that have been restored to a hydric pine flatwood. The overstory was dominated by a near impenetrable shrub layer and absent herbaceous layer. Reclamation activities within this polygon included removal of shrub overstory utilizing a Gyro-Trac followed treatment with selective herbicides, re-introduction of fire, and planting wiregrass plugs on 3' centers.

Quantitative Transects

Two transects, 6 and 7 are established within the hydric pine flatwoods restoration. Baseline monitoring in 2006 indicated 14 species in Transect 6 and 16 species in Transect 7. Seven of the species identified were shrubs.

2023 Monitoring:

Transect 6 – A total of 47 species was observed. Total plant cover (taken as the inverse of the open area) was 46%. Herbacous cover was 38%. Weedy species such as purple bluestem were common. Woody cover was low (4%). Clumps of the state-listed threatened Curtiss' sandgrass were observed near Transect 6.

Transect 7 – A total of 38 species was detected. Total plant cover (taken as the inverse of the open area) was 49%. Herbacous cover was 31%. Weedy species such as purple bluestem were common. Woody cover was low (6%). Clumps of the state-listed threatened Curtiss' sandgrass were observed along the transect.

2024 Monitoring:

Transect 6 – A total of 40 species was detected (Table 13). Total plant cover (taken as the inverse of the open area) was 72% (Table 14, Figure 13). Herbacous cover was 61%, with graminoids forming 69% of herb cover. Andropogon cover was high, with 5 species of Andropogon making up 58% of total graminoid cover.

Transect 7 – A total of 29 species was detected (Table 15). Total plant cover (taken as the inverse of the open area) was 73% (Table 16, Figure 14). Herbacous cover was 65%, with graminoids forming 25% of herb cover. Andropogon cover was around 10%, making up 62% of total graminoid cover.

Final Success Criteria:

The restoration activities for UMAM V, Management Unit 2 were completed by 2007. Fire was introduced in 2005. A Gyro-Trac shrub reduction was initiated in April 2007 and completed in August 2008. Current monitoring shows that herbaceous cover meets Final Success Criteria (total herb cover > 55%). Graminoid cover is within acceptable limits (>60% of graminoids) along Transect 6, but lower on Transect 7. And bluestem cover is quite high, particularly along Transect 6. This high cover, as well as the prevalence of Carolina redroot on Transect 7, may be due to hog rooting in the area that promotes weedy pioneer species.

Table 13. Percent cover of plant species in Transect 6 - Hydric Pine Flatwoods sampled on October 14, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Anchistea virginica	Virginia chain fern	Forb/herb	non-woody	0.47
Andropogon cretaceus	purple bluestem	Graminoid	non-woody	17.18
Andropogon dealbatus	wetland white bluestem	Graminoid	non-woody	2.87
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.22
Andropogon virginicus	broomsedge bluestem	Graminoid	non-woody	0.37
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	3.48
Bidens mitis	smallfruit beggarticks	Forb/herb	non-woody	0.05
Centella erecta	spadeleaf	Forb/herb	non-woody	0.30
Coleataenia anceps	beaked panicum	Graminoid	non-woody	0.12

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Coleataenia longifolia	ciliate redtop panicum	Graminoid	non-woody	0.12
Cyrilla parvifolia	littleleaf titi	Shrub	woody	0.42
Dichanthelium ensifolium	small-leaved witchgrass	Graminoid	non-woody	6.13
Edrastima uniflora	oldenlandia	Forb/herb	non-woody	0.18
Eupatorium mohrii	Mohr's thoroughwort	Forb/herb	non-woody	0.52
***Eupatorium* sp.**	thoroughwort	Forb/herb	non-woody	0.03
Euthamia caroliniana	slender flattop goldenrod	Forb/herb	non-woody	0.65
Gaylussacia mosieri	woolly huckleberry	Shrub	woody	0.70
Hypericum cistifolium	roundpod St. John's wort	Subshrub, Shrub	woody	0.17
Hypericum microsepalum	flatwoods St. John's wort	Shrub, Subshrub	woody	0.37
Juncus scirpoides	needlepod rush	Graminoid	non-woody	0.12
Kellochloa verrucosa	warty panicgrass	Graminoid	non-woody	3.18
Lachnanthes caroliniana	Carolina redroot	Forb/herb	non-woody	9.63
Lyonia lucida	fetterbush	Shrub	woody	2.68
Pinus elliottii	slash pine	Tree	woody	1.05
Rhexia mariana	pale meadowbeauty	Forb/herb	non-woody	1.70
Rhexia virginica	handsome harry	Forb/herb	non-woody	0.03
Rhynchospora chalarocephala	loosehead beaksedge	Graminoid	non-woody	0.85
Rhynchospora fascicularis	fascicled beaksedge	Graminoid	non-woody	0.67
Rhynchospora glomerata	clustered beaksedge	Graminoid	non-woody	0.17
Rhynchospora gracilenta	slender beaksedge	Graminoid	non-woody	0.13
***Rhynchospora* sp.**	beaksedge	Graminoid	non-woody	0.22
Scleria ciliata	hairy nutrush	Graminoid	non-woody	0.05
Smilax auriculata	earleaf greenbrier	Shrub, Vine	woody	0.03
Smilax glauca	cat greenbrier	Shrub, Vine	woody	0.23
Smilax laurifolia	laurel greenbrier	Shrub, Vine	woody	0.07
Solidago fistulosa	pinebarren goldenrod	Forb/herb	non-woody	2.58
***Sphagnum* sp.**	sphagnum moss	moss	n/a	3.87
Xyris caroliniana	Carolina yellow-eyed grass	Forb/herb	non-woody	0.07
Xyris elliottii	Elliott's yellow-eyed grass	Forb/herb	non-woody	0.12
***Xyris* sp.**	yellow-eyed grass	Forb/herb	non-woody	0.05
Open (no plant cover)				27.92

Table 14. Summary of plant cover in Transect 6 – Hydric Pine Flatwoods.

Group	Cover	Definition
Open	**27.92**	No plant cover up to 2 m above quad
Total Plant	**72.08**	Calculated as the inverse of “open” area estimated in the field
All Woody	**6.67**	Sum of “woody” plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**5.05**	Sum of “shrub” and “subshrub” growth form covers
Woody Vines	**0.38**	Sum of woody “vine” growth form covers
All Herbaceous	**60.91**	Sum of “non-woody” plant covers
Graminoids	**41.82**	Sum of covers for grasses, sedges, and rushes
Andropogon	**24.05**	Sum of covers for pioneer bluestem species

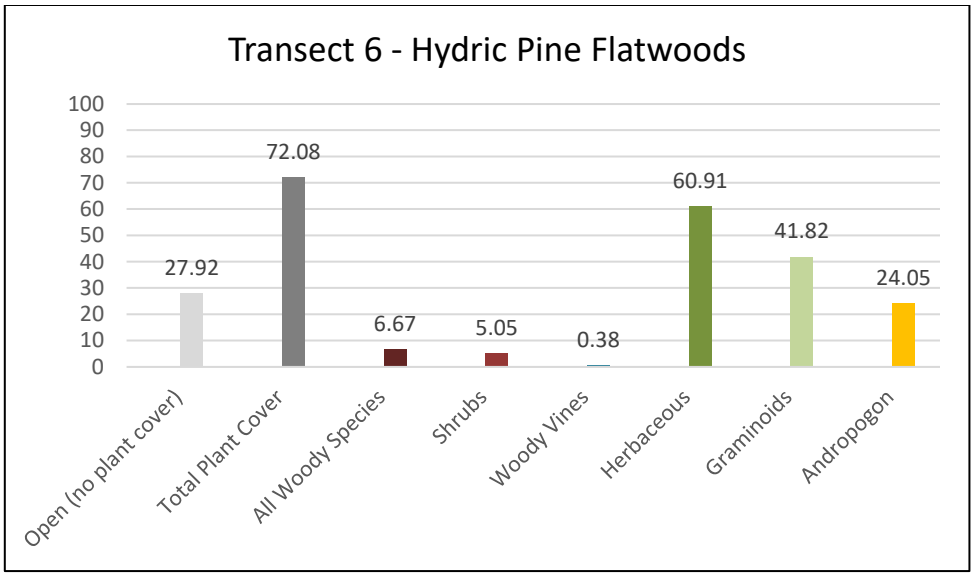


Figure 13. Summary of plant cover in Transect 6 – Hydric Pine Flatwoods.

Table 15. Percent cover of plant species in Transect 7 - Hydric Pine Flatwoods sampled on October 14, 2024.

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Anchistea virginica	Virginia chain fern	Forb/herb	non-woody	4.75
Andropogon cretaceus	purple bluestem	Graminoid	non-woody	7.75
***Andropogon* sp.**	bluestem	Graminoid	non-woody	0.83
Andropogon virginicus	broomsedge bluestem	Graminoid	non-woody	0.85
Aristida beyrichiana	Southern wiregrass	Graminoid	non-woody	1.27
Cliftonia monophylla	black titi	Shrub	woody	0.02
Ctenium aromaticum	toothache grass	Graminoid	non-woody	0.07
Cyrilla parvifolia	littleleaf titi	Shrub	woody	0.12
Cyrilla racemiflora	titi	Shrub	woody	4.17
Dichanthelium ensifolium	small-leaved witchgrass	Graminoid	non-woody	2.72
***Dichanthelium* sp.**	witchgrass	Graminoid	non-woody	0.05
Eubotrys racemosus	swamp doghobble	Shrub	woody	0.70
Eupatorium mohrii	Mohr's thoroughwort	Forb/herb	non-woody	1.00
Euthamia caroliniana	slender flattop goldenrod	Forb/herb	non-woody	1.18
Kellochloa verrucosa	warty panicgrass	Graminoid	non-woody	0.52
Lachnanthes caroliniana	Carolina redroot	Forb/herb	non-woody	32.93
Leucothoe axillaris	coastal doghobble	Shrub	woody	0.02
Lycopodiella alopecuroides	foxtail club-moss	Forb/herb	non-woody	0.12
Lyonia lucida	fetterbush	Shrub	woody	0.83
Pinus elliottii	slash pine	Tree	woody	0.02
Rhexia mariana	pale meadowbeauty	Forb/herb	non-woody	1.50
Rhexia virginica	handsome harry	Forb/herb	non-woody	0.07
Rhus copallinum* var. *copallinum	winged sumac	Shrub	woody	0.18
Rhynchospora fascicularis	fascicled beaksedge	Graminoid	non-woody	1.13
***Rhynchospora* sp.**	beaksedge	Graminoid	non-woody	0.13
Rubus cuneifolius	sand blackberry	Subshrub	woody	0.03

Scientific name	Common name	Growth Form	Woody/ Non-Woody	Average percent cover per quadrat
Solidago fistulosa	pinebarren goldenrod	Forb/herb	non-woody	2.22
Vaccinium fuscatum	hairy highbush blueberry	Shrub	woody	1.28
Xyris elliottii	Elliott's yellow-eyed grass	Forb/herb	non-woody	1.12
Open (no plant cover)				26.67

Table 16. Summary of plant cover in Transect 7 – Hydric Pine Flatwoods.

Group	Cover	Definition
Open	**26.67**	No plant cover up to 2 m above quad
Total Plant	**73.33**	Calculated as the inverse of "open" area estimated in the field
All Woody	**8.00**	Sum of "woody" plant covers (tree portions below 2 meters, shrubs, woody vines)
Shrubs	**7.98**	Sum of "shrub" and "subshrub" growth form covers
Woody Vines	**0.00**	Sum of woody "vine" growth form covers
All Herbaceous	**65.33**	Sum of "non-woody" plant covers
Graminoids	**16.63**	Sum of covers for grasses, sedges, and rushes
Andropogon	**10.23**	Sum of covers for pioneer bluestem species

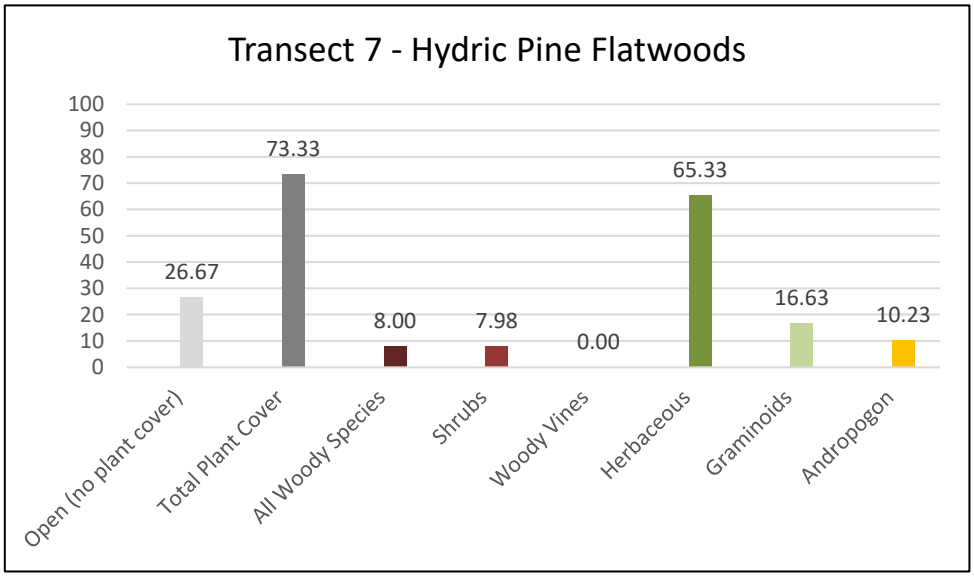


Figure 14. Summary of plant cover in Transect 7 – Hydric Pine Flatwoods.

Management Unit 5, UMAM Polygon V1, Inland Ponds, and Sloughs (Transect #9)

UMAM Polygon V1, Management Unit 5 consists of 24.880 acres of a dammed slough (Dykes Mill Pond) restored to slough/marsh. Reclamation activities within this polygon include the removal of Dykes Mill Pond dam, spanning the gap with a railcar bridge, and planting of cypress and swamp tupelo saplings. Dykes Mill Pond was removed in August of 2006 and bridge construction completed in April 2007. Planting of cypress and swamp tupelo trees occurred in fall of 2007. Since the removal of the dam, water levels have been reduced by two feet in depth.

Quantitative Transects

Most of Dykes Mill Pond is dominated by water lilies and other aquatic submerged vegetation. Cypress trees are scattered around the edge of the pond and also form a stand in the north half of the pond. Large, floating mats of vegetation are common.

During the 2023 monitoring, water levels were 3-5 feet deep along the transect with dense waterlilies. We completed the transect sampling using a 2-person kayak and a GPS unit to judge position. Estimates of cover and bare ground were difficult due to the multilayered cover in the water column as well as limited visibility. We observed 18 species in Transect 9. Submerged vegetation consisted of bladderworts intermixed with algal bulrush in most quads. Since the two were mostly indistinquishable, these are recorded as one entity. Woody cover was restricted to cypress tree bases found on the northern end of the transect. White waterlily was abundant all along the transect, with smaller amounts of spatterdock occasional. Mats of floating vegetation were dominated by a vegetative spikerush, sedge, fringed yellow-eyed grass. The state-listed threatened spoon-leaved sundew was also abundant on floating mats.

In 2024, conditions were similar to the previous year, and the transect was completed by kayak. We observed 18 species in Transect 9 (Table 17, Figure 15).

Table 17. Percent cover of plant species in Transect 9 - Inland Ponds and Sloughs sampled on October 15, 2024.

Scientific name	Common name	Average percent cover per quadrat
Cyrilla racemiflora	titi	0.02
Drosera intermedia	spoon-leaved sundew	0.95
Eleocharis confervoides	algal bulrush	24.68
Eleocharis elongata	slim spikerush	1.28
Eleocharis equisetoides	jointed spikerush	0.37
Eleocharis sp.	spikerush	0.50
Elephantopus carolinianus	Carolina elephantsfoot	1.25
Lachnanthes caroliniana	Carolina redroot	1.90
Nymphaea odorata ssp. odorata	white waterlily	27.70
Rhynchospora inundata	narrowfruit horned beaksedge	0.22
Rhynchospora sp.	beaksedge	0.25
Syngonanthus flavidulus	yellow hatpins	0.05
Triadenum virginicum	Virginia marsh St. John's wort	0.17
Utricularia purpurea	eastern purple bladderwort	0.47
Utricularia sp.	bladderwort	1.58
Xyris fimbriata	fringed yellow-eyed grass	5.17
Xyris sp.	yellow-eyed grass	0.12
Cyrilla racemiflora	titi	0.02
Open (no plant cover)/Water		22.87

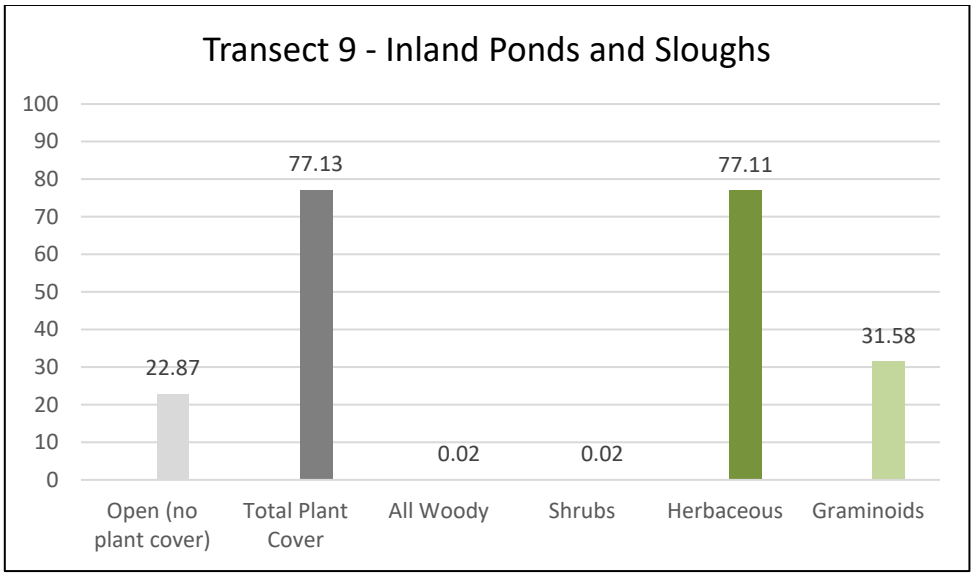


Figure 15. Summary of plant cover in Transect 9 - Inland Ponds and Sloughs.

QUALITATIVE MONITORING

METHODS

Qualitative vegetation monitoring includes an assessment of the vegetation, both ground cover and planted trees, wildlife use observations, and general habitat health. Pedestrian surveys increase site coverage and use a pre-selected meandering walk-path. Meander lines were provided by NWFWMD and loaded onto Trimble TDC 600 dataloggers using ESRI Field Maps software for navigation in the field. FNAI biologists also consulted the species lists for each walk-path from 2012. All accessible portions of the walk-path were traversed. All plant species detected along the walk-path were identified to species if possible, or higher taxon if not. General observations on community structure and health as well as incidental wildlife observations were recorded for each walk-path. Figure 1 provides the location and coverage of transects.

RESULTS AND DISCUSSION

A total of 13 pedestrian transects were located at the SHLMB (Figure 1). Two pedestrian transects are in Management Unit 1 (portions of UMAM Polygon IV), two in Management Unit 2 (UMAM Polygon V), four in Management Unit 10 (UMAM Polygon III), one in Management Unit 11, (UMAM Polygon II), two in Management Unit 12 (UMAM Polygon I), and two in Management Unit 14 (portions of UMAM Polygon IV).

A total of 294 plant taxa were recorded in meandering transects during the Fall 2024 monitoring at Sand Hill Lakes Mitigation Bank (Table 18). 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 2023 monitoring report, which followed Wunderlin, R. P., B.F. Hansen, A.R. Franck, and F.B. Essig. 2017. Atlas of Florida Plants (htpp://florida.plantatlas.usf.edu/), Institute for Systematic Botany, University of South Florida, Tampa.

Table 18. Plant species observed along meandering transects 1-13 at Sand Hill Lakes Mitigation Bank on October 14-16, 2024. (* = State listed Rare, † = FISC Non-native Invasive)

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Acalypha gracilens	slender threeseed mercury												X		1
Acer rubrum	red maple										X				1
Agalinis divaricata	pineland false foxglove	X	X	X	X	X								X	6
Agalinis sp.	false foxglove					X									1
†*Albizia julibrissin*	mimosa			X											1
Amphicarpum muehlenbergianum	blue maidencane	X					X								2
Anchistea virginica	Virginia chain fern						X	X	X	X	X	X			6
Andropogon capillipes	chalky bluestem	X	X		X										3
Andropogon cretaceus	purple bluestem								X	X	X	X			4
Andropogon glomeratus	bushy bluestem							X							1
Andropogon gyrans	Elliott's bluestem		X	X	X								X	X	5
Andropogon ternarius	splitbeard bluestem	X				X								X	3
Andropogon virginicus	broomsedge bluestem					X	X	X			X		X		5
Andropogon virginicus var. 1	smooth bluestem										X				1
Andropogon virginicus var. *virginicus*	broomsedge bluestem		X												1
Aristida beyrichiana	Southern wiregrass	X	X	X	X	X	X		X		X	X	X	X	11
Aristida purpurascens	arrowfeather threeawn	X				X									2
Aristida tenuispica	Hillsboro threeawn		X												1
Aronia arbutifolia	red chokeberry										X				1
Asclepias humistrata	pinewoods milkweed			X									X		2
Asclepias verticillata	whorled milkweed					X									1
Asimina spatulate	slimleaf pawpaw			X		X									2
Balduina angustifolia	coastalplain honeycomb-head	X		X	X									X	4
Baptisia lanceolata	gopherweed	X	X	X	X	X							X	X	7
Berlandiera pumila var. *pumila*	soft greeneyes			X	X	X									3
Bidens alba var. *radiata*	beggarticks					X									1
Bidens laevis	smooth beggarticks									X					1
Bidens mitis	smallfruit beggarticks							X	X	X	X				4
Brasenia schreberi	watershield						X	X		X					3
Bulbostylis ciliatifolia	capillary hairsedge	X	X			X							X	X	5
Burmannia capitata	southern bluethread						X								1
**Calamovilfa curtissii*	Curtiss' sandgrass								X			X			2
Callicarpa americana	American beautyberry		X			X							X	X	4
Carex glaucescens	clustered sedge							X		X		X			3
Carphephorus sp.	chaffhead												X		1
Cartrema americanum	wild olive											X	X		2
Castanea pumila	common chinquapin												X		1
Centella erecta	spadeleaf	X					X	X	X	X	X	X			7
Cephalanthus occidentalis	common buttonbush						X	X		X					3
Chamaecrista fasciculata	partridge pea					X									1
Chrysoma pauciflosculosa	woody goldenrod	X	X	X	X	X							X	X	7

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Chrysopsis lanuginosa	Lynn Haven goldenaster	X	X	X	X	X			X		X		X	X	9
Chrysopsis mariana	Maryland goldenaster					X									1
Clethra alnifolia	sweet pepperbush									X		X			2
Clethra tomentosa	downy sweet pepperbush						X	X			X				3
Cliftonia monophylla	black titi					X	X				X	X			4
Clitoria mariana	Atlantic pigeon-wing													X	1
Cnidoscolus stimulosus	tread softly	X	X	X									X	X	5
Coleataenia anceps ssp. *anceps*	beaked panicum									X					1
Coleataenia longifolia	ciliate redtop panicum							X	X		X				3
Crataegus lassa	sandhill hawthorn	X												X	2
Crocanthemum carolinianum	Carolina frostweed												X		1
Croptilon divaricatum	slender scratchdaisy													X	1
Crotalaria rotundifolia	rabbitbells					X									1
Croton argyranthemus	silver croton	X		X	X	X							X	X	6
Croton michauxii	Michaux's croton		X												1
Cyperus filiculmis	wiry flatsedge		X												1
Cyperus ovatus	pinebarren flatsedge												X	X	2
Cyperus plukenetii	Plukenet's flatsedge			X		X									2
Cyperus retrorsus	pineland flatsedge		X												1
Cyperus sp.	flatsedge	X											X		2
Cyrilla parvifolia	littleleaf titi									X		X			2
Cyrilla racemiflora	titi	X					X	X	X	X	X	X			7
Dalea pinnata	summer farewell	X	X		X	X									4
Dalea pinnata var. *trifoliata*	summer farewell			X											1
Desmodium sp.	tick-trefoil					X									1
Desmodium strictum	pinebarren tick-trefoil					X									1
Dichanthelium aciculare	needleleaf witchgrass	X	X			X									3
Dichanthelium ensifolium	cypress witchgrass	X										X	X		3
Dichanthelium malacon	dehiscent witchgrass													X	1
Dichanthelium ovale	eggleaf witchgrass			X	X	X									3
Dichanthelium sp.	witchgrass						X	X							2
Dichanthelium strigosum var. *leucoblepharis*	dwarf witchgrass										X				1
Digitaria sp.	crabgrass		X												1
Diodia virginiana	Virginia buttonweed				X	X							X	X	4
Diospyros virginiana	common persimmon	X	X	X	X	X				X			X	X	8
Drosera capillaris	pink sundew	X					X	X	X		X				5
**Drosera intermedia*	spoon-leaved sundew						X	X							2
Dulichium arundinaceum var. *arundinaceum*	threeway sedge							X	X	X	X				4
Edrastima uniflora	clustered mille graines						X	X	X		X	X			5
Eleocharis confervoides	algal bulrush						X								1
Eleocharis elongata	slim spikerush							X							1
Eleocharis sp.	spikerush						X	X		X	X	X			5

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Elephantopus elatus	tall elephantsfoot			X		X			X		X		X		5
Eragrostis sp.	lovegrass	X	X											X	3
Eremochloa ophiuroides	centipede grass				X										1
Erigeron canadensis	Canadian horseweed		X		X								X		3
Eriocaulon compressum	flattened pipewort							X							1
Eriogonum tomentosum	dogtongue wild buckwheat	X	X	X	X								X	X	6
Eryngium yuccifolium	button rattlesnakemaster				X										1
Eubotrys racemosus	swamp doghobble							X	X	X	X				4
Eupatorium capillifolium	dogfennel						X		X		X		X	X	5
Eupatorium compositifolium	yankeeweed	X	X	X	X	X							X	X	7
Eupatorium leptophyllum	falsefennel	X					X								2
Eupatorium mohrii	Mohr's thoroughwort						X	X	X		X		X		5
Eupatorium pilosum	rough boneset										X				1
Eupatorium semiserratum	smallflower thoroughwort												X		1
Euphorbia floridana	greater Florida spurge	X		X										X	3
Euphorbia sp.	spurge					X									1
Euthamia caroliniana	slender flattop goldenrod		X			X	X	X			X		X		6
Euthamia sp.	flattop goldenrod								X						1
Froelichia floridana	cottonweed				X								X		2
Fuirena breviseta	saltmarsh umbrellasedge							X							1
Galactia erecta	erect milkpea			X											1
Galactia sp.	milkpea	X	X		X								X	X	5
Galium sp.	bedstraw												X		1
Gaylussacia dumosa	dwarf huckleberry			X	X										2
Gaylussacia mosieri	woolly huckleberry								X		X				2
Gaylussacia nana	blue huckleberry						X								1
Gaylussacia sp.	huckleberry							X							1
Gaylussacia tomentosa	hairy dangleberry										X				1
Gelsemium sempervirens	yellow jessamine		X	X		X	X			X			X	X	7
Geobalanus oblongifolius	gopher apple	X	X	X	X	X							X	X	7
Gordonia lasianthus	loblolly bay										X				1
Helianthus angustifolius	narrowleaf sunflower					X									1
Hexasepalum teres	poor joe													X	1
Hieracium gronovii	queen-devil	X		X	X	X								X	5
Houstonia procumbens	roundleaf bluet			X									X		2
Hymenachne hemitoma	maidencane						X	X		X	X				4
Hypericum cistifolium	roundpod St. John's wort						X		X		X				3
Hypericum crux-andreae	St. Peter's wort					X	X		X						3
Hypericum fasciculatum	peelbark St. John's wort						X	X	X	X	X	X			6
Hypericum gentianoides	orangegrass	X	X	X	X	X								X	6
Hypericum hypericoides	St. Andrew's cross	X	X			X		X					X		5
**Hypericum lissophloeus*	smoothbark St. John's wort	X					X								2
Hypericum microsepalum	flatwoods St. John's wort						X		X						2

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Ilex ambigua	sand holly	X													1
Ilex coriacea	large gallberry						X	X			X				3
Ilex glabra	gallberry	X	X	X	X	X	X	X	X	X		X			10
Ilex myrtifolia	myrtle-leaved holly	X					X	X	X	X	X	X			7
Ilex opaca	American holly									X		X		X	3
Ilex vomitoria	yaupon	X	X	X	X	X		X		X	X		X	X	10
Itea virginica	Virginia willow										X				1
Juncus pelocarpus	annual rush						X								1
Juncus repens	lesser creeping rush								X						1
Juncus scirpoides	needlepod rush						X	X			X				3
Kellochloa verrucosa	warty panicgrass	X					X	X	X	X	X	X			7
Lachnanthes caroliana	Carolina redroot						X	X	X	X	X	X			6
Lachnocaulon anceps	whitehead bogbutton								X						1
Lechea sessiliflora	pineland pinweed	X	X	X	X								X	X	6
Leersia hexandra	southern cutgrass						X								1
Lespedeza hirta var. *curtissii*	silvery lespedeza	X		X		X									3
Lespedeza hirta var. *hirta*	hairy lespedeza		X										X		2
Lespedeza sp.	lespedeza					X									1
Liatris gracilis	slender gayfeather	X	X	X	X	X			X				X	X	8
Liatris resinosa	dense gayfeather								X		X				2
Liatris secunda	Piedmont gayfeather				X										1
Liatris tenuifolia	shortleaf gayfeather	X	X	X	X	X							X	X	7
Liquidambar styraciflua	sweetgum											X			1
Lobelia brevifolia	shortleaf lobelia					X									1
Lorinseria areolata	netted chain fern						X	X			X				3
Ludwigia lanceolata	lanceleaf primrosewillow										X				1
Ludwigia linearis	narrowleaf primrosewillow						X								1
Ludwigia maritima	seaside primrosewillow					X									1
Ludwigia pilosa	hairy primrosewillow						X								1
Lupinus sp.	lupine	X		X	X										3
Lupinus villosus	lady lupine		X												1
**Lupinus westianus*	Gulf Coast lupine													X	1
Lycopodiella alopecuroides	foxtail club-moss						X	X	X						3
Lycopodiella appressa	southern club-moss						X				X				2
Lycopus rubellus	taperleaf waterhorehound						X	X	X	X	X				5
Lyonia lucida	fetterbush						X	X	X	X	X	X			6
Magnolia virginiana var. *australis*	sweetbay										X				1
Mimosa microphylla	sensitive brier	X		X									X	X	4
Morella cerifera	southern bayberry					X	X		X	X					4
Muhlenbergia capillaris	hairawn muhly												X		1
Muscadinia rotundifolia	muscadine	X	X			X	X	X		X	X	X	X	X	10
Nuphar advena	yellow pondlily						X	X	X		X				4
Nymphaea odorata ssp. *odorata*	white waterlily						X	X	X	X	X				5

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Nymphoides cordata	little floatingheart						X								1
Nyssa biflora	swamp tupelo							X	X	X					3
Nyssa sylvatica	blackgum								X						1
Opuntia mesacantha ssp. *lata*	pricklypear	X	X	X	X	X							X	X	7
Osmundastrum cinnamomeum	cinnamon fern							X	X		X				3
Panicum virgatum	switchgrass	X	X	X		X								X	5
Paronychia rugelii	Rugel's nailwort	X	X			X									3
Paronychia sp.	nailwort												X		1
Paspalum setaceum	thin paspalum												X		1
Paspalum sp.	crowngrass				X										1
Peltandra sagittifolia	spoon-flower										X				1
Penstemon multiflorus	manyflower beardtongue	X	X	X	X	X								X	6
Pieris phyllyreifolia	climbing fetterbush						X			X		X			3
Pinus clausa	sand pine	X	X										X	X	4
Pinus elliottii	slash pine						X	X	X	X	X	X			6
Pinus palustris	longleaf pine	X	X	X	X	X							X	X	7
Pinus taeda	loblolly pine												X		1
Pityopsis aspera	pineland silkgrass	X		X	X								X		4
Pityopsis aspera var. *adenolepis*	pineland silkgrass					X								X	2
Pityopsis graminifolia	narrowleaf silkgrass			X		X	X	X							4
Pluchea baccharis	rosy camphorweed								X						1
Polygala lutea	orange milkwort								X		X				2
Polygonella gracilis	tall jointweed	X	X	X	X	X							X	X	7
Polygonella polygama	october flower		X		X										2
Pontederia cordata	pickerelweed						X	X		X	X				4
Pseudognaphalium obtusifolium	sweet everlasting													X	1
Pteridium pseudocaudatum	bracken fern		X		X			X							3
Pterocaulon pycnostachyum	blackroot					X									1
Quercus elliottii	runner oak		X												1
Quercus geminata	sand live oak	X	X	X	X	X			X				X	X	8
Quercus hemisphaerica	laurel oak	X	X		X	X						X	X	X	7
Quercus incana	bluejack oak	X	X	X	X	X							X	X	7
Quercus laevis	turkey oak	X	X	X	X	X							X	X	7
Quercus laurifolia	swamp laurel oak							X	X		X				3
Quercus margaretiae	sand post oak		X	X		X							X	X	5
Quercus minima	dwarf live oak				X										1
Quercus myrtifolia	myrtle oak		X												1
Quercus nigra	water oak											X	X		2
Quercus stellata	post oak		X		X								X		3
Quercus virginiana	live oak	X	X		X	X						X	X	X	7
Rhexia mariana	pale meadowbeauty		X												1
Rhexia mariana var. *exalbida*	white meadowbeauty						X	X			X				3
Rhexia mariana var. *mariana*	Maryland meadowbeauty	X				X	X		X	X		X		X	7

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Rhexia nashii	maid marian								X						1
Rhexia petiolata	fringed meadowbeauty	X					X				X				3
Rhexia sp.	meadowbeauty										X				1
Rhexia virginica	handsome harry									X		X			2
Rhus copallinum var. *copallinum*	winged sumac	X		X	X	X			X		X		X	X	8
Rhynchosia cytisoides	royal snoutbean	X	X	X	X	X							X	X	7
Rhynchosia reniformis	dollarleaf			X		X							X	X	4
Rhynchospora careyana	broadfruit horned beaksedge										X				1
Rhynchospora chalarocephala	loosehead beaksedge							X		X	X	X			4
Rhynchospora ciliaris	fringed beaksedge										X				1
Rhynchospora distans	narrow-fruited fascicled beaksedge										X				1
Rhynchospora fascicularis	fascicled beaksedge						X		X		X	X			4
Rhynchospora filifolia	threadleaf beaksedge						X								1
Rhynchospora inundata	narrowfruit horned beaksedge							X	X	X	X				4
Rhynchospora microcephala	bunched beaksedge						X			X	X				3
Rhynchospora pleiantha	coastal beaksedge						X								1
Rhynchospora sp.	beaksedge						X				X				2
Rubus argutus	sawtooth blackberry										X				1
Rubus cuneifolius	sand blackberry	X	X	X		X	X		X		X		X	X	9
Rubus pensilvanicus	Pennsylvania blackberry	X													1
Sabatia brevifolia	shortleaf rosegentian						X								1
Sacciolepis striata	American cupscale						X								1
Sagittaria graminea	grassy arrowhead						X	X							2
Sagittaria latifolia	common arrowhead							X		X					2
Salvia azurea var. *azurea*	azure blue sage			X											1
Schizachyrium stoloniferum	creeping little bluestem	X	X	X	X	X							X	X	7
Schizachyrium tenerum	slender bluestem	X		X	X	X									4
Scleria ciliata	fringed nutrush		X												1
Scleria elliottii	broad-leaved hairy nutrush			X											1
Scleria muhlenbergii	pitted nutrush						X	X							2
Scleria reticularis	netted nutrush						X								1
Serenoa repens	saw palmetto	X	X	X	X	X		X			X		X	X	9
Sericocarpus tortifolius	whitetop aster			X	X	X									3
Seymeria pectinata ssp. *pectinata*	Piedmont blacksenna		X	X	X	X								X	5
Smilax auriculata	earleaf greenbrier	X	X	X	X	X	X	X	X	X	X	X	X	X	13
Smilax bona-nox	saw greenbrier												X		1
Smilax glauca	cat greenbrier						X	X		X		X			4
Smilax laurifolia	laurel greenbrier									X	X	X			3
Smilax walteri	coral greenbrier								X	X	X				3
Solidago fistulosa	pinebarren goldenrod								X		X				2
Solidago odora	sweet goldenrod	X		X	X	X							X	X	6
Sorghastrum secundum	lopsided indiangrass	X													1

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Sphagnum sp.	sphagnum moss						X	X		X	X				4
Sporobolus junceus	pineywoods dropseed				X								X		2
Stillingia sylvatica	queen's delight			X	X	X									3
Stylisma sp.	dawnflower	X		X											2
Stylosanthes biflora	sidebeak pencil flower				X										1
**Symphyotrichum concolor* var. *devestitum*	Gulf coast silvery aster			X	X	X								X	4
Symphyotrichum dumosum var. *dumosum*	rice button aster			X	X	X							X	X	5
Syngonanthus flavidulus	yellow hatpins	X					X				X				3
Tamala borbonia	red bay												X		1
Tamala palustris	swamp bay					X	X	X		X	X	X			6
Taxodium ascendens	pond cypress						X	X	X	X	X	X			6
Tephrosia chrysophylla	scurf hoary-pea	X		X	X	X							X	X	6
Tephrosia spicata	spiked hoary-pea		X		X										2
Tillandsia usneoides	Spanish moss						X	X		X	X				4
Toxicodendron pubescens	eastern poison oak			X										X	2
Toxicodendron radicans var. *radicans*	eastern poison ivy										X				1
Triadenum virginicum	Virginia marsh St. John's wort							X		X	X				3
Trichostema dichotomum	forked bluecurls					X									1
Trichostema setaceum	narrowleaf bluecurls		X	X	X	X									4
Trilisa odoratissima	vanillaleaf	X			X	X									3
Triplasis americana	perennial sandgrass	X	X												2
Utricularia cornuta	horned bladderwort						X								1
Utricularia juncea	southern bladderwort						X								1
Utricularia purpurea	eastern purple bladderwort						X								1
Utricularia sp.	bladderwort							X							1
Vaccinium arboreum	sparkleberry	X	X	X	X	X		X					X	X	8
Vaccinium darrowii	Darrow's blueberry	X	X	X		X							X	X	6
Vaccinium elliottii	Elliott's blueberry	X	X		X	X	X	X		X	X		X	X	10
Vaccinium fuscatum	highbush blueberry	X					X	X	X	X	X	X			7
Vaccinium myrsinites	shiny blueberry	X	X	X	X	X							X	X	7
Vaccinium sp.	blueberry												X		1
Vaccinium stamineum	deerberry	X	X											X	3
Viola lanceolata	bog white violet						X								1
Viola sp.	violet			X											1
Xyris brevifolia	shortleaf yellow-eyed grass						X								1
Xyris elliottii	Elliott's yellow-eyed grass						X	X	X		X				4
Xyris fimbriata	fringed yellow-eyed grass						X	X	X	X	X	X			6
Xyris platylepis	tall yellow-eyed grass								X						1
Xyris sp.	yellow-eyed grass						X								1
Yucca filamentosa	Adam's needle	X	X	X		X							X	X	6
Total number of taxa: 294		**82**	**72**	**72**	**68**	**89**	**84**	**68**	**58**	**52**	**84**	**39**	**79**	**72**	**919**

Management Unit 1, UMAM Polygon IV, Preserved High Quality Forested and Herbaceous Wetlands (M9)

Management Unit 1, UMAM Polygon IV consists of 574.839 acres of a wide variety of preserved wetland habitats including FLUCCS: 621 – Cypress, 617 – Mixed Wetland Hardwoods, 644 – Emergent Aquatic Wetlands, 611 – Bay Swamps, 641 – Freshwater Marshes, 616 – Inland Ponds and Sloughs, 640 – and Vegetated Non-Forested Wetlands. The management goal for this polygon is preservation of the existing high-quality wetlands. According to the prior monitoring reports, two of the pedestrian survey paths (M8 and M9) in Management Unit I, UMAM Polygon IV, were in cypress dominated wetlands. However, after reexamination of the original permit and meander transect locations given by the NWFWMD, we determined that M8 is actually located in Management Unit 2 and has been moved to that section for this report. During the baseline monitoring, 32 species were observed in M9. Wildlife was abundant.

Fall 2023 Monitoring:

A total of 49 species were observed along M9.

Fall 2024 Monitoring:

In 2024, a total of 52 species were observed along M9. There is a dense canopy of pond cypress and swamp tupelo. The pondshore has a thicket of titi and buttonbush, while other areas have tall shrubs dominated by yaupon and sweet pepperbush. Vines are common. The pond edge has open water, but also herbs such as water lilies, maidencane, spikerush, and pickerelweed. There is a dense cover of leaf litter.

Final Success Criteria:

Success criteria have been met for this area. These include exotic vegetation cover < 1 percent per acre, nuisance vegetation cover < 5 percent per acre, and maintaining or improving in ecological function.

Management Unit 2, UMAM Polygon V, Hydric Pine Flatwoods (M8, M10 and M11)

Management Unit 2, UMAM Polygon V consists of 146.678 acres of FLUCCS 635 hydric pine flatwoods. The management goal for this polygon includes the enhancement and restoration of the degraded hydric pine flatwoods. Three pedestrian transects (M8, M10 and M11) are located in Management Unit 2, UMAM Polygon V. Each of these degraded hydric pine flatwoods were dominated by dense shrub cover and species during baseline monitoring. M8 originally had 38 species (see the previous section for notes on the placement of this transect). The location for M11 may have been altered at some time following the baseline survey, but we are unaware of the new location and instead followed the transect given in Figure 1, only recording species in what was clearly hydric pine flatwoods.

Fall 2023 Monitoring:

In 2023, a total of 57 species were observed along M8, a total of 61 species were observed along M10, and 50 species along M11. The state-listed commercially exploited cinnamon fern was seen along M10. The state-listed threatened Curtiss'sandgrass was occasional on M8 and M11.

Fall 2024 Monitoring:

In 2024, a total of 58 species were observed along M8. This transect has a sparse canopy of slash pine with scattered swamp tupeloes. Pines become denser towards the road. There is pond cypress and some slash

pines in the pond. Tall shrubs consist of scattered ericads (fetterbush, huckleberry, blueberry, etc), gallberry, and swamp bay, while short shrubs are mainly St. Johns wort and blueberry. Herbs consist of mainly graminoids. Open ground has a layer of pine litter, and occasionally patches of sphagnum moss. Some soil disturbance (likely from hog digging) was noted. The state-listed threatened Curtiss'sandgrass and the state-listed commercially exploited cinnamon fern were both seen along M8.

A total of 84 species were observed along M10. The transect was walked in an area north of the road leading to Dry Lake. An old vehicle trail runs north from this road. Along the western side of the trail, tall shrubs of titi and other wetland species are dense. East of the trail, stands of dense shrubs are also common, but there are also open areas of bluestem and redroot. The state-listed commercially exploited cinnamon fern was seen along M10. The area south of the road to Dry Lake may have been included in species lists from 2022 and before. This area will be examined in the next monitoring cycle.

Transect M11 had 39 species. The small area sampled has a canopy of scattered mature slash pines with areas filling in with water oak and live oak as subcanopy. There are dense areas of tall titi and black titi, as well as some shorter fetterbush thickets. Herbs are mainly bluestem and warty panic grass. The state-listed threatened Curtiss'sandgrass was occasional on M11. In general, the transect has heavy litter cover and open areas with forestry debris.

Final Success Criteria:

Interim success criteria have been met for this area. No exotic species were observed.

Management Unit 10, UMAM Polygon III, Xeric and Live Oak (M1, M2, M12, and M13)

Management Unit 10, UMAM Polygon III consists of 493.852 acres of FLUCCS 421 – Xeric Oak and 427 – Live Oak. Management goals include preservation, reintroduction of fire, removal of oaks and hardwoods, planting of longleaf pine, and exotic species control. Four transects were located within Polygon 10, M1, M2, M12 and M13). During baseline monitoring, 44 species were observed along M1, as were 29 species within M2, 26 species within M12, and 54 species within M13. In Transect M1, Florida threatened species, Gulf coast lupine (*Lupinus westianus*), and Gopher tortoise burrows have been observed scattered throughout the xeric communities.

Fall 2023 Monitoring:

A total of 84 species were observed along M1. This transect traverses successional hardwoods, sandhill, and karst pond habitats. The M1 transect also had two state listed rare species, smoothbark St. John's wort and karst pond xyris, where it intersects the edge of a pond. A lupine was observed which may have been Gulf Coast lupine, but the plant was senescent and only identified to genus.

A total of 55 species were found along M2. Transect M12 had 77 species, while Transect M13 had 72 species. Around 40 of the state-listed threatened Gulf Coast lupine were found along Transect M13.

Fall 2024 Monitoring:

A total of 82 species were observed along M1. The M1 transect also had the state listed rare species, smoothbark St. John's wort. The rare karst pond Xyris is likely still extant along this transect but was not

identifiable to species this year. Again, possible Gulf Coast lupines were found, but could only be identified to genus. The canopy is longleaf pine, with a few interspersed turkey oaks and sand live oaks. Woody species along the transect are mostly younger canopy species. There is a diverse sandhill herb layer dominated by wiregrass with open bare patches and sparse litter cover.

A total of 72 species were found along M2. There is a canopy of young, planted longleaf pines to 20 feet tall, and a few dense patches of short runner oak and woody goldenrod. Otherwise, the groundcover is dominated by a sparse to dense cover of wiregrass, little bluestem, and summer's farewell. Open areas may be bare sand but are sometimes covered with fruticose lichens or pine litter.

Transect M12 had 79 species. There is an open canopy of younger longleaf pines with just a few older individuals. Woody shrub cover is low, and wiregrass was blooming in recently burned sandhill. The groundcover is highly diverse, and litter is sparse due to the recent fire.

Transect M13 had 72 species. The state-listed threatened Gulf Coast lupine was again found along Transect M13, as well as Gulf coast silvery aster, an endemic species tracked by FNAI. The canopy is open with scattered longleaf pines and live oaks. Bluejack oak, turkey oak, and sand live oak are dominant in the open tall and short shrub layers. Woody goldenrod and gopherweed are also common in the short shrubs. The dominant herbs include wiregrass and little bluestem. Scattered patches of bare ground are common, and generally associated with pocket gopher mounds. Litter is sparse.

Final Success Criteria:

Success criteria have been met for this area. No nuisance native or exotic vegetation have been observed. Diversity is good and continued burns within these areas will maintain a healthy sandhill community. Wiregrass cover is excellent and oaks and other hardwood cover have been reduced to appropriate levels throughout most of the areas.

Management Unit 11, UMAM Polygon II, Upland Sand Pine or Slash Pine Plantations (M5)

Management Unit 11, UMAM Polygon II consists of 383.484 acres of FLUCCS 411, Longleaf Pine/Wiregrass restored from slash or sand pine plantations.

The restoration goal for this area is to restore the sites to a sandhill community from a slash pine plantation. Management activities included the removal of planted sand pines, reintroduction of burns, re-planting with longleaf pine, and the addition of wiregrass as needed. Slash and sand pine trees were harvested from April to November 2007 followed by winter burns. Transect M5 is located within Management Unit 11, UMAM Polygon II. Observations from the baseline monitoring in 2006, indicated six trees, seven shrubs, two vines, and 35 herbaceous species.

Fall 2023 Monitoring:

A total of 118 species were observed along M5. This was the only transect where the non-native invasive Japanese climbing fern was detected. This was the most diverse transect in 2023, perhaps in part because it traverses both good quality sandhill groundcover as well as more ruderal habitats near the vehicle trails.

Fall 2024 Monitoring:

A total of 89 species were observed along M5. The canopy and subcanopy consists of young longleaf pines and a few larger live oaks. Tall and short shrubs consist of scattered sandhill oaks such as bluejack and turkey oaks, as well as a few yaupon and gallberry. The diverse herb layer is dominated by wiregrass with little bluestem, pineland silkgrass, and sweet goldenrod also abundant. Litter cover is sparse. We did not detect any non-native invasives this year. We observed Gulf coast silvery aster, an endemic species tracked by FNAI, along M5.

Final Success Criteria:

The interim success criteria have been met for this area. No non-native invasive species were observed. Wiregrass is the dominant species throughout most of the transect. The ground cover is diverse and typical of a sandhill, and the planted longleaf pines are between 100-200 trees per acre.

Management Unit 12, UMAM Polygon 1, Sandhill (M3 and M4)

Management Unit 12, UMAM Polygon 1 consists of 263.52 acres of FLUCCS: 411 – Longleaf Pine / Wiregrass (Mesic Pine Flatwoods) restored from 421 – Xeric Oak habitat.

The goal for this polygon was to restore a diverse sandhill. Fire was reintroduced in 2004 and the once dominant woody goldenrod and oak cover has been replaced by wiregrass and diverse sandhill species. Removal of oaks ≤ 12 inches DBH occurred in the summer of 2005 and the area was replanted with longleaf pine. The sandhill is diverse and high quality with an excellent herbaceous species composition. Two transects (M3 and M4) were located within this polygon. Baseline documentation in 2006 observed a total of 35 species (seven trees, two shrubs, two vines, and 24 herbs) within pedestrian Transect M3, while 68 species (eight trees, nine shrubs, two vines and 49 herbs) were observed within M4. These two areas are the two most diverse upland areas of the bank and often have over 90 species observed. Floristically, they are typical of high quality sandhills within the region.

Fall 2023 Monitoring:

A total of 50 species were observed along M3, while 74 species were observed along M4. A gopher tortoise burrow was found in the vicinity of Transect M13.

Fall 2024 Monitoring:

A total of 72 species were observed along M3. There is a sparse canopy of planted longleaf pine, and very few other woody species besides bolting pines and short turkey oaks, bluejack oaks, sand post oaks, and gopher apple. Herbs are highly diverse and dominated by wiregrass with occasional patches of little bluestem. Summer's farewell and pineland false foxglove are very common, and the site has many pocket goper mounds. The non-native invasive mimosa was found along M3 this year.

A total of 68 species were observed along M4. We observed Gulf coast silvery aster, an endemic species tracked by FNAI, along both transects.

Final Success Criteria:

This polygon has met the restoration goals set forth in the interim success criteria. Controlled burns within this polygon have greatly reduced the cover of woody goldenrod and oaks. Successive burns have increased diversity and wiregrass cover. Oaks have been reduced to less than 50 trees per acre as measured along the tree belt transects, and the herbaceous vegetation is dominated by wiregrass.

Management Unit 14, portions of UMAM Polygon IV, Lakes (M6 and M7)

Management Unit 14, portions of UMAM Polygon IV consists of 164.958 acres of FLUCCS 520, lakes. The goal for this polygon is the preservation of the lake and aquatic habitat. One pedestrian transect (M6) was placed within the polygon around Garret Pond and another M7 at Dykes Mill Pond. A zone of Smooth barked St. John's wort and seedlings was observed just above normal pool adjacent to Garret Pond.

In 2022, water levels were above normal pool for most of the year. A total of 81 species were observed along M6, while 48 species were observed along M7. Vegetation appeared healthy and vigorous.

Fall 2023 Monitoring:

Both ponds were full of water. Only a small portion of M7 was surveyable. A total of 69 species were observed along M6, while 52 species were observed along M7. The state-listed commercially exploited cinnamon fern was seen along both M6 and M7. The M6 transect also had two state-listed rare species, smoothbark St. John's wort and karst pond xyris, around the edge of Garret Pond. The state-listed threatened spoonleaf sundew was occasional on M7 around the edge of Dykes Mill Pond.

Fall 2024 Monitoring:

Both ponds were full of water, with slightly deeper water than in 2023. Only a small portion of M7 was surveyable. A total of 84 species were observed along M6, while 68 species were observed along M7. The state-listed commercially exploited cinnamon fern was seen along M7. The M6 transect had the state-listed rare species, smoothbark St. John's wort. Karst pond Xyris is likely persisting around the edge of Garret Pond but was not identifiable to species this year. The state-listed threatened spoonleaf sundew was spotted on both M6 and M7.

Final Success Criteria:

Wetland vegetation is the dominant within both sites. Species appear healthy, diverse, and vigorous. No non-native invasive species were observed. Success criteria for this area have been met.

Appendix B (July – December 2024 Semiannual Report)

SAND HILL LAKES MITIGATION BANK
FDEP PERMIT NO. 0227351-001
SEMIANNUAL STATUS REPORT
PERIOD: JULY – DECEMBER 2024

For the period July – December 2024:

1. Efforts to limit damage to vegetation at SHLMB by feral hog and beaver are ongoing. Under Contract 24-060 with USDA APHIS-WS (Animal and Plant Health Inspection Service – Wildlife Services), 24 feral hogs were reported eliminated at SHLMB.
2. No prescribed fire was implemented.
3. Perimeter fencing was inspected; vegetation growing on perimeter fencing was controlled through use of herbicides.
4. Minor occurrences of cogongrass (*Imperata cylindrica*) were observed and treated with herbicide during the first half of 2024. These areas continue to be monitored, and additional treatment will be conducted as needed.
5. Mowing of nuisance shrubs adjacent to management access roads was conducted.
6. Public fishing and hunting continued at the Sand Hill Lakes Mitigation Bank (SHLMB) in accordance with permit conditions. Records are maintained by FWC.
7. Security and law enforcement patrols continued in accordance with permit conditions; no known violations were reported.
8. Water level gages were read monthly in accordance with permit conditions. Data is available upon request.
9. FDEP Mitigation Banking Team conducted an inspection of the Sand Hill Lakes Mitigation Bank on 13 December 2024. An "adaptive management plan" will be developed in 2025 to address concerns raised.

Anticipated restoration and/or management anticipated for January – June 2025:

1. In 2025, the majority of the property will be burned during the growing season. This approach promotes the proliferation of native grasses and forbs, helps control encroaching woody vegetation, and improves habitat conditions for fire-adapted wildlife. The goal remains to maintain fire-dependent upland communities on two-year burn cycles. Historically, hydric pine flatwood/savanna communities have been burned annually. However, due to insufficient fuel accumulation and limited fire effectiveness, burning will be shifted to a two-year cycle to allow for greater fuel buildup and more impactful burns.
2. Sandhill (longleaf pine/wiregrass community) polygons where oak/shrub densities exceed desired conditions will be managed with fire, herbicide, and/or mowing.
3. An overabundance of *Andropogon* spp., exceeding the 25% graminoid threshold defined by the FDEP permit's final success criteria, was observed in the hydric pine flatwoods during the annual inspection. Corrective measures are planned for 2025 to address this issue and ensure compliance with permit requirements.
4. Water level gages will continue to be read monthly in accordance with permit conditions.
5. Security and law enforcement patrols will continue in accordance with permit conditions.
6. Public fishing and hunting, overseen by FWC, will continue in accordance with permit conditions.

7. Inspections of perimeter fencing will continue with anticipated repairs made. Additional application of herbicide to vegetation growing on perimeter fencing is planned.
8. Exotic vegetation, if observed by NWFWMD or FWC staff, will be treated with herbicides.

Overall, the site is in excellent ecological condition. Management activities continue in accordance with permit conditions. Issues identified above (e.g., minor occurrence of exotic and/or nuisance vegetation; feral hog populations; perimeter fencing maintenance; shrub and Andropogon spp. densities in selected polygons) are being addressed.

Certification:
We certify, to the best of our knowledge, that this report represents a true and accurate description of the activities and site conditions at the time of this report. This semi-annual report was written in accordance with Specific Condition 27 of the permit.

Robert F. Lide
Robert F. Lide, Senior Environmental Scientist, QMS Team Member
28 January 2025

Philip Garrett
Philip Garrett, Senior Environmental Scientist, QMS Team Member
28 January 2025

Coakley Taylor
Coakley Taylor, Lands Manager, QMS Team Member
28 January 2025

Table 1. Representative Photos (JLY – DEC 2024)

12/26/2024

12/26/2024

12/26/2024

12/26/2024

12/26/2024

12/26/2024

Appendix C (Water Level Staff Gage Readings)

APPEXDIX C
Sand Hill Lakes Mitigation Bank
Water Level Staff Gage Readings
JAN 2006 - DEC 2024
(All Readings are in Feet)

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
16-Jan-2006	3.60	3.54	2.14	3.10	3.00	3.58	2.90	3.58	3.60	4.18
2-Feb-2006	3.60	3.50	2.12	2.88	3.18	3.88	3.62	3.58	3.70	4.15
3-Mar-2006	3.74	3.80	2.00	2.74	3.02	4.38	3.44	3.78	3.70	4.32
3-Apr-2006	3.36	3.12	1.34	2.00	2.74	4.02	1.86	3.10	3.20	3.78
2-May-2006	2.92	2.46	DRY	1.32	2.58	3.72	0.54	2.74	2.58	3.34
2-Jun-2006	2.60	1.18	DRY	0.78	2.40	3.62	DRY	1.98	2.10	3.08
7-Jul-2006	1.68	<GAGE	DRY	<GAGE	1.80	2.90	DRY	DRY	0.60	2.30
9-Aug-2006	1.58	<GAGE	DRY	<GAGE	2.00	3.00	DRY	DRY	0.35	-
22-Sep-2006	0.76	<GAGE	DRY	<GAGE	-	-	DRY	DRY	<GAGE	-
16-Oct-2006	0.06	<GAGE	DRY	<GAGE	0.30	2.17	DRY	DRY	<GAGE	-
1-Nov-2006	0.20	<GAGE	DRY	<GAGE	0.60	2.50	DRY	DRY	<GAGE	-
3-Jan-2007	<GAGE	<GAGE	DRY	<GAGE	0.50	2.80	DRY	DRY	<GAGE	2.18
6-Feb-2007	<GAGE	<GAGE	DRY	<GAGE	0.60	3.18	DRY	DRY	<GAGE	-

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
5-Mar-2007	<GAGE	<GAGE	DRY	<GAGE	0.29	3.05	DRY	DRY	<GAGE	2.32
5-Apr-2007	<GAGE	<GAGE	DRY	<GAGE	<GAGE	2.48	DRY	DRY	<GAGE	1.80
3-May-2007	<GAGE	DRY	DRY	<GAGE	<GAGE	2.17	DRY	DRY	<GAGE	1.46
4-Jun-2007	<GAGE	<GAGE	DRY	<GAGE	<GAGE	0.95	DRY	DRY	<GAGE	0.58
30-Jan-2008	<GAGE	DRY	DRY	<GAGE	<GAGE	0.98	DRY	DRY	DRY	0.94
27-Feb-2008	<GAGE	DRY	DRY	<GAGE	0.30	3.30	DRY	1.30	<GAGE	3.00
2-Apr-2008	<GAGE	DRY	1.53	<GAGE	1.20	3.16	DRY	2.60	<GAGE	2.65
5-May-2008	<GAGE	DRY	DRY	<GAGE	1.12	2.92	DRY	DRY	<GAGE	2.30
6-Jun-2008	<GAGE	DRY	DRY	<GAGE	0.70	2.42	DRY	DRY	<GAGE	1.56
2-Jul-2008	<GAGE	DRY	DRY	<GAGE	1.30	3.34	DRY	DRY	<GAGE	2.00
1-Aug-2008	<GAGE	DRY	1.34	<GAGE	1.52	3.36	DRY	2.28	<GAGE	2.56
2-Sep-2008	<GAGE	DRY	2.20	<GAGE	2.50	3.38	DRY	2.90	<GAGE	3.16
2-Oct-2008	<GAGE	DRY	0.32	<GAGE	2.22	3.06	DRY	DRY	<GAGE	2.40
7-Nov-2008	<GAGE	DRY	DRY	<GAGE	1.98	3.06	DRY	DRY	<GAGE	2.00
5-Jan-2009	<GAGE	DRY	1.72	<GAGE	2.52	3.38	DRY	3.05	<GAGE	2.98
12-Feb-2009	<GAGE	DRY	0.30	<GAGE	2.15	3.13	DRY	<GAGE	<GAGE	2.60

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
3-Mar-2009	<GAGE	DRY	1.98	<GAGE	2.44	3.30	DRY	2.90	<GAGE	2.90
3-Apr-2009	1.80	<GAGE	3.78	<GAGE	2.72	4.40	4.26	3.52	3.30	3.92
1-May-2009	6.60	6.11	4.12	<GAGE	2.52	3.40	4.44	3.96	6.34	>GAGE
3-Jun-2009	6.37	5.89	3.88	<GAGE	2.52	3.42	4.58	3.74	6.13	6.70
7-Jul-2009	5.16	5.22	3.45	<GAGE	2.53	3.28	3.18	2.70	4.94	5.49
5-Aug-2009	4.58	4.60	2.88	<GAGE	2.50	3.27	2.52	<GAGE	4.31	4.79
1-Sep-2009	4.35	4.17	2.45	<GAGE	2.50	3.22	2.39	1.75	4.09	4.61
1-Oct-2009	4.60	4.29	2.58	<GAGE	2.42	3.29	3.09	<GAGE	4.30	4.90
2-Nov-2009	4.58	4.16	2.45	<GAGE	2.44	3.39	2.85	2.42	4.31	4.90
1-Dec-2009	4.45	3.89	2.18	<GAGE	2.42	3.30	2.50	2.38	4.20	4.75
4-Jan-2010	6.10	5.80	3.91	<GAGE	2.53	3.52	4.40	3.47	5.82	6.40
3-Feb-2010	>GAGE	6.42	4.36	<GAGE	2.74	3.60	4.96	4.78	>GAGE	>GAGE
1-Mar-2010	>GAGE	6.43	4.42	<GAGE	2.83	3.56	4.60	4.35	>GAGE	>GAGE
1-Apr-2010	6.30	5.82	3.92	<GAGE	2.82	3.50	4.16	3.68	6.06	6.62
3-May-2010	5.82	5.89	4.10	1.20	2.73	4.00	3.38	4.23	5.60	6.12
31-May-2010	5.92	5.60	3.70	1.90	2.67	3.49	3.99	3.32	5.71	6.28

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
2-Jul-2010	5.00	5.00	3.26	2.14	2.68	3.70	3.20	3.00	4.78	5.32
2-Aug-2010	4.52	4.36	2.52	1.90	2.48	3.36	3.05	<GAGE	4.30	4.84
1-Sep-2010	4.72	4.48	2.75	2.20	2.52	2.90	3.40	2.60	4.51	5.05
1-Oct-2010	4.45	4.14	2.48	2.12	2.62	3.80	2.90	2.00	4.22	4.67
1-Nov-2010	3.91	3.42	1.82	1.59	2.50	3.53	2.12	<GAGE	3.70	4.24
1-Dec-2010	3.75	3.21	1.76	1.26	2.50	3.41	0.80	<GAGE	3.50	4.05
3-Jan-2011	3.57	2.88	1.60	0.87	2.74	3.60	<GAGE	<GAGE	3.35	3.90
1-Feb-2011	3.48	2.65	1.35	0.58	2.76	3.68	<GAGE	2.00	3.30	3.80
1-Mar-2011	3.70	3.00	1.68	0.60	2.94	3.80	<GAGE	2.52	3.46	4.02
1-Apr-2011	3.65	3.02	2.00	0.50	2.98	3.74	2.34	3.10	3.42	3.98
2-May-2011	2.90	1.12	0.68	<GAGE	2.49	3.18	<GAGE	<GAGE	2.56	3.26
1-Jun-2011	1.00	<GAGE	<GAGE	<GAGE	1.80	2.55	<GAGE	<GAGE	1.16	2.52
1-Jul-2011	1.40	<GAGE	<GAGE	<GAGE	1.68	2.50	<GAGE	<GAGE	<GAGE	2.08
2-Aug-2011	1.20	<GAGE	<GAGE	<GAGE	1.97	3.00	<GAGE	<GAGE	<GAGE	2.20
1-Sep-2011	0.70	<GAGE	<GAGE	<GAGE	2.50	3.20	<GAGE	<GAGE	<GAGE	1.75
3-Oct-2011	0.10	<GAGE	<GAGE	<GAGE	1.90	3.80	<GAGE	<GAGE	<GAGE	1.30

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
2-Nov-2011	<GAGE	<GAGE	<GAGE	<GAGE	1.46	2.80	<GAGE	<GAGE	<GAGE	0.88
2-Jan-2012	<GAGE	<GAGE	<GAGE	<GAGE	1.09	2.80	<GAGE	<GAGE	<GAGE	0.60
1-Feb-2012	<GAGE	<GAGE	<GAGE	<GAGE	0.96	2.94	<GAGE	<GAGE	<GAGE	0.58
2-Mar-2012	<GAGE	<GAGE	<GAGE	<GAGE	1.15	3.22	<GAGE	2.40	<GAGE	0.90
2-Apr-2012	<GAGE	<GAGE	<GAGE	<GAGE	2.24	3.38	<GAGE	2.76	<GAGE	2.02
1-May-2012	<GAGE	<GAGE	<GAGE	<GAGE	1.80	3.00	<GAGE	<GAGE	<GAGE	1.42
1-Jun-2012	<GAGE	<GAGE	<GAGE	<GAGE	0.90	2.72	<GAGE	<GAGE	<GAGE	0.98
2-Jul-2012	<GAGE	<GAGE	<GAGE	<GAGE	0.98	2.94	<GAGE	<GAGE	<GAGE	1.02
1-Aug-2012	<GAGE	<GAGE	<GAGE	<GAGE	1.45	3.04	<GAGE	<GAGE	<GAGE	0.88
3-Sep-2012	<GAGE	<GAGE	<GAGE	<GAGE	2.16	3.45	<GAGE	<GAGE	<GAGE	1.35
1-Oct-2012	<GAGE	<GAGE	1.30	<GAGE	2.85	3.67	<GAGE	1.98	<GAGE	1.85
5-Nov-2012	<GAGE	<GAGE	<GAGE	<GAGE	2.40	3.32	<GAGE	<GAGE	<GAGE	1.35
3-Dec-2012	<GAGE	<GAGE	<GAGE	<GAGE	2.00	3.32	<GAGE	<GAGE	<GAGE	1.02
2-Jan-2013	<GAGE	<GAGE	<GAGE	<GAGE	2.06	3.40	<GAGE	<GAGE	<GAGE	1.24
1-Feb-2013	<GAGE	<GAGE	<GAGE	<GAGE	1.26	3.10	<GAGE	<GAGE	<GAGE	0.97
1-Mar-2013	<GAGE	<GAGE	1.39	<GAGE	2.60	3.82	<GAGE	3.38	<GAGE	2.25

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
1-Apr-2013	<GAGE	<GAGE	1.04	<GAGE	2.66	3.65	<GAGE	3.16	<GAGE	2.46
1-May-2013	<GAGE	<GAGE	1.92	<GAGE	2.76	3.78	<GAGE	3.44	<GAGE	2.96
3-Jun-2013	<GAGE	<GAGE	0.50	<GAGE	2.26	3.08	<GAGE	<GAGE	<GAGE	2.28
1-Jul-2013	<GAGE	<GAGE	1.08	<GAGE	2.50	3.54	<GAGE	<GAGE	<GAGE	2.50
1-Aug-2013	>GAGE	>GAGE	5.46	0.12	2.80	4.14	5.18	5.16	>GAGE	>GAGE
1-Sep-2013	>GAGE	>GAGE	5.35	2.95	2.78	4.20	5.25	5.30	>GAGE	>GAGE
1-Oct-2013	>GAGE	>GAGE	5.38	3.40	2.82	4.27	4.86	4.80	>GAGE	>GAGE
4-Nov-2013	6.12	5.62	5.35	3.38	2.79	4.32	3.78	3.50	5.90	6.45
3-Dec-2013	6.00	5.48	5.22	.	2.70	.	.	3.48	5.79	.
4-Dec-2013	.	.	.	3.46	.	.	.	.	.	.
5-Dec-2013	.	.	.	.	.	4.20	.	.	.	.
6-Dec-2013	.	.	.	.	.	.	4.00	.	.	.
7-Dec-2013	.	.	.	.	.	.	.	.	.	6.32
1-Jan-2014	6.31	5.76	5.29	3.40	2.68	4.20	4.25	3.70	6.10	6.67
5-Feb-2014	6.08	5.50	3.79	3.40	2.55	3.95	3.70	3.42	5.84	6.39
3-Mar-2014	6.55	5.84	3.94	3.38	2.60	4.02	4.36	3.90	6.35	>GAGE

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
1-Apr-2014	>GAGE	>GAGE	4.68	3.44	3.02	4.46	4.84	4.84	>GAGE	>GAGE
2-May-2014	>GAGE	>GAGE	>GAGE	3.60	3.00	4.62	6.36	6.42	>GAGE	>GAGE
2-Jun-2014	>GAGE	>GAGE	>GAGE	3.52	2.82	4.23	4.88	4.80	>GAGE	>GAGE
1-Jul-2014	6.57	5.44	5.33	3.40	2.71	3.34	4.06	3.92	>GAGE	>GAGE
1-Aug-2014	5.95	5.33	3.50	3.38	2.69	4.28	3.67	3.34	5.72	6.24
1-Sep-2014	5.06	4.56	2.94	3.38	2.65	4.14	3.00	2.98	4.98	5.40
6-Oct-2014	5.27	4.74	3.02	3.24	2.58	4.00	3.20	3.34	5.04	5.58
3-Nov-2014	5.23	4.92	2.97	3.13	2.44	3.95	3.03	2.80	5.02	5.54
1-Dec-2014	5.41	5.25	3.42	3.28	3.05	4.01	3.49	3.47	5.18	5.71
2-Jan-2015	5.88	5.37	3.94	3.34	3.54	4.54	4.09	3.53	5.65	6.20
2-Feb-2015	6.15	5.44	4.02	3.44	3.78	4.08	3.99	3.57	5.96	6.50
2-Mar-2015	5.86	5.14	3.26	3.36	3.83	3.97	3.64	3.46	5.64	6.18
1-Apr-2015	5.66	4.70	3.14	3.22	3.78	3.84	3.85	3.38	5.46	5.98
1-May-2015	6.68	5.50	3.44	3.64	3.66	4.12	4.70	4.06	6.48	>GAGE
2-Jun-2015	>GAGE	5.88	3.82	3.40	3.66	4.25	4.80	4.44	>GAGE	>GAGE
1-Jul-2015	6.48	5.38	3.44	3.35	3.58	4.34	4.10	3.84	6.26	>GAGE

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
31-Jul-2015	5.56	4.55	2.70	3.16	3.51	4.12	3.66	3.34	5.44	5.95
1-Sep-2015	5.06	3.84	2.12	2.66	3.40	3.92	3.07	2.75	4.86	5.37
1-Oct-2015	5.14	3.88	2.47	2.47	3.50	4.40	3.18	3.46	4.94	5.45
2-Nov-2015	4.86	3.65	2.18	2.02	3.50	4.10	2.85	3.07	4.64	5.16
1-Dec-2015	5.40	4.26	2.22	2.17	3.54	4.07	3.85	3.34	5.19	5.70
31-Dec-2015	6.20	5.13	3.12	2.62	3.60	4.48	4.75	3.66	5.97	6.48
1-Feb-2016	>GAGE	5.90	3.78	3.20	3.56	4.18	5.00	4.48	>GAGE	>GAGE
1-Mar-2016	>GAGE	5.64	3.70	3.36	3.60	4.03	4.78	4.18	6.60	>GAGE
1-Apr-2016	>GAGE	6.10	3.75	3.46	3.63	4.25	5.37	4.74	>GAGE	>GAGE
2-May-2016	>GAGE	5.78	3.78	3.45	3.48	4.40	4.92	4.40	>GAGE	>GAGE
1-Jun-2016	5.82	4.65	3.76	3.36	3.45	3.83	3.98	3.22	5.64	6.14
1-Jul-2016	5.62	4.42	2.42	3.36	3.50	4.14	3.96	3.34	5.40	5.94
1-Aug-2016	5.10	3.84	2.13	3.08	3.34	4.06	3.52	2.26	4.86	5.42
1-Sep-2016	5.55	4.35	2.49	3.12	3.42	4.17	4.37	3.36	5.33	5.86
3-Oct-2016	5.02	3.77	2.06	2.56	3.50	3.94	3.58	2.32	4.80	5.32
31-Oct-2016	4.48	3.00	1.36	1.86	3.12	3.68	2.88	0.00	4.32	4.84

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
1-Dec-2016	4.20	2.70	0.00	1.25	2.94	3.78	2.40	0.00	3.99	4.50
11-Jan-2017	5.76	4.72	2.81	2.44	3.38	4.22	4.86	3.81	5.54	6.08
1-Feb-2017	6.62	5.40	3.34	2.74	3.50	4.12	5.07	4.20	6.40	>GAGE
1-Mar-2017	6.26	5.12	3.13	2.89	3.54	4.06	4.72	3.72	6.04	6.58
30-Mar-2017	5.54	4.37	2.50	2.54	3.48	3.88	3.90	3.21	5.30	5.84
1-May-2017	5.36	4.18	2.31	2.48	4.46	3.88	3.88	2.98	5.12	5.64
2-Jun-2017	4.88	3.62	1.81	2.10	3.50	2.78	3.40	1.90	4.62	5.14
30-Jun-2017	6.49	5.28	3.20	3.02	3.60	4.32	5.43	4.50	6.28	>GAGE
1-Aug-2017	6.22	5.12	3.00	3.16	3.50	4.24	4.94	3.84	6.00	6.52
31-Aug-2017	5.66	4.58	2.70	3.18	3.70	4.38	4.38	3.52	5.46	5.98
2-Oct-2017	5.18	4.08	2.30	2.96	3.50	4.13	3.98	2.78	4.96	5.46
1-Nov-2017	4.70	3.50	1.86	2.54	3.42	4.00	3.40	1.95	4.60	5.06
5-Dec-2017	4.42	2.90	1.58	3.00	3.25	3.72	2.75	<GAGE	4.20	4.74
2-Jan-2018	4.48	3.00	1.62	1.64	3.22	3.80	2.70	1.65	4.28	4.80
1-Feb-2018	4.64	2.96	1.80	1.40	3.26	3.98	2.75	3.04	4.40	4.94
1-Mar-2018	>GAGE	5.84	3.64	2.64	3.58	4.10	5.20	4.56	>GAGE	>GAGE

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
4-Apr-2018	6.02	-	3.25	2.58	3.46	4.06	4.38	3.48	5.83	6.34
1-May-2018	5.62	4.54	2.64	2.42	3.36	3.94	4.18	3.18	5.42	5.96
1-Jun-2018	5.52	4.54	2.66	2.57	3.56	4.26	4.24	3.48	5.34	5.86
3-Jul-2018	5.96	4.82	2.86	2.96	3.56	4.31	4.48	3.47	5.65	6.17
2-Aug-2018	6.29	5.56	2.84	3.69	4.38	5.02	5.09	4.02	6.10	6.67
4-Sep-2018	6.68	5.75	2.50	3.55	4.33	4.34	5.25	4.28	6.78	7.00
1-Oct-2018	6.59	5.52	2.47	3.51	4.29	4.09	5.00	4.08	6.29	6.97
3-Dec-2018	>GAGE	>GAGE	5.49	3.70	4.30	5.30	>GAGE	>GAGE	>GAGE	>GAGE
4-Jan-2019	>GAGE	>GAGE	5.18	3.59	3.75	4.00	>GAGE	5.65	>GAGE	>GAGE
1-Feb-2019	>GAGE	>GAGE	5.16	3.53	3.59	4.70	>GAGE	5.00	>GAGE	>GAGE
1-Mar-2019	>GAGE	6.05	3.76	3.59	3.55	4.60	>GAGE	4.69	>GAGE	>GAGE
5-Apr-2019	>GAGE	5.60	3.64	3.54	3.56	4.46	>GAGE	4.28	>GAGE	>GAGE
30-Apr-2019	6.58	5.26	3.16	3.44	3.40	4.38	>GAGE	4.10	6.38	>GAGE
5-Jun-2019	-	4.10	3.34	3.10	3.36	4.08	4.76	2.42	5.16	5.68
2-Jul-2019	6.18	4.94	3.00	3.46	3.34	4.58	5.60	3.54	5.94	6.48
31-Jul-2019	5.79	4.55	2.66	3.42	3.58	4.49	>GAGE	3.48	3.59	6.12

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
5-Sep-2019	5.50	4.26	2.48	3.42	3.52	4.48	>GAGE	2.96	5.30	5.84
1-Oct-2019	5.00	3.56	1.98	3.14	3.44	4.12	5.80	0.00	4.70	5.28
4-Nov-2019	5.22	3.98	2.30	3.28	3.58	4.30	6.02	3.34	4.98	5.52
3-Dec-2019	4.98	3.72	2.10	3.02	3.36	4.14	5.50	2.72	4.78	5.30
2-Jan-2020	5.70	4.52	2.66	3.38	3.40	4.52	-	3.46	5.52	6.02
3-Feb-2020	5.88	4.52	2.56	3.36	3.34	4.44	-	3.34	5.70	6.22
2-Mar-2020	6.02	4.74	2.82	3.46	3.36	4.74	-	3.44	5.82	6.34
1-Apr-2020	5.54	4.18	2.36	3.36	3.36	4.32	-	3.34	5.34	5.86
4-May-2020	5.06	3.76	2.12	3.36	3.30	4.18	-	3.36	4.88	5.38
1-Jun-2020	4.62	3.15	1.58	2.38	3.26	3.94	-	0.00	4.40	4.90
1-Jul-2020	5.12	3.86	2.10	2.64	3.38	4.18	-	2.86	-	6.44
12-Aug-2020	5.16	3.92	2.10	2.50	3.36	4.12	-	2.64	-	5.50
1-Sep-2020	5.92	4.86	2.88	3.34	3.48	4.68	-	4.22	-	6.24
12-Oct-2020	>GAGE	>GAGE	4.70	3.54	3.60	4.40	>GAGE	5.14	>GAGE	>GAGE
6-Nov-2020	>GAGE	5.84	3.66	3.48	3.52	4.26	N/A	4.40	N/A	>GAGE
1-Dec-2020	6.26	5.12	3.08	3.52	3.50	4.32	N/A	3.56	N/A	6.58

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
4-Jan-2021	6.14	5.09	3.00	3.60	3.50	4.38	N/A	3.48	N/A	6.48
9-Feb-2021	6.60	5.43	3.35	3.58	3.48	4.26	N/A	3.96	N/A	>GAGE
1-Mar-2020	>GAGE	6.16	3.90	3.57	3.43	4.26	N/A	4.62	N/A	>GAGE
5-Apr-2021	6.50	5.17	3.12	3.49	3.47	4.78	N/A	3.70	N/A	>GAGE
3-May-2021	6.64	5.45	3.21	3.48	3.40	4.86	N/A	4.00	N/A	>GAGE
1-Jun-2021	6.16	4.90	2.89	3.47	3.45	4.60	N/A	3.47	N/A	>GAGE
1-Jul-2021	6.45	5.24	3.28	3.54	3.58	4.69	N/A	3.93	N/A	>GAGE
2-Aug-2021	6.60	5.38	3.32	3.48	3.72	4.54	N/A	4.38	N/A	>GAGE
7-Sep-2021	>GAGE	>GAGE	5.50	3.60	3.92	4.40	N/A	5.78	N/A	>GAGE
4-Oct-2021	>GAGE	6.40	4.20	3.60	3.90	4.36	N/A	4.77	N/A	>GAGE
1-Nov-2021	>GAGE	6.28	4.10	3.58	3.86	4.40	N/A	4.62	N/A	>GAGE
1-Dec-2021	6.38	5.45	3.52	3.50	3.50	4.08	N/A	3.68	N/A	6.65
3-Jan-2022	6.20	5.15	3.20	3.56	3.48	4.26	N/A	3.57	N/A	N/A
1-Feb-2022	6.64	5.48	3.50	3.48	3.36	4.10	N/A	3.98	N/A	N/A
2-Mar-2022	5.90	4.74	2.86	3.44	3.30	5.18	N/A	3.36	N/A	N/A
4-Apr-2022	5.88	4.68	2.86	3.60	3.62	5.10	N/A	3.38	N/A	N/A

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
4-May-2022	5.60	4.36	2.54	3.34	3.74	4.88	N/A	3.36	N/A	N/A
1-Jun-2022	5.74	4.62	2.80	3.43	3.54	4.91	N/A	3.34	N/A	N/A
1-Jul-2022	5.50	4.18	2.46	3.38	3.64	4.76	N/A	3.35	N/A	N/A
1-Aug-2022	6.22	4.94	2.98	3.38	3.62	4.76	N/A	3.72	N/A	N/A
2-Sep-2022	6.16	4.89	2.90	3.88	3.58	4.76	N/A	3.98	N/A	N/A
3-Oct-2022	5.76	4.44	2.48	3.02	3.46	4.58	N/A	3.18	N/A	N/A
4-Nov-2022	5.08	3.76	1.90	2.68	3.46	5.06	N/A	DRY	N/A	N/A
5-Dec-2022	4.82	3.64	1.84	2.64	3.22	4.72	N/A	DRY	N/A	N/A
3-Jan-2023	5.56	4.26	2.38	2.52	3.42	5.58	N/A	DRY	N/A	N/A
1-Feb-2023	5.60	4.36	2.44	2.58	3.50	5.72	N/A	DRY	N/A	N/A
3-Mar-2023	5.28	3.88	2.08	2.06	3.30	5.94	N/A	DRY	N/A	N/A
3-Apr-2023	5.18	3.70	2.00	1.78	3.30	6.22	N/A	DRY	N/A	N/A
1-May-2023	5.78	4.88	3.10	2.12	3.44	4.12	N/A	DRY	N/A	N/A
2-Jun-2023	5.70	4.36	2.48	1.94	3.38	3.48	N/A	DRY	N/A	N/A
21-Jul-2023	5.58	4.36	2.50	2.20	NA	3.54	N/A	DRY	N/A	N/A
24-Aug-2023	5.38	4.02	2.18	1.98	3.35	3.36	N/A	DRY	N/A	N/A

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)
1-Sep-2023	-	-	-	-	-	-	-	-	-	-
16-Oct-2023	5.08	3.70	2.05	1.38	3.30	3.46	N/A	DRY	N/A	N/A
27-Nov-2023	4.70	3.12	1.87	0.80	3.20	3.50	N/A	2.15	N/A	N/A
29-Dec-2023	5.52	4.15	2.22	1.10	3.25	3.70	N/A	3.45	N/A	N/A
30-Jan-2024	5.76	4.44	2.48	1.36	3.35	5.08	N/A	3.44	N/A	N/A
20-Feb-2024	6.44	5.12	3.00	1.70	3.52	4.74	N/A	4.08	N/A	N/A
12-Mar-2024	6.34	5.04	2.98	1.70	3.48	5.52	N/A	3.70	N/A	N/A
9-Apr-2024	5.78	4.58	2.60	1.67	3.44	5.10	N/A	<GAGE	N/A	N/A
24-May-2024	5.44	4.28	2.40	1.78	3.28	4.92	N/A	<GAGE	N/A	N/A
28-Jun-2024	5.08	3.82	2.12	1.50	3.52	4.76	N/A	<GAGE	N/A	N/A
24-Jul-2024	5.04	3.78	2.28	1.81	3.64	4.86	N/A	<GAGE	N/A	N/A
20-Aug-2024	5.12	3.84	2.04	1.94	3.56	4.60	N/A	<GAGE	N/A	N/A
25-Sep-2024	4.92	3.60	1.98	1.76	3.50	4.60	N/A	<GAGE	N/A	N/A
30-Oct-2024	4.90	3.48	1.76	1.62	3.36	Dry	N/A	<GAGE	N/A	N/A
27-Nov-2024	4.88	3.62	2.20	1.66	3.42	4.62	N/A	<GAGE	N/A	N/A
31-Dec-2024	4.84	3.38	2.24	1.68	3.47	4.68	N/A	3.40	N/A	N/A

Date	Black Pond (Gage #1)	Power Line Pond (Gage #2)	Pine Log Creek (Gage #3)	Deep Edge Pond (Gage #4)	Little Deep Edge Pond (Gage #5)	Dykes Mill Pond (Gage #6)	Joiner Lake Canal (Gage #7)	Green Ponds Channel (Gage #8)	Green Ponds (Gage #9)	Dry Pond (Gage #10)

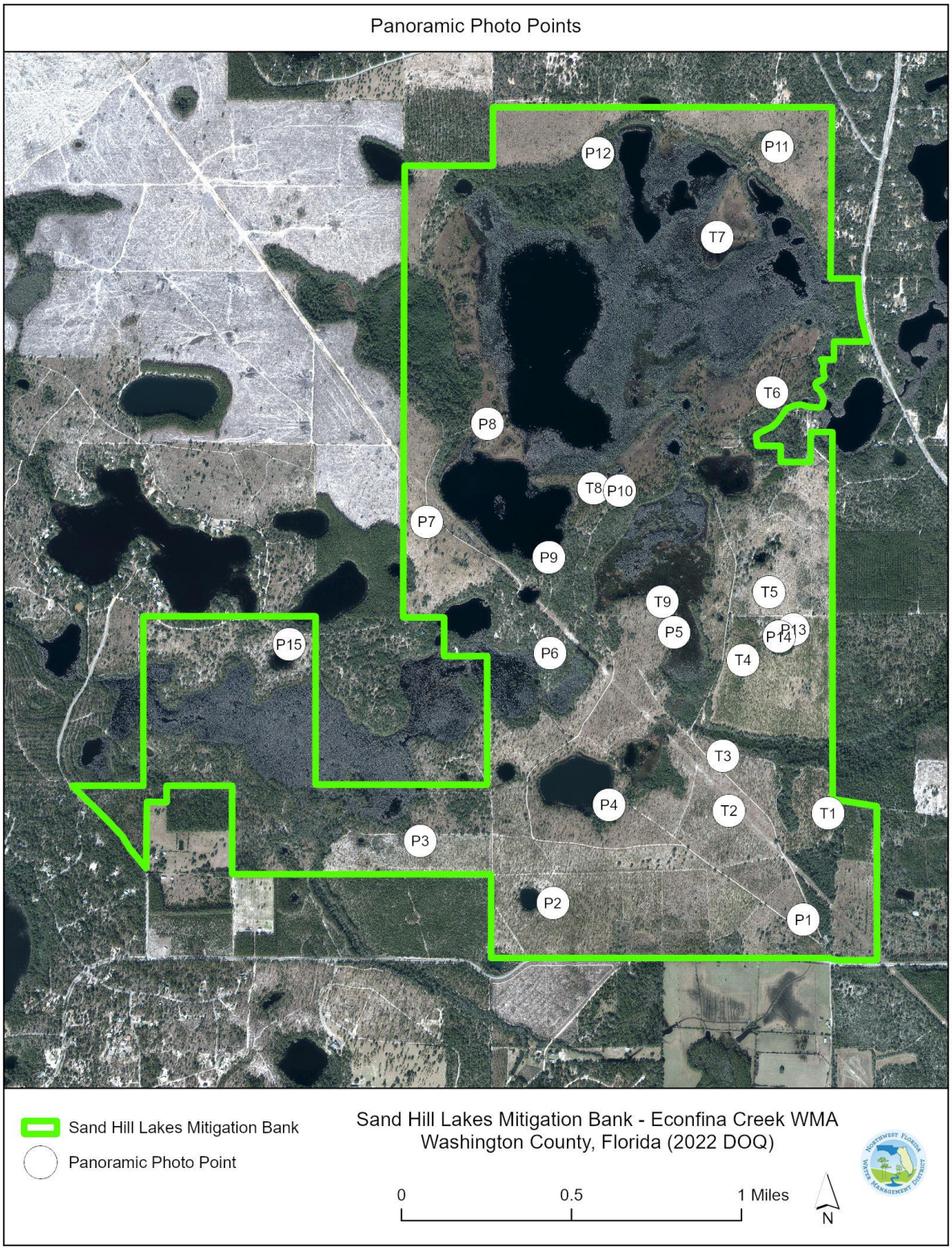
Notes:

"-" = No reading for staff gage.
DRY = Pond, channel,or canal is dry.
>GAGE = Water level is above staff gage.
<GAGE = Water level is down slope of staff gage.
N/A = Staff gage is missing.

Staff gages were generally installed in shallow water near shore. Staff gage elevations have not been surveyed. Staff gage readings are used to monitor water level fluctuations; they do not represent maximum or average water level depths. Staff gages are monitored by Florida Wildlife Conservation Commission (FWC) personnel.

Appendix D (Panoramic Photo Monitoring)

Appendix D
(Panoramic Monitoring Photos)



P1 – 2006

P1 – 2024

P2 – 2006

P2 – 2024

P3 – 2006

P3 – 2024

P4 – 2006

P4 – 2024

P5 – 2006

P5 – 2024

P6 – 2006

P6 – 2024

P7 – 2006

P7 – 2024

P8 – 2006

P8 – 2024

P9 – 2006

P9 – 2024

P10 – 2006

P10 – 2024

P11 – 2006

P11 – 2024

P12 – 2006

P12 – 2024

P13 – 2006

P13 – 2024

P14 – 2006

P14 – 2024

P15 – 2006

P15 – 2024

T1 – 2006

T1 – 2024

T2 – 2006

T2 – 2024

T3 – 2006

T3 – 2024

T4 – 2006

T4 – 2024

T5 – 2006

T5 – 2024

T6 – 2006

T6 – 2024

T7 – 2006

T7 – 2024

T8 – 2006

T8 – 2024

T9 – 2006

T9 – 2024

Note: Panoramic monitoring photos have been annually, since 2006, at each point identified in the FDEP permit. Photos from all years are available online at https://nwfwater.com/water-resources/regional-wetland-mitigation-program/regional-mitigation-plan/nwfwmd-mitigation-sites/choctawhatchee-watershed-mitigation-sites/sand-hill-lakes-mitigation-bank/panoramic-photos/.